

ABSTRACT

Economic growth in East Asia, dubbed as a miracle story by a World Bank report (1993), has inspired thinking into a new development paradigm in East Asian economies leapfrogging the industrialization process. This miracle story, however, has triggered a debate into the causes of the spectacular economic rise of the Asian economies. This debate on the Asian miracle has crossed various disciplines, spanning the political (democratic versus authoritarian rule) and cultural (Asian values versus Western values) to the economic spheres, where growth accounting studies ushered the economic controversy on accumulation (growth by increase in inputs) versus assimilation (growth by learning new technologies) behind Asia's stellar economic performance. Both results of growth accounting though of 'accumulationists' and 'assimilationists' are based on the neoclassical growth theory of Solow-Swan and depending on the assumptions on parameters such as factor shares and elasticity of substitution propose either way convincing arguments. Endogenous growth theories as well as evolutionary and Schumpeterian approaches have also proliferated in growth literature, challenging the neoclassical explanation for economic growth. Because of the assumptions and limitations of growth accounting, new approaches such as the field of influence technique of input-output analysis, which is Schumpeterian in approach, have recently emerged with promising implications and applications for growth theory.

A key assumption of input-output analysis is that the inverse of technical coefficients are fixed and yet the inverse coefficients change over time. The proponents of the field of influence approach to input-output analysis, i.e., Hewings, Sonis & Jensen (1988) assume that this change in coefficients represent technological change as sectors compete for fixed shares of inputs when producing their outputs resulting from innovation diffusion. This Schumpeterian competition operates in both production (supplying industries) and consumption (buying industries) spheres between new and old products displaying characteristics of the logistics or sigmoid curve where a period of slow growth is followed by rapid and then decelerating growth and consequent decline. Given a longer time series of input-output tables, the changes in coefficients can further depict technological diffusion across industries akin to Schumpeterian waves.

In this study, the focus is on economic growth in East Asia (particularly on Malaysia, Thailand and the Philippines), where the field of influence approach was applied over a period of four to five decades. The use of field of influence as a novel approach in studying growth episodes reveals an interesting evolution of the growth dynamics of the selected countries similarly starting out as basically agricultural and yet producing different development trajectories with the type of industries that these economies eventually promoted and developed. The creators of the field of influence approach introduced the calculation of a first order intensity of the direct field of influence of the base year that, in turn, is linked to key sector analysis of backward and forward linkages which can be ranked to form a hierarchy that depicts the economic landscape of countries over time. A second order intensity could likewise be produced, generating scaling effects of inter-sectoral linkages from which bilateral balances and imbalances through push-pull effects of backward and forward linkages are generated. Finally, the propagation of influence through feedback loops can be mapped to see how innovation diffuses throughout the entire economy.

The general purpose technology that propelled technological change in the sample Asian economies is information and communication technology (ICT) represented by the semiconductor industry classified in the national accounts under electrical machinery where the three countries competed as assemblers in the global supply chain. The semiconductor industry are among three sectors, the other two being transport equipment (automotive) and textiles/wearing apparel, which became archetypes of an emerging development paradigm of global production networks, also referred to as supplier-oriented model of development. The study ends with policy implications in targeting industries that are technology intensive in industrial policy and national innovation systems and in identifying national champions with the right balance among sectors that contribute most to growth and those that minimize vulnerabilities from sectoral or even global-specific shocks. It also indicates the need to graduate into higher value-added phases under the new development paradigm such as developing own brand and

design as well as original equipment manufacturing rather than just remaining as assembly, packaging and testing satellites.

1. Introduction

The objective of this paper is to investigate the role of technology in the Asian growth episode by applying input-output analysis. Economic growth literature has focused on explaining the sources and measures of growth between countries and whether this growth will converge or diverge between countries or groups of countries. Behind the Asian growth miracle story is the *accumulation* versus *assimilation* debate over the real source of growth in Asia where the neoclassical growth theory of Solow-Swan using growth accounting was applied by different researchers. This paper attempts to contribute to the debate by exploring new developments in dynamic input-output analysis in a technique called the *field of influence* approach. The study will focus on three Southeast Asian economies which happen to also be the most affected during the Asian crisis of 1997. These are the ASEAN member countries of Thailand, Malaysia, and the Philippines. The hypotheses put forward in this paper is that using the field of influence approach, the role of technology in growth when defined in terms of how inputs are bought from and sold to other industries or sectors in the economy could stimulate growth via multiplier effects in these sectors.

Growth accounting exercises have proven to shed little light on the causes of the Asian miracle with the use of the standard neo-classical production function to isolate the Solow residual or total factor productivity (TFP). The '*accumulationists*' view the growth process as merely attributable to the increase in productive inputs, specifically capital, and also skilled and a more literate labor force. The *assimilationists*, however, believe that there was technological progress and learning that spurred this growth process. The empirical evidence are inconclusive with different TFP estimations for the same countries even for the same periods, which are largely contingent on the assumptions about output elasticities of capital and labor, and about the specifications of the production functions. An emerging approach is the use of field of influence approach in input-output analysis that examines the changes in the inverse of the technical coefficients over time.

The structure of this paper will proceed as follows. Section 2 will survey major economic growth theories. Section 3 will discuss the accumulation and assimilation debate applied to the three selected countries. Section 4 will describe the field of influence approach and what it contributes to the study of growth. Section 5 presents results of the field of influence approach of the three Asian economies and Section 6 will conclude with policy implications, limitations of the study and scope for further research.

2. Survey of Growth Theories

The following section provides an overview of growth theories and their evolution in macro-economic thinking. These major growth theories will focus on the role of technology in economic growth.

Harrod-Domar growth model

The growth model of Harrod and Domar represents the first of a series of attempts to extend the Keynesian model of macroeconomic equilibrium from the short to the long run. Sir Roy Harrod (1939) and Evsey Domar (1946) developed the model separately. The Harrod model examined the implications of investments being induced partly by increases in income through the Keynesian acceleration principle, with the result that savings grow with increasing income. The Domar model, fused the multiplier and capacity-creating effects of investments to determine the rate of growth of income required to maintain the full-capacity utilization of a growing capital stock. The combined result is a growth model that uses the multiplier and acceleration principles to determine the growth rate of output or national income needed to maintain the Keynesian notion of equality between planned savings and investments. While the two economists used different approaches, their final results were the same as

expressed in the following equation: $g = \frac{\Delta Y}{Y} = \frac{s}{k}$, where $\frac{\Delta Y}{Y}$ is the growth rate of output, defined as g , s is the ratio of savings to GDP or the savings rate, and k is the capital-output ratio.

The equation simply states that the rate of growth of output $\frac{\Delta Y}{Y}$ is determined jointly by the national savings ratio s and the capital-output ratio k . The growth rate of output is thus positively related to s (the more an economy is able to save and invest out of a given GDP, the greater will be the growth rate of that GDP) and inversely or negatively related to the economy's capital-output ratio k . The actual rate at which economies grow for any level of savings and investment, depends on how productive is investment spending, i.e., how much additional output could be obtained from an additional unit of investment (ΔK). This productivity of investment is measured by the reciprocal of the capital-output ratio, i.e., $\frac{1}{k}$, known as the incremental capital-output ratio or ICOR. Thus we can rewrite the growth equation as: $g = s \times \frac{1}{k}$, such that the growth rate of GDP is now positively related to the ICOR (implying the more productive the investments, the higher the growth rate of output).

The Harrod-Domar growth model is premised on the assumption that the ICOR is constant. This implies that the production function employs fixed proportions of capital and labor. Therefore, we have a situation of constant returns to scale as represented by L-shaped isoquants. Such a fixed coefficient production function precludes the substitution of capital for labor or vice-versa in the production process. Another underlying assumption is that output is dependent on the amount of capital invested in the economy. The major contributions of the Harrod-Domar model to growth theory are: (i) showing the dynamic relationship between capital and output; (ii) recognizing that one period's capital formation is the next period's source of output; and (iii) emphasizing the role of savings to finance productive investments. Despite, these contributions, the model nevertheless is drawn back by: (i) neglecting the effects of relative factor prices on factor proportions so that changes in the prices of inputs could lead to a change in the combination or proportions of inputs used which in the model is assumed fixed; (ii) ignoring technological change which could save capital or labor in the production process. These limitations have led to the formulation of new growth models such as the neoclassical growth model of Solow-Swan.

Solow growth model

The neoclassical growth model, known as the Solow and Swan growth models, builds upon the Harrod-Domar model, which as mentioned in the preceding section was the very first attempt at formalizing the modelling of the growth process. While Trevor Swan (1956) developed his model independently of Robert Solow (1956, 1957), the model has been known more as the Solow model probably because his work earned the 1987 Nobel Prize in economics and because Swan's approach was less mathematically explicit even though analytically similar. Solow extended the Harrod-Domar model by: taking labor as a factor of production, introducing technology as a third independent variable, and critically, Solow's model has diminishing returns to labor and capital separately, and constant returns jointly. The ratio of capital-output and capital-labor are not fixed as they are in the Harrod-Domar model. These refinements allow the separation of: a) increasing capital intensity, and b) technological innovation.

The Solow growth model can be described by the macroeconomic production function: $Y = AK^\alpha L^{1-\alpha}$. This is a Cobb-Douglas production function where Y represents the total production in an economy. The term A represents multifactor productivity (often generalized as technology), K is capital and L is labor. The model states that there will be diminishing returns to capital as shown by the slope of the production function $y = f(k)$ expressed in per capita terms. It shows that output per worker is a function of capital per worker. Capital per worker in turn is determined by three variables: (i) investment (or saving) per worker (since $S=I$); (ii) population growth (increasing population decreases the level of capital per worker (since an economy has more labor competing for the use of a fixed amount of machines)); and (iii) depreciation, i.e., capital stock declines as it depreciates in value (becomes obsolete

over time). A high depreciation rate implies a high rate of obsolescence of capital such that firms will postpone purchases of K the faster they become obsolete.

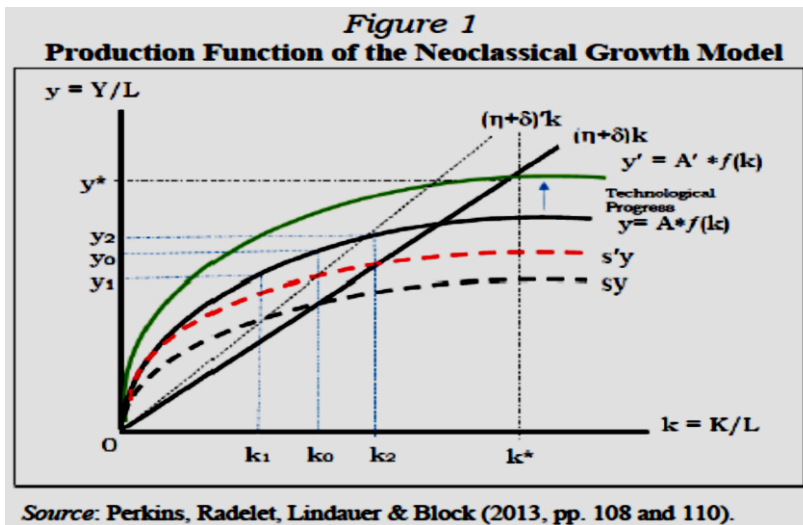


Figure 1 shows the dynamics behind the neoclassical or Solow growth model. The production function without technological progress is given as the concave curve $y = A * f(k)$ and is expressed in per worker terms. The $s'y$ curve is the savings function per worker and the capital-widening line, which is the ray from the origin, denotes the growth rates of population (η) and depreciation or obsolescence rate of capital (δ) which in the Harrod-Domar model is designated as the natural rate of growth. The

intersection of the capital-widening line with the savings function defines the steady state and projecting this point to the production function will determine the output per worker at y_0 . As represented by the concavity of the production function, the growth trajectory slows down as diminishing returns set in where a fixed A parameter is combined with variable units of capital (and labor). As in the Harrod-Domar model, an increase of savings will shift the savings function upward ($s'y$) leading to an increase in capital per worker (called capital deepening) from k_0 to k_2 and output per worker (y_2) from y_0 . An increase in population and depreciation of capital will make the capital-widening line steeper $(\eta + \delta)'k$ so that output per worker declines as more labor (population) compete for less capital, hence capital per worker declines to k_1 from k_0 and with it, output per worker (y_1). The basic question raised by the model, however, is that if the economy tends towards the steady state, how can long-term growth be generated? The answer is only through the upward shift of the production function ($y' = A' * f(k)$ curve), which is made possible by technological progress. Technological progress shifts the production function upwards, so that output per worker increases from y_2 to higher levels (y^*). However, the Solow model is unable to explain where technological progress comes from. It is exogenous in the model like 'manna from heaven'.

New Growth or Endogenous Growth Theories

The exogenous treatment of technological change as 'manna from heaven' was a major shortcoming of the neoclassical growth model. Nothing is known about the most significant variable — technological progress that affects long-run growth except that it is free for the taking. A resurgence of interest in growth theories in the late 1980s, led to a new generation of growth models that sought to explain the growth rate of the economy as an endogenous process when it comes to the role of technology. These became known as new growth or endogenous growth models.

Endogenizing growth in these models entails the relaxation of the 'diminishing-marginal-returns to-capital' assumption of the neoclassical model. Evidently, there would be no incentive to invest in a factor such as capital if its returns were diminishing as an economy accumulates more of it and only find that growth would vanish in the course of time. For growth rate in output to remain positive, the factor that is accumulated should therefore exhibit at least constant marginal returns or much better if it exhibited positive externalities.

The AK models are the simplest endogenous growth models that specify a production function, which is linear in only one input — capital. The production function takes the form: $Y = AK$, hence the name "AK" model, which Sala-i-martin (1990) describes as the micro-foundation of all other endogenous

growth models as they build upon it and become variations of this basic framework. Salvadori (2003b) notes that historically though, the determination of growth as an endogenous process in a one-sector model dates back to the Harrod-Domar model with the exception that the new growth models ala AK type derive the savings or consumption behaviour as part of an inter-temporal optimization problem rather than being imposed as in the Harrod-Domar setup. Capital here is defined not only as the physical type but broadened to include other forms like human capital, stock of knowledge, and financial capital to ensure that diminishing marginal returns that usually accompanies physical capital is ruled out. The simplest version of the model is attributed to Romer (1986) and Rebelo (1991).

One taxonomy of how endogeneity is achieved in new growth models is found in Verspagen (1990) who uses the competitive market-clearing assumption as his starting point. Since technological progress is assumed to be exogenous, it is freely accessible and hence, depicts characteristics of a public good, which means it is obtainable at zero costs. But the neoclassical model does not adequately and convincingly answer who produces and shoulders the cost of this new technology. Endogenous and new growth theory, following the Schumpeterian concept of appropriating innovation, settles the issue of the public good character of technology by introducing monopoly power and externalities or spillover effects as means of appropriating this new technology. Thus, we have endogenous models that involve externalities such as Romer (1986) and Lucas (1988), and those that involve a research sector producing innovation through monopoly power as in Romer (1990), Grossman & Helpman (1990a, 1990b, 1991), and Aghion & Howitt (1990, 1992). Verspagen (1990) summarizes the endogenization of technological change in new growth theory in Appendix Table 1.

Lucas (1986) and Romer (1990) introduced the positive externality by introducing human capital and R&D blueprints, respectively. For Lucas, investments in human capital will raise the average skills level of the economy thereby raising productivity of all factors (e.g., the higher the education level, the more the positive externality on the non-educated in society). The production function is now revised to add this positive externality, \bar{h} representing the external or spillover effect of human capital such that: $Y = AK^\alpha(\mu hL)^{1-\alpha}\bar{h}^\beta$, where μ is the fraction of time devoted to production and h the internal effect of human capital. Note that adding the exponents will be greater than 1: $\alpha+(1-\alpha) +\beta = 1+\beta$ denoting increasing returns to scale. For Romer, the blueprints of new designs produced by the R&D sector will lead to increasing returns since firms will have access to prior discoveries or the existing stock of designs to improve factor productivity. It could be observed that this production function is similar to the equation for human capital accumulation except that knowledge or blueprints (χ) or R&D outputs such as patents replace human capital in the notation: $Y = AK^{\alpha+\beta}\chi^{1-\alpha}$.

The key idea is that in new growth theories, the output elasticities represented by the exponents in the Solow model are not equal to unity (constant returns) but now are greater than unity (increasing returns) because of the positive externalities introduced by education or human capital investments (Lucas version) or R&D outputs (Romer version). There are other more versions of endogenous model typologies. Van Meijl (1995) presents three possibilities for keeping constant the marginal returns to capital which are by: (i) simply assuming constant returns to capital and labor is not productive, i.e. $\beta=1$ and $\alpha=0$, which was the model of Rebelo (1991) or that labor is not growing, as assumed by Romer (1986); (ii) keeping the productivity of capital positive by allowing increases in total factor productivity as in Lucas (1988), Romer (1990), Aghion and Howitt (1998), Grossman and Helpman (1989, 1990a, 1990b, 1990c, 1991), among others; and (iii) keeping the growth rate of labour positive, as in the labour accumulation models mentioned above.

Schumpeterian theory of innovation

The neoclassical and early endogenous growth explanations of technological change and economic growth are grounded deeply in the theory of the firm and production theory in a competitive setting. Firms are viewed as facing choice sets about inputs to be procured and outputs to be produced with the objective of maximizing profits and reaching equilibrium when demand balances supply in all relevant

markets. Growth in the system is just a time path traced by these maximizing firms reacting to changes in demand and factor supply conditions as well as technological advances. Schumpeter (1934) portrayed an alternative view of the growth process that places the real drivers of the system at its core — innovating entrepreneurs. What makes the Schumpeterian alternative distinct is that the competitive environment of firms is not oriented towards static equilibrium conditions but rather characterized as a dynamic and selective process.

Schumpeter proposed the view that capitalism could not be treated as a stationary process but rather that of recurring structural changes called ‘gales of creative destruction’ followed by waves of expansion and growth. The innovating firm or entrepreneur activates economic growth by actively searching for new products, new methods, new markets, new supply sources, and new organizations in production processes. Schumpeter suggested that during periods of crisis (recession), firms will undertake creative destruction (look for new processes, invent new products) to increase sales and to survive during difficult times. These novelties listed above will drive the firm and eventually the economy towards recovery in the business cycle. The *long wave theory of innovation* tests this Schumpeterian belief that new innovations will swarm during periods of crisis and seem to present evidence of waves of innovation created that drive a new economic order (e.g., steam, electricity, computers, etc.). These innovations bring about changes in the economic structure, which are not exogenous, but come from within the system. The long-term perspective of economic growth is thus seen in qualitative changes, which are difficult to model formally or empirically, and the generation of economic diversity, which is the basic source of innovation.

Evolutionary School

The Evolutionary School is a branch of growth theory that uses biological evolution to construct a theory of the firm. The evolutionary approach is traced to Schumpeterian economics where the generation of economic variety through radical innovations is central to economic development. This is combined with the Darwinian theory of evolution who established a principle of natural selection governing species called ‘survival of the fittest’. A number of elaborate publications on the whole topic of evolutionary economics have mushroomed, notably those of Nelson & Winter (1982a), Nelson (1995), Saviotti and Metcalfe (1991a), Dosi and Nelson (1994), Andersen (1996), Hodgson (2002, 1998, 1993), Verspagen (2000) and Dopfer (2001). Nevertheless in these works, three basic principles have emerged as governing the evolutionary approach to technological change.

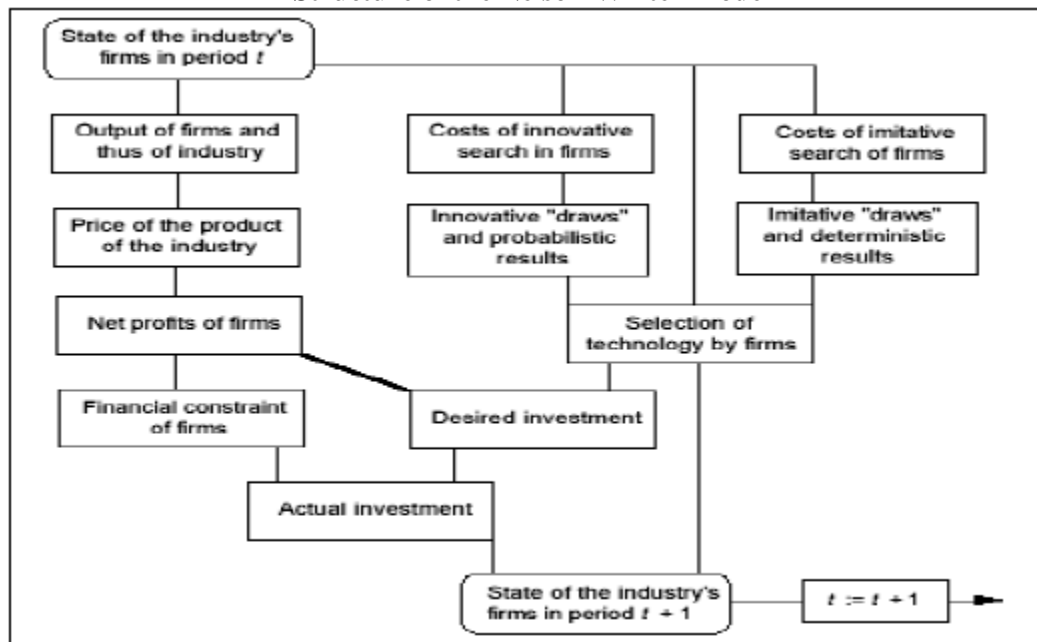
These three Darwinian principles applied to evolutionary economics are: (i) process of search and selection, (ii) hereditary mechanisms (genetics) by which characteristics are passed on to succeeding generations, and (iii) the emergence of variety or novelty (mutation). Firms search and select new routines and technologies by innovation or imitation of existing routines in competitor firms. Firms also pass on their organizational competence, knowhow and skills to next generations of workers by codifying knowledge, take-overs and acquisitions and mergers with other firms and also through labor piracy. Finally, firms generate variety of new technologies and competences through product and process innovations.

The evolutionary theory of the firm is attributed to Nelson & Winter (1982a) who applied the metaphor of biological evolution to firms. The basic idea of the Nelson & Winter model shown in Figure 2 is that the state of the industry at a certain period inherits from the previous period the size of physical capital stock (K_{jt}) and the productivity of capital (A_{jt}) for each of the individual firms which is aggregated to yield the total output or supply of the industry. Each individual firm follows a full-capacity utilization rule so that actual output equates to the maximum output for each firm. The search process for new combinations of capital and labor coefficients assumes two different forms: local search or innovation and imitation. The former means that firms search for new techniques not yet available in industrial applications whereas the latter means that the firm looks for techniques presently employed by

competitor firms but not yet used in its own production process. The probability that firms innovate or imitate depends on R&D funds that are determined as a ratio to the level of physical capital.

The main selection force in the model is the rate of return on techniques. The willingness of a firm to invest in search depends not only on the character of its search routines but also on its ability and willingness to finance these investments. The ability to finance in turn is dependent on how profitable the firm is. A firm's capital stock shrinks if it makes losses, acting as another filtering force for firms that cannot keep pace with technological advances of competitors to withdraw from the industry. If firms are financially constrained to make investments out of retained profits, loans from banks are resorted to, calculated as proportional to profits so that bank's decision rules (institutions) play a role in the evolutionary process. The firm therefore has a financial constraint based on availability of internal (retained earnings) and external funds (loans). The investment decision of each firm is governed by an investment function that depends on the firm's market share, price elasticity of demand, firm's profit per unit of capital, and bank policy. Desired investment is determined by the actual mark-up of price over costs and the desired mark-up that is influenced by the firm's market share. The actual or maximum investment made by the firm depends on current profits plus loans from the banks calculated in proportion to profits. The changes in physical capital affect production in the next period.

Figure 2
Structure of the Nelson-Winter Model



Source: Andersen (1996), p. 104.

Evolutionary theorizing also reveals four unique properties that distinguish it from other strands of research on growth and technology. These four properties stem from the fact that the multiplicity and uncertainty of outcomes makes it difficult to predict which technology will succeed or be selected. Brian Arthur (1989, 1988a, 1988b) names these properties as: (i) *existence of multiple equilibria*, (ii) *likelihood of inefficiency*, (iii) *path dependency*, and (iv) *possibility of 'lock-in' solutions*. These properties are attributed to what he calls 'self-reinforcing mechanisms' such as increasing returns, indivisibilities, network externalities and learning by doing such that minute differences in initial conditions could determine long-run outcomes. He illustrates the case of the Sony Betamax and VHS technology to explain these properties.

Multiple equilibria means that two different asymptotic market shares for the competing technologies lead to indeterminate, and unpredictable solutions which are likewise not unique, hence chaotic. At the start, both Betamax and VHS prevalence in the market encourages video outlets to stock film titles in either

format so it was difficult to say in advance which technology would dominate. Possible inefficiencies mean that an inferior (superior) technology could in fact dominate (disappear from) the industry as in the case of the Betamax, which was believed to be technically superior in terms of sound and picture quality to the VHS but by ill-timing or bad luck did not gain enough foothold in the market. *Lock-in* effects refer to the case where the dominant technology creates a barrier for the other technology to re-enter the market again. Thus, the videocassette recorder (VCR) technology was locked into the VHS format and the Sony Betamax recorder became an extinct technology. Finally, *path-dependency* connotes that initial conditions or early history such as first-mover advantages or ‘founder status’ determines which technology would prevail. When VHS cassette producer first introduced the bulkier VHS tapes with extended two hour playing time in response to consumer need to pre-tape television programs, it took the lead and eventually captured the whole market. Another often-cited example of both ‘lock-in’ and ‘path-dependent’ technology is the QWERTY mechanical typewriter keyboard, which according to David (1985) was developed to slow down typing to prevent frequent jamming on mechanical typewriters. The QWERTY keyboard became the universal keyboard even in the age of microcomputer technology and precluded entry of more speed.

3. Survey on the Accumulation vs Assimilation Debate on Solowian Growth Accounting

This section presents the economic debate surrounding the East Asian miracle triggered by Krugman (1994) who used Young’s (1992) results in declaring that the miracle story was actually a myth and comparing Asian growth with that of the Soviet Union, where diminishing returns were imminent to occur. The productivity debate is not exclusive insofar as the Asian miracle is concerned but is in fact, as noted by Hulten (2000), a long-standing controversy in growth theory. He typifies Marxian and neoclassical theories as attributing growth to productivity gains driven by technological advances and organization of production (i.e., assimilation), while new growth theory and the neoclassical theory of capital and investments, as assigning greater weights to incremental investments in fixed and human capital, in explaining growth (i.e., accumulation).

Table 1
Comparison of Two Contesting Paradigms
on the Productivity Debate in Asia

<i>Dimension</i>	<i>Accumulation View</i>	<i>Assimilation View</i>
Engine of Growth	Investments in physical and human capital	Human capital and innovation and entrepreneurship
Nature of Technology	Codified in blueprints	Tacit and cumulative
Effect of human capital accumulation	Increased quality and effectiveness of labor	Increased ability to search, learn and innovate
Technology alternatives	Embodied, available and accessible	Need to be searched, acquired and learned
Determinants of firm decisions	Market incentives and constraints and the external environment	Firm’s search and learning ability and daring
Role of entrepreneurship	Automatic result of massive investments	Key to overcoming uncertainty
Inducement structure	Getting prices right for efficient allocation	Successful entrepreneurship
Reasons for strong export performance	Change in comparative advantage arising from changes in input accumulation	Government incentives to push exports and learning to compete in world markets
Ex-post elasticity of substitution	High	Low

As far as the productivity debate concerns Asia, Chen (1997), Felipe (1999, 1997) and Chris Rodrigo (2001) provide detailed and comprehensive surveys of total factor productivity studies on the East Asian economies. The *accumulation* versus *assimilation* debate is borrowed from Nelson and Pack (1995, 1999) who coined the terms to describe the two different interpretations of the Asian growth story. According to them, the *accumulationists* and *assimilationists* differ in the following dimensions: engine of growth, the nature of technology, the effect of human capital accumulation, determinants of firm decisions, the role of entrepreneurship, inducement structure, reasons for strong export performance, and the ex-post elasticity of substitution. These differences are summarized in Table 1 and explained in the subsequent descriptions of each view.

The main empirical framework used in this productivity debate is the growth accounting framework which is derived from Solow's neoclassical growth model. Given the Cobb-Douglas macro production function: Y (or GDP) = $AK^\alpha L^{1-\alpha}$, the equation could be linearized by taking the growth rates (logarithms). Hence, one arrives at: Growth rate of GDP = $g(A) + \alpha * g(L) + (1 - \alpha) * g(K)$, which are now additive. The new equation simply tells that growth in the economy can arise from technological progress (growth in A), or growth in labor supply, or growth in capital stock (investments in machinery and equipment). Hence, growth is broken down into its causes – growth in inputs capital and labor or advances in technology.

Because of difficulties in measuring technological advancements compared to capital and labor which are easily calculable using national income accounts and employment statistics, the growth in A or technology is normally taken as a residual given the growth rate of GDP in the equation. Thus, the A term is referred to as the *Solow residual*. It stands for *everything else* that explains growth aside from growth in inputs capital and labor. As an all exclusive term, it is called total factor productivity or TFP to take into account other determinants of growth aside from capital accumulation and growth in labor supply now dumped under this A term. Because it is a residual, Abramovitz (1956) referred to it as the 'measure of our ignorance' since the Solow residual includes all other factors besides input accumulation that could not account for growth. These could be technical change and organizational innovation, as the Solow residual is mistakenly identified with, but also other factors such as measurement errors (e.g., capital stock measurement), omitted variables (e.g., cultural, political and other determinants of growth), aggregation bias (e.g., summing up firm level data to macro level indicators) and model misspecification (e.g., Cobb-Douglas constant returns to scale production function).

3.1 Accumulation: Growing by Perspiration

Economists who support the accumulation view attribute the lion's share of increased per capita incomes in Asia as originating from increases in physical and human capital per worker, hence, it is mainly input-driven. Their emphasis is on explaining how investments enable the Asian economies to move 'along their production functions'. This implies that if other countries marshalled the same investment effort, growth and development would ensue. *Accumulationists* tend to believe that much of technological knowledge is codified and what matters for growth is to simply acquire these blueprints. The technological possibilities and alternatives are available to firms and the fact that the Asian countries were able to fend off diminishing returns reflects the extensiveness of the technological frontier already in use in other countries that have been made available to them as the high elasticities of substitution also show. This set of technological possibilities are defined in terms of parameters of a conventional production function and ignores the process of search and learning and mastery of technology that the assimilationists would instead focus on.

The *accumulationists* also perceive the increase in educational levels in the high-performing Asian economies as just a shift to a more capital-intensive form of production, i.e., a rise in human capital that raises the quality or effectiveness of labor. There is also a passive role for entrepreneurship except that this was an automatic result of the massive investments in physical and human capital. Entrepreneurs or owners of firms react to the incentives and constraints offered to the firm and choose the most profitable set of actions. Finally, the accumulation view sees the surge of manufactured exports in the Asian economies as

comparative advantage in motion. Comparative advantage merely shifted to sectors or industries that intensively used the rapidly rising stocks of physical and human capital inputs.

The accumulation view is associated with the work on productivity growth in East and Southeast Asia conducted by Young (1992, 1994a, 1994b, 1995); Kim and Lau (1994); Nehru and Dhareshwar (1994) and Collins and Bosworth (1997). Their findings typify the view that development in the miracle economies was characterized more by ‘hard work rather than by smart work’, hence *growing by perspiration*. Using growth accounting, their findings revealed that the main source of East Asian growth was capital accumulation, with total factor productivity growth calculated at zero to even negative for some countries in the last two to three decades prior to the Asian crisis. Economists who wanted to confirm the Young, Kim & Lau and Bosworth studies eventually came up with findings that also support the input or endowment-driven view such as those of Osaka (1994), Park & Ryu (2003) and Hahn & Kim (2003). A comparison of assumptions and empirical results of the key ‘*accumulationists*’ are presented in Table 2.1. There are other analyses done supporting the accumulation view but more specifically focused on the sources of growth in individual countries or pairs of countries. These studies are listed in Table 2.2 and their findings show that TFP growth in these countries have been low and in some cases even negative, and that the contribution of TFP growth to overall growth has been second, if not third, to growth of capital or labor inputs. Hence, economic growth in these countries, as concluded by these studies, is more input-driven or endowment-driven rather than productivity-driven.

3.2 Assimilation View: Growing by Inspiration

The assimilation view emphasizes the role of entrepreneurship, innovation and learning, and the mastery of new technologies in the spectacular growth of the East Asian economies, with investments in physical and human capital only as necessary but not sufficient conditions. This is because using these new technologies acquired in the 1970s and 1980s that were not available to them in the 1950s and 1960s required the learning and development of new skills and organizational improvements as well as marketing abilities to become competent in new markets.

The ‘*assimilationists*’ believe that much of technological knowledge is tacit and not codified in blueprints as ‘*accumulationists*’ think so that learning by doing and acquiring mastery over these technologies mattered. As for rising educational levels, the ‘*assimilationists*’ perceive this as a necessary adjunct to the development of successful entrepreneurship with the build-up of a cadre of engineers and scientists and managers that have a comparative advantage in searching for new opportunities and learning new mechanisms, thus *growing by inspiration*. The role of entrepreneurship is focal in the assimilation view because new ventures carry with it uncertain profitability that requires daring of firms and their decision-makers. Finally, in terms of the export surge in the Asian economies, the assimilationists while not denying the workings of comparative advantage, credit this to innovation and learning that firms had to muster with government’s support to enable them to effectively compete in international markets. Table 3.1 compares the assumptions and key results of the *assimilationists*. Other economists and scholars calculated TFP at the macro level but focused more narrowly on individual countries and their findings support the assimilation view. These studies are listed in Table 3.2.

There are other economists and scholars who have contested the accumulation view but without necessarily conducting growth accounting exercises. They resorted to comparing TFP trends of the Asian economies with that of the Western industrialized countries or providing micro-evidence that there was indeed technological learning and mastery in the case of the East Asian economies either through case studies or growth accounting at the plant or firm-level. Case studies of technological capability building, learning and mastery of foreign technology either through imitation or innovation are provided by Enos and Park (1988), Westphal (1990), Hobday (1994a, 1994b, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1996e, 1997, 1998, 2000), Kim & Dahlman (1992), Dahlman & Westphal (1981), Dahlman & Sercovich (1984), Dahlman, Ross-Larson & Westphal (1987), Dahlman & Sananikone (1990), Kim (1997), Lee & Lim (1998), Kim & Nelson (2000), and Pack (2001). These case studies document evidences of leapfrogging and in most instances, the painstaking and cumulative process of technological learning and

acquisition that firms in the East Asian economies went through in ascending the technology ladder. The build-up of technological capability in areas of electronics, automotive, steel, shipbuilding, and consumer appliance industries only serve to confirm that technological assimilation did take place. The work done by these scholars also serve to support the observations of Stiglitz (1998) who remarked that: ‘.... Any visitor to the cities and factories in East Asia comes away impressed by the enormous technological progress in the last decades. The Young, Kim, Lau, et al. results are simply not very robust....East Asia has seen impressive productivity growth in recent decades.’

3.3 Issues and Implications for Growth Empirics: *The ‘Last’ of the Residual?*

Felipe (1997, 2006), Chen (1997, 1977), and Chris Rodrigo (1998, 2001) provide a thorough discussion of the various issues involved in growth accounting. A better understanding of the accumulation-assimilation debate using growth accounting should reveal theoretical or conceptual issues, empirical issues and policy inferences arising from the empirical exercises.

Theoretical and Conceptual Issues

The theoretical or conceptual issues relate to the interpretation of the residual as technological progress, the idea of an aggregative production function and the embodiment of technological advance in capital goods. The residual can generally be defined as the determinant of growth not explained for by factors or inputs used in production. To equate the residual to technological progress ignores other determinants to growth that could have played a role such as social capital, the policy regime and other political, social, cultural and non-economic forces that could influence economic growth and hence are technically covered by the residual. Thus, the residual cannot be entirely interpreted as total factor productivity. Prescott (1998) observed that differences in TFP account for large international income and productivity gaps between countries, invoking the need for a theory of TFP. Such theory according to him ‘*must account for differences in TFP other than those arising from growth in the stock of technical knowledge*’. Therefore, TFP could not be assumed to encompass entirely technological progress.

A second theoretical issue involves what is known as the aggregation problem. The aggregate production function, the bulwark of the neoclassical growth model, simply does not exist at the macro-level. One cannot just add up the production functions of firms to build up the aggregate production function and even if one could, the economic sense is baseless. This is because the aggregate production function expresses the technological relationships of the macro-economy; to be precise it measures the maximum or optimal output producible given the input or factor bundles. Summing up micro production functions presents a conceptual dilemma since the production function of a multinational automotive manufacturing corporation and the production function of an agricultural enterprise and the production function of an ICT service firm cannot just be added up because these are heterogeneous entities, e.g., ‘adding up apples and oranges’, unless some formula exists that converts heterogeneous quantities into a homogeneous whole. In fact this aggregation problem appears equally with two or a thousand firms but becomes more pressing the greater the number of firms, as they will differ in multiple ways that would prevent aggregation.

Felipe and McCombie (2003) and Felipe (2000) contend that growth accounting results from the specification of an aggregate production function using aggregate output and input data from the national income accounts are tenuous. The income identity relating value-added output to the sum of the wage bill and overall profits just happens to be written in a form that resembles the production function. Because growth accounting data come from an accounting identity, this will always yield a good statistical fit to the data that coincidentally displays the properties of a neoclassical aggregate production function. The parameters resulting from such estimation however does not capture a technological relationship that an aggregate production function is supposed to represent. At best, it just shows how national income is divided between labour income and capital income and not the technological relationship between output and inputs. Because of the difficulty of differentiating between the accounting identity and the production

Table 2.1
Comparison of Growth Accounting Empirics of the ‘Accumulationists’

	<i>Young (1992, 1994a, 1994b)</i>	<i>Kim & Lau (1994, 1996)</i>	<i>Nehru & Dhareshwar (1994)</i>	<i>Osaka (1994)</i>	<i>Collins & Bosworth (1997)</i>	<i>Park & Ryu (2003)</i>	<i>Hahn & Kim (2003)</i>
ASSUMPTIONS							
• Production function	Trans-logarithmic	Trans-logarithmic Meta-production function approach	Various models (Cobb-Douglas, CES and translog) with physical capital, labor and human capital	Trans-logarithmic (with physical capital and employment)	Cobb-Douglas (with physical capital per worker and education per worker)	Cobb-Douglas and homothetic variable returns to scale on meta-production function approach	Cobb-Douglas (with physical capital, labor and human capital)
• Returns to scale	Imposed (constant)	Estimated (Diminishing)	Imposed (constant)	Imposed (constant)	Imposed (constant)	Estimated (Increasing and constant compared)	Imposed (constant)
• Elasticity of substitution	Any value	Any value	Unity	Any value	Unity	Any value	Unity
• Perfect competition	Imposed	Estimated (rejected)	No assumptions made	Imposed	Imposed	No assumptions made	Imposed
• Technical progress	Imposed (Hicks neutral)	Estimated (Capital-augmenting)	Imposed (Hicks neutral)	Imposed (Hicks neutral)	Imposed (Hicks neutral)	Factor-augmenting (Both capital and labour)	Imposed (Hicks-neutral)
•							
• Technology	Common across countries	Common across countries and firms in terms of efficient-equivalent inputs	Common across countries	Common across countries	Common across countries	Common across countries	Common across countries
METHODOLOGY							
• Measurement of physical capital	Perpetual inventory method with geometric depreciation based on a formula; the initial capital stock is taken assuming	Derived as accumulation of gross fixed capital formation in non-residential assets (equipment and structure) in 1980 prices	Not explained	Perpetual inventory method, 5% assumed rate of depreciation, initial capital stock 1959 data World	Perpetual inventory method, geometric depreciation rate of 4%, initial capital stock	Physical capital stock constructed using real gross fixed investments based on perpetual inventory method	Same as in Nehru and Dhareshwar (1994)

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

	growth rate of investment in the first 5 years of the investment series	but no depreciation assumed		Bank database “STARS”	1950 data World Bank database	and initial capital stocks based on Boskin and Lau (2002)	
• Sample countries	Gang of Four (South Korea, Singapore, Hong Kong and Taiwan)	Group of 5 industrialized countries (France, West Germany, Japan, UK and USA) and the four NICs (Hong Kong, Singapore, South Korea and Taiwan)	Selected OECD, African, Middle Eastern, South Asian, European, American. Among East Asian economies included were: Myanmar, China, Indonesia, South Korea, Malaysia, Philippines and Thailand	South Korea, Thailand and the Philippines	Indonesia, South Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan	G-5 countries (USA, Japan, West Germany, France and UK) and four NIEs (Hong Kong, Taiwan, Singapore and South Korea)	Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan and regions (East Asia, Latin America, Middle East, South Asia and Sub-Saharan Africa)
• Estimation period	1960-1985	Various starting dates for countries (as early as 1953 for Taiwan to 1990 for other countries)	1960-1990	1960-1993 broken into 3 subperiods: 1960-70, 1971-80, 1981-93	1960-1994 broken into 4 subperiods: 1960-73, 1973-94, 1973-84, 1984-94	Same as Kim & Lau’s (1994) study but extended to 1995	1960-1990
• Approach	Econometric	Econometric	Econometric and error correction model	Growth accounting and econometric (co-integration test)	Growth accounting	Econometric	Growth accounting and econometric regressions
<i>EMPIRICAL FINDINGS</i>							
• Level of capital shares (α)	Average of 0.37 for Hong Kong, 0.60 for Singapore, 0.19 for South Korea and Taiwan	0.44 to 0.67 input shares do not add up to unity because of diminishing returns to scale	0.5 when human capital is not included and below 0.4 when human capital is included	Very high ranging averaging 0.59, 0.63 and 0.72 for 3 sample countries	0.35 for the entire sample	Variable	0.35 for entire sample, and 0.4 when human capital is included as an input
• Total Factor Productivity growth	Negligible, ranging from -0.3% to 2.3%	Close to zero	Negligible	Negligible	Low but rising in the latter period 1984-1994	Negligible because of scale effects	Low and not remarkably higher than other developing regions
• Contribution of TFP growth to total output growth	Not discussed but implicitly low	Low ranging from zero for all Asian NICs under first estimate; 14%-35% under second estimate and -6% to 27% for conventional estimate	Low because of high human capital contribution	Negative	Low throughout all subperiods but high in 1984-1994 (except for the Philippines)	Negligible under increasing returns to scale	Low

Source: Author’s compilation.

Table 2.1
TFP studies on individual East Asian economies
leaning towards the accumulation view

THE ACCUMULATIONISTS				
Country	Author	Period	Method	Average TFP growth (%)
Japan	▪ Norsworthy & Malmquist (1983)	1965-1978	Translog function with gross output	0.91 to 1.64
	▪ Jorgenson et al. (1960-1979)	1998	Translog quantities index	0.83
	▪ Morrison (1990)	1960-1981	Generalized Leontief cost function	0.99
	▪ Inoue (1995)	1961-1993	Not explained	-0.7 to 4.1
	▪ Wolff (1996)	1950-1989	Growth accounting	0.11 to 4.92
	▪ Nakajima et al. (2004)	1960-2000	Growth accounting	-0.16 to 5.903
South Korea	▪ Pyo & Kwon (1991)	1960-1989	Growth accounting	1.65
	▪ Pyo et al. (1993)	1970-1990	Growth Accounting	1.31
	▪ Kang & Kwon (1993)	1963-1983	Growth accounting with cost function	0.16 to 3.43
	▪ Kwak (1994)	1970-1988	Growth accounting	1.51
	▪ Park & Kwon (1995)	1973-1983	Generalized Leontief cost function	-1.6
	▪ Pyo (1995)	1970-1992	Growth accounting	1.09
	▪ Kim (2000)	1966-1988	Traditional approach	1.9
	▪ Kim (2000)	1966-1988	Modified approach	0.5
	▪ Yuhn & Kwon (2000)	1962-1981	Growth accounting with cost function	1.52
	▪ Lee (2004)	1972-1999	Traditional approach	1.94
	▪ Lee (2004)	1972-1999	Modified approach	0.3 to 1.3
	▪ Timmer (1999)	1963-1993	Tornqvist TFP index (indexed to USA=100)	23 to 45.5
Taiwan	▪ Liang (1995)	1973-1987	Growth accounting	0.12 to 1.41
	▪ Chuang (1996)	1975-1990	Econometric	1.9
	▪ DGBAS (2000)	1978-1998	Tornqvist TFP index	1.9
	▪ Timmer (1999)	1963-1993	Tornqvist TFP index (indexed to USA=100)	36.8 to 40.8
Singapore	▪ Tsao (1985)	1970-1979	Growth accounting	0.08
	▪ Rao & Lee (1995)	1976-1994	Growth accounting	-0.4 to 3.2
	▪ Wong & Gan (1994)	1981-1990	Growth accounting	1.6
	▪ Toh & Low (1996)	1970-1992	Growth accounting	1.37
	▪ Bloch & Tang (2000)	1975-1994	Generalized Leontief cost function (sectoral)	-8.8 to 2.5
	▪ Thangavelu (2004)	1970-1998	Growth accounting	-2.46 to 2.74
	▪ Wu & Ping (2002)	1991-2001	Growth accounting	1.6
Hong Kong	▪ Kwong et al. (2000)	1984-1993	Growth accounting	-1.53
	▪ Imai (2001)	1981-1997	Growth accounting	0.2 to 2.4
	▪ Voon & Chen (2003)	1966-1996	Growth accounting	0.39
	▪ Kee (2005)	1984-1997	Econometric	-1.75
Malaysia	▪ Gan & Robinson (1993)	1975-1991	Econometric	Low
	▪ Zarina & Shariman (1994)	1978-1992	Growth accounting	Negative
	▪ Okamoto (1994)	1981-1990	Growth accounting	-1.9 to 0.3
	▪ Ab. Walab (1996)	1990-1997	Growth accounting	1.3
	▪ Choong & Tham (1995)	1986-1990	Growth accounting	0.64
	▪ Tham (1997)	1986-1991	Econometric	0.3
	▪ Tham (1998)	1986-1993	Econometric	0.1
	▪ Gan & Soon (1998)	1974-1995	Growth accounting	1.6
	▪ Menon (1998)	1988-1992	Growth accounting	0.205
	▪ Oguchi et al. (2002)	1992-1996	Growth accounting	1.0
▪ Muhamad (2004)	1981-2001	Growth accounting	1.08	
Thailand	▪ Wiboonchutikula (1982)	1963-1976	Growth accounting	Declining
	▪ Brimble (1987)	1973-1983	Econometric	Negative to 7.62
	▪ Limskul (1988)	1960-1986	Econometric	Negative
	▪ Urata & Yokota (1994)	1976-1988	Growth accounting	0.7 to 1.8
	▪ Kraipornsak (1995)	1971-1996	Econometric	-1.25 to 1.6
	▪ Chandrachai et al. (2004)	1977-1999	Growth accounting	1.27
Indonesia	▪ Osada (1994)	1985-1990	Growth accounting	-2.7
	▪ Aswicahyono (1999)	1976-1993	Growth accounting	0.49
	▪ Sigit (2004)	1980-2000	Growth accounting	-0.80
	▪ Timmer (1999)	1963-1993	Tornqvist TFP index (indexed to USA=100)	17.8 to 20.0

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

Philippines	▪ Williamson & Sicut (1968)	1957-1968	Growth accounting	1.0
	▪ Williamson (1969)	1947-1965	Growth accounting	1.367 to 1.489
	▪ Patalinghug (1980)	1956-1970	Growth accounting	-5.0
	▪ Sanchez (1983)	1957-1978	Growth accounting	-0.15
	▪ Hooley (1985)	1957-1980	Growth accounting	-0.26
	▪ Kajiwara (1994)	1984-1988	Econometric	-0.6
	▪ Austria & Martin (1995)	1950-1987	Econometric	-2.54 to 6.28
	▪ Cororaton et al. (1996)	1957-1992	Sectoral growth accounting	-6.17 to 7.41
	▪ Austria (1998)	1960-1996	Growth accounting	-0.116
	▪ Lim (1998)	1975-1997	Econometric	-0.9
	▪ Cororaton & Caparas (1998)	1980-1996	Growth accounting, translog index, econometric	-0.097 to 0.052
	▪ Cororaton & Abdula (1999)	1958-1991	Growth accounting	0.0294
	▪ Yamagata (2000)	1956-1980	Growth accounting	-3.6
	▪ Cororaton & Cuenca (2001)	1981-1998	Translog Index	-0.00359
	▪ De Silva (2001)	1971-1998	Growth accounting	-0.8
	▪ Cororaton (2002, 2004)	1967-2000	Growth accounting	-0.24

Sources of Basic Data: Sun (2005), Felipe (1997), Park (2001), Said et al. (2003) and added compilations of this author.

Table 3.1
Comparison of Growth Accounting Empirics of the ‘Assimilationists’

	<i>Pack & Page (1994a, 1994b)</i>	<i>Kawai (1994)</i>	<i>Lindauer & Roemer (1994)</i>	<i>Marti (1996)</i>	<i>Sarel (1996)</i>	<i>Drysdale & Huang (1997)</i>	<i>Klenow & Rodriguez- Clare (1997)</i>	<i>Nadiri & Son (1998)</i>	<i>Hsieh (1999,2000a)</i>
ASSUMPTIONS									
• Production function/	Cobb-Douglas ¹	Non-parametric (No assumption about production function)	Cobb-Douglas (implied)	Trans-logarithmic	Cobb-Douglas	Trans-logarithmic ²	Cobb-Douglas with human capital	Trans-logarithmic	None. Used national income dual estimates (e.g., returns to capital and labor or factor incomes)
• Returns to scale	Imposed (constant)	None	Constant (implied)	Imposed (constant)	Imposed (constant)	Not mentioned	Imposed (constant)	Imposed (constant)	Not applicable
• Elasticity of substitution	Any value	None	Unity (implied)	Any value	Unity	Not mentioned	Unity	Unity	Not applicable
• Perfect competition	Implied	None	Implied	Imposed	Estimated (rejected)	Not mentioned	Implied	Imposed	Implied
• Technical progress	Imposed (Hicks neutral)	None	Not discussed	Imposed (Hicks neutral)	Imposed (Hicks-neutral)	Not mentioned	Imposed (Hicks-neutral)	Disembodied	No assumption
• Technology	Access to best practice common to all countries. Technical efficiency change is constant and does not vary across countries	US technology taken as best practice and is accessible to all countries	Not discussed	Common across countries	Common across countries	Not mentioned	Common across countries	Common across countries	No assumption
METHODOLOGY									
• Measurement of physical capital	Average share of investment in GDP from Summers and Heston database (1988) and also	Calculated but not discussed	Used investment to GDP ratio to proxy share of capital and an assumed	Perpetual inventory method with geometric depreciation	Used historical data on investment flows for 1960-1992,	Used average shares of gross domestic investment to GDP over the	Used Summers and Heston database on investments	To derive capital stock series, investment data disaggre-	Perpetual inventory method with geometric depreciation rate. Computed for 5 types of capital and their

¹Methodology and assumptions based on Nishimizu and Page (1982)

²Methodology and assumptions based on Dowrick (1992)

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

	average share of equipment investment in GDP from De Long and Summers (1991)		marginal productivity of capital of r equal to 12%.	based on a formula; the initial capital stock is taken assuming growth rate of investment in the first 5 years of the investment series	measured in 1985 dollars adjusted for purchasing power parity. Extrapolated series forward to 1996 and backwards to 1901 using logarithmic extrapolation assuming capital stock was zero in 1900 and an annual depreciation rate of 5%.	period studied, measured in percent	to GDP ratios over period 1960-1985 a la Mankiw-Romer and Weil (MRW) model with assumed depreciation rate of 3% which was raised by these authors to 6% per year	gated into non-residential buildings, other construction, transport equipment, and machinery and equipment were obtained from Yearbook of National Account Statistics. Depreciation rates used were 2.87%, 3.33%, 21.13% and 13.29% respectively. Base year capital stocks were calculated using formula.	corresponding depreciation rates (residential buildings, 1.3%; non-residential buildings, 2.9%; other construction, 18.2%; transportation equipment, 18.2%; and machinery equipment, 13.8%). Growth rate of investment at start of series is equal to average growth rate for first 5 years.
• Sample countries	Countries in the Summers-Heston database but focusing on Singapore, South Korea, Hong Kong, Taiwan, Japan Malaysia, Indonesia and Thailand	9 Asian countries (China, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand; 7 Latin American countries and 12 OECD countries	22 countries, of which 9 are East/Southeast Asian economies of Korea, Taiwan, Hong Kong, Singapore, China, Indonesia, Malaysia, Philippines and Thailand	Gang of Four (South Korea, Singapore, Hong Kong and Taiwan)	5 ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand) and the USA	APEC countries with focus on Japan, China, Hong Kong, Korea, Taiwan, Singapore, Indonesia, Malaysia, Thailand and Philippines	98 countries in the Summers-Heston database but focusing on Singapore, South Korea, Hong Kong, and Taiwan to compare with Young's results	Korea, Japan, Taiwan, Singapore, Thailand, Malaysia	Gang of Four (South Korea, Singapore, Hong Kong and Taiwan)
• Estimation period	1960-1985	1950-1990	1965-1990	1970-1990	1978-1996	1950-1990 broken into 4 sub periods 1950-59; 1960-	1960-1985	1969-1990	1966-1990

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

						69; 1970-79; and 1980-89			
• Approach	Econometric	Growth accounting and econometric	Growth accounting	Econometric	Growth accounting and econometric for calculating factor shares	Econometric	Growth accounting	Econometric	Growth accounting (dual estimates)
<i>EMPIRICAL FINDINGS</i>									
• Level of capital shares (α)	Not mentioned	Not mentioned	Assumes labor share of 60%, hence, capital share is 40% and marginal product of capital $r = 12\%$	Very high for Singapore and Hong Kong	Varying depending on industry, averaging 0.315	High ranging from 0.29 to 0.60 and averaging 0.38	Used fixed share of 0.30	Cost share of capital was derived using a formula	Multiplying the nominal rental price of capital by the estimated capital stock and dividing their product by the total payments to capital in the national income accounts obtained the share of payments to each type of capital.
• Total Factor Productivity growth	Substantial (outliers in scatter diagram)	Substantial (reaching 40%-60% of US level by 1990)	Substantial (2% to 5% average) except for Malaysia and the Philippines with 1.1% and 0%, respectively	High average growth rates ranging from 1.4% to 2.4% per annum	High ranging from 1.2% to 2.2% average except for the Philippines (with negative 0.8%) and compared to 0.3% for the USA	High except for Malaysia, Philippines, China and Indonesia	High ranging from 2.5% to 4.4%	High ranging from 1.2% to 2.5% per annum	High ranges exceeding primal estimates but depending on measure of real interest rates
• TFP growth contribution to total output growth	High	High	Not discussed	Implicitly high although not discussed	High except for the Philippines	Except for Malaysia, Philippines and China with less than 10% share, the rest had high TFP contributions	High	High	Implicitly high

Source: Author's compilation

Table 3.2
TFP studies on individual East Asian economies
leaning towards the assimilation view

THE ASSIMILATIONISTS				
Country	Author	Period	Method	Average TFP growth (%)
Japan	▪ Prasad (1997)	1971-1993	Not explained	2.8
	▪ Nakajima et al. (1998)	1998	Index number approach	3.73
	▪ Sato (2002)	1979-1997	Not explained	2.2 to 2.5
South Korea	▪ Kim (1979)	1966-1975	Growth accounting	2.6
	▪ Kim & Park (1985)	1963-1982	Growth Accounting	2.72
	▪ Kwon (1986)	1961-1980	Growth accounting with cost function	2.95
	▪ Christensen & Cummings (1981)	1960-1973	Growth accounting	4.1
	▪ Kim, Yoo & Hwang (1984)	1967-1979	Growth accounting	5.5
	▪ Kim & Park (1988)	1966-1983	Growth accounting	7.03
	▪ Moon, Wang, Cho & Kim (1991)	1971-1989	Growth accounting	3.66
	▪ Kim & Hong (1997)	1963-1995	Growth accounting	3.63
	▪ Lee (1988)	1966-1983	Growth accounting	6.15
	▪ Dollar & Sokoloff (1988)	1963-1979	Growth accounting	6.1
	▪ Pilat (1995)	1967-1987	Growth accounting	4.3
	▪ Van (2004)	1983-1998	Growth accounting (capital intensive sectors)	7.5 to 14.0
	▪ Okuda (1997)	1967-1989	Growth accounting	3.2
	▪ Hwang (1998)	1970-1993	Growth accounting (augmented Solow model)	2.06 to 2.46
▪ Kwack (2000)	1971-1993	Growth accounting	3.0	
▪ Lee (2001)	1971-1996	Growth accounting	2.0	
Taiwan	▪ Okuda (1994)	1978-1991	Growth accounting	2.6
	▪ Dessus, Shea & Shi (1995)	1951-1990	Growth accounting	3.16
	▪ Dessus (1997)	1971-1990	Econometric	2.3
	▪ Chang (1997)	1961-1996	Growth accounting	3.7
	▪ Lin, Wang & Chu (1998)	1952-1996	Growth accounting	3.12
	▪ Liang & Jorgenson (1999)	1961-1993	Growth accounting	2.46
	▪ Hu & Chan (1999)	1979-1996	Growth accounting	3.1
	▪ Sun (2004a, 2004b)	1951-1999	Multilateral TFP Index	2.52 to 2.68
	▪ Chow & Lin (2002)	1981-1991	Growth accounting	3.24
	▪ Aw et al. (2001)	1961-1980	Growth accounting	2.03
	▪ Liang (2002)	1980-1999	Growth accounting	2.37
	▪ Fu (2004)	1965-1999	Growth accounting	2.28
Singapore	▪ Leung (1997)	1983-1993	Growth accounting	2.8
	▪ Elaine-Seow & Lall (1996)	1981-1990	Translog cost function	6.19
	▪ Koh, Rahman & Tan (2002)	1975-1998	Growth accounting	2.7
Hong Kong	▪ Lin & Wong (1997)	1975-1990	Error correction model	5.4
Malaysia	▪ Thomas & Wang (1992)	1960-1987	Econometric	2.0
	▪ Maisom, Ariff & Aini (1994)	1975-1989	Growth accounting	4.1 to 13.5
	▪ Rahman & Idris (2000)	1982-1994	Growth accounting (sectoral)	0.769 to 11.24
	▪ Zulalifah & Maisom (2001)	1985-1995	Growth accounting	4.3
Thailand	▪ Sakonpan (1997)	1979-1991	Growth accounting	3.29
	▪ Tinakorn & Sussangkarn (1998)	1970-1996	Growth accounting	2.11
Indonesia	▪ Abimanyu (1995)	1975-1995	Growth accounting	3.0
	▪ Timmer (1999)	1975-1993	Growth accounting	2.7
	▪ Aswicahyono & Hill (2002)	1984-1993	Growth accounting	2.1
	▪ Widiyanto (2004)	1970-1997	Econometric	3.6
Philippines	▪ Hooley (1968)	1948-1961	Growth accounting	2.0

Source: Author's compilation.

function, any econometric estimation of the aggregate production function becomes a dubious exercise. In a survey of the aggregation debate by economy could fulfil them. Nevertheless, Fisher (1969) proved that the empirical fit on aggregate output data to aggregate input data tend to be high, especially in the Cobb-Douglas case where elasticities approximate factor shares so that economists tend to use the aggregate production function as a tool (called the instrumental argument) without realizing the invalidity of the concept at the theoretical level. In the end, Felipe and Fisher (2001) made the case that “*one does not need an aggregate production function to study growth unless one insists that the only possible conception of growth is the neoclassical model.*”

Empirical Issues

The empirical issues in growth accounting logically follow from the dependence of TFP calculations on assumptions about the dubiously existing aggregate production function. These assumptions relate basically to perfectly competitive markets where factor prices approximate marginal products of inputs and where output elasticities equal their respective factor shares. In developing countries, factor markets are imperfect due to minimum wage legislations, public sector employment and wage policies, social security systems, and regulations covering job security and tenure, so that the so-called competitive assumption fails to hold or at best comes close to being approximated. If markets are not competitive or approximately close to being one, then factor prices cannot be used to represent marginal products of the inputs and therefore, weighing growth rates of the contributing inputs by their factor shares in national income accounts to account for total growth becomes disputable. The neoclassical production function is Cobb-Douglas, which imposes the elasticity of substitution between capital and labour to equal unity, hence, displaying constant returns to scale. Since TFP is obtained as a residual, an assumed elasticity of substitution that is too high would underestimate TFP growth. This sensitivity is illustrated by Rodrik (1997) who using the Collins & Bosworth (1996) study, imputed the TFP growth rates implied by differing assumptions about factor substitution. He showed that the lower the assumption on elasticity of substitution, the higher TFP growth rates tend to be, and vice versa.

This problem exists even if the production function is not the Cobb-Douglas case. Citing Young’s (1995) approach using a translog production function that does not restrict the elasticity of substitution to unity, Rodrik (1997) shows that averaging the end-period factor shares between periods t and $t - 1$ could exhibit a high capital share despite capital deepening. As the capital-labour ratio rises, the marginal productivity of capital should tend to fall but is upheld by either high substitutability between capital and labor or by labor-saving technological change. But then again because technological progress is assumed to be Hicks-neutral, much of output growth is attributed to capital accumulation rather than to TFP growth in Young’s study. This is known as the identification problem — that is a case of two underlying production functions that could satisfy identical data sets. Growth accounting exercises could not distinguish between two interpretations of the growth decomposition borne by time series data: one coming from a production function with unitary elasticity of substitution between inputs and Hicks-neutral technological change and another arising from a production function with less-than-unitary elasticity of substitution and with factor-augmenting technological change. Under the first interpretation, a steeper production function with high elasticity of substitution would attribute overall growth more to capital accumulation and less to technological progress. On the other hand, under the second interpretation, a production function with lower elasticity of substitution implies that less of output growth is attributable to increasing capital intensity and more to improvements in technology.

A measurement problem also results from the fact that as the capital-labor ratio increases, the returns to new investment will tend to diminish but this decline in profits is mitigated by either improvements in technological change or the high substitutability of capital for labor, e.g., input usage, otherwise known as efficiency change. The imposed constancy of capital share is therefore implied by an assumed high elasticity of substitution, which in the case of the Cobb Douglas production function is equal to unity. In case where the elasticity of substitution is below unity, capital share could still be prevented from declining in the capital-labor ratio because of high labor saving technological progress. Because it is unlikely to

separate factor-augmenting technological change from the shape of the production function and its elasticity of substitution as proven by the ‘Impossibility theorem’ of Diamond, McFadden & Rodriquez (1972,1978), labor-saving technological change may be wrongly attributed to an assumed elasticity of substitution that is too high resulting in an underestimation of TFP growth.

Policy Inferences

The issue with respect to policy implications arising from growth accounting could be summed up in terms of what is called the interpretation problem and the attribution problem. Since growth accounting is nothing more than an accounting exercise, no causal behavioral relationship could be established between factor input growth or factor productivity to output growth. The association of the residual with technological progress blurs even more the distinction between the decomposition of growth and the explanation for growth. There is still no agreement on what the computed productivity parameters actually measure and how they are to be interpreted, much more what the sources of their fluctuations and growth denote. Sudit and Finger (1981), on the other hand, cite the lack of policy analysis resulting from growth accounting since we cannot explain the residual, which measures what we do not know about growth. Thus according to them, ‘*public exhortations for deliberate efforts to improve the rate of growth in aggregate productivity suffer from an underlying contradiction in logic (as) we simply cannot hope to affect consciously something that is defined to measure our lack of knowledge.*’ Thus, the role of policies that promote growth in TFP seems to be without strong basis.

The attribution problem, in turn, questions the whole rationale for decomposing growth since in the real world, only actual combinations of inputs and output are observed in a dynamic process rather than the production function itself. Thus, it is meaningless to distinguish between shifts in the production function and movements along it. According to Felipe (1997), the neoclassical growth model upon which growth accounting exercises are grounded assumes the smooth substitution among inputs in the production isoquant implying that a one percent increase in overall output could be achieved by either a one percent increase in the capital stock, or a one percent increase in employment, or a one percent increase in factor productivity. This premise, however, does not hold when inputs are complementary and interdependent, in which case growth becomes super-additive or synergetic so that the overall growth is greater than the sum of individual growth rates of its components. Nelson (1981) best summarizes the attribution problem as follows: *Consider the sources of a well-made cake. It is possible to list a number of inputs — flour, sugar, milk, etc. It is even possible to analyze the effects upon the cake of having a little bit more or less of one ingredient, holding the other ingredients constant. But it makes no sense to try to divide the credit for a good cake to various inputs* (Nelson, 1981, p. 1054.)

The productivity debate surrounding East Asian growth has led to a sceptical view about the usefulness of growth accounting or econometric estimation of production functions in explaining the sources of growth in an economy. The attribution problem calls into question the validity of the exercise when factors exhibit complementarities and shows intrinsic discrepancies and the relevance of policy inferences resulting from decomposing overall growth. More important is the issue of the Solow residual as a measure of factor productivity where technological progress is largely viewed as exogenous, disembodied and of the non-factor augmenting or Hicks-neutral type. An important part of technological progress is of course embodied in inputs, and it is difficult to disentangle disembodied technological change from those embodied in inputs, especially capital or machinery, indicating that some portion of TFP has already been factored out or counted in capital’s share. This prompted Felipe (1999, 2000) to state that the “*Solow residualization of the East Asian economies is an activity...subject to significant diminishing returns.*”

The rate of TFP is thus not a sufficient statistic upon which conclusions could be drawn and policy statements about growth and its prediction could be made. Chen (1997) suggested that there is also a fixation of analysis on TFP and the neglect of labour productivity growth as an indicator of productive efficiency and technological advance. Rodrik (1997) opines that labour-augmenting technology may be misattributed due to the assumed high elasticity of substitution between capital and labour implicit in the

Cobb-Douglas production function. There is also the question of the theoretical basis of an aggregate production function and the empirical coincidence of deriving such aggregate production functions from national income accounting identities. The aggregate production function is grounded upon neoclassical theory and its restrictive assumptions, and together with the new endogenous growth models, are viewed as ignoring how countries create and assimilate technology. Thus, growth empirics in explaining the East Asian case has to look at other paradigms such as the evolutionary theory of technological change or even non-linear models of technology. Finally, there are sources of errors in the measurement of physical capital such as capital composition or what constitutes capital and judgments about capacity utilization and depreciation. Finally, Timmer (1999b) summarizes the disagreement between accumulationists and assimilationists as based on whether capital intensification can be considered as technological change as it involves exploration of global production possibilities that are novel to countries, such as the East Asian economies, putting them into practice. Studies on catch-up processes of developing countries, he affirms should be conducted at a more detailed industry level given that growth accounting studies focus on aggregative comparisons of growth rates.

Despite all its flaws and shortcomings, growth accounting continues to be used by economic growth analysts because of its simplicity and convenience. Even though it has turned out to be a war of numbers, the productivity debate in East Asia has focused attention of economic analysts about the importance of productivity in the growth process. Already, many East Asian economies have imposed targets on their TFP growth rates and have looked at enhancing technological progress or shifts in their production functions, if not improving at least technological efficiency, which is an important component of TFP. In the meantime, new approaches have to be developed and tried that could better explain technological change which could be an alternative to growth accounting and econometric estimation of production functions. Such novel methodologies should be able to incorporate alternatives to the neoclassical paradigm and to flexibly deal with its restrictive assumptions. In this paper, the use of the field of influence approach to input-output analysis will be shown to hold promise.

4. The Field of Influence Approach to input-Output Analysis

The input-output system has been widely used in economic analysis with new ideas and applications discussed at proceedings of World input-output conferences that are organized every three years. Most applications of I-O analysis are conducted in development planning. Eleish (1963) enumerates several particular applications of input-output analysis in planning such as calculation of production targets, sectoral analysis, regional analysis, calculating foreign currency requirements of development projects, testing the effects of an import substitution policy (or agricultural or industrial policy), modelling choice of investments, national budgeting, calculating requirements of an investment program, and evaluating management of public sector entities.

The applications of input-output analysis has in recent years delved into relaxing the static or fixed technological coefficients assumption of the I-O tables using the concept of field of influence approach developed by Hewings, Sonis & Jensen (1988). This approach will be used in this study to explain the role of technology in growth episodes via its diffusion or propagation among sectors in the inter-industry flows contained in input-output tables.

The most important assumption in Leontief's input-output theory was that direct input coefficients were constant or fixed. In Sonis & Hewings (2007), the authors surveyed the literature on the treatment of coefficient change in input-output models as error analysis and sensitivity analysis. Since changes in input coefficients in the input-output framework can be attributed to various factors such as price changes, technological change, substitution of products, changes in scale, Sonis & Hewings (1988a, 1988b) conceptualized the field-of-influence approach as a "*general way of representing the gradient of change of all coefficients in the Leontief inverse associated with a change of all coefficients in the direct coefficients matrix.*"

The field-of-influence approach, unlike error and sensitivity analysis, measures the overall changes in economic relationships between industries caused by changes in technological coefficients. In Hewings, Sonis & Jensen (1988), the authors explain the field-of-influence approach as a technique to measure the effects of technological change, specifically in relation to an initial innovation. The authors acknowledged the presence of two dominant logistic relationships in the theory of innovation diffusion – the first one being new products or processes undergoing slow growth then rapid spread, decelerating growth and subsequent decline; and the second one being the competition between new and old products for production space (i.e., competing products from two or more firms or competing processes) and consumption space (i.e., consumer preferences regarding which products to adopt) that determines which old or new products would dominate the market. They thus define technological change as a process of competition for inputs resulting from innovation diffusion or spread. The competitive process which can be modelled as a Markov or general logistic process can be translated to changes in coefficients and hence to changes in the field of influence so that innovation changes are mapped into changes in the economy's structure of industries.

The Basic Equations of the Field-of-Influence Approach

The field-of-influence approach uses the decomposition analysis of the influence of changes in the input coefficients and in the components of final demand on output levels proposed in the work of Feldman, et al. (1987). Defining x_0 and x_t as the gross output vectors; B_0 and B_t the Leontief inverses of matrix A of direct input coefficients, and f_0 and f_t the vectors of final demand over time periods 0 and t , then their changes are expressed as:

$$\begin{aligned}\Delta x &= x_t - x_0 \\ \Delta B &= B_t - B_0 \\ \Delta f &= f_t - f_0\end{aligned}$$

The changes in gross output is then represented as: $\Delta x = x_t - x_0 = B_t f_t - B_0 f_0$. This can be further decomposed into: $\Delta x = (B_0 + \Delta B)(f_0 + \Delta f) - B_0 f_0 = B_0 \Delta f + \Delta B f_0 + \Delta B \Delta f$. The Feldman et al. (1987) approach to decomposition proposed a split of Δx into two components:

$$\frac{1}{2}[B_t(f_t - f_0) + B_0(f_t - f_0)] \text{ and } \frac{1}{2}[(B_t - B_0)f_0 + (B_t - B_0)f_t]$$

where the former represents the gross output changes attributed to changes in final demand and the latter the changes in output attributed to changes in input coefficients. These two contributions to changes in output can be expressed as: $B_0 \Delta f + \frac{1}{2} \Delta B \Delta f$ and $\Delta B f_0 + \frac{1}{2} \Delta B \Delta f$. The presence of the term $\Delta B \Delta f$ in both expressions depicts the problem of assigning the effects of changes in final demand and changes in input coefficients which Feldman et al. (1987) conveniently assigned equally (50 percent) to each component. The field-of-influence approach improves on this technique by decomposing ΔB and Δf and adding a synergetic interaction of the two effects. Thus, the change in gross output is presented as: $\Delta x_i = \Delta x_i^f + \Delta x_i^B + \Delta x_i^{Bf}$, where the superscripts refer to changes associated in final demand (f), changes in input coefficients or technology (B), and their synergetic effect (Bf).

The field-of-influence approach begins by defining $A = (a_{ij})$ which is the $n \times n$ matrix of direct input coefficients of the I-O table; $E = (e_{ij})$ which is a matrix of incremental changes e in the direct input coefficients (i.e., matrix of direct input coefficients in the current year less matrix of direct input coefficients in the base or reference year); $B_0 = (I - A)^{-1} = (b_{ij})^1$ and $B_t = B(E) = (I - A - E)^{-1}$ which are the respective Leontief inverse matrices before and after the coefficient changes; and $\det B$ and $\det B(E)$ which are the determinants of the corresponding inverses. The basic formula of the field of influence

¹ Note that in the theoretical discussion of input-output in Chapter 6.1, the elements of the Leontief inverse matrix were notated as $L = (I - A)^{-1} = l_{ij}$ but in the field of influence approach, the Leontief inverse is notated as the B matrix comprised of elements b_{ij} .

approach was derived from an earlier work of Sherman & Morrison (1950) where change in the direct input coefficient occurred in only one sector to determine inverse-important input coefficients. The Sherman-Morrison formula for the Leontief inverse assumes the form:

$$B(E) = B + \frac{1}{1 - b_{j_1 i_1}} F \begin{pmatrix} j_1 \\ i_1 \end{pmatrix} e$$

where j 's are rows and i 's are columns, and e 's are the corresponding changes in technical coefficients; and where the field of influence is notated as:

$$F \begin{pmatrix} j_1 \\ i_1 \end{pmatrix} = \begin{pmatrix} b_{1i_1} \\ b_{2i_1} \\ \vdots \\ b_{ni_1} \end{pmatrix} (b_{j_1 1}, b_{j_1 2}, \dots, b_{j_1 n}) = (b_{i_1 j_1} \dots b_{i_1 n})$$

This is simply a reorganized version of an $n \times n$ block matrix of the Leontief inverse of technical coefficients of the reference or base year with blocks comprising the fields of influence of the first order called the span where:

$$\left\{ F \begin{pmatrix} j_1 \\ i_1 \end{pmatrix} \right\} = \begin{Bmatrix} F(1; 1) & F(2; 1) & \dots & F(n; 1) \\ F(1; 2) & F(2; 2) & \dots & F(n; 2) \\ \vdots & \vdots & \ddots & \vdots \\ F(1; n) & F(2; n) & \dots & F(n; n) \end{Bmatrix}$$

$$= \left\{ \begin{array}{ccc} \left[\begin{pmatrix} b_{11} \\ b_{21} \\ \vdots \\ b_{n1} \end{pmatrix} (b_{11} \quad b_{12} \quad \dots \quad b_{1n}) \right] & \left[\begin{pmatrix} b_{11} \\ b_{21} \\ \vdots \\ b_{n1} \end{pmatrix} (b_{21} \quad b_{22} \quad \dots \quad b_{2n}) \right] & \dots & \left[\begin{pmatrix} b_{11} \\ b_{21} \\ \vdots \\ b_{n1} \end{pmatrix} (b_{n1} \quad b_{n2} \quad \dots \quad b_{nn}) \right] \\ \left[\begin{pmatrix} b_{12} \\ b_{22} \\ \vdots \\ b_{n2} \end{pmatrix} (b_{11} \quad b_{12} \quad \dots \quad b_{1n}) \right] & \left[\begin{pmatrix} b_{12} \\ b_{22} \\ \vdots \\ b_{n2} \end{pmatrix} (b_{21} \quad b_{22} \quad \dots \quad b_{2n}) \right] & \dots & \left[\begin{pmatrix} b_{12} \\ b_{22} \\ \vdots \\ b_{n2} \end{pmatrix} (b_{n1} \quad b_{n2} \quad \dots \quad b_{nn}) \right] \\ \vdots & \vdots & \ddots & \vdots \\ \left[\begin{pmatrix} b_{1n} \\ b_{2n} \\ \vdots \\ b_{nn} \end{pmatrix} (b_{11} \quad b_{12} \quad \dots \quad b_{1n}) \right] & \left[\begin{pmatrix} b_{1n} \\ b_{2n} \\ \vdots \\ b_{nn} \end{pmatrix} (b_{21} \quad b_{22} \quad \dots \quad b_{2n}) \right] & \dots & \left[\begin{pmatrix} b_{1n} \\ b_{2n} \\ \vdots \\ b_{nn} \end{pmatrix} (b_{n1} \quad b_{n2} \quad \dots \quad b_{nn}) \right] \end{array} \right\}$$

$$= \begin{Bmatrix} \begin{pmatrix} b_{11} \\ b_{21} \\ \vdots \\ b_{n1} \end{pmatrix} \\ \begin{pmatrix} b_{12} \\ b_{22} \\ \vdots \\ b_{n2} \end{pmatrix} \\ \vdots \\ \begin{pmatrix} b_{1n} \\ b_{2n} \\ \vdots \\ b_{nn} \end{pmatrix} \end{Bmatrix} [(b_{11} \quad b_{12} \quad \dots \quad b_{1n}) \quad (b_{21} \quad b_{22} \quad \dots \quad b_{2n}) \quad \dots \quad (b_{n1} \quad b_{n2} \quad \dots \quad b_{nn})]$$

Following this formulation, Sonis & Hewings (1992, 2007, 2009) and Sonis, Hewings & Guo (1996) developed the following general field-of-influence equation:

$$B_t = B(E) = B_0 + \frac{1}{Q(E)} \left[\sum_{k=1}^n \sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} 'F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix} e_{j_1 i_1} \dots e_{j_k i_k} \right]$$

where $F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix}$ is the matrix of intensity (i.e., product of the row and column multipliers of the direct field of influence, $e_{j_1 i_1} \dots e_{j_k i_k}$ are the respective incremental changes and $Q(E)$ is the ratio of the determinants of the Leontief inverses pre-and post-changes in the coefficients which is defined as the polynomial of the incremental changes e_{ij} with the formula:

$$Q(E) = \frac{\det B_0}{\det B_t} = 1 - \sum_{j_1 i_1} b_{j_1 i_1} e_{i_1 j_1} + \sum_{k=2}^n (-1)^k \sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} B_{or} \begin{pmatrix} j_1 & \dots & j_k \\ i_1 & \dots & i_k \end{pmatrix} e_{i_1 j_1} \dots e_{i_k j_k}$$

where $B_{or} \begin{pmatrix} j_1 & \dots & j_k \\ i_1 & \dots & i_k \end{pmatrix}$ in the right hand term is a determinant of order k that contains the Leontief inverse B_0 from the ordered array of columns $i_1, i_2 \dots i_k$ and rows $j_1, j_2 \dots j_n$. In this formula, the negative of the determinant of the Leontief inverse matrix is multiplied by the elements of the Leontief inverse matrix of the initial year, i.e., $-\det B \times B$.

To take account of the second order fields of influence as noted in Sonis and Hewings (n.d.) $-\det B \times B$ is multiplied by the matrix of changes in technical coefficients (i.e., E matrix). The authors illustrated this in a sample 2 x 2 matrix where:

$$B(E) = B + \frac{1}{Q(E)} \left[F(1,1)e_{11} + F(1,2)e_{12} + F(2,1)e_{21} + F(2,2)e_{22} - \det B B \begin{bmatrix} e_{11} & e_{12} \\ e_{21} & e_{22} \end{bmatrix} \right].$$

Through direct calculation, this expands to:

$$\begin{aligned} & \begin{pmatrix} b_{11}(E) & b_{12}(E) \\ b_{21}(E) & b_{22}(E) \end{pmatrix} \\ &= \begin{pmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{pmatrix} \\ &+ \frac{1}{Q(E)} \left[\begin{pmatrix} b_{11}b_{11} & b_{11}b_{12} \\ b_{21}b_{11} & b_{21}b_{12} \end{pmatrix} e_{11} + \begin{pmatrix} b_{11}b_{21} & b_{11}b_{22} \\ b_{21}b_{21} & b_{21}b_{22} \end{pmatrix} e_{12} + \begin{pmatrix} b_{11}b_{21} & b_{12}b_{12} \\ b_{11}b_{22} & b_{21}b_{22} \end{pmatrix} e_{21} \right. \\ &+ \left. \begin{pmatrix} b_{12}b_{21} & b_{12}b_{22} \\ b_{21}b_{22} & b_{22}b_{22} \end{pmatrix} e_{22} - \det B \begin{pmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{pmatrix} \begin{bmatrix} e_{11} & e_{12} \\ e_{21} & e_{22} \end{bmatrix} \right] \\ &= \frac{1}{Q(E)} \begin{pmatrix} 1 - a_{22} - e_{22} & a_{12} + e_{12} \\ a_{21} + e_{21} & 1 - a_{11} - e_{11} \end{pmatrix} \end{aligned}$$

In Sonis, Hewings & Guo (1996), the connection to decomposition of changes in gross output by the given field-of-influence formula stated above is provided as:

$$\Delta x = B_0 \Delta f + \frac{1}{Q(E)} \sum_{k=1}^n \left[\sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} 'F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix} f_0 e_{j_1 i_1} \dots e_{j_k i_k} \right] + \frac{1}{Q(E)} \sum_{k=1}^n \left[\sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} 'F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix} \Delta f e_{j_1 i_1} \dots e_{j_k i_k} \right].$$

The first term $B_0 \Delta f$ represents changes in gross output resulting from changes in final demand weighted by the Leontief inverse before the change in direct input coefficients; the second term represents the contributions of each individual field of influence to changes in gross output weighted by final demand f_0

before the change in direct input coefficients; and the third term measures the changes in gross output ascribed to the synergetic interaction of all individual fields of influence weighted by changes in final demand. This decomposition is divided into self-induced or own-generated changes in gross output arising from the sector itself due to changes in final demand or technological change; and other-generated changes in gross output arising from another sector in the inter-industry accounts.

Adding the first and second terms to yield $B_t \Delta f$, one derives the portion of changes in gross output attributed to changes in final demand weighted by the Leontief inverse after the change in direct input coefficients such that the expression above can be rewritten as:

$$\Delta x = B_t \Delta f + \frac{1}{Q(E)} \sum_{k=1}^n \left[\sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} 'F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix} f_0 e_{j_1 i_1} \dots e_{j_k i_k} \right].$$

Hence, in essence, the matrix notations simply state that the new Leontief inverse $B(E)$ also referred to as the perturbed inverse matrix should be equal to the sum of two matrices which are the old Leontief inverse B (that of the initial year) and the field of influence $F(i_1; j_1)$ multiplied by the rational fraction function of e which are the respective changes in the direct input coefficients, as follows: $B(E) = B + \frac{e}{1 - b_{j_1, i_1} e} F(i_1; j_1)$. This decomposition of changes in gross output can be simplified as: $\Delta x_i = \Delta x_i^f + \Delta x_i^B + \Delta x_i^{Bf}$, where the superscripts represent changes arising from final demand (f), changes in technology, i.e., intermediate inputs (B) and their synergetic action (Bf). Expressed as relative changes assuming that Δx_i is not equal to zero, the relative shares of these changes to the total change in gross output are further represented by the following equations: $p_i = \frac{\Delta x_i^f}{\Delta x_i}$; $q_i = \frac{\Delta x_i^B}{\Delta x_i}$; $r_i = \frac{\Delta x_i^{Bf}}{\Delta x_i}$ where the relative shares of these components add up to unity or are normalized, $p_i + q_i + r_i = 1$.

Intensity of Direct Field-of-Influence, Global Intensity Matrix, the Multiplier Product Matrix and Backward and Forward Linkages

To link the field of influence approach with key sector analysis of backward and forward linkages, Sonis and Hewings (2009) introduced the concept of the intensity of the direct field of influence. This intensity of the field of influence is linked to the concept of multiplier product matrix which is derived from the matrix A of direct input coefficients in the input-output table and matrix B which is the associated Leontief inverse matrix. This Leontief inverse matrix will be comprised of $B_{i \bullet}$ for column multipliers and $B_{\bullet j}$ for row multipliers defined as:

$$B_{i \bullet} = \sum_{i=1}^n b_{ij}, B_{\bullet j} = \sum_{j=1}^n b_{ij}.$$

In matrix format as depicted in Sonis & Hewings (1999), the row vector (M_c) comprising column multipliers can be expressed as:

$$M_c(B) = [B_{\bullet 1} \quad B_{\bullet 2} \quad \dots \quad B_{\bullet n}]$$

and the column vector comprising row multipliers (M_r) as:

$$M_r(B) = \begin{bmatrix} B_{1 \bullet} \\ B_{2 \bullet} \\ \vdots \\ B_{n \bullet} \end{bmatrix}.$$

The intensity of the direct field of influence is calculated as the sum of all elements of the field of influence notated as $f_{ij}(i_1, j_1)$ equal to the sum of the products of the column and row multipliers:

$$IntF(i_1; j_1) = \sum_{ij} f_{ij}(i_1; j_1) = B_{i \bullet} B_{\bullet j} .$$

The field of influence is a mathematical technique where row and column multipliers of the Leontief inverse are arranged as a column vector and a row vector, respectively and their products are taken to yield the

intensity of the direct field of influence. The multiplier product matrix M is calculated by weighing the field of influence by the volume V of the Leontief inverse matrix. This volume using the field of influence is the *global intensity* as it is the sum of the all the row multipliers and column multipliers expressed in Sonis & Hewings (2009, p. 91) as: $V = \sum_{i=1}^n \sum_{j=1}^n b_{ij} = \sum_i B_{i\cdot} = \sum_j B_{\cdot j}$.

Thus, the input-output multiplier product matrix M is notated under the global intensity matrix as:

$$M = \frac{1}{V} \begin{bmatrix} B_{1\cdot} \\ B_{2\cdot} \\ \vdots \\ B_{n\cdot} \end{bmatrix} \times [B_{\cdot 1} \ B_{\cdot 2} \ \dots \ B_{\cdot n}].$$

The components of the multiplier product matrix m_{ij} is expressed as:

$$M = (m_{ij}) = \frac{B_{\cdot i} B_{\cdot j}}{V}$$

which simply states that the product of the column vector of row multipliers and the row vector of column multipliers yields the multiplier product matrix which the authors interpret as a matrix of first order intensities of the fields of influence of individual changes in the direct input coefficients. Thus, using the first order intensities of the direct field of influence (i.e., product of the column and row vectors of corresponding row and column multipliers of the Leontief inverse of the initial year), the global intensity matrix whose entries are the intensity $F(i_1, j_1)$ can be expressed as the multiplier product matrix where the intensity per sector is weighed by the total or global intensity (volume) of the direct field of influence matrix based on Sonis & Hewings (2009):

$$M = \frac{1}{V} [IntF(i_1, j_1)]$$

For purposes of illustration, the intensities of the first order fields of influence are thus incorporated into the multiplier product matrix using a sample of a 2 x 2 matrix as follows:

$$M = \frac{1}{V} \begin{bmatrix} (b_{11} + b_{21})(b_{11} + b_{12}) & (b_{12} + b_{22})(b_{11} + b_{12}) \\ (b_{11} + b_{21})(b_{21} + b_{22}) & (b_{12} + b_{22})(b_{21} + b_{22}) \end{bmatrix}$$

where V is the global intensity is: $V = b_{11} + b_{12} + b_{21} + b_{22}$.

The multiplier product matrix M that is derived from the products of the corresponding column and row multipliers of the Leontief inverse is next used to conduct key sector analysis of backward and forward linkages which Sonis & Hewings (2009) proposed. Using Rasmussen (1957) and Hirschman's (1958) concepts of backward and forward linkages, sectors can be identified that have linkage structures that create an above average impact on the rest of the economy due to an expansion of that sector or in response to a change in other sectors of the system. The backward linkage or power of dispersion is calculated as: $BL_j = \frac{nB_{\cdot j}}{V}$, where $B_{\cdot j}$ is the row vector of column multipliers of sector j ; and the forward linkage or sensitivity of dispersion is calculated as: $FL_i = \frac{nB_{i\cdot}}{V}$; $B_{i\cdot}$ being the column vector of row multipliers of sector i .

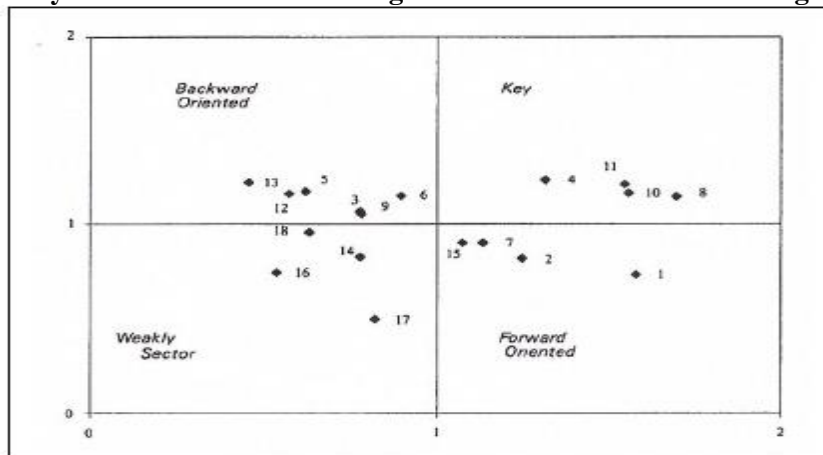
The sum of all backward linkages and the sum of all forward linkages add up to n , and the average linkage should add up to unity. When the backward linkage exceeds the average linkage, i.e., $BL_j > 1$, the corresponding column multiplier of a sector $B_{\cdot j}$ is higher than the average column multiplier indicating that a unit increase in final demand in sector j will trigger an above average increase in the economy. On the other hand, when the forward linkage exceeds the average linkage, i.e., $FL_i > 1$, the corresponding row multiplier of a sector $B_{i\cdot}$ is higher than the average row multiplier, implying that a unit increase in all sectors' final demand would cause an above average increase in sector i . A key sector is defined as one where both backward and forward linkages exceed the value of 1.

These backward and forward linkage indices could be ranked in descending order, results of which according to Sonis & Hewings (2009) categorizes industries or sectors into four groups as follows: (i) a key sector if $BL_i > 1$ and $FL_i > 1$; (ii) a backward linkage oriented sector if $BL_i > 1$ and $FL_i < 1$; (iii) a forward linkage oriented sector if $BL_i < 1$ and $FL_i > 1$; and (iv) a weak linkages oriented sector if $BL_i < 1$

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1 and $FL_i < 1$. This typology is depicted in Figure 3 using the case of the Chinese economy as a sample in Sonis & Hewings (1999). The rank size ordering or hierarchy of the backward and forward linkage indices reflect the rank size ordering of the column and row multipliers.

Figure 3
Key Sector Classification using Backward and Forward Linkages



Source: Sonis & Hewings (1999, p.62).

Inasmuch as the column and row multipliers for the multiplier product matrix are the same as those of the Leontief inverse matrix, the structure of the multiplier product matrix is basically connected to the cross-structure properties of backward and forward linkages of the sectors. The cross structure properties imply proportionality which means that if ranked in descending order, the elements of the row containing the largest row multipliers should be larger than the corresponding elements of all other rows. Likewise, the elements of the column containing the largest column multiplier should be larger than the corresponding elements of all other columns. If the largest column multiplier and the largest row multiplier are located in the coordinates (i_0, j_0) in the multiplier product matrix M , then the element located in i_0, j_0 would define the center of the largest cross within the M matrix as shown in Figure 4.

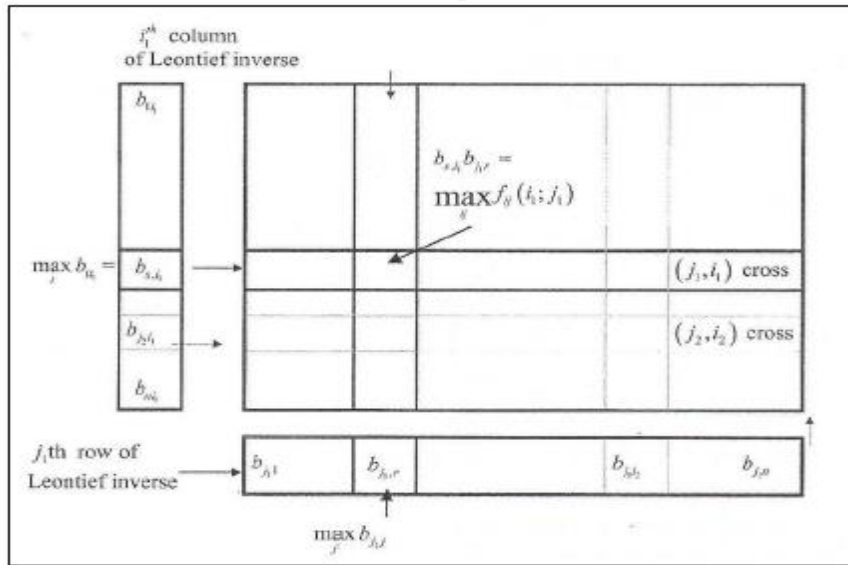
The ranking may also be interpreted as the strength of backward and forward linkage effects with respect to the first order field of influence, i.e., the center of the largest cross of the direct field of influence will coincide with the location of change in direct coefficient e . Thus, the largest components of the direct field of influence (e.g., $f(i_1; j_1)$ in the diagram) will be located in the i_1 th row and j_1 th column impacting most the forward linkages of sector i_1 and the backward linkages of sector j_1 . Excluding this cross from M would reveal the second largest cross and so on. When reorganizing the locations of rows and columns of M in such a way that the centers of the corresponding crosses ranked by size appear on the main diagonal, a descending economic landscape is portrayed as shown on Figure 5.

The most significant property of the economic landscape is that the elements of the multiplier product matrix represent the intensities of the first order fields of influence of changes, i.e., the components of the gradients of changes in direct input coefficients. This gradient is a measure of the inverse importance of direct inputs explained in Sonis & Hewings (1999) where inverse important inputs refer to those inputs, changes of which lead to the most sizeable impact on the economy.

Second Order Intensity Matrix N, Residual, Symmetric and Antisymmetric Matrices

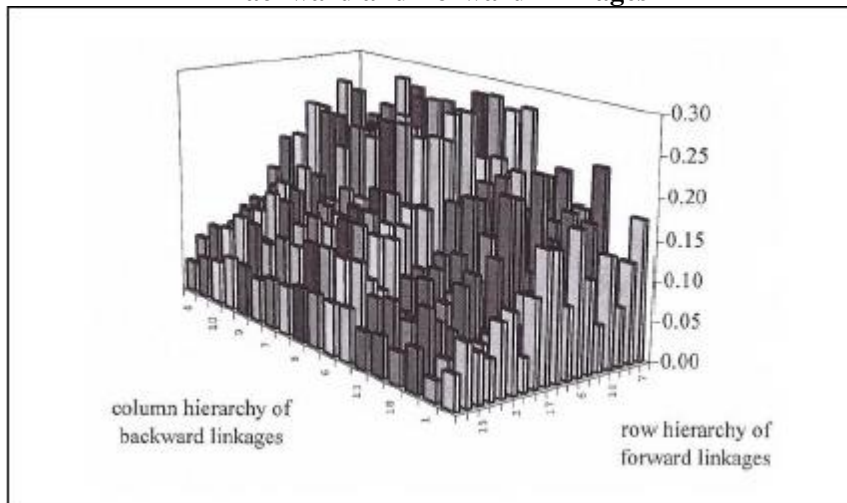
It should be noted that while traditional key sector analysis calculate backward and forward linkages from the input-output tables per year, this traditional approach based on Rasmussen (1957) and Hirschman (1958) looks at changes in the Leontief inverse caused by changes in individual direct inputs and ignores the details

Figure 4
Cross Structure of Multiplier Product Matrix



Source: Sonis & Hewings (2009, p. 83).

Figure 5
Economic Landscape using Rank Size Hierarchy of Backward and Forward Linkages



Source: Sonis & Hewings (n.d., p.65).

of intra/inter-sectoral interdependencies. Sonis & Hewings (2009) propose a new framework for key sector analysis using the multiplier product matrix to calculate forward and backward linkages as this approach can further be processed into scaling effects of inter-sectoral linkages and synergetic interactions between different sectors associated with rounds of spending derived from the power series expansion of the Leontief inverse matrix. This implies that a second order intensity matrix N could be computed from the multiplier product matrix using the intensities of the second order fields of influence. The sum of the second order intensities are equal to $\pm \det B (b_{11} + b_{12} + b_{21} + b_{22}) = \pm V \det B$ since the sum of the row and column multipliers of the Leontief inverse yield the total volume V . The equation for the N matrix could be derived as follows using a sample 2x2 matrix:

$$N = \frac{1}{V^2} \begin{bmatrix} -V \det B & V \det B \\ V \det B & -V \det B \end{bmatrix}$$

The Leontief inverse matrix could thus be decomposed into the following satisfying the minimum information property² which was proven in Sonis & Hewings (2009, pp. 90-93):

$$B = M - N = \frac{1}{v} \begin{bmatrix} (b_{11} + b_{21})(b_{11} + b_{12}) & (b_{12} + b_{22})(b_{11} + b_{12}) \\ (b_{11} + b_{21})(b_{21} + b_{22}) & (b_{12} + b_{22})(b_{21} + b_{22}) \end{bmatrix} - \frac{1}{v} \begin{bmatrix} -\det B & \det B \\ \det B & -\det B \end{bmatrix}.$$

This matrix of synergetic interaction N includes scaling effects of intra-sectoral linkages and is obtained based on the equation above by using the reciprocal of the global intensity of the multiplier product matrix, i.e., $\frac{1}{v}$ and multiplying this by the second order effects of the direct field of influence. The scaling effects indicate the self-influence of sectors that are reflected in the diagonal components of the Leontief inverse which contain the largest coefficients. Sonis & Hewings (2009, n.d.) further introduce a residual matrix R from the N matrix that reflects bilateral balances and imbalances through push-pull backward and forward linkages. The residual matrix is obtained by the formula: $R = -D - N$ where D represents the diagonal components of the N matrix. Thus, the Leontief inverse can be decomposed into: $B = M + D + R$, where B is the Leontief inverse matrix, M is the multiplier product matrix, D is the diagonal of the N matrix and R is the residual matrix with zero as diagonal elements and usually positive numbers as off-diagonal elements.

The residual matrix R contains symmetric (S) and anti-symmetric (S_a) components, hence $R = S + S_a$ to represent the respective sectoral balances and imbalances between the various sectors when the technical coefficients change that causes the multiplier product matrix M to deviate from a homogeneous distribution of backward and forward linkages. The authors denote the symmetric part of R as an S matrix which is obtained by taking one-half of the sum of the R matrix and its transpose R^T , i.e., ($S = \frac{1}{2}(R + R^T)$). The anti-symmetric part known as the S_a matrix, in turn, is obtained by taking one-half of the difference between the R matrix and its transpose R^T , i.e. $S_a = \frac{1}{2}(R - R^T)$. The sum of the column and row elements of the anti-symmetric matrix add up to zero. Furthermore, the sum of the column and row elements of both the N matrix and the S matrix must also be identical according to the authors.

In conclusion, the total linkages for key sector analysis obtained from the multiplier product matrix is simply the direct field of influence multiplied by respective change in inverse coefficients of each sector weighted by the volume (intensity) or total sum of columns and rows. If the second order or synergetic effects are weighted similarly by the total volume used in the multiplier product matrix, the N matrix is derived which shows scaling effects of self-influence sectors. This N matrix in turn can further be manipulated to derive sectoral compensatory balances needed to keep the same distribution as the multiplier product matrix which is known as the residual matrix. This decomposition is not obtainable under the traditional static key sector analysis using the actual multipliers of the given Leontief inverse matrices of each year as opposed to using the field of influence approach which shows further dynamics behind changes in technical coefficients.

5. Research Methodology

For purposes of comparative analysis, the input-output tables of the three sample countries were used. A brief description of the three sample economies are first provided in Appendix Table 2. The characteristics of each country's input-output data in terms of available years and number of sectors or size are summarized in Table 4.

² In statistical inference, the minimum information principle is related to the dynamics of entropy where the non-zero probability of a new information or event affecting a given probability distribution is calibrated. It is a standard by which data derived by relevant methods can easily be verified, analysed and interpreted by the wider scientific community. This minimum information property according to Sonis & Hewings (2009) is equal to the solution to the minimization problem: $\min \ln fN = \sum_{ij} \frac{B_{\bullet i} B_{\bullet j}}{v^2} \ln \frac{B_{\bullet i} B_{\bullet j}}{v^2}$ which yields the equation above where $B = M - N$.

From the table, one can already glean that the availability period and size of sectors per year vary in each of the countries. To keep the research manageable, particularly in terms of matrix calculations, the size per country was collapsed to 26 sectors for Thailand and Malaysia and 29 sectors for the Philippines using the industrial classifications applied by the respective statistical offices in preparing the national accounts. More importantly, only one year per decade was taken as sample to better visualize the evolution of the economic structures.

Table 4
Input-Output Tables of Subject Countries

Malaysia Year (Size)	Thailand Year (Size)	Philippines Year (Size)
1978 (60)	1975 (16; 26; 58; 180)	1961 (12; 29; 50)
1983 (60)	1980 (16; 26; 58; 180)	1965 (97)
1987 (60)	1985 (16; 26; 58; 180)	1969 (120)
1991 (27; 92)	1990 (16; 26; 58; 180)	1974 (60; 120)
2000 (94)	1995 (16; 26; 58; 180)	1979 (24; 65)
2005 (120)	1998 (16; 26; 58; 180)	1985 (11; 59)
	2000 (16; 26; 58; 180)	1988 (60)
	2005 (16; 26; 58; 180)	1994 (11; 59)
		2000 (60)
		2006 (11; 60; 70; 120; 240)

Source: Department of Statistics, Malaysia (1978, 1983, 1987, 1991, 2000, 2005); Office of the Prime Minister, Thailand (1975, 1980, 1985, 1990, 1995, 1998, 2000, 2005), National Economic Council (1961) and National Economic Development Authority, Philippines (1965, 1969, 1974, 1979, 1985, 1988, 1994, 2000, 2006).

Per country, the input-output tables for the following years were used in the calculations: Malaysia – 1978, 1983, 1991, 2000 and 2005; Thailand – 1975, 1985, 1995, 2000, 2005; and Philippines – 1969, 1979, 1988, 1994, 2000 and 2006. The years chosen for each country were as close as possible which means that even though input-output tables were available for the Philippines as early as 1961, the year 1969 for 1960s was taken as the initial year so that the subsequent year which is 1979 is as close as possible to the years available for Malaysia (1978) and Thailand (1975) when these two countries initially began compiling input-output tables. Malaysia began compiling input-output tables in 1960 but the tables were only for the capital city Kuala Lumpur. In 1965 and 1970, the Planning Unit of the Prime Minister’s Department compiled input-output tables but never published them. The input-output table for 1978 was the first published statistic on input-output for Malaysia and was therefore taken as the base or initial year for this study.

Each of the input-output tables of the chosen years were then deflated to yield figures at constant prices using the respective GDP deflators of each sector available from the national accounts. If a breakdown exists per sector, then the corresponding deflators for that sector were used and if not available for a particular year such as for Malaysia which began showing GDP by industrial origin only in 1991, the overall GDP rather than the sectoral deflator was used.

First, the inverse coefficients of the initial year of the input-output table used as base or initial year is presented from which further analysis of the direct field of influence is calculated. This is the first term (B_0) in the equation:

$$B_t = B(E) = B_0 + \frac{1}{Q(E)} \left[\sum_{k=1}^n \sum_{\substack{i_r \neq i_s \\ j_r \neq j_s}} i_r' F \begin{pmatrix} i_1 & \dots & i_k \\ j_1 & \dots & j_k \end{pmatrix} e_{j_1 i_1} \dots e_{j_k i_k} \right].$$

The direct field of influence is just a re-arranged version of the Leontief inverse matrix of technical coefficients of the initial or base year of each country where both columns and rows of the entire Leontief inverse are arranged into a column of row multipliers and row vector of column multipliers, respectively and multiplied to yield the intensity of the direct field of influence F. The products contained as elements

of this F matrix which should be equal on the row or column sides because of the commutative property of multiplication yields the intensity of linkages in the initial year chosen for each country as represented in the term on the bracket in the equation above. This implies that if input coefficients are fixed, the same intensities should prevail in succeeding years of the input-output table. The intensity of the direct field of influence measures the degree of interdependency of a sector to both buying and selling sectors during the initial year.

Then the changes in the inverse coefficients over succeeding sample years representing the E matrix (e_{jts}) was mapped on the surface of the direct field of influence of the initial year. If technical coefficients are fixed as assumed in input-output analysis, the surface map of successive years should be identical to the initial year's. The maps show that this is not the case because technical coefficients changed for many sectors, if not all, in succeeding years.

The second term of the field of influence equation – the term inside the brackets will then be discussed which denotes the changes in technical coefficients (e_{jts}) for each of the sample years multiplied on the direct field of influence of the initial year and summed up for all sectors. This product of the direct field of influence and the corresponding changes in technical coefficients (i.e., elements of the E matrix) comprise the first order intensities or first round effects of the field of influence approach, measuring the change in linkage intensities from the initial year resulting from the changes in technical coefficients of the succeeding years. In the field of influence framework the first order intensities represent technological change as sectors compete for inputs given an innovation, and hence the span of linkage intensities measure the extent of diffusion of technology as shown in Sonis & Hewings (1996, 1988a, 1988b, 2007, 2009); Hewings, Sonis & Jensen (1988); and Sonis, Hewings & Guo (1996).

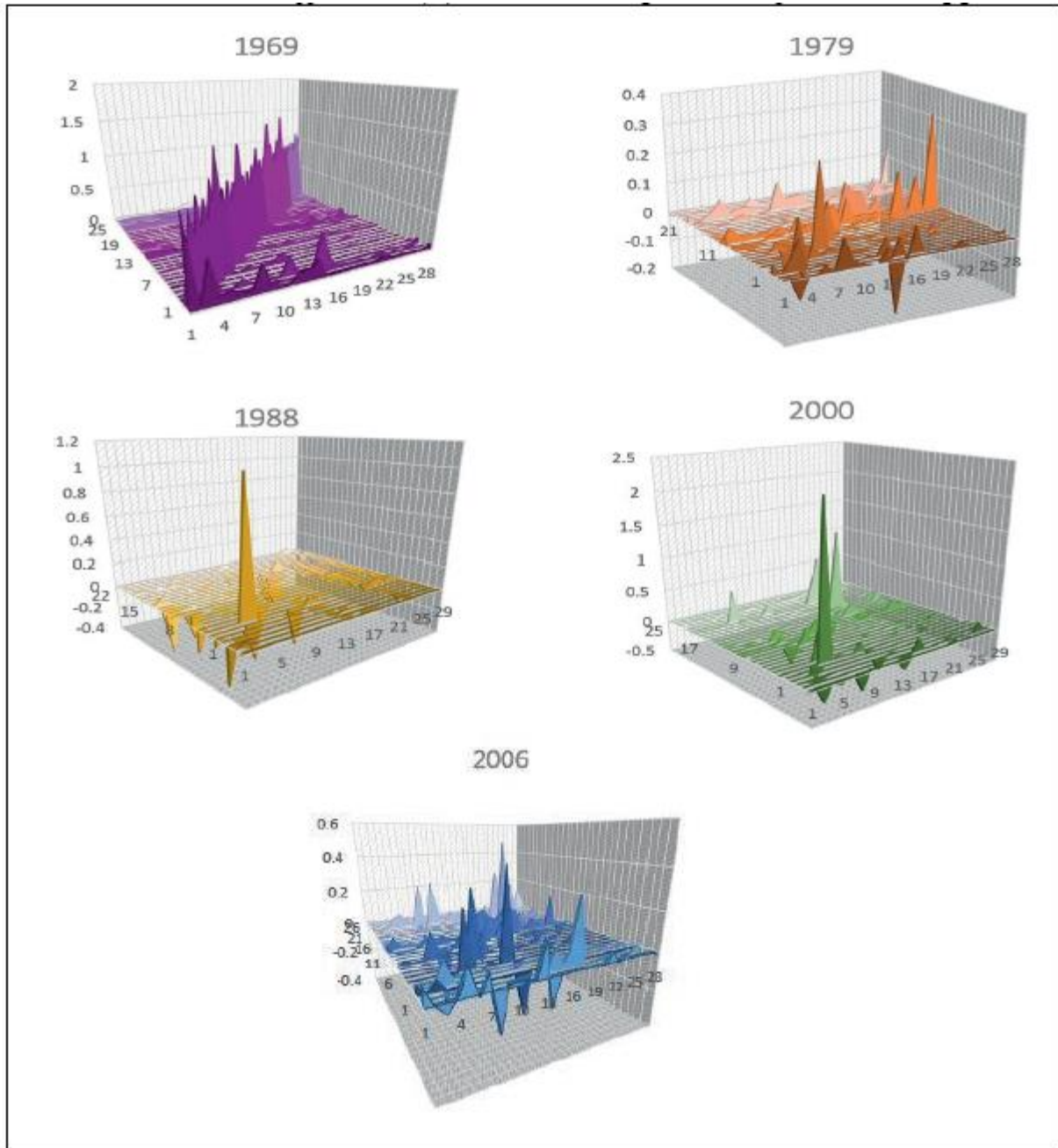
The third term of the field of influence equation shows the synergetic effects of both a change in final demand shown by the initial year inverse matrix and the self-generated sectoral change arising from technological change as interpreted by the creators of the approach. The second round impact after the sectoral change (i.e., change in technical coefficients) affects final demand and starts a new round of inter-industry sales and purchases of intermediate inputs. This is calculated by multiplying the reciprocal of the ratio of the determinants of the Leontief inverse matrix of the initial year to the Leontief inverse of the next year, i.e., $\left(\frac{1}{Q(e)}\right)$ by the results of the first order effects. Alternatively, the same results are arrived at by multiplying the negative of the determinant of the Leontief inverse of the initial year to the entire Leontief inverse matrix of that same year and multiplying this by the E matrix or matrix of changes in technical coefficients.

Then, the analysis proceeds with generating the change in linkage intensities (backward, forward and total) by sector arising from the field of influence above and weighting each element by the column and row totals called volume or global intensity. The field of influence approach yields the individual changes in each sector's technical coefficients from which a revised set of linkage intensities are calculated resulting from multiplying the direct field of influence by the respective sectoral changes in technical coefficients weighted by the sum total (or volume) for all sectors. The multiplier product matrix is also calculated which is just the direct field of influence divided by the total volume. From here, the backward, forward and total linkages for each year ranked in descending order reveal the key sectors of the economy driven by growth in technological change which is mapped into an economic landscape. To calculate backward and forward linkages, the criteria used by Rasmussen (1957) and Hirschman (1958) as acknowledged by Sonis & Hewings (2009) is applied.

6. Key Findings and Results

The direct field of influence for the respective base years 1969 for the Philippines, 1978 for Malaysia and 1975 for Thailand are shown in [Appendix Tables 3, 4 and 5](#). The surface maps of the inverse coefficients in the base years of these countries and how it has changed over the sample years are shown in Figures 6, 7, and 8. The field of influence for the same years multiplied by the sectoral changes in technical

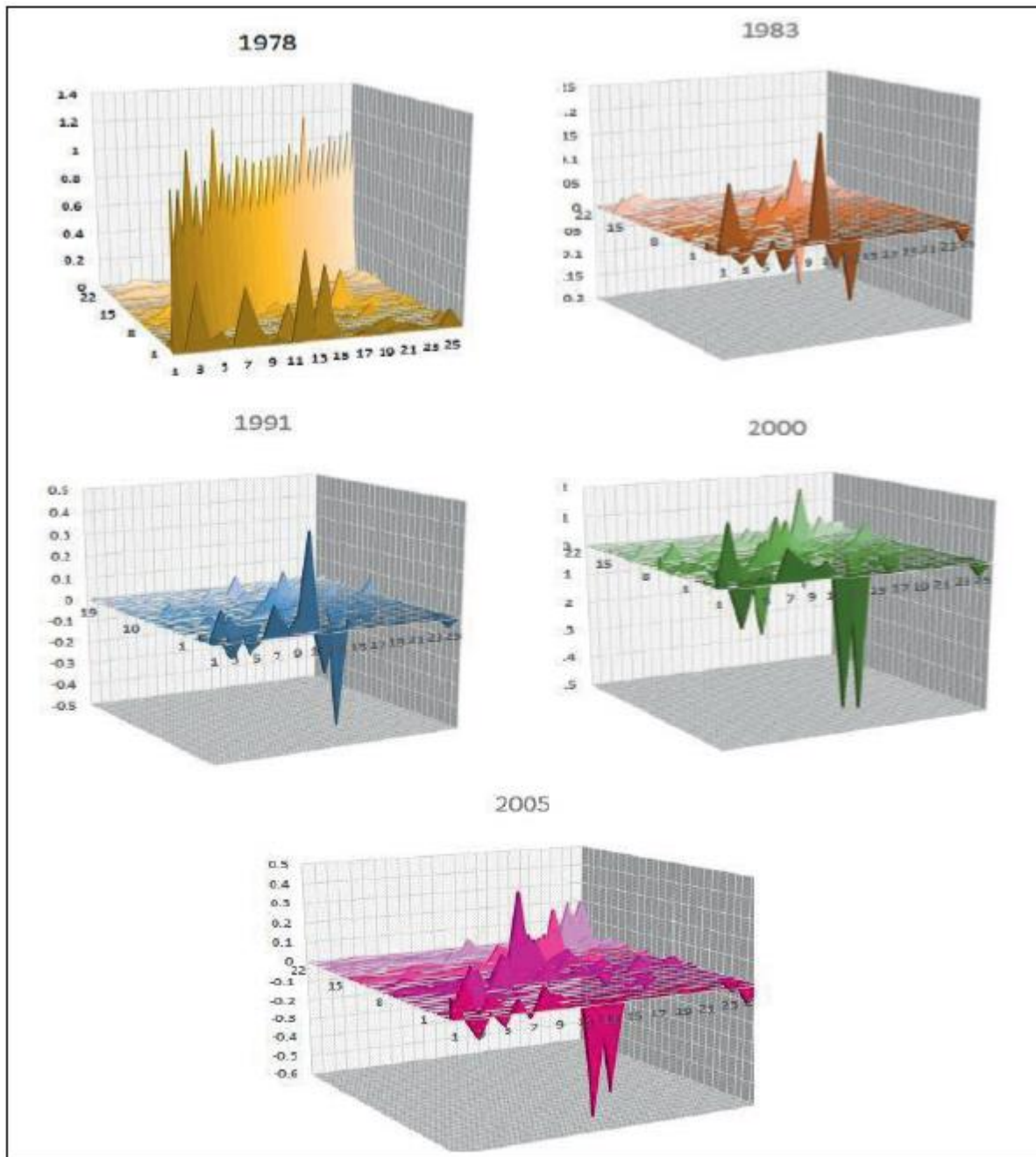
Figure 6
**Surface Map of Base Year Field of Influence and
 Changes in Technical Coefficients over Sample Years
 PHILIPPINES**



Legend

- 1 Agriculture, fishery & forestry
- 2 Mining
- 3 Food manufactures
- 4 Beverages
- 5 Tobacco products
- 6 Textiles
- 7 Footwear & wearing apparel
- 8 Wood products
- 9 Furniture & fixtures
- 10 Paper & products
- 11 Printed materials
- 12 Leather & leather products
- 13 Rubber products
- 14 Chemicals
- 15 Petroleum products
- 16 Non-metallic products
- 17 Ferrous metallic products
- 18 Non-ferrous metallic products
- 19 Non-electrical machinery
- 20 Electrical machinery
- 21 Transport equipment
- 22 Miscellaneous manufactures
- 23 Construction
- 24 Wholesale & retail trade
- 25 Transport services
- 26 Communication
- 27 Electricity, gas & water
- 28 Banking, insurance & real estate
- 29 Other services

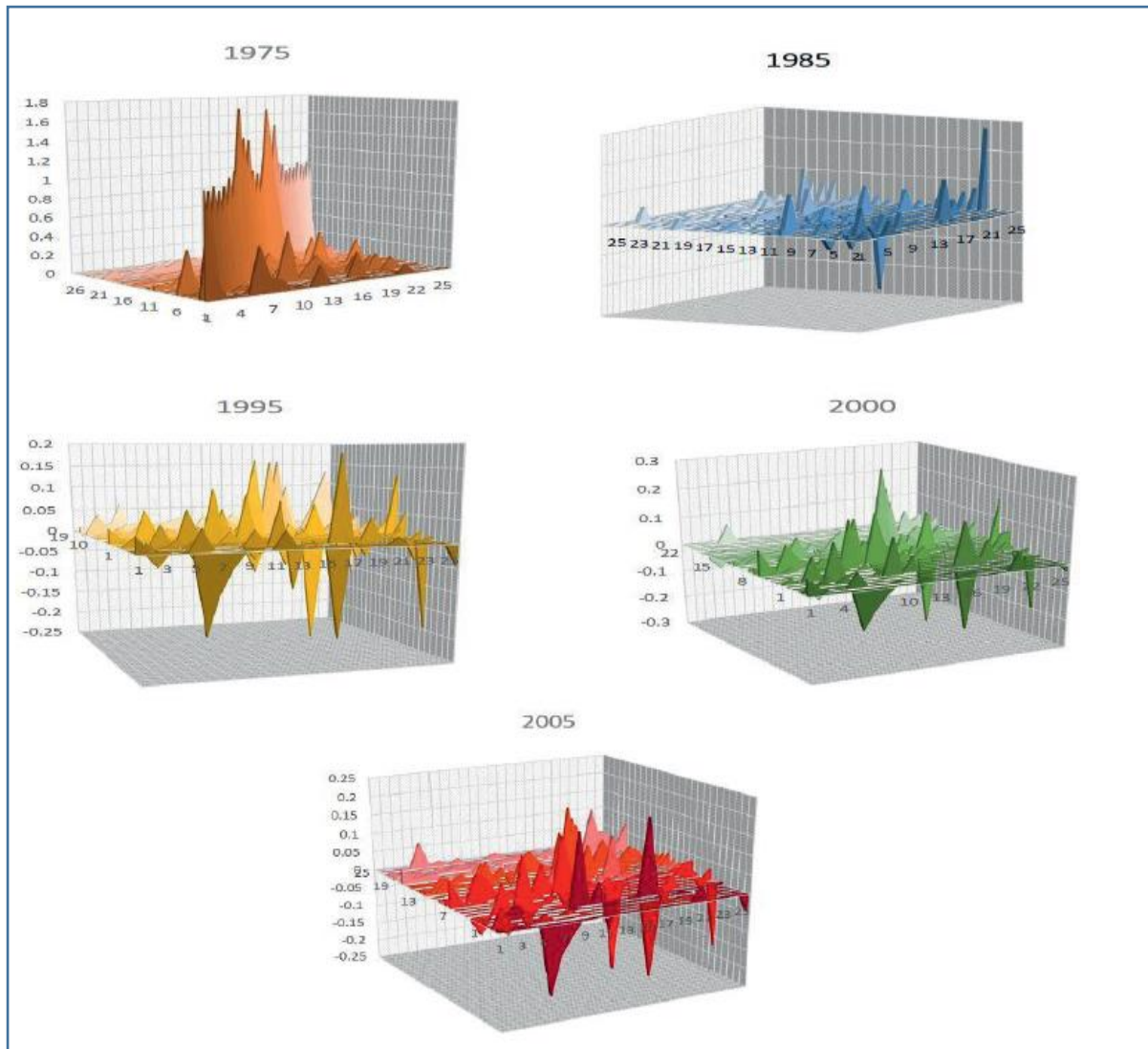
Figure 7
**Surface Map of Base Year Field of Influence and
 Changes in Technical Coefficients over Sample Years
 MALAYSIA**



Legend

1 Agriculture, fishery & forestry 2 Mining 3 Food manufactures 4 Beverages 5 Tobacco products 6 Textiles , Leather, Footwear & Wearing apparel 7 Wood & wooden products 8 Furniture & fixtures 9 Paper & paper products 10 Chemicals 11 Petrol & Coal 12 Rubber & rubber products 13 Non-Metallic Manufacturing 14 Iron & Steel 15 Non-Ferrous & other metals 16 Electrical & industrial machinery 17 Transport & transport equipment 18 Miscellaneous manufacturing 19 Electricity, gas & water 20 Construction 21 Trade 22 Transport services 23 Communication 24 Banking, finance and real estate 25 Private services 26 Public services

Figure 8
**Surface Map of Base Year Field of Influence and
 Changes in Technical Coefficients over Sample Years
 THAILAND**



Legend

- 1 Agriculture 2 Livestock 3 Forestry 4 Fishery 5 Mining & Quarrying 6 Food Manufacturing 7 Beverage & Tobacco Products 8 Textiles 9 Paper Products & Printing 10 Chemical Industries 11 Petroleum Refinery 12 Rubber & Plastic Products 13 Non-Metallic Products 14 Basic Metals 15 Fabricated Metallic Products 16 Machinery 17 Other Manufacturing 18 Electricity and Waterworks 19 Construction 20 Trade 21 Restaurants & Hotels 22 Transportation & Communication 23 Banking & Insurance 24 Real Estate 25 Services 26 Unclassified

coefficients to yield first round intensities of succeeding years for the same countries are shown in Figures 9, 10 and 11.

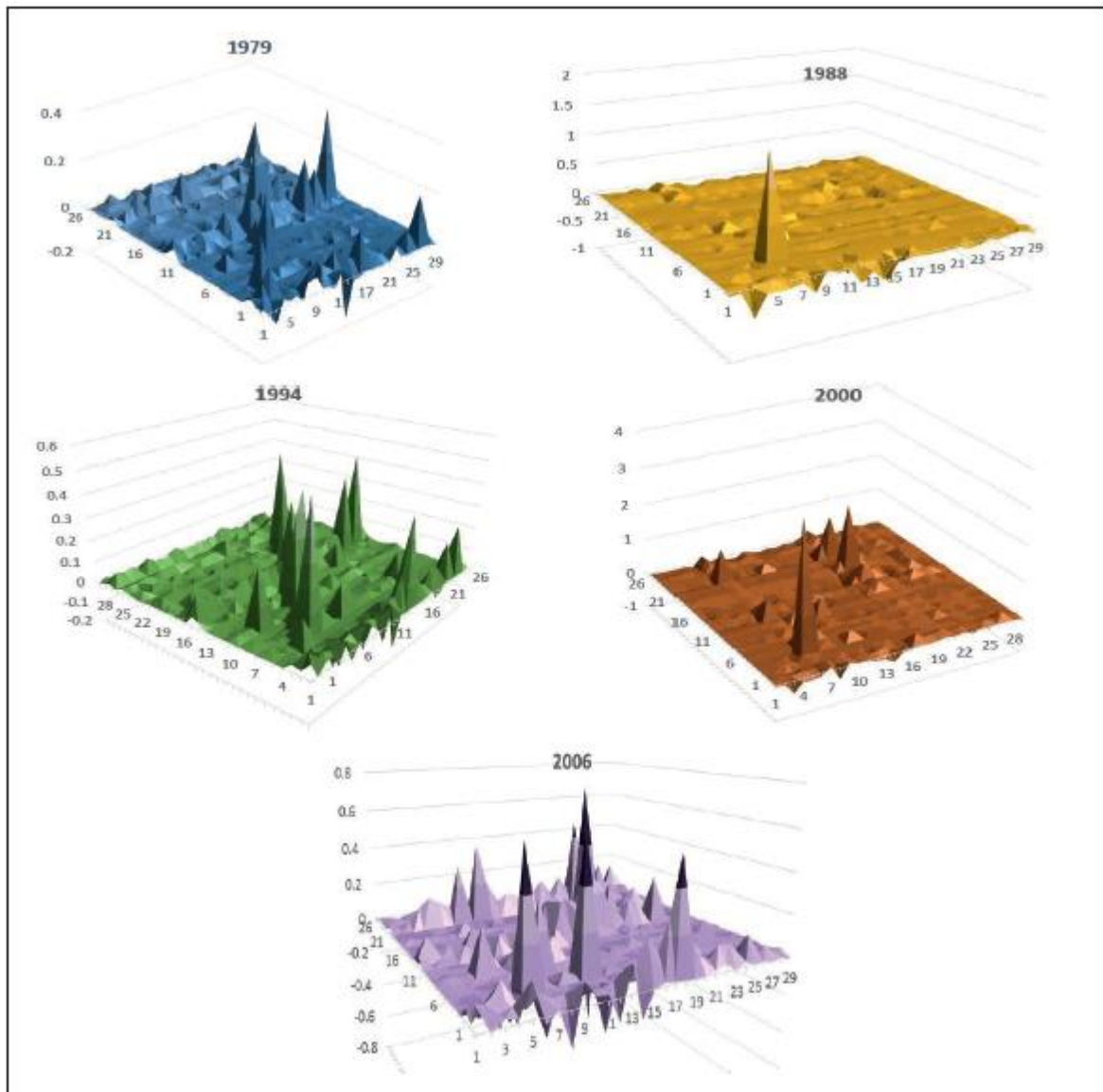
Base Year Field of Influence and Change in Technical Coefficients

The inverse important coefficients in the Philippines for its base year 1969 show the biggest inverse coefficients along the main diagonal which is one of the properties of the field of influence approach. As depicted in Figure 6, the changes in technical coefficients varied among sectors during the sample periods after the initial year 1969. Sectors that consistently showed increments in the inverse coefficients were petroleum in 1979, 1994, 2000 and 2006; textiles in 1988, 1994, 2000 and 2006; furniture and fixtures in 1979, 2000 and 2006; electrical machinery in 1994, 2000 and 2006; non-electrical machinery in 1994 and 2000; mining in 1994 and 2006; and wholesale and retail trade in 1979 and 2006. Decrements in the inverse of the technical coefficients were consistently observed for other services and construction for all the sample years after 1969; food manufacturing for 1988, 1994, 2000 and 2006; non-ferrous metals for 1979, 1988, 1994 and 2000; transport equipment for 1979, 1988 and 2006; and chemicals for 1988, 1994, and 2000. Since the imports are recorded in the Philippines on the final demand side and imported intermediate inputs and raw materials are lumped with imports of finished goods, it cannot be determined if these decrements in inverse coefficients could be interpreted as technical efficiency or whether there was a rise in import dependency unless a breakdown of imported intermediate inputs by industry can be obtained.

For Malaysia thirteen industries as of its base year 1978 were inverse important as shown in Figure 7, namely: 1) agriculture, fishery and forestry; 2) trade; 3) food manufacturing; 4) private services; 5) mining; 6) wood and wooden products; 7) petrol and coal; 8) iron and steel; 9) electricity, gas and water; 10) miscellaneous manufacturing; 11) rubber and rubber products; 12) textile, leather, footwear and wearing apparel; and 13) transport services. Industries that were way below the averages and have the least impact on the economy given a change in final demand were transport and transport equipment; communication; public services; tobacco manufacturing; beverages; banking, finance and real estate; and non-ferrous and other metals. The decrements in inverse coefficients could be interpreted as either technical efficiency (less input intensity) or trade dependency if domestic production is replaced by imports. In the case of Malaysia, the input-output tables show imports along the rows with value added and intermediate inputs. However, these import figures do not segregate between imported inputs and imported finished goods. The sectors that registered consistent decrements for Malaysia in linkage intensity reveal the following sectors with higher import coefficients compared to 1978: 1) miscellaneous manufacturing in 1983 to 2005; 2) textiles, leather, footwear & wearing apparel in 1983, 1991 and 2000; 3) construction in 1983 to 2005; 4) furniture and fixtures in 1983 to 2005; and 5) wood products in 1983, 2000 and 2005. As for sectors with negative changes in inverse coefficients only in certain years, higher import coefficients resulted for mining in 2000; iron and steel in 1991 and 2000; trade in 1983 and 2000; and banking, finance and real estate in 2000. This can be indicative of replacement of domestic production for greater imports for these sectors instead of a rise in technical efficiency.

For Thailand, the sectors that ranked highest in terms of inverse coefficients in its base year 1975 as illustrated in Figure 9 were: 1) basic metals; 2) machinery; 3) chemical industries; 4) petroleum refineries; 5) textile industry; 6) food manufacturing; 7) mining and quarrying; 8) trade; 9) unclassified industries; and 10) paper and printing. Sectors that ranked lowest in terms of inverse coefficients were: 1) real estate; 2) fishery; 3) services; 4) forestry; 5) banking and insurance; 6) beverage and tobacco; 7) livestock; 8) restaurant and hotels; 9) non-metallic products; and 10) other manufacturing. As for the changes in technical coefficients, the surface map shows substantial changes in the technical coefficients after 1975, the initial year of the study for Thailand. Increments in the technical coefficients were recorded for the following sectors in 1985, 1995, 2000, and 2005: mining and quarrying; rubber and plastic products; and fishery. From 1995 to 2005, technical coefficients for the following industries increased as well – machinery, and chemicals. Finally, the following sectors registered positive changes in the inverse of technical coefficients for two or three intermittent or successive years: electricity and water works; paper and printing; basic metals; services; transport and communications; and banking and insurance.

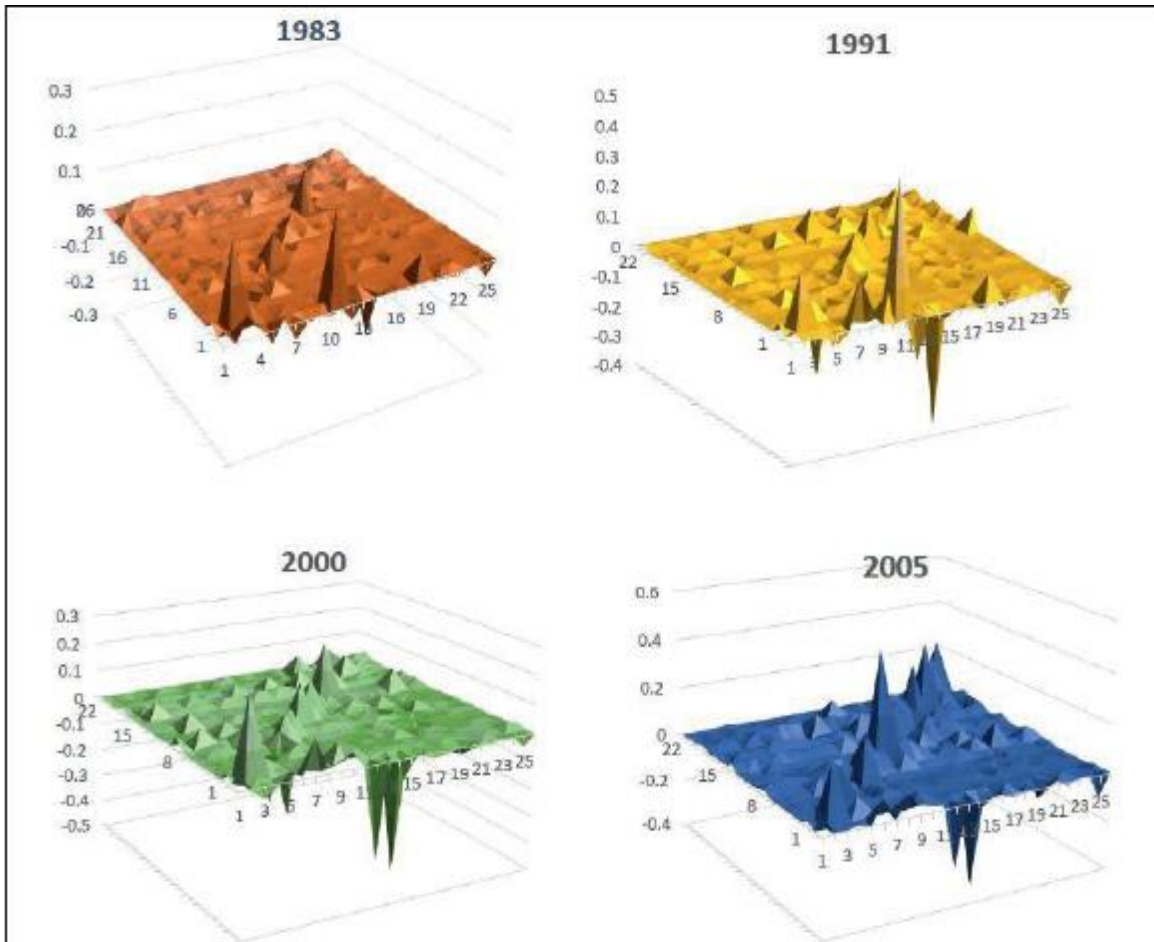
Figure 9
Surface Map of First Order Effects
PHILIPPINES



Legend

- 1 Agriculture, fishery & forestry 2 Mining 3 Food manufactures 4 Beverages 5 Tobacco products 6 Textiles 7 Footwear & wearing apparel 8 Wood products 9 Furniture & fixtures 10 Paper & products 11 Printed materials 12 Leather & leather products 13 Rubber products 14 Chemicals 15 Petroleum products 16 Non-metallic products 17 Ferrous metallic products 18 Non-ferrous metallic products 19 Non-electrical machinery 20 Electrical machinery 21 Transport equipment 22 Miscellaneous manufactures 23 Construction 24 Wholesale & retail trade 25 Transport services 26 Communication 27 Electricity, gas & water 28 Banking, insurance & real estate 29 Other services

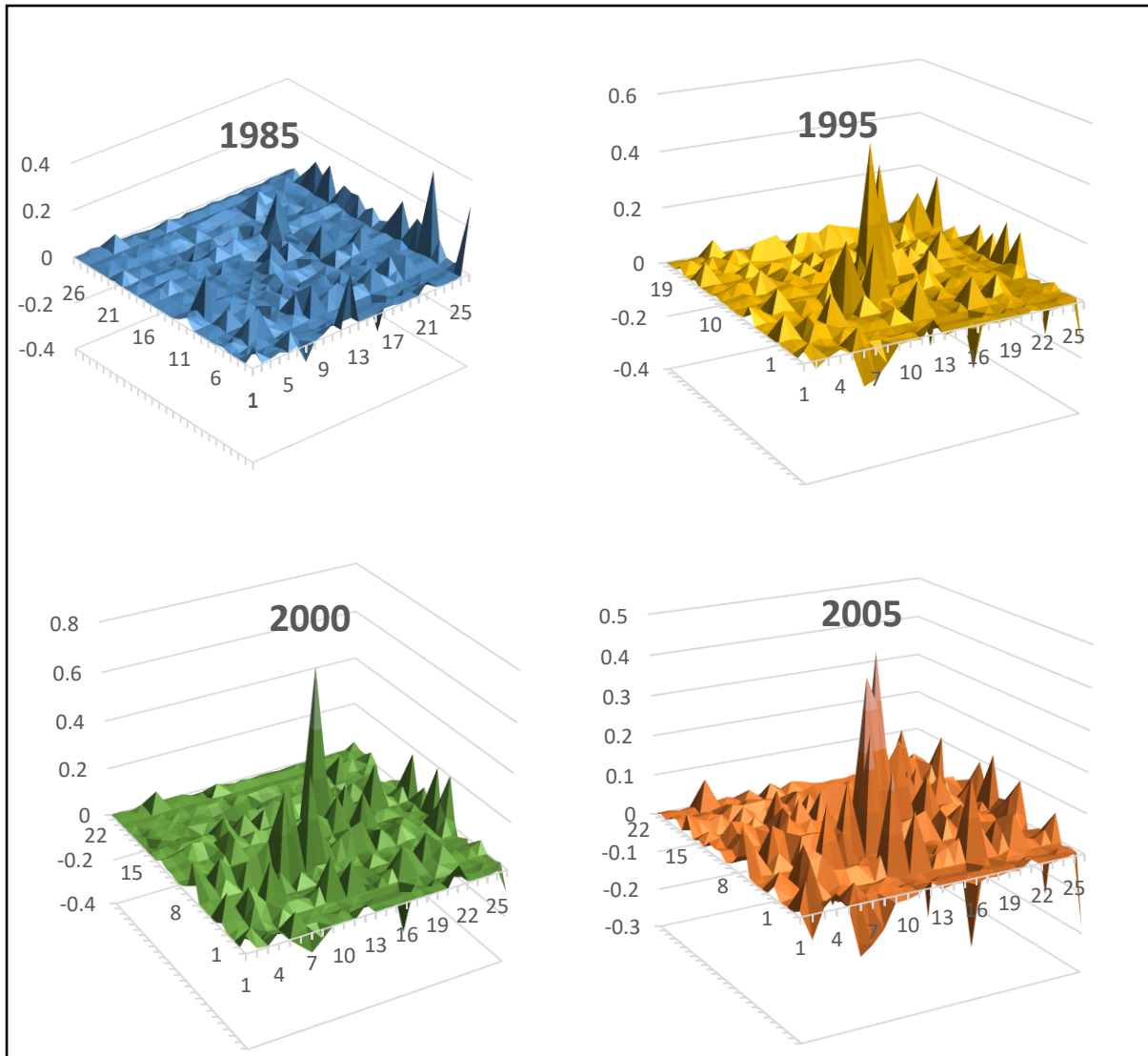
Figure 10
**Surface Map of First Order Effects
 MALAYSIA**



Legend

1 Agriculture, fishery & forestry 2 Mining 3 Food manufactures 4 Beverages 5 Tobacco products 6 Textiles , Leather, Footwear & Wearing apparel 7 Wood & wooden products 8 Furniture & fixtures 9 Paper & paper products 10 Chemicals 11 Petrol & Coal 12 Rubber & rubber products 13 Non-Metallic Manufacturing 14 Iron & Steel 15 Non-Ferrous & other metals 16 Electrical & industrial machinery 17 Transport & transport equipment 18 Miscellaneous manufacturing 19 Electricity, gas & water 20 Construction 21 Trade 22 Transport services 23 Communication 24 Banking, finance and real estate 25 Private services 26 Public services

Figure 11
**Surface Map of First Order Effects
 THAILAND**



Legend

1 Agriculture 2 Livestock 3 Forestry 4 Fishery 5 Mining & Quarrying 6 Food Manufacturing 7 Beverage & Tobacco Products 8 Textiles 9 Paper Products & Printing 10 Chemical Industries 11 Petroleum Refinery 12 Rubber & Plastic Products 13 Non-Metallic Products 14 Basic Metals 15 Fabricated Metallic Products 16 Machinery 17 Other Manufacturing 18 Electricity and Waterworks 19 Construction 20 Trade 21 Restaurants & Hotels 22 Transportation & Communication 23 Banking & Insurance 24 Real Estate 25 Services 26 Unclassified

First Order or Self-Generated Effects of the Field of Influence

Multiplying the changes in technical coefficients of each year by the direct field of influence and summing up the products for each sector yields the first order or self-generated effects of changes in linkage intensities in each sector compared to the initial year. The first order effects of the field of influence approach for the Philippines, Malaysia and Thailand are shown in **Appendix Tables 6, 7 and 8.**

For the Philippines, changes in linkage intensities in the field of influence surface shown in Figure 9 were pronounced in 1979 through 2006 for exactly the same sectors discussed in the change in technical coefficients described in Figure 6. In 1979, four sectors registered negative changes in first order linkage

intensities – construction, transport equipment, textiles, and other services. Sectors that deepened their interdependency with other sectors were led by petroleum, ferrous metals, mining, chemicals, wholesale and retail trade, tobacco, furniture and fixtures, food manufacturing paper, and electricity, gas and water. In 1988, all sectors with the exception of footwear and wearing apparel registered decrements in their linkage intensities notably ferrous and non-ferrous metals, chemicals, trade, agriculture, paper, other services, transport equipment, banking, and food manufacturing. In 1994, only other services recorded a decline in linkage intensity whereas all sectors experienced more sectoral interdependency especially petroleum, mining, paper, transport equipment, textiles, electricity, transport services, electrical and non-electrical machinery, and ferrous metals. In 2000, half of the sectors reduced their linkage intensities led by agriculture; other services; food manufactures; construction; ferrous metals; paper products; non-ferrous metals; tobacco; rubber; non-metallic products; banking, insurance & real estate; chemicals; beverages; wood products; and printing. Those that became more linkage intensive were: electrical machinery, footwear, leather, non-electrical machinery, textiles, trade, petroleum, and electricity. Finally, in 2006, other services and transport equipment showed negative changes in their linkage intensities while sectors that became more linkage intensive were trade, petroleum, mining, electrical machinery, textiles, chemicals, paper, non-electrical machinery, wood, and furniture.

For Malaysia, as shown in Figure 10, the change in first round linkage intensities of four sectors compared to the base year 1978 consistently rose in 1983, 1991, 2000 and 2005 – food manufacturing; petrol; transport equipment; and transport services. Electricity, gas and water became linkage intensive in 1983, 2000 and 2005; non-ferrous metals in 1983, 1991 and 2005; beverage in 1983 and 2000; communication in 2000 and 2005; chemicals in 1983 and 2000; and non-metals in 1991 and 2000. The following sectors ranked among the top ten in terms of first round linkage intensities only once during the sample years after the base year – mining and private services in 1983; trade, tobacco, and public services in 1991; paper and paper products in 2000; and electrical machinery, rubber and rubber products, and banking, finance and real estate in 2005. On the other hand, the following sectors showed decrements in their first round linkage intensities – miscellaneous manufacturing, and textile, leather, footwear and wearing apparel throughout the whole sample years after 1978; furniture and fixtures in 1983, 1991 and 2000; iron and steel, trade, and construction in 1991 and 2000; wood and wooden products, and mining in 2000 and 2005. In contrast, electrical machinery, paper and rubber recorded declines in linkage intensities in 1983 and banking, finance and real estate in 2000.

For Thailand, the top 10 sectors that became linkage intensive after the change in inverse coefficients using the field of influence framework depicted in Figure 11 are: mining and quarrying and chemicals for the four sample years after the initial year 1975; food manufacturing in 1985, 1995 and 2000; machinery and other manufacturing in 1995, 2000 and 2005; electricity and waterworks in 1985, 2000 and 2005; transport and communications in 1985 and 2005; paper and printing, and rubber and plastics in 1995 and 2000; basic metals in 1995 and 2005; livestock in 1985 and 1995; fishery in 1985 and 2000; and petroleum, fabricated metals and services in 2005. Sectors the experienced declines in first order linkage intensities are: forestry for the entire sample years after 1975; textiles in 1985, 1995 and 2005; and twice for the following sectors – construction, and beverage and tobacco in 1985 and 1995; trade in 1985 and 2000; restaurant and hotels in 1995 and 2000; and agriculture in 1995 and 2005.

Second Order or Synergetic Effects of the Field of Influence

The synergetic effects of the field of influence approach are in turn shown in Figures 12, 13 and 14 for the Philippines, Malaysia and Thailand, respectively.

The synergetic effects for the Philippines (Figure 12) based on data summarized in **Appendix Table 9**, depicted the following sectors as showing greater than average second round intensities triggered by the change in technical coefficients over the sample years: 1) petroleum products; 2) mining; 3) paper and paper products; 4) textile products; 5) electricity, gas and water; 6) ferrous metal products; 7) transport services; 8) transport equipment; 9) wholesale and retail trade; 10) electrical machinery; and 11) non-electrical

machinery. Sectors with lower synergetic effects were other services; footwear and wearing apparel; miscellaneous manufactures; food manufacturing; banking, insurance and real estate; construction; non-ferrous metals; communication; beverages; and furniture and fixtures. It should be noted that the synergetic effects were largest in 1994 or three years before the crisis, indicating the rapid diffusion of innovation during the decade of the 1990s of information technology.

As for the synergetic or second round effects of the changes in inverse coefficients on the 1978 field of influence of Malaysia, **Appendix Table 10** shows the following sectors of the Malaysian economy having greater than average second round impacts: 1) petrol and coal; 2) transport services; 3) electrical and industrial machinery; 4) electricity, gas and water; 5) food manufacturing; 6) banking, finance and real estate; 7) rubber and rubber products; 8) transport and transport equipment; 9) non-ferrous and other metals; 10) communication; 11) chemical manufacturing; 12) paper and printing; 13) tobacco manufacturing; 14) private services and 15) non-metallic manufacturing. The synergetic effects of technological change as depicted in Figure 13 was faster in 2005 compared to earlier years as Malaysia's investments into the super corridor project at the beginning of the new millennium begin to tell results.

For Thailand, the synergetic effects of the change in technical coefficients shown in **Appendix Table 11** depict that half of the sectors have higher than average sectoral impacts in the second round: 1) chemical industries; 2) machinery; 3) basic metals; 4) mining and quarrying; 5) rubber and plastic products; 6) other manufacturing; 7) food manufacturing; 8) paper products and printing; 9) banking and insurance; 10) electricity and waterworks; 11) transportation and communication; 12) services; and 13) fishery. As shown in Figure 14, the synergetic effects in Thailand, unlike Malaysia, were more pronounced in 2000 indicating wider second round diffusion of technological change as represented by the change in technical coefficients after the Asian crisis of 1997.

Figure 12
**Synergetic Effects of Changes in Inverse Coefficients
 for the Philippines 1979-2006**

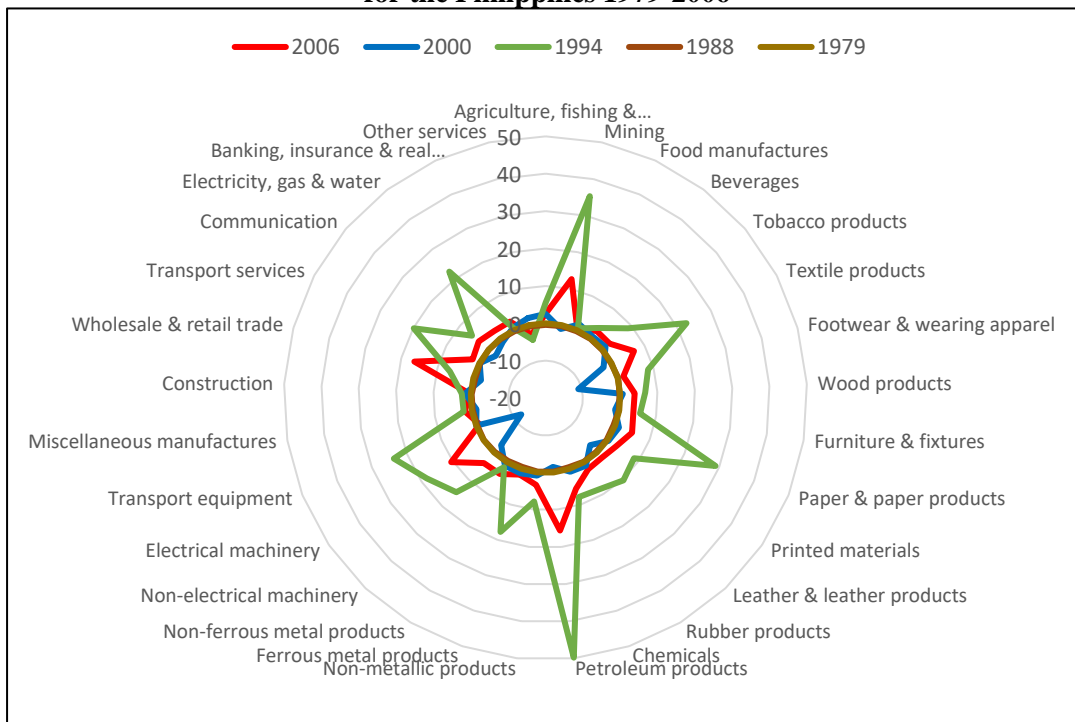


Figure 13
**Synergetic Effects of Changes in Inverse Coefficients
 for Malaysia 1983-2005**

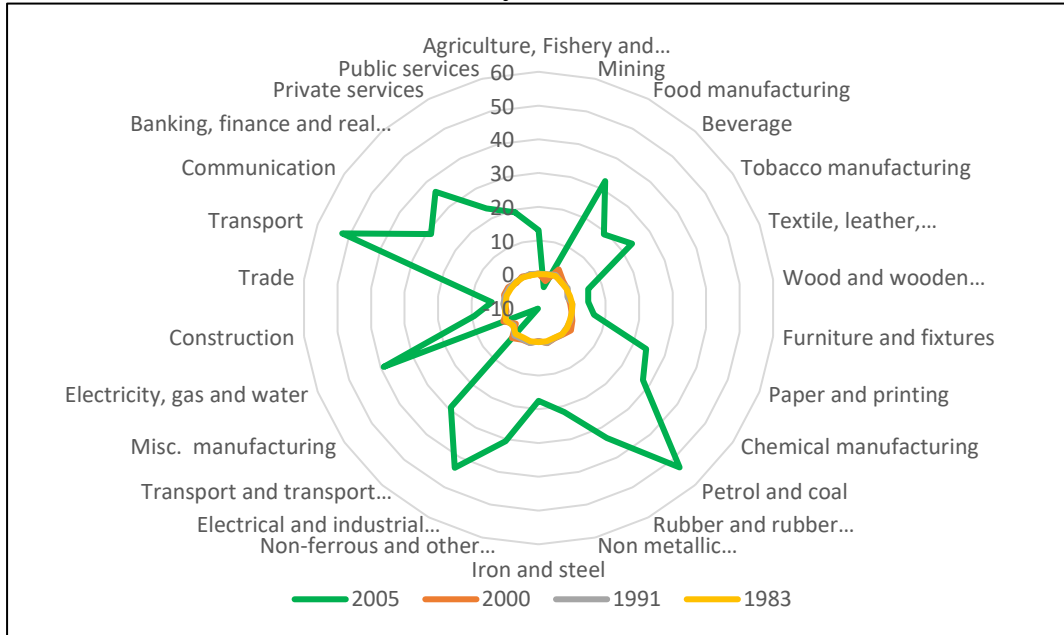
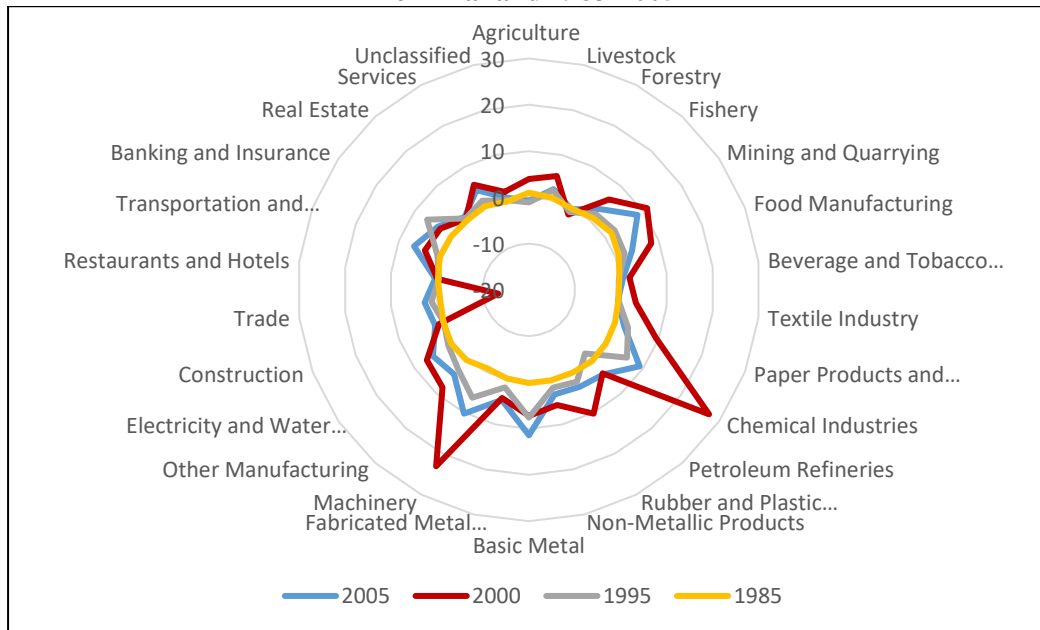


Figure 14
**Synergetic Effects of Changes in Inverse Coefficients
 for Thailand 1983-2005**



Multiplier Product Matrices and Economic Landscape

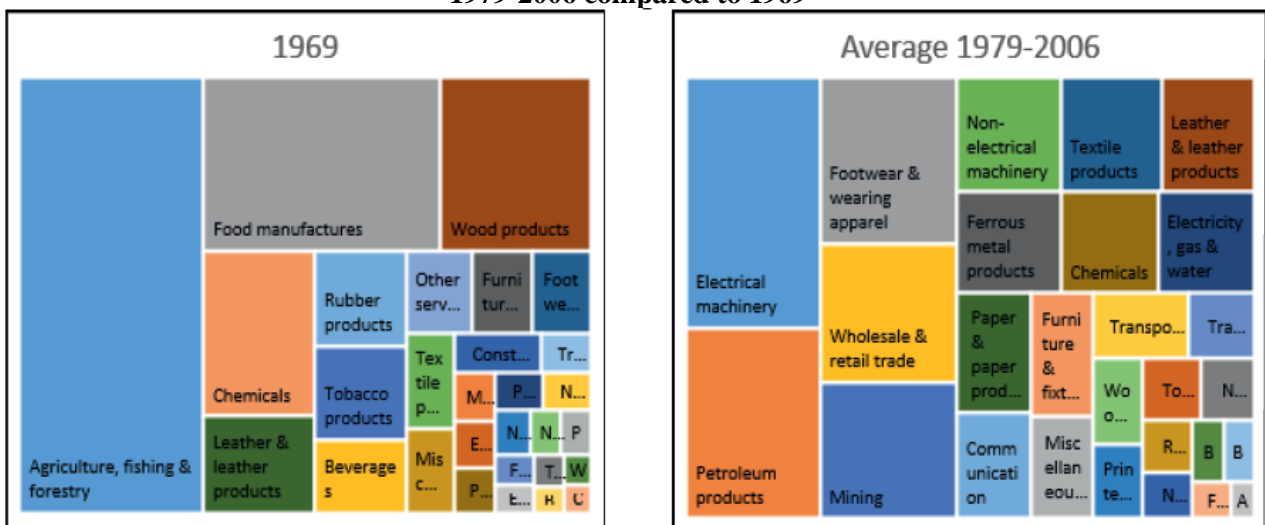
The direct field of influence when weighted by the sum of the column and row totals (i.e., global intensity or volume) yields the multiplier product matrix as shown in **Appendix Tables 12, 13 and 14** for the Philippines, Malaysia and Thailand. This allows the rearrangement into rank-size hierarchy of the backward and forward linkages to reveal the cross-structure of the field of influence and hence, the economic landscapes of the three economies.

For the Philippines, Figure 15 shows the key sectors in the Philippines in terms of average intensity changes weighted by the global intensity from 1979 to 2006 compared to the initial year 1969. The key sectors of the Philippine economy based on the linkage indices of the field of influence approach show that based on the global intensities, the key industries of the Philippines whose changes in coefficients generate the biggest share of interdependence with other sectors in the economy are: 1) ferrous metals; 2) wholesale and retail trade; 3) chemicals; 4) agriculture, fishery and forestry; 5) paper products; 6) other services; 7) non-ferrous metals; 8) petroleum products; 9) textiles; 10) food manufactures; and 11) mining. On the other hand, the sectors that ranked lowest were: communication; tobacco; furniture and fixtures; beverages; printing; construction; non-electrical machinery; rubber; footwear and wearing apparel; and wood products.

Based on magnitudes of the average change in linkage intensity coefficients from the base year, the most linkage intensive sectors of Malaysia were: 1) food manufacturing; 2) transport and transport equipment; 3) petrol and coal; 4) electricity, gas and water; 5) chemical manufacturing; 6) transport services; 7) non-ferrous metals; 8) non-metallic manufacturing; 9) communication; and 10) beverage manufacturing. Sectors with the weakest linkage intensities on average over the last three decades of the sample period were: 1) miscellaneous manufacturing; 2) textile, leather, footwear and wearing apparel; 3) construction; 4) furniture and fixtures; 5) wood and wooden products; 6) trade; 7) mining; 8) iron and steel; 9) rubber production; and 10) agriculture, fishery and forestry. The transition of key sectors in the Malaysian economy are depicted in Figure 16. From agriculture, fishery and forestry, rubber and rubber products, wood and wooden products and food manufacturing in 1978, the Malaysian economy has diversified into transport and transport equipment; petroleum and coal; electricity, gas and water; chemical manufacturing; transport services; non-ferrous metals; and non-metallic manufacturing.

The transformation of the Thai economy in terms of inter-industry linkages based on the field of influence approach is shown on Figure 17. From the dominance of agriculture, food manufacturing, livestock, rubber and plastic products, the mix of industries that emerged in 1985-2005 were more diffused and balanced with chemicals, mining, machinery, basic metals, food manufacturing, banking and insurance, unclassified industries and other manufacturing. The sectors with lower values of total linkages were: real estate; unclassified sectors; fishery; forestry; services; banking and insurance; and beverage and tobacco products.

Figure 15
Inverse Important Sectors in the Philippines
 based on average changes in linkage intensity coefficients of the field of influence
 1979-2006 compared to 1969



Key Sectors Philippines based on Average Total Linkages using Field of Influence, 1969-2006

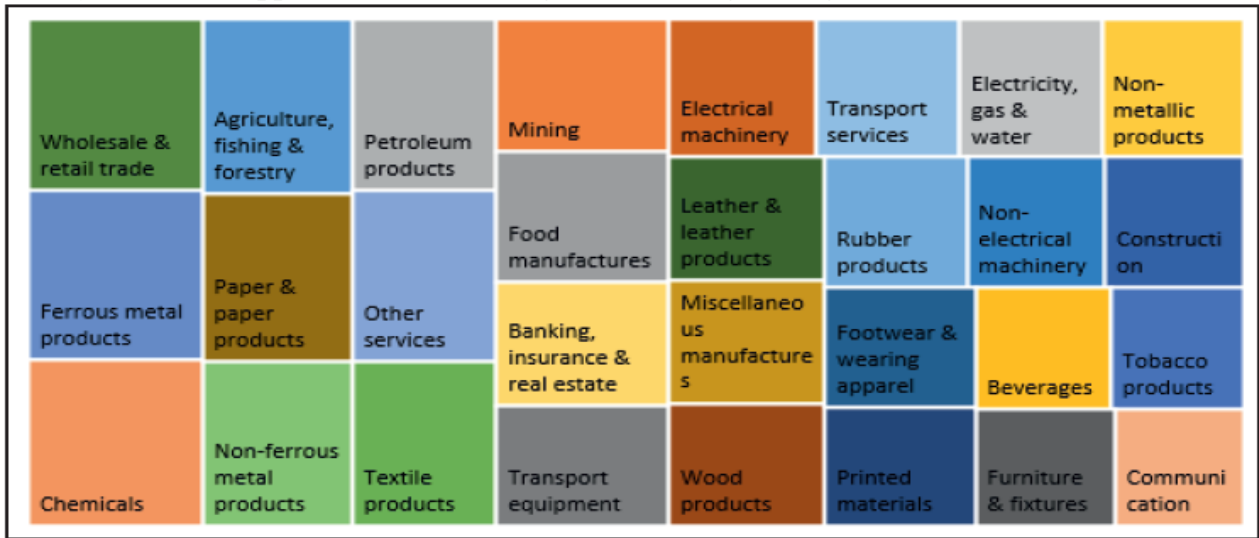
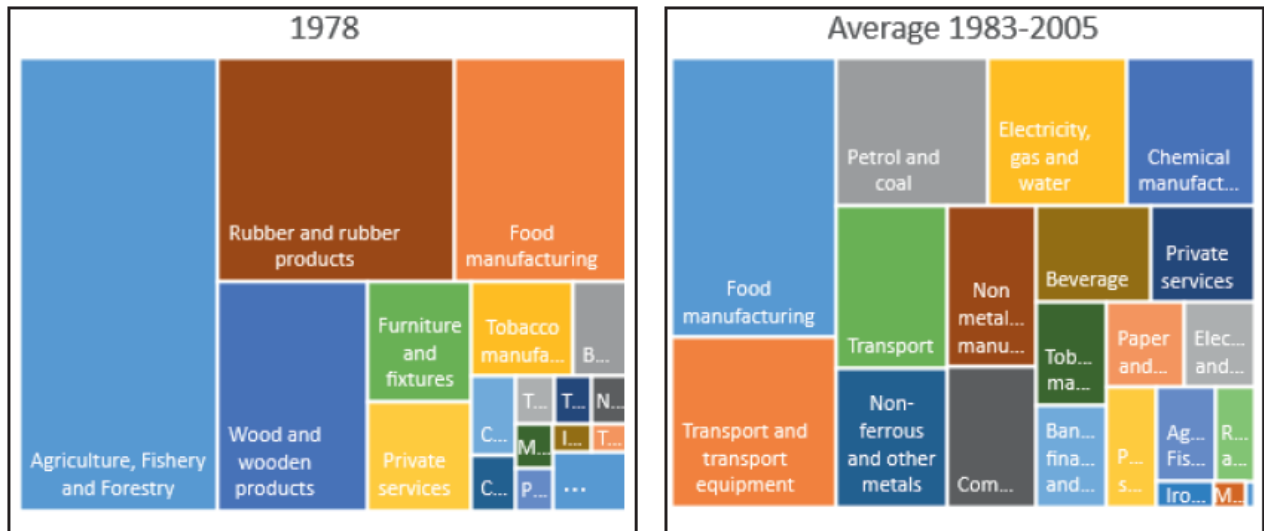


Figure 16
Inverse Important Sectors in Malaysia
 based on average changes in linkage intensity coefficients of the field of influence 1983-2005 compared to 1978



Key Sectors Malaysia based on Average Total Linkages using Field of Influence, 1978-2006

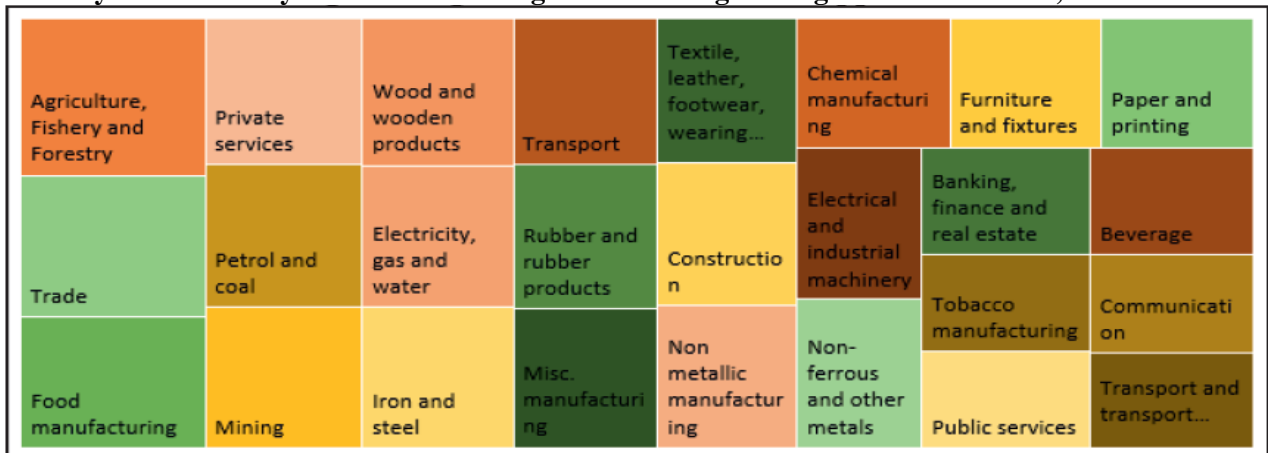
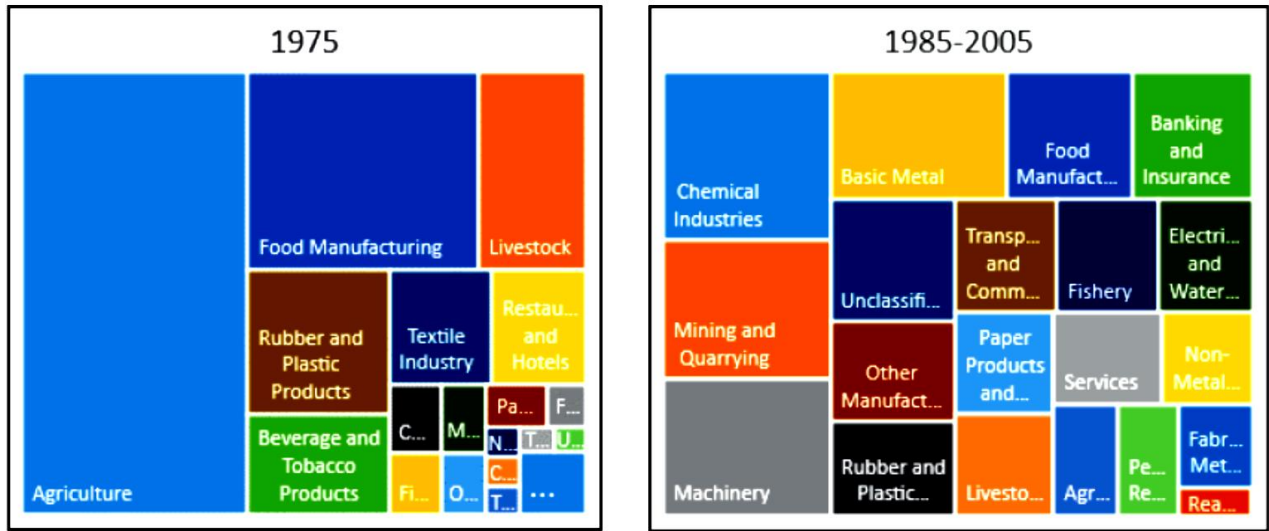
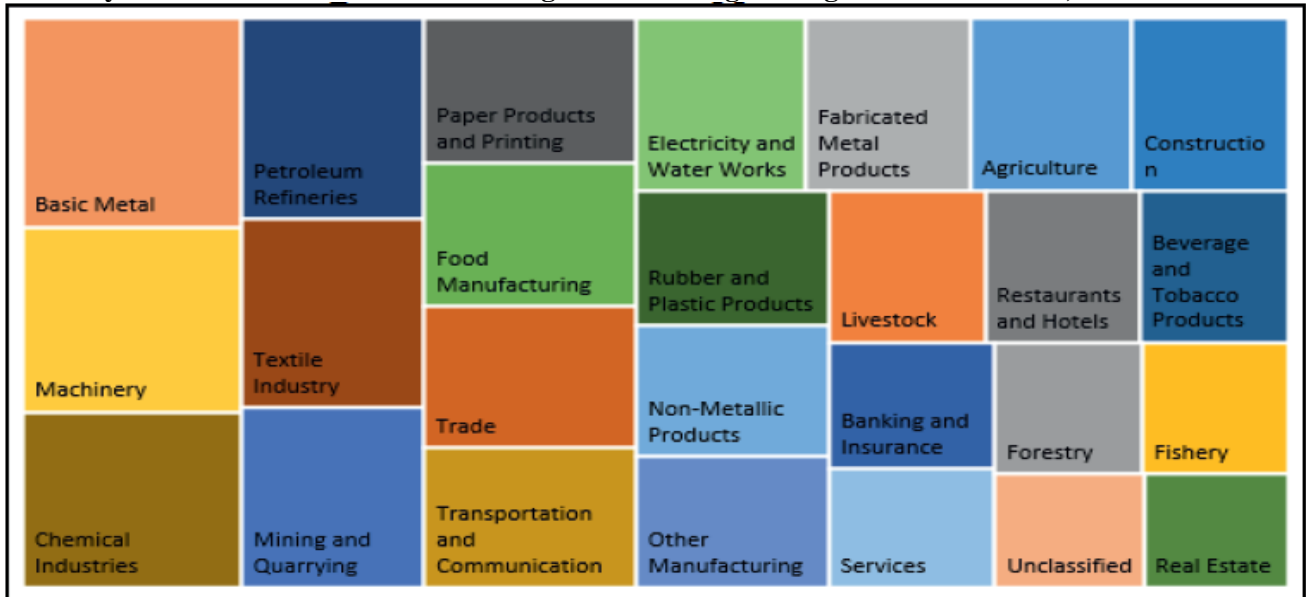


Figure 17
Inverse Important Sectors in Thailand
 based on average changes in linkage intensity coefficients of the field of influence
 1985-2005 compared to 1975



Key Sectors Thailand based on Average Total Linkages using Field of Influence, 1975-2005



The multiplier product matrices of the base or reference years allows for the rearrangement into rank-size hierarchy of the backward and forward linkages to reveal the cross-structure or economic landscape of the field of influence as visualized in Figures 18, 19 and 20 for the Philippines, Malaysia and Thailand.

Figure 18
Economic Landscape of the Philippines, 1969

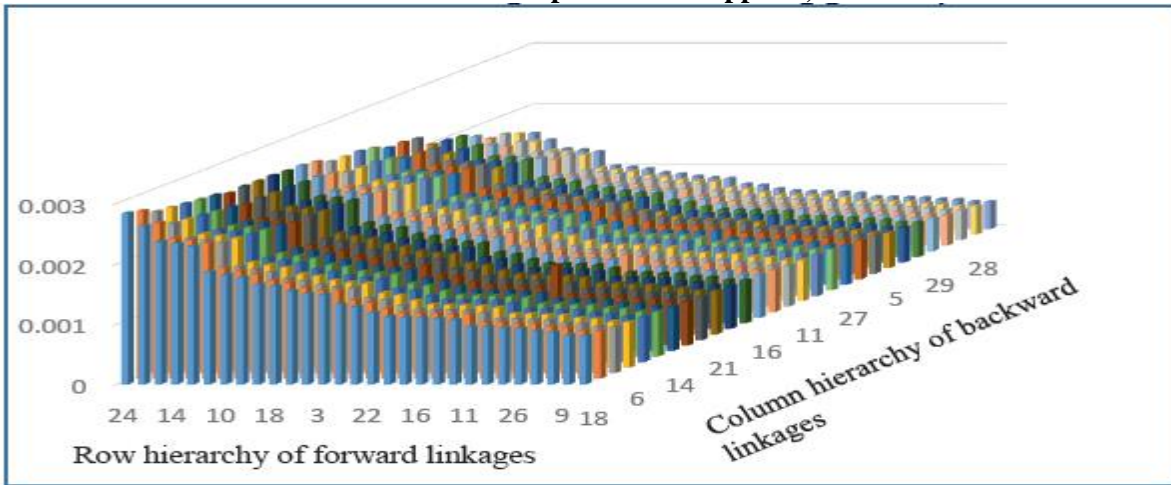


Figure 19
Economic Landscape of Malaysia, 1978

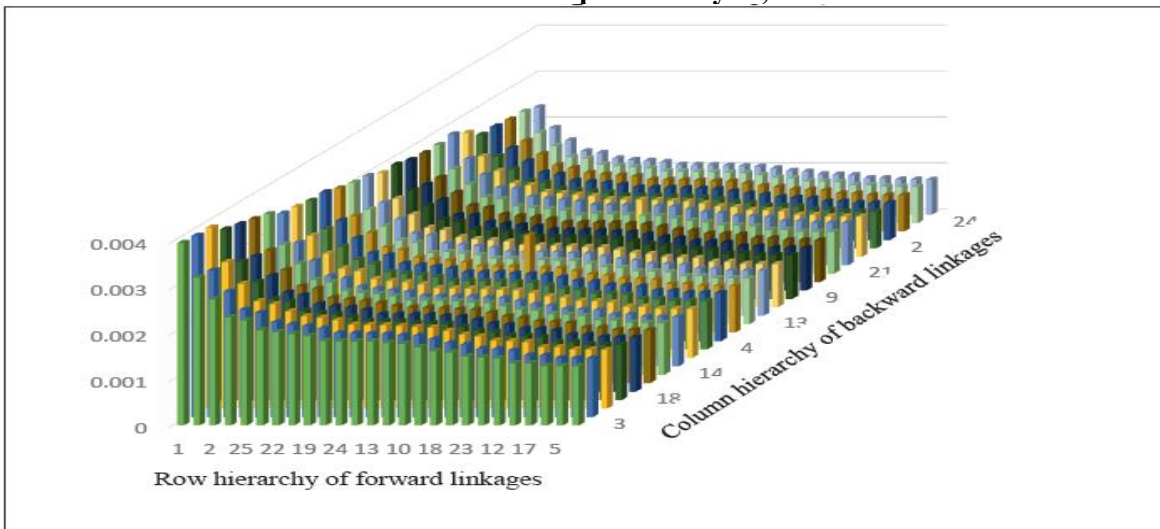
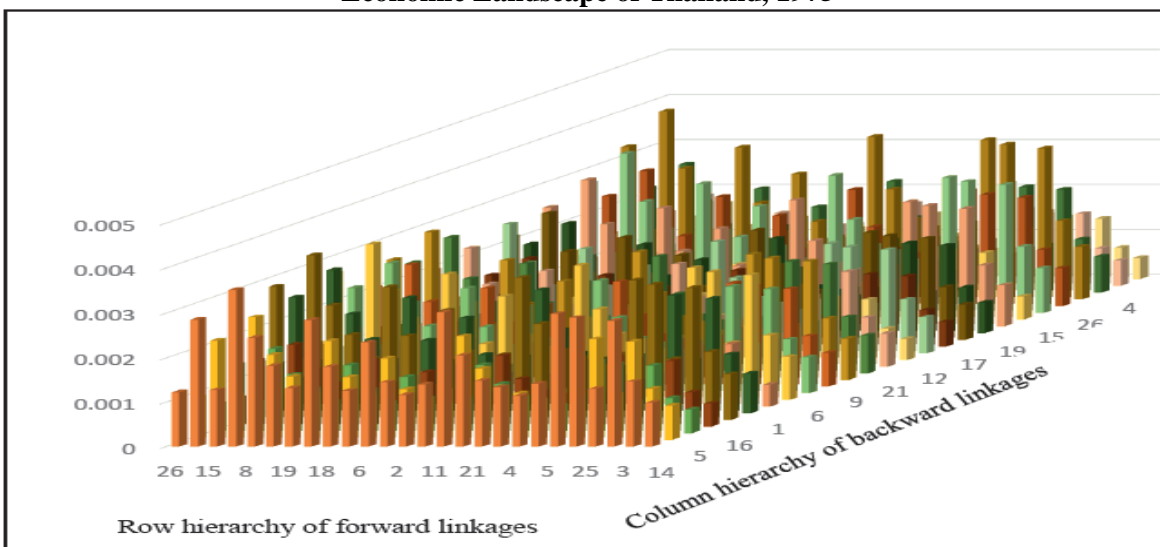


Figure 20
Economic Landscape of Thailand, 1975



Backward and Forward Linkages based on Field of Influence Approach

Figures 21, 22 and 23 show the backward and forward linkages based on the field of influence calculations for the Philippines, Malaysia and Thailand, respectively.

Figure 21
Key Sectors based on Field of Influence Results, Philippines, Average 1969-2006

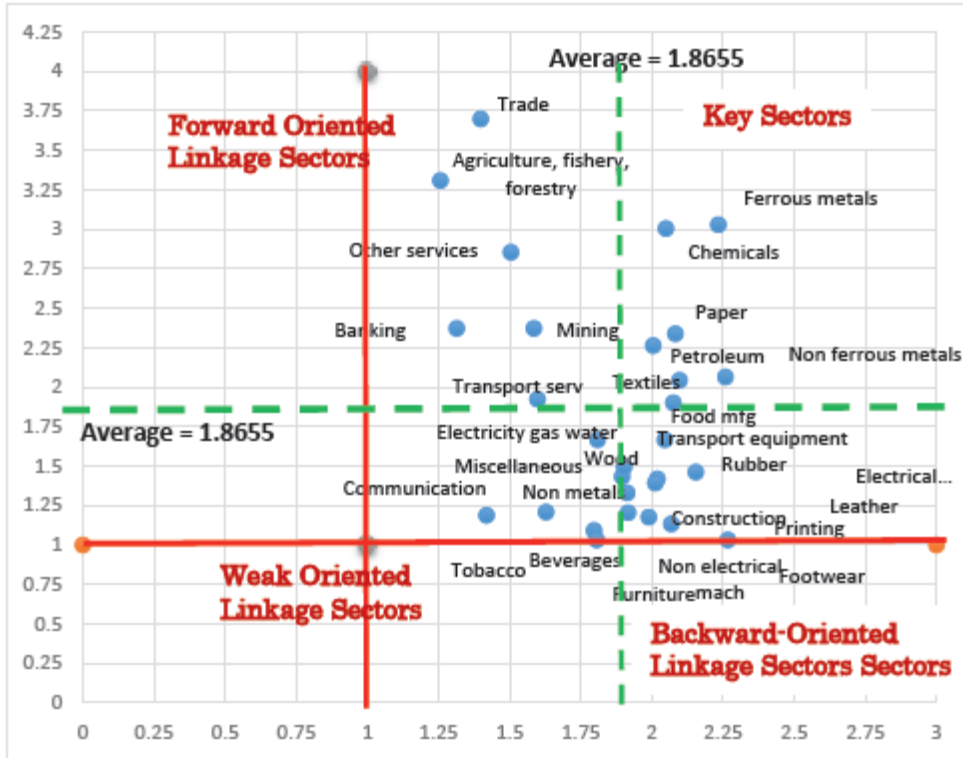


Figure 22
Key Sectors based on Field of Influence Results, Malaysia, Average 1969-2006

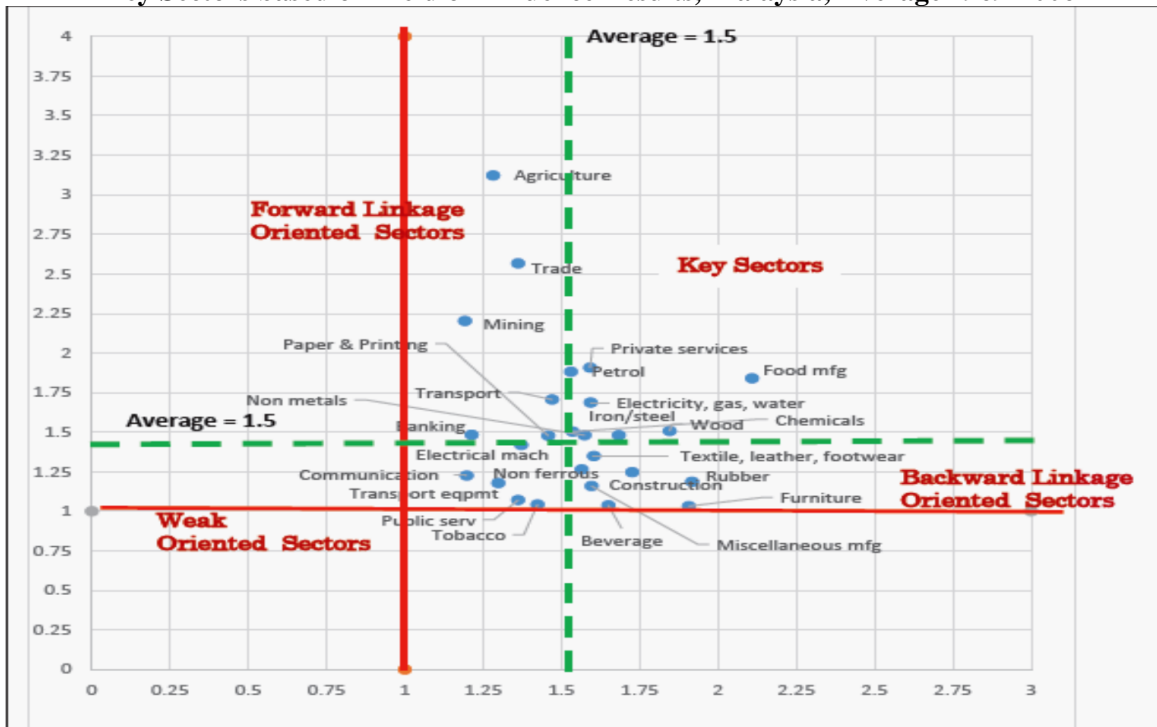
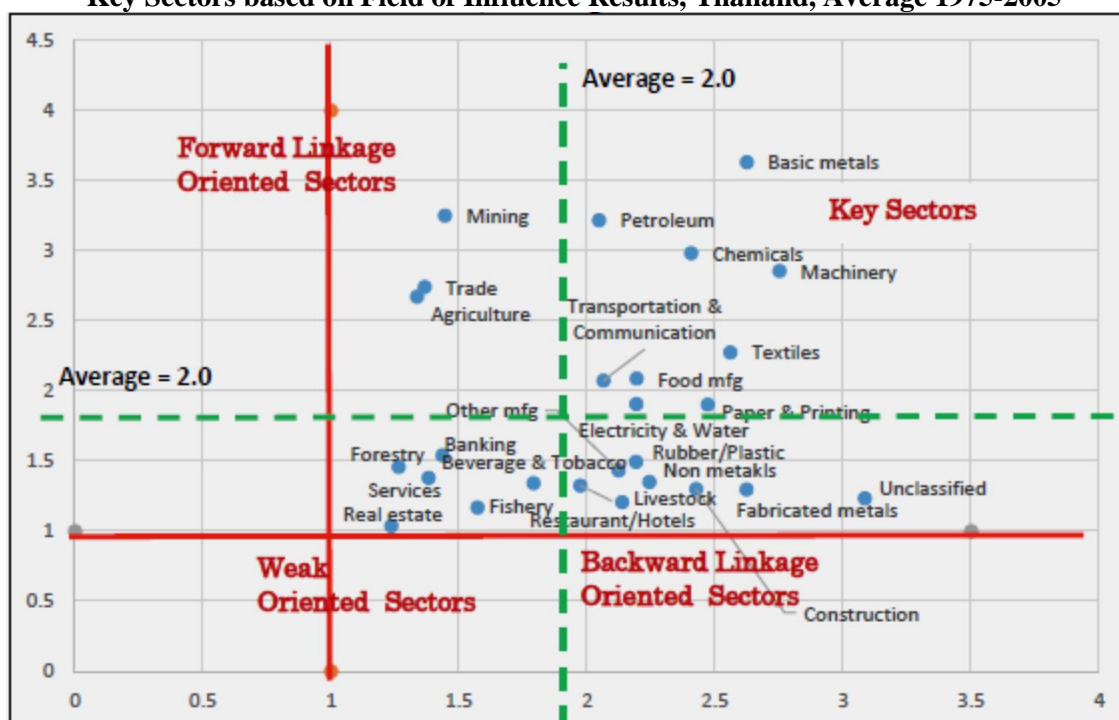


Figure 23

Key Sectors based on Field of Influence Results, Thailand, Average 1975-2005



Averaging the data for the Philippines from 1969 to 2006 and following the criteria discussed in Sonis & Hewings (1999), Figure 21 shows that the sectors with both strong forward and backward linkages are: 1) ferrous metals; 2) chemicals; 3) petroleum; 4) paper; 5) non-ferrous metals; 6) textiles; and 7) food manufacturing. Sectors with strong backward linkages are: 1) transport equipment; 2) electrical machinery; 3) leather; 4) rubber; 5) construction; 6) footwear; and 7) non-electrical machinery. This implies that a change in demand will starkly affect these supplier industries. On the other hand, the sectors with strong forward linkages are: 1) trade; 2) agriculture, fishery and forestry; 3) other services; 4) mining; 5) banking; and 6) transport services. Supply-side shocks such as changes in technology affect these buying industries the most. The weak interdependent sectors are: 1) electricity, gas and water; 2) wood; 3) communication; 4) non-metallic production; 5) tobacco; and 6) beverages. Comparison with the results of key sector analysis using the field of influence approach in Table 5 shows seven common industries among the top ten sectors between the two approaches although the rankings shifted – textiles, petroleum products, wholesale and retail trade, chemicals, ferrous metals, paper, and agriculture, forestry and fisheries. Among the sectors which ranked lowest, the following seven industries consistently showed up in the two methods for key sector analysis – printing, rubber, non-electrical machinery, tobacco, beverages, construction, and communication.

The key sectors of the Malaysian economy during the sample years as depicted in Figure 22 were: 1) agriculture, fishery and forestry; 2) food manufacturing; 3) trade; 4) public services; 5) petrol and coal; 6) mining; 7) wood and wooden products; 8) electricity, gas and water; 9) transport; 10) iron and steel; and 11) rubber and rubber products. The sum of the backward and forward linkages of these sectors exceeded one and also exceeded the average linkage index for all sectors. The sectors that ranked least were: public services; communication; tobacco; transport and transport equipment; beverages; banking, finance and real estate; and miscellaneous manufacturing. The key sector analysis using the traditional approach based on the given Leontief inverses of each sample year are shown on Table 5. Comparing the leading and lagging sectors in terms of total linkages shown in Table 7.39 discloses that nine of the sectors are the major sectors of Malaysia under both approaches although the rankings changed – 1) food manufacturing;

2) agriculture, fishery and forestry; 3) petrol and coal; 4) trade; 5) transport; 6) private services; 7) electricity, gas and water; 8) wood and wooden products; and 9) iron and steel. Seven of the sectors ranked the lowest under both approaches with their rankings shifting led by public services; communication; tobacco; miscellaneous manufacturing; transport and transport equipment; beverages; and banking.

Table 5
Comparison of Key Sector Analysis between using Field of Influence Results and Leontief inverses of each year based on averages

Philippines 1969-2006			Malaysia, 1978-2005			Thailand, 1975-2005		
Leontief inverses per year	Rank	Multiplier Product Matrix	Leontief inverses per year	Rank	Multiplier Product Matrix	Leontief inverses per year	Rank	Multiplier Product Matrix
Footwear	1	Ferrous metal products	Food manufacturing	1	Agriculture, Fishery and Forestry	Basic Metal	1	Basic Metal
Textile products	2	Wholesale & retail trade	Agriculture, Fishery and Forestry	2	Food manufacturing	Machinery	2	Machinery
Petroleum products	3	Chemicals	Petrol and coal	3	Trade	Chemical Industries	3	Chemical Industries
Wholesale & retail trade	4	Agriculture, fishing & forestry	Trade	4	Private services	Mining and Quarrying	4	Petroleum Refineries
Chemicals	5	Paper & paper products	Transport	5	Petrol and coal	Petroleum Refineries	5	Textile Industry
Ferrous metal products	6	Other services	Private services	6	Mining	Food Manufacturing	6	Mining and Quarrying
Mining	7	Non-ferrous metal products	Electricity, gas and water	7	Wood and wooden products	Textile Industry	7	Paper Products and Printing
Paper & paper products	8	Petroleum products	Rubber and rubber products	8	Electricity, gas and water	Paper Products and Printing	8	Unclassified
Agriculture, fishing & forestry	9	Textile products	Wood and wooden products	9	Transport	Electricity and Water Works	9	Food Manufacturing
Leather & leather products	10	Food manufactures	Iron and steel	10	Iron and steel	Transportation and Communication	10	Transportation and Communication
Electricity, gas & water	11	Mining	Chemical manufacturing	11	Rubber and rubber products	Agriculture	11	Trade
Non-ferrous metal products	12	Transport equipment	Non metallic manufacturing	12	Non metallic manufacturing	Unclassified	12	Electricity and Water Works
Food manufactures	13	Banking, insurance & real estate	Mining	13	Chemical manufacturing	Fabricated Metal Products	13	Agriculture
Transport services	14	Electrical machinery	Paper and printing	14	Construction	Rubber and Plastic Products	14	Fabricated Metal Products
Other services	15	Transport services	Electrical and industrial machinery	15	Textile, leather, footwear, wearing apparel	Other Manufacturing	15	Construction
Miscellaneous manufactures	16	Electricity, gas & water	Non-ferrous and other metals	16	Furniture and fixtures	Trade	16	Rubber and Plastic Products
Transport equipment	17	Leather & leather products	Construction	17	Paper and printing	Non-Metallic Products	17	Non-Metallic Products
Banking, insurance & real estate	18	Non-metallic products	Furniture and fixtures	18	Non-ferrous and other metals	Construction	18	Other Manufacturing
Wood products	19	Miscellaneous manufactures	Banking, finance and real estate	19	Electrical and industrial machinery	Livestock	19	Livestock
Furniture & fixtures	20	Wood products	Textile, leather, footwear, wearing apparel	20	Misc. manufacturing	Banking and Insurance	20	Restaurants and Hotels
Non-metallic products	21	Footwear	Beverage	21	Banking, finance and real estate	Restaurants and Hotels	21	Beverage and Tobacco Products
Printed materials	22	Rubber products	Transport and transport equipment	22	Beverage	Services	22	Banking and Insurance
Rubber products	23	Non-electrical machinery	Misc. manufacturing	23	Transport and transport equipment	Beverage and Tobacco Products	23	Unclassified
Non-electrical machinery	24	Construction	Tobacco manufacturing	24	Tobacco manufacturing	Fishery	24	Fishery
Tobacco products	25	Printed materials	Communication	25	Public services	Forestry	25	Forestry
Beverages	26	Beverages	Public services	26	Communication	Real Estate	26	Real Estate
Construction	27	Furniture & fixtures						
Communication	28	Tobacco products						
Electrical machinery	29	Communication						

The key sectors of the Thai economy as shown on Figure 23 are: 1) basic metals; 2) machinery; 3) chemical industries; 4) petroleum refinery; 5) textile industry; 6) mining and quarrying; 7) paper products and printing; 8) food manufacturing; 9) trade; 10) transportation and communication; 11) electricity and water works; 12) agriculture; and 13) fabricated metal products. The linkage indices of these sectors exceeded the average for all sectors and their backward and forward linkages exceeded unity. With backward and forward linkages exceeding the value of 1, the key sectors of Thailand are generally interdependent based on the taxonomy of Miller and Blair (2009). Comparing the results of key sector analysis arising from the field of influence approach and from the Leontief inverses of each sample year shown in Table 5 indicate more commonalities. Nine sectors ranking the highest in both approaches were identical except for the standings which changed for some industries. Only electricity and water works which ranked ninth under the traditional approach and unclassified sectors which ranked eighth under the field of influence operations differed between both approaches. As for sectors with weak linkage effects, only services which ranked 22nd under the old approach and unclassified sectors which ranked 23rd under the new approach were dissimilar. Under both approaches to key sector analysis, the analysis showed real estate; forestry; fishery; beverage and tobacco; banking and insurance; restaurants and hotels; and livestock consistently ranked as the least intensive sectors.

N Matrices and Scaling Effects

The synergetic relationships among sectors that create the largest self-influence and scaling effects on the volume of change in the economic system is further shown in the N matrices on [Appendix Tables 15, 16](#)

and 17 for the sample years of the Philippines, Malaysia and Thailand and are illustrated correspondingly in Figures 24, 25 and 26 for the same countries.

Figure 24
Self-Influence and Scaling Effects from the N Matrix, Philippines, 1969-2006

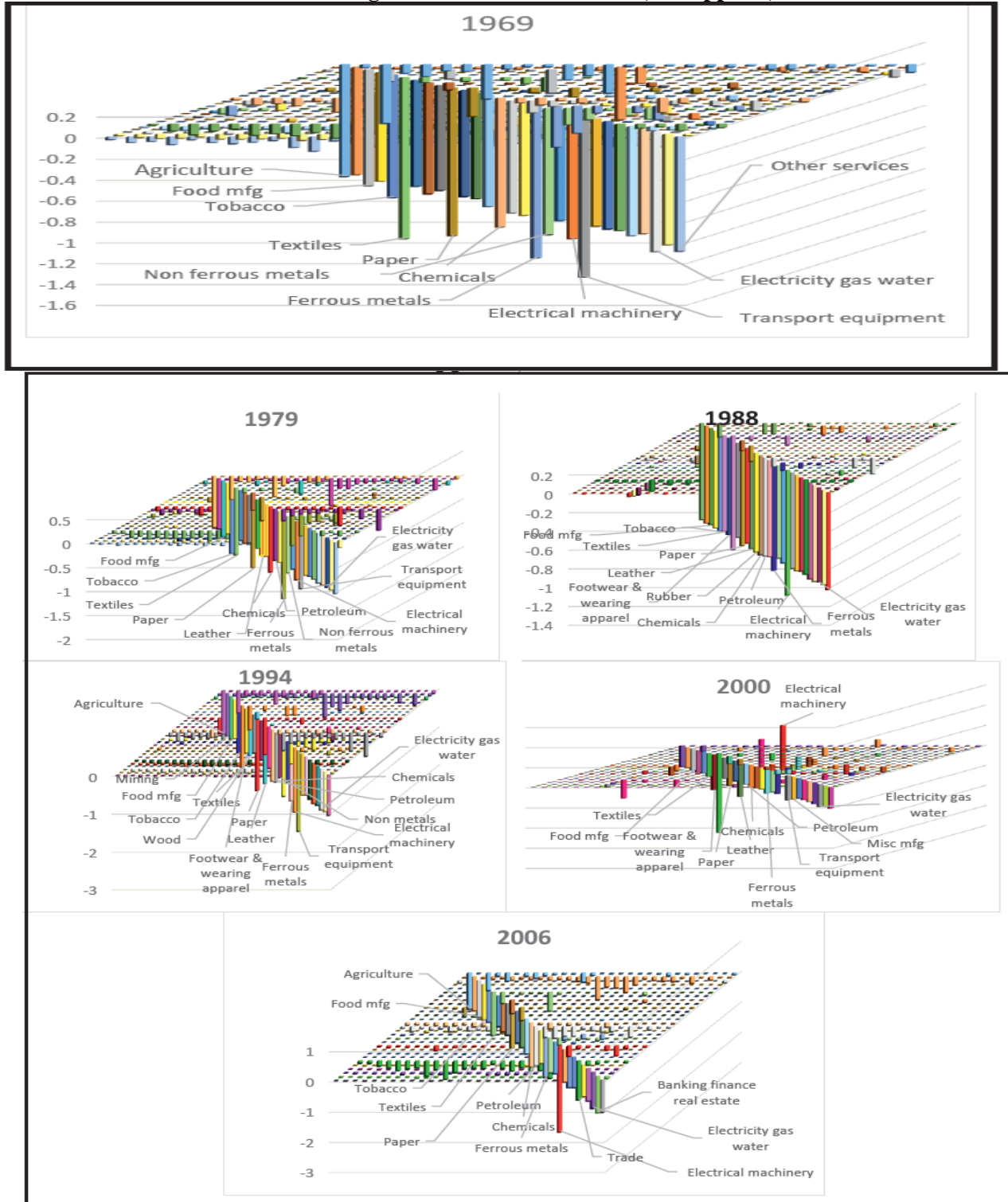


Figure 25
Self-Influence and Scaling Effects from the N Matrix, Malaysia, 1978-2005

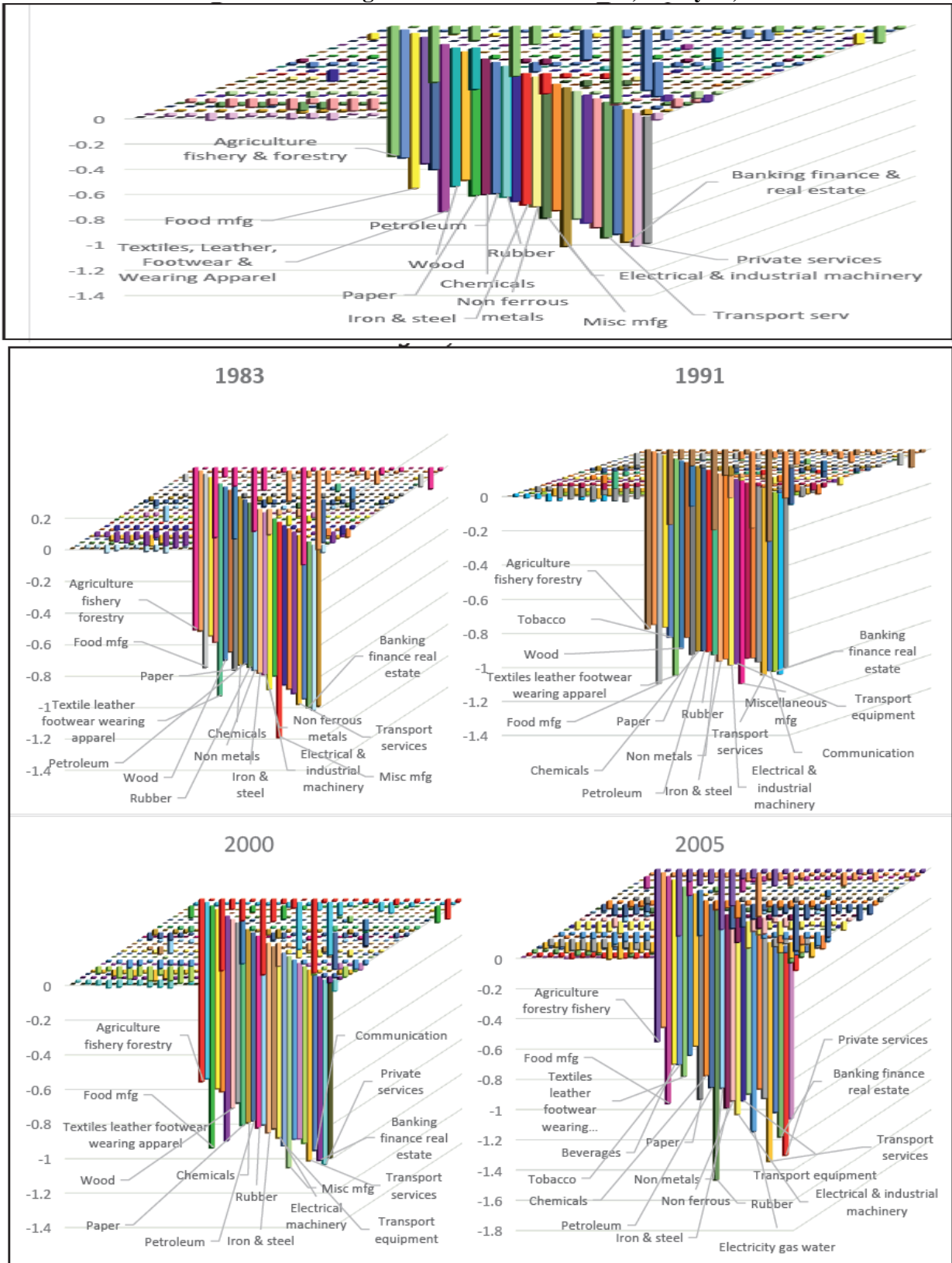
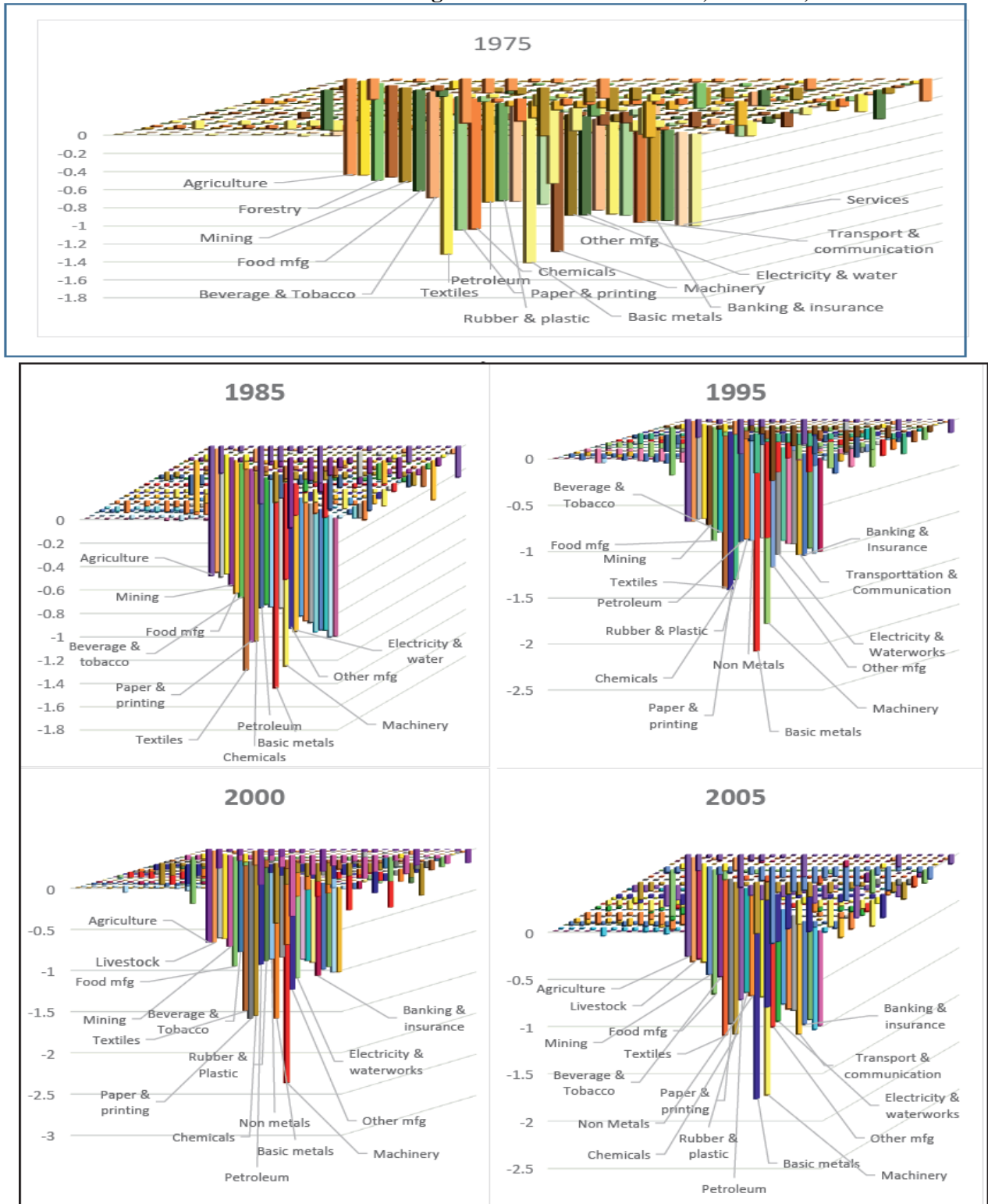


Figure 26
Self-Influence and Scaling Effects from the N Matrix, Thailand, 1975



For the Philippines, the diagonal elements of the N matrix in Figure 24 reveal that the multipliers along the diagonals that exceeded the average value throughout the sample years were the highest for the following sectors: 1) textiles; 2) transport equipment; 3) ferrous metals; 4) paper; 5) chemicals; 6) tobacco; 7) non-ferrous metals; and 8) electrical machinery. This indicates that these sectors have the highest self-influence in cases of sector-specific technological change or sector-specific crisis that produces the most impact on

the entire economic output. The sectors that exert the least self-influence for all sample years for the Philippines were: 1) furniture and fixtures; 2) communication; 3) printing; 4) wholesale and retail trade; 5) footwear and wearing apparel; 6) construction; 7) miscellaneous manufacturing; and 8) leather and leather products. The scaling effects were high for the following pairs of sectors: agriculture and food manufacturing; agriculture and wood products; agriculture and chemicals; mining and petroleum; paper and printing; leather and footwear; non-ferrous metals and ferrous metals; and non-electrical machinery and ferrous metals. From the N matrices, the sectors which exert strong scaling effects on other sectors are consistent throughout the sample years: electrical machinery, ferrous metals, chemicals, textiles, paper, tobacco, petroleum, food manufacturing, and electricity, gas and water. The economic self-influence of some sectors were stronger in selected years such as footwear and wearing apparel in 1988, 1994 and 2000; transport equipment in 1979, 1994 and 2000; and banking, finance and real estate in 2006.

For Malaysia, the diagonals of the N matrix in Figure 25 reveal the following sectors with the highest self-influence exceeding the average value for all sectors throughout the sample years: 1) textiles, leather, footwear and wearing apparel; 2) miscellaneous manufacturing; 3) food manufacturing; 4) paper and paper products; 5) wood and wood products; 6) electrical and industrial machinery; 7) chemicals; 8) transport services; and 9) banking and finance. Sectors with the weakest self-influence were: public services; beverages; transport equipment; electricity, gas and water; construction; mining; communication; furniture and fixtures; tobacco; and trade. The scaling effects were prominent for the following pairs of sectors: rubber and agriculture; mining, and iron and steel; petroleum and electricity, gas and water; agriculture and food manufacturing; wood and furniture; mining and petrol; and agriculture and wood. The self-influencing sectors consistently observed between the base year and succeeding years were: agriculture, fishery, forestry; food manufacturing; textile, leather, footwear & wearing apparel; petroleum; wood; paper; chemicals; rubber; iron & steel; electrical & industrial machinery; miscellaneous manufacturing; transport services; and banking, finance & real estate. Scaling effects of selected sectors became pronounced in selected years, notably transport equipment from 1991, 2000, and 2005; communication in 1991 and 2000; and beverages and electricity, gas and water in 2005.

Scaling effects from Thailand's N matrix were highest for many pairs of sectors such as: agriculture and food manufacturing; food manufacturing and livestock; petroleum and mining; mining and basic metals; forestry and other manufacturing; electricity and waterworks and mining; fabricated metals and basic metals; electricity and petroleum; construction and basic metals; transportation & communications and petroleum; and food manufacturing and unclassified industries. Subtracting the inverse matrices of succeeding years from their respective multiplier product matrices obtained by taking the products of the first order intensities of the direct field of influence and the changes in technical coefficient, the N matrices of the rest of the sample years were derived and portrayed in Figure 26. As expected, the following self-influencing sectors consistently reflected large scaling effects as in the initial year — agriculture, mining, food manufacturing, beverage & tobacco, textiles, paper & printing, chemicals, petroleum, basic metals, machinery, other manufacturing, electricity & waterworks, and banking & insurance. In some years, rubber & plastics (except for 1985) and transport and communication (in 1995 and 2005) were self-influencing.

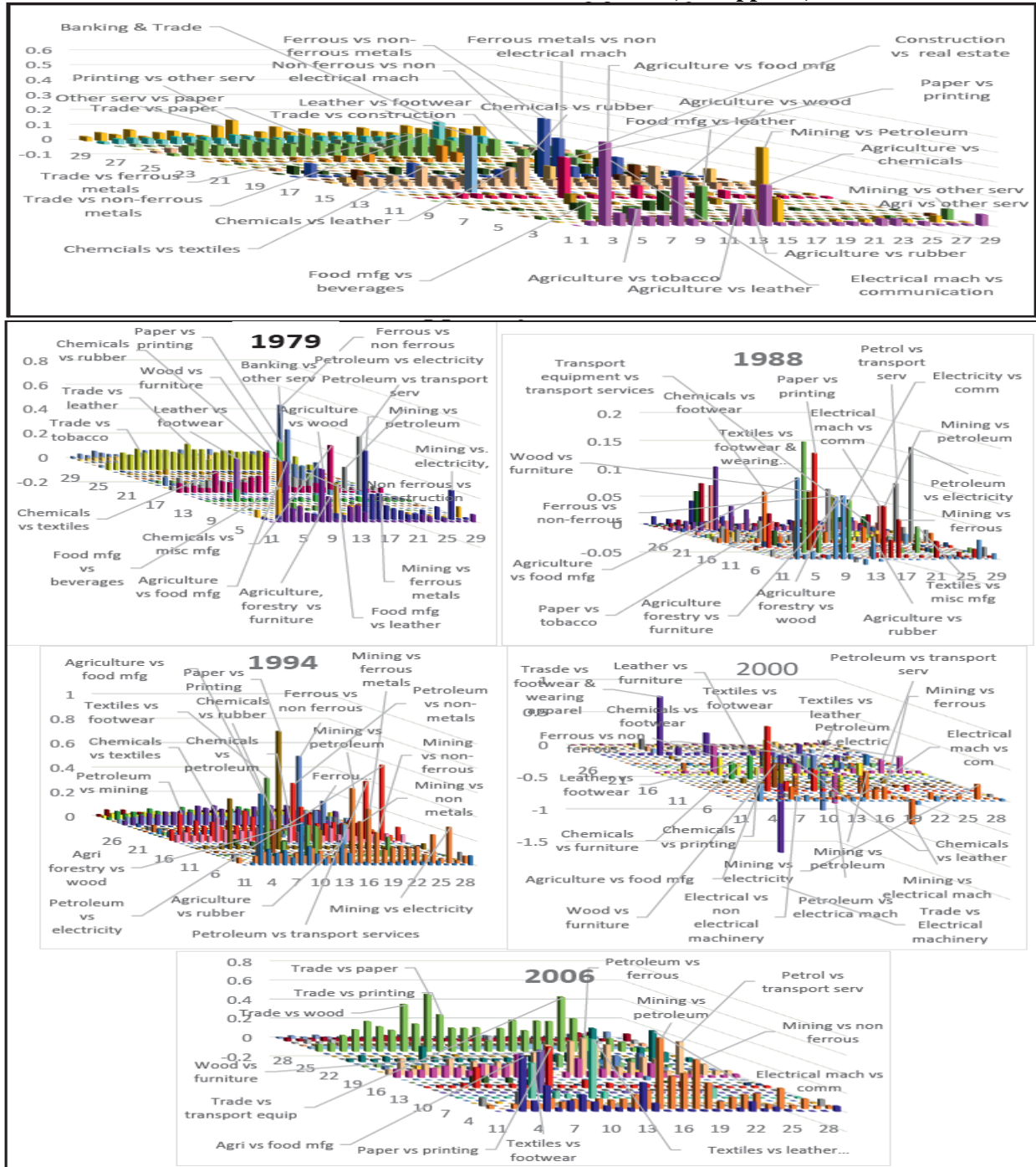
Residual Matrices and Sectoral Compensatory Balances

As for the residual matrix, pictured on Figures 27, 28 and 29 are sectoral distortions for the Philippines, Malaysia and Thailand that required compensating balances arising from sector-specific shocks such as technological change or demand or supply shocks in times of economic crisis.

These shifts in sectoral balances were pronounced in the Philippines between the following pairs: agriculture and food manufacturing; agriculture and unclassified industries; forestry and other manufacturing; mining and petroleum; mining and basic metals; food manufacturing and livestock; food manufacturing and unclassified industries; chemicals and rubber & plastic products; petroleum and electricity & waterworks; transportation/communication and petroleum; basic metals and fabricated metals; machinery and basic metals; and construction and basic metals. The residual matrices are provided in **Appendix Tables 18** for the Philippines, **Appendix Tables 19** for Malaysia and **Appendix Tables 20** for

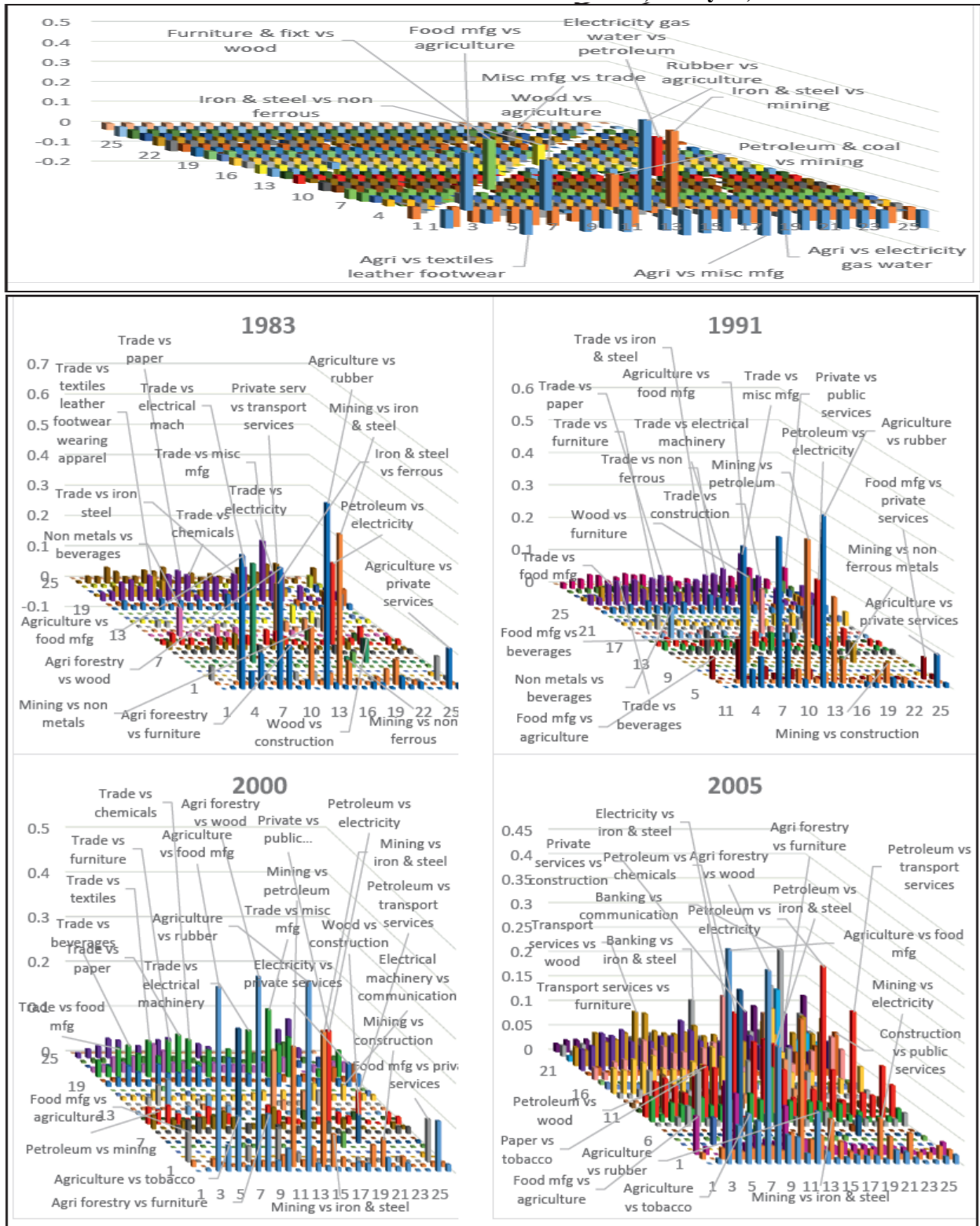
Thailand, indicating same multiplier and same sign for pairs of sectors under symmetric and same multiplier but opposite signs for antisymmetric residuals.

Figure 27
Sectoral Bilateral Balances under Residual Matrices, Philippines, 1969-2006



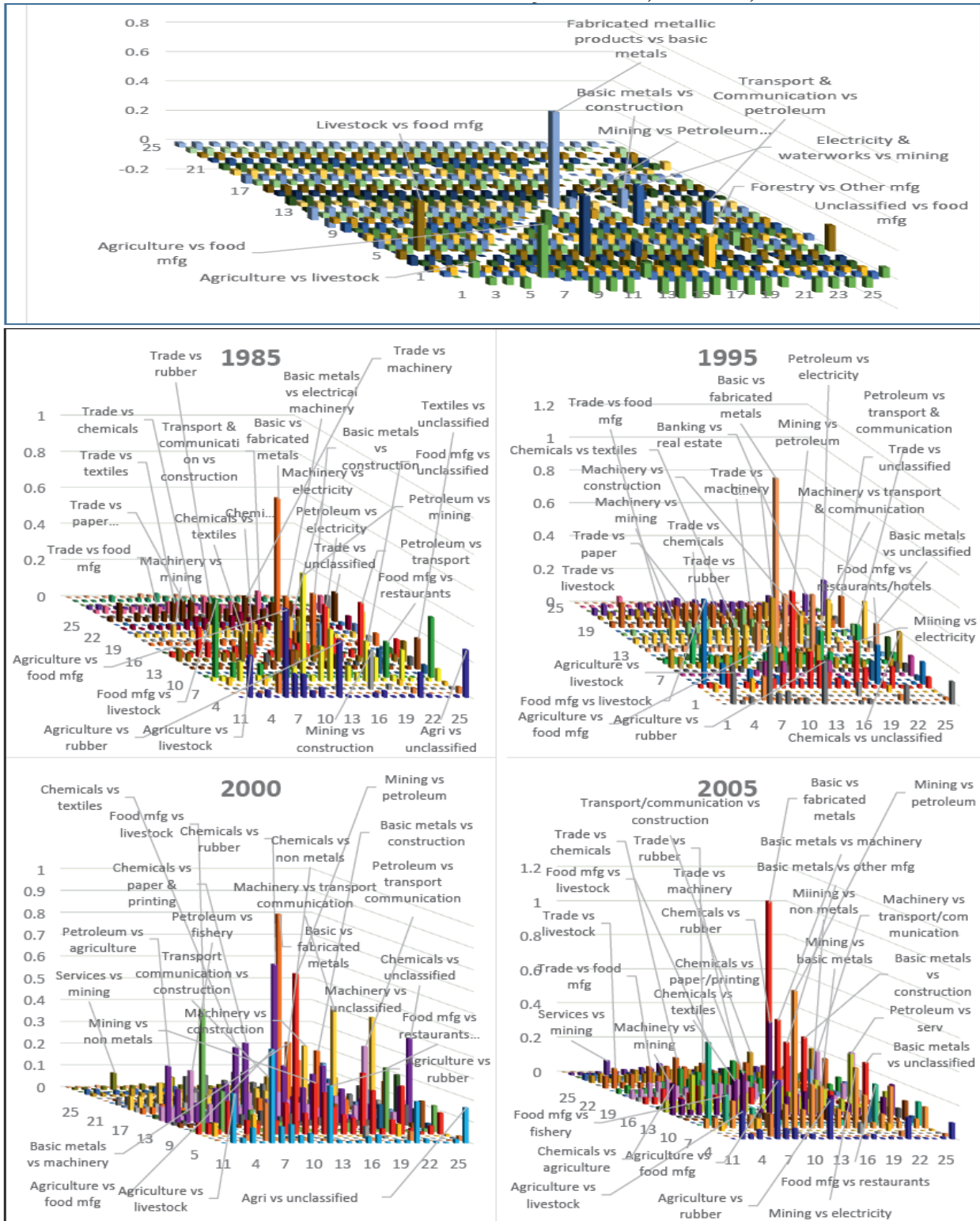
- Legend**
- 1 Agriculture, fishery & forestry
 - 2 Mining
 - 3 Food manufactures
 - 4 Beverages
 - 5 Tobacco products
 - 6 Textiles
 - 7 Footwear & wearing apparel
 - 8 Wood products
 - 9 Furniture & fixtures
 - 10 Paper & products
 - 11 Printed materials
 - 12 Leather & leather products
 - 13 Rubber products
 - 14 Chemicals
 - 15 Petroleum products
 - 16 Non-metallic products
 - 17 Ferrous metallic products
 - 18 Non-ferrous metallic products
 - 19 Non-electrical machinery
 - 20 Electrical machinery
 - 21 Transport equipment
 - 22 Miscellaneous manufactures
 - 23 Construction
 - 24 Wholesale & retail trade
 - 25 Transport services
 - 26 Communication
 - 27 Electricity, gas & water
 - 28 Banking, insurance & real estate
 - 29 Other services

Figure 28
Sectoral Bilateral Balances under Residual Matrices, Malaysia, 1978-2005



Legend
 1 Agriculture, fishery & forestry 2 Mining 3 Food manufactures 4 Beverages 5 Tobacco products 6 Textiles, Leather, Footwear & Wearing apparel 7 Wood & wooden products 8 Furniture & fixtures 9 Paper & paper products 10 Chemicals 11 Petrol & Coal 12 Rubber & rubber products 13 Non-Metallic Manufacturing 14 Iron & Steel 15 Non-Ferrous & other metals 16 Electrical & industrial machinery 17 Transport & transport equipment 18 Miscellaneous manufacturing 19 Electricity, gas & water 20 Construction 21 Trade 22 Transport services 23 Communication 24 Banking, finance and real estate 25 Private services 26 Public services

Figure 29
Sectoral Bilateral Balances under Residual Matrices, Thailand, 1975-2005



Legend

- 1 Agriculture
- 2 Livestock
- 3 Forestry
- 4 Fishery
- 5 Mining & Quarrying
- 6 Food Manufacturing
- 7 Beverage & Tobacco Products
- 8 Textiles
- 9 Paper Products & Printing
- 10 Chemical Industries
- 11 Petroleum Refinery
- 12 Rubber & Plastic Products
- 13 Non-Metallic Products
- 14 Basic Metals
- 15 Fabricated Metallic Products
- 16 Machinery
- 17 Other Manufacturing
- 18 Electricity and Waterworks
- 19 Construction
- 20 Trade
- 21 Restaurants & Hotels
- 22 Transportation & Communication
- 23 Banking & Insurance
- 24 Real Estate
- 25 Services
- 26 Unclassified

The sectoral compensatory balances of the residual matrices for the Philippines are depicted in Figure 27. The largest sectoral balancing effects occur between 1) food manufacturing and agriculture; 2) petroleum and mining; 3) printing and paper; 4) footwear/wearing apparel and leather; 5) ferrous and non-ferrous metals; 6) non-electrical machinery and ferrous metals; 7) food manufacturing and leather; 8) agriculture and chemicals; 9) agriculture and wood; 10) petroleum and electricity, gas and water; 11) rubber and chemicals; 12) wood and furniture; 13) trade and banking; and 14) mining and non-metals. It can be observed that the charts are very similar to the initial year due to the fact that the multiplier product matrices were calculated on the basis of the first order field of influence intensities using the inverse matrix of the base year. The only difference is that the multiplier product matrices are multiplied by the matrix of the change in technical coefficients and are scaled by these changes and weighed by their volume (sum of rows and column entries).

As illustrated in Figure 28, the residual matrices of Malaysia show that sectoral balances and imbalances were largest for agriculture and rubber; mining and iron and steel; agriculture and wood; wood and furniture; and petroleum and electricity, gas and water; and petroleum and mining. The residual matrices exhibited more push-pull backward and forward bilateral adjustments through the sample years. The agricultural and forestry sectors alone impact food manufacturing, tobacco, rubber, wood, and furniture; mining affects iron & steel, non-ferrous metals, petroleum, electricity, and construction; and trade with practically every sector.

As for the residual matrix for Thailand, pictured on Figure 29, shifts in sectoral balances were pronounced between the following pairs: agriculture and food manufacturing; agriculture and unclassified industries; forestry and other manufacturing; mining and petroleum; mining and basic metals; food manufacturing and livestock; food manufacturing and unclassified industries; chemicals and rubber & plastic products; petroleum and electricity & waterworks; transportation/communication and petroleum; basic metals and fabricated metals; machinery and basic metals; and construction and basic metals. The residual matrices calculated from the N matrices above showed increasing bilateral push-pull backward and forward linkage effects especially in 2000 and 2005 from agriculture with livestock, food manufacturing, rubber and unclassified sectors; mining with basic metals, non-metals, petroleum, electricity and construction; and trade with majority of the sectors to food manufacturing with restaurants & hotels; and machinery with mining, transport & communication, and construction.

Conclusion

Taking the changes in linkage intensities arising from the changes in technical coefficients as indicative of technological change per Hewings, Sonis & Jensen (1988), the Solow growth accounting can also be applied using the field of influence approach with the advantage of decomposing capital and labor value-added results by sectors or industries. These value added coefficients in the Leontief inverse which also change over time using the field of influence approach would be an indicator of the capital and labor variables of the Solow equation. Table 6 below tabulates the change in linkage intensities along with the value added shares of each sector to total output, the percent share of each sector's output to total output as an indicator of their contribution or weight to total GDP, and the growth rates of the reference years of the input-output tables of the three countries compared to their respective initial or base year.

The results show that the Philippines had two sectors with among the highest average linkage intensities similar to Malaysia and Thailand – petroleum products, and chemicals. Her leading 10 industries which experienced the most technological change had the highest value added share to GDP at approximately 12 percent accounting for almost a third of the country's GDP (31 percent). The average growth of these key technological sectors over a span of half a century was a little more than twice (214 percent) over the initial or base year in 1969. The key sectors of the Philippines shared more in common with Thailand with electrical machinery, mining and basic metals ranking high as well. The bottom 10 industries, i.e., with the least technological change (or possibly technological efficiency depending on import coefficient trends)

had a value added share to GDP averaging only 27 percent, and contributed a little more than half (55 percent) to GDP. Growth of the 10 sectors with decrements in technological coefficients averaged 40 percent during the past five decades. Only construction ranked low in linkage intensities for the Philippines as well as Malaysia and Thailand. Agriculture, fishery and forestry, and the rubber sectors ranked low in linkage intensities between the Philippines and Malaysia while tobacco, beverages and non-metals were least intensive in both the Philippines and Thailand. Sectors that ranked high in linkage intensity in the Philippines not common to the other two countries were footwear and wearing apparel; leather; textiles and trade. Non-ferrous metals; banking, insurance and real estate; food manufacturing and other services ranked low in the Philippines but not in the other two nations.

Malaysia's key sectors in linkage intensities had the lowest contribution to value added at 8 percent average over the 1978 to 2005 period with a share to GDP of more than a quarter (29 percent) during the same period. Their combined growth on average was however about 18 times more than in 1978. Malaysia's lagging ten sectors in technological change, in turn, had a value added share to GDP averaging 18 percent, contributing about a third to GDP (34 percent) and growing by close to seven and a half times more (766 percent) from the base year 1978. Common with Malaysia, the Philippines and Thailand, the petroleum and chemical industries ranked high as key sectors while construction placed as least intensive. Transport and communication and food manufacturing were highly linkage intensive in both Malaysia and Thailand as trade and textile sectors were least intensive in both countries as well. Five sectors that were uniquely linkage intensive in Malaysia were transport equipment; electricity, gas and water; non-ferrous metals; non-metallic products; and beverages. Five sectors were also uniquely least intensive for Malaysia – furniture and fixtures; wood; mining; iron and steel; and miscellaneous manufacturing.

Finally, Thailand's dominant sectors in terms of technological change, like the Philippines averaged slightly more than a tenth (11 percent) in terms of value added share to GDP and contributed about two-fifths (41 percent) to GDP over the three decades from 1975. Their growth combined was five times more (520 percent) than in 1975. The average value added share to GDP of its ten sectors with negative linkage intensities was 15 percent with a weight to GDP of more than a third (35 percent) and growing on average three times more (326 percent) than in 1975. Three sectors were highly linkage intensive only in Thailand – fishery; banking and insurance; and rubber and plastic products. Five sectors were least intensive only in Thailand – forestry; restaurant and hotels; real estate; unclassified sectors; and fabricated metals.

If we take the average value added shares to GDP as representing accumulation inasmuch as value-added is represented by wages and salaries and operating surplus in the input-output framework, the industries where technological change occurred in the Philippines had slightly higher value added contributions to output (at 12 percent) compared to Malaysia and Thailand and these industries contributed also significantly to GDP (31 percent) but grew at a smaller rate among the three economies compared to the base year (214 percent). Malaysia's dominant industries in terms of linkage intensities were industries with lower value-added (average of 8 percent) compared to Philippines and Thailand, implying lower accumulation. With five of its industries topping the list of linkage intensities among the three countries, this indicates more assimilation of technological change. These industries with a weight of more than a quarter (28 percent) to total output grew also the largest among the three countries at 1801 percent or 18 times more, reflecting Solowian predictions to economic growth. Value addition of Thailand's dominant linkage intensive industries reached more than 10 percent yet contributed the most to GDP (41 percent) and grew also substantially by 5 times more than in the base year. Only two of her industries, which is chemical production and petroleum refining, entered the top ten industries combined and ranked for all three nations.

While the field of influence results of the three economies generally followed the predictions of the Solow model, Malaysia's, Thailand's and Philippines' linkage intensive industries had lower value addition at 8 percent, 11 percent, and 12 percent, respectively but corresponding explosive growths of 18 times, 5 times and 2 times more than the initial years, revealing technological progress as a driver of growth.

Table 6
Comparative Table on Sectoral Linkage Intensity Coefficients, Value Added Share to GDP, Percent Contribution to GDP and Growth Rates of the Philippines, Malaysia and Thailand

Sectors	PHILIPPINES				Sectors	MALAYSIA				Sectors	THAILAND			
	Average Change in Linkage Intensities	Average Valued Added Share to GDP	Sectoral Share to GDP	Average Growth Rates from Base Year		Average Change in Linkage Intensities	Average Valued Added Share to GDP	Average Sectoral Share to GDP	Average Growth Rates from Base Year		Average Change in Linkage Intensities	Average Valued Added Share to GDP	Average Sectoral Share to GDP	Average Growth Rates from Base Year
Agriculture, fishing & forestry	0.006877439	8.44%	12.9%	-19.3%	Agriculture, Fishery and Forestry	0.054631961	5.21%	7.34%	279.0%	Agriculture	0.08722379	4.41%	6.10%	99.8%
Mining	0.151902706	0.63%	1.3%	-6.4%	Mining	0.007668152	4.59%	5.73%	813.3%	Livestock	0.09119551	0.57%	1.44%	124.9%
Food manufactures	0.010900756	3.49%	13.9%	31.5%	Food manufacturing	0.45672498	0.84%	6.73%	792.2%	Forestry	-0.0284245	0.28%	0.37%	22.5%
Beverages	0.015213801	0.36%	1.2%	-2.8%	Beverage	0.11061689	0.12%	0.32%	917.2%	Fishery	0.13524197	0.60%	1.13%	178.3%
Tobacco products	0.029403671	0.19%	0.9%	-41.0%	Tobacco manufacturing	0.073655275	0.11%	0.40%	401.3%	Mining and Quarrying	0.32078574	0.66%	1.35%	482.1%
Textile products	0.094882129	0.60%	2.1%	6.3%	Textile, leather, footwear, wearing apparel	-0.11109801	0.46%	1.71%	585.8%	Food Manufacturing	0.11129979	1.98%	9.31%	159.1%
Footwear & wearing apparel	0.187302623	0.53%	1.5%	434.2%	Wood and wooden products	-0.003978886	0.41%	1.66%	420.7%	Beverage and Tobacco Products	-0.0244846	0.49%	2.13%	244.2%
Wood products	0.034625197	0.23%	0.9%	26.9%	Furniture and fixtures	-0.012026363	0.10%	0.36%	2332.0%	Textile Industry	-0.061264	1.58%	6.17%	334.9%
Furniture & fixtures	0.06248205	0.15%	0.5%	77.8%	Paper and printing	0.06458978	0.46%	1.41%	1562.8%	Paper Products and Printing	0.09689003	0.31%	1.16%	356.7%
Paper & paper products	0.073188531	0.16%	0.8%	52.8%	Chemical manufacturing	0.18455393	0.90%	3.12%	2575.3%	Chemical Industries	0.20298873	0.57%	2.24%	546.7%
Printed materials	0.029912327	0.11%	0.4%	-28.3%	Petrol and coal	0.220646899	0.34%	3.06%	1362.3%	Petroleum Refineries	0.2271624	0.31%	2.93%	603.9%
Leather & leather products	0.086704827	0.04%	0.1%	14.7%	Rubber and rubber products	0.035957283	0.40%	1.71%	326.4%	Rubber and Plastic Products	0.10707258	0.36%	1.76%	495.0%
Rubber products	0.020945824	0.10%	0.4%	-15.1%	Non metallic manufacturing	0.140204799	0.72%	2.28%	1595.0%	Non-Metallic Products	0.05363005	0.45%	1.54%	695.5%
Chemicals	0.079796136	0.90%	2.9%	38.9%	Iron and steel	0.014649726	0.26%	1.59%	295.3%	Basic Metal	0.11818773	0.31%	1.47%	338.0%
Petroleum products	0.208540324	0.44%	4.0%	156.0%	Non-ferrous and other metals	0.151203386	0.41%	1.92%	2915.9%	Fabricated Metal Products	0.0204204	0.27%	0.97%	572.3%
Non-metallic products	0.018521795	0.28%	1.1%	40.2%	Electrical and industrial machinery	0.059522214	3.05%	17.82%	5631.8%	Machinery	0.13599564	1.87%	11.25%	1272.1%
Ferrous metal products	0.085788612	0.28%	1.5%	141.7%	Transport and transport equipment	0.276064041	0.68%	2.92%	1377.0%	Other Manufacturing	0.09574198	1.37%	4.65%	640.6%
Non-ferrous metal products	0.02619827	0.28%	1.1%	15.2%	Misc. manufacturing	-0.425895452	0.16%	0.70%	1592.1%	Electricity and Water Works	0.09753258	0.94%	2.76%	924.3%
Non-electrical machinery	0.097357487	0.33%	1.0%	218.4%	Electricity, gas and water	0.203587355	1.00%	2.12%	1345.4%	Construction	-0.017622	1.68%	6.15%	297.0%
Electrical machinery	0.27343334	1.46%	5.9%	1114.7%	Construction	-0.031623836	2.01%	6.68%	487.9%	Trade	-0.086381	7.95%	11.32%	291.4%
Transport equipment	0.034748086	0.33%	1.4%	73.8%	Trade	0.002270187	4.64%	6.84%	530.8%	Restaurants and Hotels	-0.0210114	1.52%	4.34%	270.0%
Miscellaneous manufactures	0.051839773	0.30%	0.8%	94.3%	Transport	0.178304319	1.74%	4.69%	1010.1%	Transportation and Communication	0.12115877	2.34%	7.08%	452.2%
Construction	-0.01020154	2.41%	5.5%	37.2%	Communication	0.121193062	0.92%	1.50%	4120.3%	Banking and Insurance	0.12379616	1.63%	2.52%	667.3%
Wholesale & retail trade	0.154880691	6.67%	11.0%	20.9%	Banking, finance and real estate	0.07189036	4.34%	5.93%	1819.4%	Real Estate	0.018593	0.65%	1.97%	167.3%
Transport services	0.051415891	1.41%	4.9%	59.0%	Private services	0.098843901	3.01%	6.02%	1078.9%	Services	0.09173705	4.87%	7.25%	317.1%
Communication	0.064345829	0.62%	1.4%	283.8%	Public services	0.057844086	3.01%	5.42%	417.1%	Unclassified	-0.0174164	0.02%	0.65%	368.5%
Electricity, gas & water	0.079204632	0.95%	2.5%	158.3%	Total		39.89%	100.00%	1407.1%	Total		37.98%	100.00%	420.1%
Banking, insurance & real estate	0.015443306	4.53%	6.4%	-5.9%										
Other services	-0.03565451	6.52%	11.7%	-0.03%	Top 10 sectors (average value added)	7.67%				Top 10 sectors (average value added)	10.63%			
Total (or Average)		42.72%	100.0%	102.68%	Top 10 sectors (average % share GDP)	28.68%				Top 10 sectors (average % share GDP)	41.05%			
					Top 10 Sectors (average growth rate)	1801.1%	18010.9%			Top 10 Sectors (average growth rate)	519.5%	5194.7%		
Top 10 sectors (average value added)	11.87%				All Sectors (total value added)	39.89%				All Sectors (total value added)	37.98%			
Top 10 sectors (average % share GDP)	31.2%				All Sectors (total percent share to GDP)	100.00%				All Sectors (total percent share to GDP)	100.00%			
Top 10 Sectors (average growth rate)	213.9%	2139.3%			All Sectors (average growth rate)	1407.1%				All Sectors (average growth rate)	420.1%			
All Sectors (total value added)	42.72%				Bottom 10 sectors (average value added)	18.23%				Bottom 10 sectors (average value added)	14.88%			
All Sectors (total percent share to GDP)	100.00%				Bottom 10 sectors (average % share GDP)	34.33%				Bottom 10 sectors (average % share GDP)	35.60%			
All Sectors (average growth rate)	102.68%				Bottom 10 sectors (average growth rate)	766.35%	7663.5%			Bottom 10 sectors (average growth rate)	326.4%	3263.7%		
Bottom 10 sectors (average value added)	26.59%													
Bottom 10 sectors (average % share GDP)	55.15%													
Bottom 10 sectors (average growth rate)	4.01%	40.1%												

linkage intensive industries reached more than 10 percent yet contributed the most to GDP (41 percent) and grew also substantially by 5 times more than in the base year. Only two of her industries, which is chemical production and petroleum refining, entered the top ten industries combined and ranked for all three nations.

While the field of influence results of the three economies generally followed the predictions of the Solow model, Malaysia's, Thailand's and Philippines' linkage intensive industries had lower value addition at 8 percent, 11 percent, and 12 percent, respectively but corresponding explosive growths of 18 times, 5 times and 2 times more than the initial years, revealing technological progress as a driver of growth.

It would also be interesting to see the type of industries where technological change occurred most, i.e. whether these are high-technology, medium-technology or low technology industries. No authoritative definition of high technology industries exists. This was the conclusion of Baldwin & Gellatly (1998) in their study of the taxonomy of classification schemes for high and low-tech industries. Basically, the three approaches they came up with were innovation, technology use and worker skills from which they proposed a competency-based approach that removes the bias against small firms in favor of large multinationals by combining the three categories into a weighted index. In the USA, high-technology industries are defined by Wolf & Terrell (2016) as those "having high concentrations of workers in STEM (Science, Technology, Engineering and Mathematics) occupations." This is the classification based on worker skills.

The Organization for Economic Cooperation and Development (OECD), in turn, distinguishes high-tech sectors based on research and development (R&D) intensities as measured by the ratio of industry R&D expenditures to industry sales. The OECD definition is associated with the innovation index. Meanwhile, the technology use measurement pertains to sectors that develop or purchase new technologies or use computer process technologies or use inputs that reduce costs as a strategy. This study will take the Eurostat view for the simple reason that it has systematized the categorization of high technology manufacturing sectors based on the OECD classification. As described by Hatzichronoglou (1997), the OECD classification uses the International Standard Industrial Classification (ISIC) which are also used in constructing the input-output tables, but updates the classification using the *Nomenclature générale des Activités économiques dans les Communautés Européennes* or NACE (European system). A second and probably more overriding reason for the choice of the OECD classification is its added value of classifying services in terms of knowledge intensiveness. This Eurostat classification is reproduced in Table 7.

Using this taxonomy, the top-ranking linkage intensive sectors of Malaysia show that three industries are medium high-tech (transport and transport equipment; electricity, gas and water; chemical manufacturing); three are medium low-tech (petrol and coal; non-ferrous metals; non-metallic manufacturing); two are low-tech (food manufacturing and beverage manufacturing); and two services are highly knowledge-intensive (transport and communication). For Thailand, of her most linkage intensive sectors, two are medium high-tech (chemicals and machinery); four are medium low-tech (mining and quarrying; basic metals; petroleum refinery and rubber and plastic products); two are low-tech (food manufacturing, and fishery); and two services industries are highly knowledge intensive (banking and insurance; and transportation and communication). The linkage intensive sectors of the Philippines show that three are medium high-tech (electrical machinery; non-electrical machinery and chemicals); three are medium low-tech (petroleum, mining, and chemicals); three are low-tech (footwear and wearing apparel, textiles, and leather and leather products) and one service is less knowledge-intensive (wholesale and retail trade).

The key sectors of the three countries based on total linkage indices using the field of influence computations are shown on Table 8. For the Philippines, out of eleven key sectors that exceeded the average for all sectors, one is medium high-tech (electricity, gas and water); four are medium low-tech (ferrous metals, non-ferrous metals, petroleum refinery and mining); four are low tech (agriculture, fishery and forestry; paper and paper products; textiles; and food manufactures); and two are less knowledge intensive services (wholesale and retail trade and other services).

For Malaysia, eleven industries were also classified as key sectors exceeding the national average. Of these, one is medium high tech (electricity, gas and water); four are medium low-tech (petrol and coal; mining;

Table 7
OECD Classification of Industries Based on Technology Intensity

Manufacturing Industries	NACE Rev 1.1 codes	
High-technology	24.4 30 32 33 35.3	Manufacture of pharmaceuticals, medicinal chemicals and botanical products; Manufacture of office machinery and computers; Manufacture of radio, television and communication equipment and apparatus; Manufacture of medical, precision and optical instruments, watches and clocks; Manufacture of aircraft and spacecraft
Medium-high-technology	24 29 31 34 35	Manufacture of chemicals and chemical product, excluding 24.4 Manufacture of pharmaceuticals, medicinal chemicals and botanical products; Manufacture of machinery and equipment n.e.c. ; Manufacture of electrical machinery and apparatus n.e.c. ; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other transport equipment, excluding 35.1 Building and repairing of ships and boats and excluding 35.3 Manufacture of aircraft and spacecraft.
Medium-low-technology	23 25 to 28 35.1	Manufacture of coke, refined petroleum products and nuclear fuel; Manufacture of rubber and plastic products; basic metals and fabricated metal products; other non-metallic mineral products; Building and repairing of ships and boats
Low-technology	15 to 22 36 to 37	Manufacture of food products, beverages and tobacco; textiles and textile products; leather and leather products; wood and wood products; pulp, paper and paper products; publishing and printing; Manufacturing n.e.c.
Manufacturing Industries	NACE Rev 1.1 codes	
Knowledge-intensive services	61 62 64 65 to 67 70 to 74 80 85 92	Water transport; Air transport; Post and telecommunications; Financial intermediation; Real estate, renting and business activities; Education; Health and social work; Recreational, cultural and sporting activities
High-tech KIS	64 72 73	Post and telecommunications; Computer and related activities; Research and development
Market KIS (excl. financial intermediation and high-tech services)	61 62 70 71 74	Water transport; Air transport; Real estate activities; Renting of machinery and equipment without operator and of personal and household goods; Other business activities
Less Knowledge-intensive services	50 to 52 55 60 63 75 90 91 93 95 to 97 99	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; Hotels and restaurants; Land transport; transport via pipelines; Supporting and auxiliary transport activities; activities of travel agencies; Public administration and defense; compulsory social security ; Sewage and refuse disposal, sanitation and similar activities; Activities of membership organization n.e.c. ; Other service activities; Activities of households; Extra-territorial organizations and bodies
Market services less KIS	50 to 52 55 60 63	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; Hotels and restaurants; Land transport; transport via pipelines; Supporting and auxiliary transport activities; activities of travel agencies

Source: Eurostat (n.d.) https://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf

Table 8

Key Sectors of the Philippines, Malaysia and Thailand based on Multiplier Product Matrices using averages

MALAYSIA	1978-2005	PHILIPPINES	1969-2006	THAILAND	1975-2005
Agriculture, Fishery and Forestry	4.4032	Ferrous metal products	5.2626	Basic Metal	6.2565
Food manufacturing	3.9491	Wholesale & retail trade	5.0975	Machinery	5.6073
Trade	3.9270	Chemicals	5.0534	Chemical Industries	5.3894
Private services	3.4980	Agriculture, fishing & forestry	4.5658	Petroleum Refineries	5.2638
Petrol and coal	3.4128	Paper & paper products	4.4212	Textile Industry	4.8328
Mining	3.3939	Other services	4.3577	Mining and Quarrying	4.6951
Wood and wooden products	3.3524	Non-ferrous metal products	4.3222	Paper Products and Printing	4.3733
Electricity, gas and water	3.2807	Petroleum products	4.2679	Unclassified	4.3182
Transport	3.1761	Textile products	4.1411	Food manufacturing	4.2808
Iron and steel	3.1641	Food manufactures	3.9759	Transportation and Communication	4.1373
Rubber and rubber products	3.1033	Mining	3.9565	Trade	4.1068
Non metallic manufacturing	3.0548	Transport equipment	3.7118	Electricity and Waterworks	4.0985
Chemical manufacturing	3.0385	Banking, insurance & real estate	3.6853	Agriculture	4.0066
Construction	2.9724	Electrical machinery	3.6156	Fabricated Metal Products	3.9199
Textile, leather, footwear, wearing apparel	2.9515	Transport services	3.5205	Construction	3.7259
Furniture and fixtures	2.9389	Electricity, gas & water	3.4760	Rubber and Plastic Products	3.6859
Paper and printing	2.9350	Leather & leather products	3.4384	Non-Metallic Products	3.5934
Non-ferrous and other metals	2.8280	Non-metallic products	3.4052	Other Manufacturing	3.5562
Electrical and industrial machinery	2.7905	Miscellaneous manufactures	3.3975	Livestock	3.3446
Misc. manufacturing	2.7557	Wood products	3.3293	Restaurant and Hotels	3.2981
Banking, finance and real estate	2.6962	Footwear & wearing apparel	3.2984	Beverage and Tobacco Products	3.1329
Beverage	2.6869	Rubber products	3.2439	Banking and Insurance	2.9754
Transport and transport equipment	2.4767	Non-electrical machinery	3.2013	Services	2.7599
Tobacco manufacturing	2.4660	Construction	3.1650	Fishery	2.7405
Communication	2.4230	Printed materials	3.1203	Forestry	2.7216
Public services	1.9551	Beverages	2.8893	Real Estate	2.2718
Average	3.0627	Furniture & fixtures	2.8371	Average	3.9651
		Tobacco products	2.8361		
		Communication	2.6060		
		Average	3.7310		

iron and steel; and rubber); three are low-tech (agriculture, fishery and forestry; food manufacturing; and wood); and of the two services, one is highly knowledge intensive (transport) and the other is less knowledge intensive (trade). Finally for Thailand, thirteen industries exceeded the overall average and thus were key sectors of which three are medium high-tech (chemicals; machinery; and electricity and waterworks); three are medium low-tech (basic metals; petroleum refineries; and mining and quarrying); five are low-tech (textiles; paper products and printing; food manufacturing; unclassified sectors and agriculture) and two are services, of which one is highly knowledge-intensive (transportation and communication) and the other less knowledge intensive (trade).

Five sectors of all three countries are commonly categorized as key industries using the total linkages from the field of influence formula – agriculture; food manufacturing; trade; petroleum; and mining. The latter two sectors are medium low-tech and the first two are low tech while trade is less knowledge intensive. The Philippines and Thailand are more alike with four common key sectors – metals (ferrous and non-ferrous) which are both medium low-tech; and textiles and paper products which are both low-tech sectors. Malaysia and Thailand, in turn, share two common key sectors – electricity and water, which is a medium high-tech industry; and transport services, which is a highly knowledge-intensive sector. The Philippines and Malaysia share services as a key sector, which is less knowledge intensive in the Philippines (other services) and more knowledge-intensive in Malaysia (private services). All key industries of the Philippines are common to both or one of the other two countries. Thailand has one key medium high-tech sector – machinery not common to the other two; whereas Malaysia has three sectors not common to the other two – iron and steel; and rubber and rubber products which are both medium low-tech; and wood, a low-tech sector.

One common feature for all three countries is that the linkage intensity of the machinery sector became prominent in the 1990s to mid-2000s as electronics became one among their major foreign exchange export earners. The three countries competed in the electronics and semiconductor industry. This reflected in the machinery sector entering the dominant sectors of the Philippines and Thailand and in the case of Malaysia in the last three years of its sample period (entering the third spot in 2005).

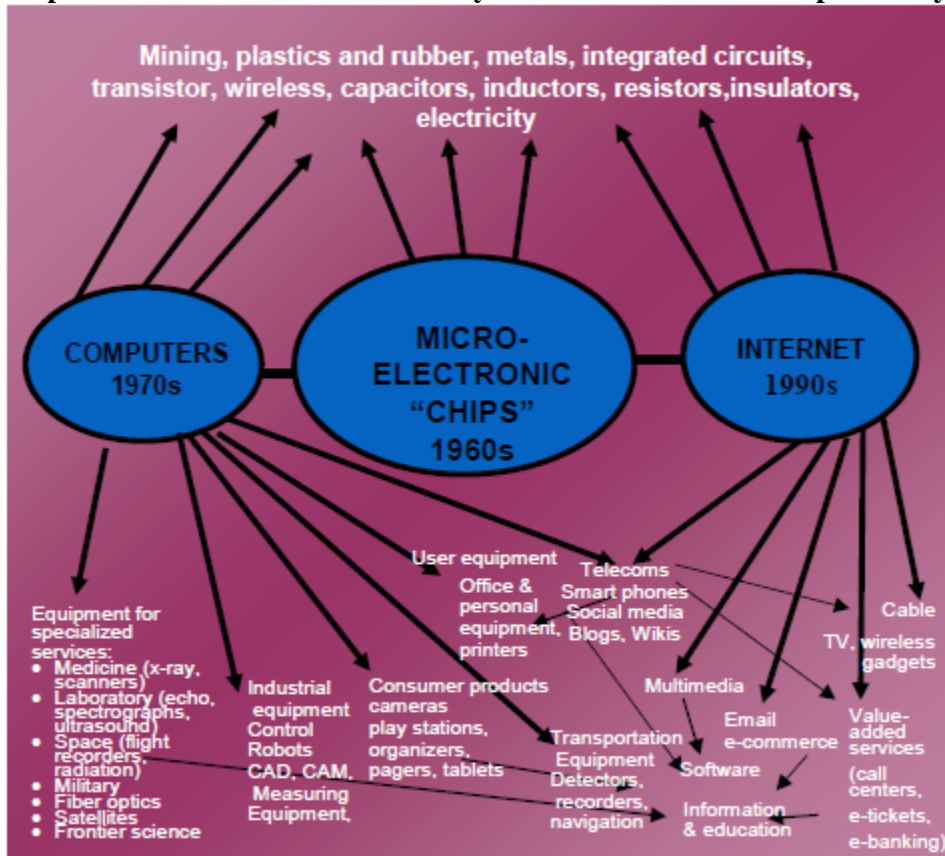
Growth effects of joining the global value chain of semiconductors has raised export earnings of participating nations. Based on various country reports by Salazar (1998) for the Philippines, Amad, Amalu, Kitamura, Lohan & Simalabwi (2015) for Malaysia, and the UNCTAD (2005) for Thailand, the three countries boosted their export earnings mostly from electronics and semiconductors. Salazar (1998) notes that in the Philippines, the electronics industry provided the highest export revenues since the early 1980s such that by 1996, more than half of its export proceeds originated from the electronics industry of which 80 percent were from semiconductors which are electronic devices that transform electrical signals into sound or pictures. Considered one of the world's largest assemblers of integrated circuits, the Philippines focuses on wafer fabrication, printed circuit boards and finished original equipment manufactures (OEMs).

In Malaysia according to Amad et al. (2015), about 40 percent of the country's exports come from electronics, particularly semiconductors along with personal computer parts, with integrated circuits as the primary product and competing directly with the Philippines in wafer production, assembly and testing.

The UNCTAD report (2005) attributes Thailand's electronics industry to the role of foreign direct investments such that more than a third of the country's exports come from electronic products. Thailand not only produces integrated circuits but next to Singapore, is also the world's second major producer of hard disk drives (HDDs). As early as the 1970s, Thailand's exports have diversified into electronic products such as printed circuit boards, piezoelectric crystals and microwave isolators and further into floppy disk drives, computer keyboards and HDDs.

The electronics and semiconductor industry have strong backward linkages in the mining sector (copper, gold, and aluminum for wiring, germanium before silicon was used), metals (lead) and metalloids (silicon) and plastic, ceramics, and rubber for the frames. The industry has forward linkages in electrical components needed to produce high definition televisions sets (HDTVs), microwave ovens, dishwashers, dryers, washing machines, digital cameras, vacuum cleaners, stereo and audio equipment, refrigerators, coffee machines, musical instruments, computers, laptops, tablets, mobile phones, laser printers, transport and communication equipment (navigation systems, dashboard cameras, USB chargers, rear vision cameras, Bluetooth adaptors, etc.). The upstream and downstream network of industries for the microchip industry which Perez (2001) identified as the fifth wave of technological revolution is shown in Figure 30.

Figure 30
Upstream and Downstream Industry Networks of the Microchip Industry



Source: Adapted from Perez, C. (2001). "Technological Revolutions and Opportunities for Development as a Moving Target", Amílcar Herrera Lectures, UNU-MERIT.

Thus, it can be claimed that the invention of the microchip in the 1960s that led to the invention of the computer in the 1970s and the Internet in the 1990s modified the manufacturing structures of Malaysia, Thailand and the Philippines to become the world's largest assemblers and testers of electronic products. In 1995, the dot com bubble which burst in 2000 led to a proliferation of internet companies that stimulated the rapid diffusion of electronics and semiconductor devices, particularly the trend towards the further miniaturization of the microchip. Consumer-driven demand for greater and better capabilities, features, reliability and speed necessitates heavy investments in R&D, low-cost manufacturing, design, testing, assembling, packaging and distribution of semiconductor products which simultaneously requires production of new manufacturing equipment, development of design software and raw materials provision. As Nathan Associates (2016) observe, the industry is rapidly moving into pristine areas as brain-inspired

computing, the Internet of Things, artificial intelligence, robotics, energy-efficient sensing, and automated devices that go beyond just scale economies and cost reductions to improve device performance.

The semiconductor industry is characterized by rapid technological improvements that require substantial costs for upgrading and adoption of new knowhow along the global value chain such that participation in the value chain allows countries to adapt to industry complexity and innovative changes cascading from other suppliers and to adjust to new demand from fickle consumers. The *Galapagos syndrome* is avoided where the metaphor refers to the development of a product under a one nation value chain that becomes isolated from the rest of the globe because of its focus on the domestic market. According to Fasol (2013) this happened to Japan when imposing proprietary national standards on wireless communication, mobile data and frequency bands rendering its mobile phone incompatible with global standards. In the global value chain of the semiconductor industry, a one-nation value chain misses out on knowledge transfer and technological breakthroughs as well as international expertise apart from digging into deep pockets for capital investments to become self-sufficient in the industry and losing out on export opportunities on an international product.

In conclusion, the field of influence approach can be a valuable supplement to Solowian growth accounting as it could decompose growth at the macro-level to growth at the meso-level and possibly the micro level if data on firms exists. The changes in technology coefficients yield changes in linkage intensities that represent technological change by industry which present meaningful insights about economic structures when compared with the sectoral value added components of the input-output table to represent the capital and labour components of the Solow model and their contributions to GDP in terms of their percentage shares. Thus, the field of influence approach has the potential to remedy shortcomings of the Solowian growth accounting approach by providing a more detailed analysis of technological change among different industries or sectors.

Appendix Table 1
Endogenization of Technology in New Growth Theories

Model	Sectors	Type of Innovation	Production of Innovation	Production Function Final Goods Sector	Externalities of Innovation
Rebelo (1991)	One consumer good	Not explicit	Not explicit	$Y = AK$	None
Romer (1986)	One consumer good	Process innovation through knowledge accumulation	Not explicit	$Y = AK^{\alpha+\beta} x^{1-\alpha}$	Knowledge spillovers (positive)
Lucas (1988) I	One consumer good	Human capital accumulation through 'saving'	$\frac{dH}{H} = I_H - d_H H$	$Y = AK^\alpha H^{1-\alpha}$	Productivity stimulus from average human capital (positive)
Lucas (1988) II	Two consumer goods	Human capital accumulation through learning by doing	$\frac{dH}{H} = B(1-\mu)$	$Y = AK^\alpha H^{1-\alpha} \bar{h}^\beta$	Productivity stimulus from average human capital (positive)
Romer (1990)	Research, intermediate goods, consumer goods	Addition of new varieties of intermediate goods (Ethier production function)	$\frac{\Delta B}{B} = \zeta H - \frac{\beta r}{(\alpha+\beta)(1-\alpha-\beta)}$	$Y = L^\alpha H_r^\beta \int_0^\infty x_i^{1-\alpha-\beta} di$	Knowledge spillovers in R&D and intermediate goods
Aghion and Howitt (1992)	Research, intermediate goods, consumer goods	Stochastic (Poisson) improvements in blueprints for intermediate goods	$x = \lambda \Phi(n, R)$	$Y = Ax^\alpha$	Intertemporal improvements (positive); Business-stealing effect (negative)
Grossman and Helpman (1990a,b,c and 1991)	Research, intermediate goods, consumer goods	Addition of new varieties of intermediate goods (Ethier production function)	$\kappa_t = F(n_t, \tau_t)$	$Y_t = AL_t^{1-\beta} \left[\int_0^1 x(\omega)^\alpha d\omega \right]^\beta$	Knowledge spillovers in R&D and intermediate goods (positive)

Source of basic data: Verspagen (1990), pp. 12-13.

Appendix Table 2
Country Description

Philippines

From a predominantly agricultural producer of subsistence crops like palay (unhusked rice) and corn and exporter of commercial crops like coconut and copra in the 1950s to 1960s, the Philippine economy transformed into a major producer of manufactured exports in the next decades with electronics and telecommunications comprising three quarters of total export revenues by the start of the new millennium. Its growth momentum, however, compared to its Asian tiger neighbors was hampered by political instability in the 1970s with the declaration of martial law which reached a climax in 1986 with the overthrow of a 20-year dictatorship under Ferdinand Marcos in a people power revolt. At the start of the 1990s, a triple blow of natural disasters such as an earthquake, volcanic eruption and super typhoons hit the economy which suffered in the mid-1990s from an even more devastating typhoon followed by the Asian financial crisis of 1997 and a global recession at the onset of 2001 following the dot com bubble.

Following Indonesia, the Philippines ranked second in mining prospectivity and resources, owning the world's biggest source of chromite and huge deposits of gold, silver, copper and nickel. The production of limestone, marble, sand and gravel dominated its industrial mining sector along with the production of phosphate, bentonite, feldspar, lime, perlite, pyrite, silica sand and sulphur. The Mining Act of 1995 enhanced the exploitation of mineral resources by providing incentives to international companies, allowing exploration permits for a maximum of four years through production sharing, co-production, joint ventures and financial/technical assistance.

The industrial sector which accounts for about a third of the country's real output is led by textiles, pharmaceuticals, chemicals, wood products, food processing, petroleum, electrical machinery, electronics assembly, and petroleum refining along with significant production of transport equipment, non-metallic minerals, fabricated metal, beverages, paper and paper products, leather products, printing and publishing, and furniture and fixtures. In 1981, the Marcos government launched an ambitious implementation of 11 industrial projects covering a copper smelter, aluminum smelter, phosphate fertilizer plant, diesel engine manufacturing, cement, coco-chemicals complex, petrochemical complex, an integrated pulp and paper mill, heavy engineering, integrated steel mill, and the production of *alcogas* (a mixture of alcohol and gas). In the late 1990s, the export value of electronics overtook food products and textiles as the new Aquino and later Ramos governments shifted industrial policy from an agricultural-based economy to high value-added manufactured exports anchored on the assembly of computer chips and peripherals and information technology products. Computer chip assemblers and component manufacturers such as Intel, Philips, Acer, Toshiba, Hitachi, and Fujitsu set up operations in the Philippines.

In terms of the energy sector, the Philippines is the world's second largest producer of geothermal energy. With modest oil reserves amounting to about 152 million barrels as of the early 2000s, the country discovered significant natural gas reserves of about 3.6 trillion cubic ft. in the mid-2000s, leading the government to replace oil-fired power plants with natural gas. The country has also recoverable coal reserves although its share to the energy mix has declined significantly on account of the discovery of natural gas reserves. A substantial portion of the economy's electricity generating capacity still comes from fossil fuels with hydropower and geothermal sources filling in the gap.

The archipelagic geography of the country requires the set-up of regional centers with the proliferation of small retail shops in its domestic trading sector. Distribution centers, trading firms and retail establishments are located in the major metropolitan hub in Makati City where commercial banks and financial institutions are also situated.

Malaysia

Like the Philippines, the Malaysian economy relied on agriculture and mining production up to the 1970s based on rubber and tin exports which comprised 30 percent and 20 percent, respectively of its total export revenues. In the early 1980s, Malaysia diversified into the production of palm oil, petroleum, tropical hardwood, natural gas and manufactured goods notably electronics and semiconductors. In the mid-1980s, Malaysia's continuing streak of high growth was abruptly interrupted by the fall in oil including palm oil prices. During most of the 1990s, the Malaysian economy annually grew by about 9 percent until the Asian financial crisis took its toll in mid-1997.

Building up to the 1990s, Malaysia became the world's leading producer of natural rubber, contributing a quarter of world production. In the mid-1990s however Thailand and Indonesia became competitors in natural rubber production while the development of synthetic rubbers in the late 1990s undermined the natural rubber industry. Malaysia also became the world's largest producer of tropical hardwood in the 1990s, as well as the source of about three-fifths of total world production of palm oil. In the decade of 2000s, two-thirds of Malaysia's exports were attributed to electronics.

In the agricultural sector, competition from Thailand and Indonesia caused the Malaysian economy to diversify from rubber into newer crops such as palm oil, cocoa and pineapples. In forestry which is grouped under agriculture, Malaysia is a major exporter of tropical hardwoods like timber, logs, lumber, veneer, and plywood. Many federal states of Malaysia though began banning the exports of sawn logs in favor of higher value-added wood-using domestic industries and in view of the policy to preserve remaining forests.

In mining, Malaysia is a major producer of tin as well as iron ore, bauxite, coal, silver, zircon as well as metal minerals like gold. However, production of most of these minerals have declined in the late 1990s to 2000s due to depleted reserves. The states granted prospecting licenses and mining leases and received export duties on key minerals.

In energy and power, Malaysia is a key player in the world's energy markets with its vast natural gas reserves estimated at 75 trillion cu. ft. as of 2005 and crude oil production estimated at an average of around 750,000 barrels per day in the mid-2000s. Malaysia is also a major exporter of liquefied natural gas which is controlled by its National Petroleum Company (PETRONAS). Major destinations of its crude oil exports are neighboring countries Japan, Thailand, South Korea and Singapore.

The establishment of import-substituting industries was the cornerstone of its industrial policy in the 1960s with the Malaysian Industrial Development Authority granting special incentives to labor-intensive and export-oriented industries that also utilized domestic rubber, wood and other resources. The country transformed into a manufacturing-based from a commodity-based economy in the mid-1980s with industries dominated by rubber processing, tire manufacturing, palm oil processing, tin smelting and chemical, plywood, furniture, textile, food processing and steel manufacturing. The Malaysian government relaxed its restrictions on foreign ownership of manufacturing to 100 percent in 1998 to encourage manufacturing activities. By the new millennium, two-thirds of Malaysian exports were accounted for by electronics and electrical products, chemical products, petroleum and liquefied natural gas, palm oil and textiles, clothing and footwear. Next to China with a little above 50 percent, Malaysia produces 15 percent of the world's DVD players.

In the 1990s, the Malaysian government embarked on the development of a multi-media super corridor transforming an area south of the capital Kuala Lumpur into its version of Silicon Valley that involved the construction of the world's tallest twin towers the Petronas Towers, the creation of two smart cities Putrajaya which houses the new seat of government and administrative capital, and Cyberjaya which is an intelligent city that nurtures multimedia industries, research and development centers, and a multimedia university. All these projects are linked by a fiber optic telecommunications system.

Thailand

For almost a decade, the Thai economy like Malaysia grew annually by a little less than 10 percent until it became the epicentre of the Asian financial crisis in 1997. The Thai economy continued to mature from the 1980s to the 1990s where agriculture's share to total output continued to shrink as agricultural workers moved in between farm work to self-employment and light industrial jobs in the metropolis. Manufacturing's share to total GDP continued to rise from just a fifth in the 1980s to about a third in the mid-1990s and further to almost two-fifths into the new millennium.

In agriculture, Thailand is the world's biggest rice exporter as its government bred higher-yielding varieties and launched large scale irrigation systems. Rubber is a second earner of foreign exchange from agriculture along with cassava, corn, soybeans, cocoa, jute, and coffee. In forestry, rubber trees occupy a tenth of the forested area in the southern part while the northern part is dominated by teak production which once was a major export that declined due to government deforestation restrictions.

Thailand has a small mining and mineral processing sector for ferrous and non-ferrous metals but has a large industry for industrial minerals. The country owns considerable resources of minerals particularly feldspar and gypsum, tin, diatomite, dolomite, limestone, gemstones, lead, silica and other industrial minerals. Its resources of fuel and metallic minerals like antimony, cadmium, iron ore, lead, manganese, zinc and zirconium are produced on a smaller scale. Exploration in the 2000s were concentrated on gold, copper, and potash with considerable reserves on the latter two that could make Thailand a top producer in the region. In the energy and power sector, Thailand is a net importer of crude oil and natural gas as its reserves of the latter are mostly consumed for electricity generation. It boasts of recoverable coal reserves as well with coal production mostly reserved for domestic demand.

The industrial sector of Thailand is overseen by eight institutions — the Ministries of Finance, Commerce and Industry, Board of Investment, Bank of Thailand, Industrial Finance Corporation, National Economic and Social Development Board and the Industrial Restructuring Committee as the coordinating agency for the five-year economic development plans. The extensive use of price controls and tariffs as import substitution policies in the 1960s and 1970s was relaxed in the 1980s leading Thailand into export-led boom beginning mid-1980s. In the 1990s, Thailand's automotive production was the world's fastest as the country became the world's second largest manufacturer of motorcycles and pick-up trucks. Dubbed as the Detroit of Asia, Thailand's automotive and auto parts industry generated the second highest share to the nation's export revenues by the 2000s, only next to computers and electronic parts.

Since mid-1980s, electronics has been Thailand's leading manufactured exporting sector with fully assembled computers, computer accessories and integrated circuits. Textiles and garments are another of its largest industries with synthetic fiber production growing fastest in the 1990s. Two-thirds of the output of this sector from an estimated 4,500 textile firms employing a million work force are ready-to-wear apparel destined for the American and European markets. During its decade of boom from the mid-1980s to mid-1990s, Thailand became the largest producer of petrochemicals, cement and textiles among the ASEAN nations. The country's four oil refineries were running at their peak capacity during the crisis years with distillate fuel oil, motor gasoline, residual fuel oil, jet fuel and liquefied petroleum gas as among the major refined outputs.

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

Appendix Table 3

The Direct Field of Influence for the Philippines 1969

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	4.127557	5.264631	6.886312	5.915988	5.327856	6.970655	7.037094	6.254321	5.829072	6.825279	6.258354	6.520915	6.28992	6.762242	6.614374	6.619547	7.314619	7.440039	6.652346	6.66762	6.651831	6.13988	6.608103	4.617708	5.188545	4.575488	5.91267	4.347098	4.949875	176.5699
2	2.79138	3.560359	4.657068	4.000859	3.603117	4.714108	4.759038	4.229666	3.942079	4.615793	4.232393	4.409957	4.253741	4.573162	4.473162	4.47666	4.946723	5.031542	4.498842	4.509171	4.498493	4.152272	4.468921	3.122859	3.508904	3.094307	3.998614	2.939851	3.347497	119.4105
3	2.352642	3.000678	3.925072	3.371981	3.036789	3.973123	4.01907	3.564745	3.322277	3.890232	3.567121	3.741616	3.559255	3.854294	3.770027	3.772996	4.169175	4.240653	3.791581	3.79997	3.790773	3.499589	3.766488	2.631954	2.956407	2.607894	3.369987	2.477792	2.821332	100.6455
4	1.359633	1.734188	2.268379	1.948744	1.755012	2.296161	2.319071	2.059134	1.920001	2.248267	2.061526	2.148007	2.071926	2.22751	2.178801	2.180498	2.409459	2.45077	2.191279	2.196335	2.191139	2.022495	2.176685	1.521091	1.709128	1.507185	1.947658	1.431946	1.630509	58.16254
5	1.499622	1.912743	2.501931	2.149394	1.935714	2.532574	2.556713	2.272316	2.117815	2.479757	2.273781	2.369175	2.28525	2.456854	2.40313	2.40501	2.657543	2.703111	2.416927	2.422476	2.416739	2.230738	2.400852	1.677703	1.885099	1.662364	2.148188	1.579385	1.798386	64.15129
6	2.439502	3.111544	4.070002	3.496514	3.148912	4.119852	4.159119	3.696478	3.445144	4.03393	3.698862	3.854042	3.717518	3.996674	3.909279	3.912337	4.323144	4.397271	3.931722	3.940749	3.931417	3.62884	3.905573	2.729194	3.066575	2.704241	3.494553	2.569256	2.925514	104.3578
7	1.269381	1.619075	2.117803	1.819392	1.638519	2.143742	2.164174	1.923442	1.792662	2.099033	1.924682	2.005429	1.93439	2.079647	2.034172	2.035763	2.249524	2.288095	2.04585	2.050547	2.045691	1.888247	2.032243	1.420121	1.595675	1.407137	1.818371	1.336898	1.522275	54.30198
8	1.760298	2.245231	2.936837	2.523019	2.272195	2.972807	3.001141	2.667309	2.485951	2.910808	2.669029	2.781004	2.682491	2.883924	2.820862	2.823068	3.119499	3.172988	2.837056	2.84357	2.836837	2.618503	2.818188	1.969335	2.212783	1.951329	2.521603	1.853927	2.110996	75.30259
9	1.278241	1.630375	2.132585	1.832091	1.649956	2.158705	2.17928	1.936867	1.805174	2.113685	1.938116	2.019428	1.947892	2.094163	2.04837	2.049972	2.265226	2.304067	2.060131	2.065105	2.059663	1.901429	2.046432	1.430033	1.606805	1.416968	1.831064	1.34623	1.532901	54.68096
10	2.865406	3.654779	4.780571	4.10696	3.69867	4.839124	4.885246	4.341835	4.046621	4.738202	4.344634	4.526908	4.366548	4.694441	4.591788	4.595379	5.077908	5.164976	4.618149	4.628752	4.617791	4.262388	4.587435	3.205676	3.601959	3.176366	4.104656	3.017815	3.436271	122.5773
11	1.503392	1.917556	2.50822	2.173192	1.919311	2.538942	2.563144	2.278032	2.123138	2.486004	2.279522	2.375129	2.291	2.463045	2.409175	2.411066	2.664225	2.709908	2.423005	2.428577	2.422818	2.23635	2.406902	1.681934	1.889874	1.666558	2.153598	1.583373	1.803213	64.3102
12	1.741992	2.221881	2.906294	2.49678	2.248565	2.941891	2.96993	2.63957	2.460098	2.880536	2.641271	2.752082	2.654594	2.853932	2.791526	2.793709	3.087057	3.139989	2.807552	2.813998	2.807334	2.591271	2.788879	1.948854	2.18977	1.931036	2.495379	1.834647	2.089042	74.51946
13	1.665777	2.161579	2.776328	2.334642	2.145764	2.82675	2.832617	2.546256	2.351123	2.787797	2.528707	2.625224	2.544037	2.731144	3.781943	1.669468	2.995264	3.020109	2.697651	2.680529	2.678012	2.451338	2.59173	1.859122	2.151716	1.842508	2.529101	1.743804	1.989007	71.53904
14	3.669401	4.680261	6.121935	5.259318	4.736468	6.196917	6.255981	5.560096	5.182049	6.067678	5.56368	5.797097	5.591743	6.011638	5.880182	5.884782	6.502701	6.6142	5.91394	5.927518	5.913482	5.458357	5.874607	4.105146	4.61262	4.067612	5.256367	3.864573	4.400442	156.9708
15	2.613326	3.333271	4.359926	3.745541	3.373239	4.413305	4.45504	3.959867	3.690448	4.320852	3.962314	4.127949	3.982325	4.281306	4.187835	4.190804	4.629795	4.709756	4.211423	4.221354	4.234229	3.871929	4.183631	2.923684	3.285752	2.896942	3.743536	2.752316	3.133913	111.7956
16	1.734279	2.212045	2.893427	2.485726	2.23861	2.928866	2.956782	2.627883	2.449206	2.867783	2.629578	2.739898	2.642841	2.841297	2.779167	2.781341	3.07339	3.126088	2.795122	2.80154	2.794905	2.579799	2.776532	1.940226	2.180076	1.922487	2.484331	1.826524	2.079793	74.18954
17	3.71625	4.740016	6.200097	5.326466	4.79694	6.276036	6.335854	5.631084	5.248211	6.145147	5.634715	5.871112	5.663136	6.088391	5.955258	5.959915	6.585724	6.698647	5.989446	6.003198	5.988982	5.528047	5.949611	4.157558	4.671512	4.119545	5.323478	3.913914	4.456625	158.9749
18	2.559944	3.265231	4.271008	3.66922	3.3044	4.323326	4.364844	3.878983	3.615385	4.233532	3.881563	4.044947	3.901117	4.194117	4.102201	4.105685	4.537767	4.615076	4.126197	4.135452	4.125506	3.821858	4.0847	2.863852	3.217961	2.837739	3.667059	2.695681	3.069958	109.5143
19	1.386249	1.768154	2.312779	1.986893	1.789371	2.341109	2.36342	2.100527	1.957725	2.292284	2.10188	2.190059	2.112482	2.271111	2.221457	2.223193	2.457189	2.498451	2.234262	2.23932	2.234039	2.062091	2.219361	1.550867	1.742584	1.536685	1.985791	1.459983	1.662425	59.30174
20	1.713751	2.185861	2.859179	2.456303	2.212112	2.894198	2.921783	2.596778	2.420216	2.833838	2.598452	2.707467	2.611558	2.807665	2.746271	2.748419	3.037011	3.089085	2.762037	2.768378	2.761823	2.549262	2.743667	1.91726	2.154271	1.899731	2.454925	1.804904	2.055175	73.31138
21	2.087105	2.662069	3.482074	2.991428	2.694038	3.524722	3.558317	3.162507	2.947479	3.451212	3.164546	3.29731	3.180507	3.419338	3.344568	3.347184	3.698648	3.762067	3.363769	3.371492	3.363508	3.104639	3.341397	2.334951	2.623596	2.313602	2.98975	2.198117	2.502912	89.28285
22	1.870371	2.385628	3.12048	2.680785	2.414277	3.158699	3.188805	2.834098	2.6414	3.092823	2.835925	2.954903	2.850229	3.064259	2.997253	2.999597	3.314564	3.371397	3.01446	3.021381	3.014226	2.78224	2.994411	2.092479	2.35115	2.073348	2.679281	1.969855	2.242998	80.01133
23	1.469364	1.87415	2.45145	2.106026	1.896657	2.481475	2.505126	2.226468	2.075084	2.429723	2.227904	2.321373	2.239141	2.407282	2.354643	2.356485	2.603922	2.648571	2.368161	2.373598	2.367977	2.185728	2.35241	1.643852	1.847064	1.628823	2.104844	1.547518	1.7621	62.85692
24	4.45194	5.678376	7.427504	6.380923	5.74657	7.518476	7.590136	6.745846	6.287176	7.361675	6.750195	7.033391	6.784242	7.293684	7.134194	7.139774	7.889472	8.024749	7.175151	7.191625	7.174595	6.62241	7.127431	4.980612	5.596311	4.935074	6.377344	4.688735	5.338884	190.4465
25	2.381143	3.034761	3.972608	3.414496	3.073644	4.021341	4.059595	3.608002	3.360326	3.937375	3.61035	3.761772	3.628597	3.901173	3.814569	3.848427	4.177178	4.280081	3.829652	3.844802	3.836463	3.541265	3.811045	2.663985	2.993063	2.639478	3.410235	2.507815	2.855659	101.8189
26	1.459482	1.861546	2.434963	2.091862	1.883902	2.464787	2.488279	2.211495	2.061129	2.413382	2.21292	2.305761	2.224082	2.391093	2.338807	2.340637	2.58641	2.630758	2.352234	2.357635	2.352052	2.171029	2.33659	1.632797	1.834642	1.617868	2.090688	1.537111	1.75025	62.43419
27	2.025079	2.582955	3.378591	2.902527	2.613975	3.419972	3.452568	3.068521	2.859884	3.348647	3.070499	3.199318	3.085987	3.317719	3.245171	3.24771	3.588729	3.650263	3.263802	3.271295	3.263549	3.012373	3.242095	2.265559	2.545626	2.244845	2.900899	2.132792	2.428528	86.62948
28	2.939902	3.749796	4.904857	4.213733	3.794829	4.964932	5.012253	4.454714	4.151826	4.861386	4.457587	4.644599	4.48007	4.816487	4.711166	4.714851	5.209924	5.299256	4.738212	4.749091	4.737845	4.373202	4.706699	3.289017	3.695603	3.258946	4.211369	3.096272	3.525607	125.764
29	3.602711	4.594079	6.009578	5.16231	4.649684	6.082689	6.13923	5.457674	5.086057	5.953198	5.46027	5.688141	5.488577	5.899854	5.772063	5.774981	6.377447	6.488797	5.802894	5.817271	5.804168	5.295336	5.765692	4.023401	4.527301	3.992678	5.159039	3.730928	4.318964	153.925
SUM	66.33512	84.64282	110.6679	95.04311	85.59909	112.0393	113.0937	100.5345	93.67475	109.7199	100.5804	104.814	101.0652	108.6774	107.4114	105.4093	117.5492	119.5708	106.9128	107.1424	106.9159	98.5829	106.1083	74.20083	83.44237	73.52879	95.16438			

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

Appendix Table 4
The Direct Field of Influence for Malaysia 1978

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	3.79510187	3.80438293	6.10893593	4.97917033	4.36503829	5.10632351	5.598502	6.06884075	4.48685805	4.66864754	4.31854688	6.04981705	4.73518332	5.37337442	4.82748125	4.38475802	3.74493408	5.7149366	4.97459935	5.49414322	4.31843203	4.49465032	3.59435513	3.73325671	5.05723491	4.15153336	123.949038
2	2.62358723	2.63000331	4.22316102	3.44214415	3.01758928	3.53004626	3.87029357	4.19544287	3.10180435	3.22747702	2.98544935	4.18229162	3.27347379	3.71466089	3.33728015	3.0312217	2.5889058	3.95078583	3.43898419	3.79814943	2.98536996	3.10719121	2.48480924	2.58083312	3.49611087	2.86999144	85.6870576
3	1.98189528	1.98687854	3.18965852	2.59340708	2.27897824	2.66635055	2.92371363	3.16755291	2.34254421	2.43621289	2.25533572	3.24269	2.38921812	2.80621629	2.52089441	2.28934078	1.95796433	2.98310056	2.59791167	2.86205125	2.25444844	2.34879792	1.87692675	1.949418	2.641319	2.16783202	64.7106571
4	1.22779814	1.2308013	1.9763734	1.61087245	1.41218464	1.65200683	1.81193833	1.96295796	1.45159538	1.51041153	1.39714338	1.95724797	1.53193714	1.73840384	1.56179592	1.41856406	1.21156917	1.84891488	1.60939125	1.77752374	1.39710705	1.45411739	1.16285306	1.20779125	1.63612616	1.34311358	40.1005398
5	1.23152395	1.23453569	1.98237127	1.61575834	1.41647033	1.65702	1.81673365	1.96936024	1.45600127	1.5149926	1.4013837	1.96318698	1.5365837	1.74367896	1.5665347	1.42286945	1.21524432	1.85451709	1.61427504	1.78286886	1.40134643	1.45852989	1.16638092	1.21145497	1.64109057	1.34718722	40.2219002
6	1.71062759	1.714811	2.75357941	2.24434191	1.96752425	2.30165571	2.52350328	2.73550666	2.02243404	2.10437495	1.94656842	2.7269318	2.1343657	2.42202788	2.17596863	1.97641284	1.68801466	2.57598572	2.24228155	2.47646396	1.94651665	2.02594637	1.62014177	1.68275112	2.27952921	1.87128772	55.8695528
7	1.90212814	1.90677987	3.06183585	2.49559046	2.18778375	2.55932041	2.80600326	3.0417399	2.24884055	2.33995455	2.16448196	3.03220511	2.37330269	2.69316795	2.41956297	2.19766739	1.87698374	2.86436099	2.49329946	2.753698	2.1644244	2.25274608	1.80151265	1.87113097	2.5347169	2.08077377	62.1240118
8	1.23378197	1.23679923	1.98600598	1.61872086	1.41906745	1.66005817	1.82006467	1.97297109	1.45867087	1.51777037	1.40395316	1.96678652	1.53940105	1.74687603	1.56940697	1.42547831	1.2174725	1.85791738	1.61723485	1.78613778	1.40391582	1.46120413	1.1685195	1.2136762	1.64409954	1.34965732	40.2956477
9	1.75643742	1.76102249	2.82656697	2.30305699	2.01942046	2.36117027	2.59126162	2.8070035	2.07378336	2.15846109	1.99915647	2.79904322	2.18971841	2.48701938	2.23180906	2.02570432	1.73322072	2.63943335	2.3001351	2.58774927	1.95276086	2.07972136	1.66452446	1.73061562	2.33955897	1.92378487	57.3421396
10	1.69742567	1.70157679	2.73232842	2.227021	1.9523397	2.28389248	2.50402791	2.71439514	2.00682572	2.08813425	1.9315456	2.70588646	2.11789354	2.40333567	2.1591754	1.9611597	1.67498725	2.55610533	2.22497655	2.45735163	1.93149424	2.01031095	1.60763818	1.66976434	2.26193674	1.85684589	55.4383745
11	2.24584471	2.25135576	3.61514235	3.0070934	2.52147937	3.02180829	3.31306941	3.59141372	2.6552319	2.76279372	2.55561849	3.58013828	2.80217017	3.17984388	2.85679989	2.59479985	2.21616812	3.38180866	2.94386028	3.25131953	2.55558203	2.65986534	2.12706153	2.20926262	2.99340318	2.45682683	73.3499333
12	1.39253059	1.39593607	2.24154198	1.82699891	1.60165644	1.87365502	2.05424928	2.22682992	1.64635556	1.71305929	1.58459742	2.21984958	1.73747315	1.97164358	1.77133988	1.60889217	1.3741226	2.09697244	1.82532169	2.01595708	1.58455528	1.64921477	1.31887091	1.36983784	1.85564302	1.52331542	45.4804199
13	1.73248902	1.73019989	2.80855176	2.28566824	1.99307517	2.32948703	2.55101594	2.77024996	2.04570048	2.1396993	1.97424302	2.75968001	2.15792359	2.44827329	3.26760161	0.87089266	1.70366653	2.57099791	2.26421856	2.50402505	1.97360004	2.04954138	1.63393501	1.70346969	2.30255761	1.89061468	56.4613778
14	1.74354378	1.74780768	2.80656425	2.28752791	2.00538368	2.34594456	2.57206095	2.78814374	2.06135005	2.14486769	1.98402462	2.77940389	2.17543552	2.46863296	2.21783899	2.01444331	1.72049572	2.62555328	2.28542792	2.5241165	1.98397186	2.06492997	1.65131681	1.71513091	2.3233923	1.90729535	56.9446042
15	1.41614503	1.41957778	2.2795265	1.85805613	1.6287716	1.90559462	2.08884828	2.26460691	1.67450261	1.74228189	1.61142059	2.25754169	1.76706675	2.00505201	1.80157148	1.63647406	1.39739257	2.13300825	1.85649368	2.05027501	1.61559226	1.67265293	1.34116744	1.39300108	1.88718422	1.54908332	46.2528887
16	1.62765584	1.63163633	2.62002064	2.13548304	1.87209206	2.19001691	2.40110405	2.60282449	1.92433852	2.00230499	1.85215266	2.59466554	2.03084108	2.30455059	2.07402612	1.88054952	1.60613971	2.45104091	2.13352262	2.35634631	1.85210341	1.92768049	1.54155891	1.60113148	2.16896363	1.78052335	53.1596732
17	1.2858687	1.28901334	2.06984944	1.68705861	1.4789764	1.73014106	1.89690257	2.05626426	1.52025177	1.58184627	1.46322403	2.04981859	1.60439014	1.82062411	1.63566282	1.4856579	1.26887069	1.93635331	1.68550985	1.86154339	1.46318512	1.52289197	1.21785104	1.26491412	1.7135087	1.40663597	41.9968141
18	1.54629097	1.55007565	2.48905911	2.02873755	1.77852069	2.08054204	2.28110063	2.47272771	1.82814345	1.9022147	1.7595663	2.46496477	1.92932534	2.18935081	1.9669301	1.78654488	1.52585326	2.3285163	2.02687252	2.23856419	1.75952189	1.83185209	1.46398626	1.52108654	2.06053548	1.69151865	50.5024019
19	1.85386409	1.85838735	2.98412402	2.43223105	2.13223595	2.49419532	2.73480982	2.9645201	2.1916912	2.28054593	2.10953564	2.95524162	2.31306428	2.62480393	2.35813866	2.14186873	1.8485709	2.76769612	2.43000699	2.68380157	2.10947985	2.19596147	1.7557633	1.82361505	2.47052817	2.02793847	60.5426196
20	1.51166091	1.51535773	2.43330481	1.98329779	1.73867737	2.03394531	2.22998931	2.41733414	1.78720049	1.85961068	1.72015896	2.40975664	1.88611314	2.14031674	1.92287715	1.74653211	1.49167813	2.27636742	1.98147708	2.18842124	1.72011321	1.7903043	1.43169968	1.48702681	2.01439238	1.65363432	49.3712478
21	3.07387375	3.08139102	4.94798254	4.03291967	3.53549841	4.13590843	4.53455241	4.91550712	3.63416732	3.7814092	3.49784231	4.90009873	3.8353004	4.35220849	3.91005786	3.55147057	3.03323994	4.62885957	4.02921737	4.45002617	3.49774929	3.64047873	2.91127729	3.02378176	4.09614871	3.36256835	100.393535
22	1.93506799	1.93980027	3.11485878	2.53880751	2.22567039	2.60364109	2.85459584	3.09441482	2.28778454	2.38047639	2.20196509	3.08471491	2.41440203	2.73980652	2.46146342	2.2357252	1.90948815	2.91396417	2.53647683	2.8013848	2.20190653	2.29175771	1.8327101	1.90353403	2.57861151	2.11680729	63.1998359
23	1.42750407	1.43099508	2.29783843	1.87288409	1.64188213	1.92071197	2.10584186	2.28275687	1.68770387	1.75608286	1.62439467	2.27560122	1.78110989	2.02116152	1.81582718	1.64929958	1.40863377	2.14963802	1.87116475	2.06658795	1.62435147	1.69063489	1.35199442	1.40424139	1.9022476	1.56157357	46.6226631
24	1.75036331	1.75464388	2.81754157	2.29647513	2.01322734	2.35512026	2.58212106	2.79904902	2.06941262	2.15325691	1.99178474	2.79027497	2.18394431	2.47828852	2.22651363	2.02232241	1.7272251	2.63582261	2.29436691	2.53398908	1.99173177	2.07300654	1.65777561	1.7218393	2.33247979	1.91475536	57.1673318
25	2.1843113	2.18978786	3.51599359	2.86588108	2.51224334	2.93895547	3.22233417	3.49292752	2.5824836	2.68709362	2.48559257	3.4820481	2.72545502	3.09279131	2.77871589	2.55889733	2.1230215	3.29041477	2.86338577	3.16312704	2.48545738	2.58625554	2.06898988	2.1487137	2.91061139	2.38952889	71.3450177
26	1.28748312	1.29063171	2.07244817	1.68917673	1.48083328	1.73231327	1.89928415	2.05884593	1.52216046	1.5838323	1.46506113	2.05239217	1.60640447	1.82290993	1.63771642	1.48752317	1.27046377	1.93878443	1.68762603	1.86388058	1.46502216	1.52480398	1.21938006	1.26650224	1.71566003	1.40840202	42.0495417
SUM	47.1748044	47.2841885	75.9551647	61.9583804	54.19662	63.4698248	69.5879217	75.4341873	55.7678362	58.0378125	53.6847469	75.2822775	58.7714967	66.7890195	61.0693906	53.40507	46.534327	70.9720279	61.8280379	68.3295026	53.6397398	55.8650477	44.6729999	46.4077809	62.8575906	51.603029	1540.57883

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

Appendix Table 5
The Direct Field of Influence for Thailand 1975

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	3.79510187	3.80438293	6.10893593	4.97917033	4.36503829	5.10632351	5.598502	6.06884075	4.48685805	4.66864754	4.31854688	6.04981705	4.73518332	5.37337442	4.82748125	4.38475802	3.74493408	5.7149366	4.97459935	5.49414322	4.31843203	4.49465032	3.59435513	3.73325671	5.05723491	4.15153336	123.949038
2	2.62358723	2.63000331	4.22316102	3.44214415	3.01758928	3.53004626	3.87029357	4.19544287	3.10180435	3.22747702	2.98544935	4.18229162	3.27347379	3.71466089	3.33728015	3.0312217	2.5889058	3.95078583	3.43898419	3.79814943	2.98536996	3.10719121	2.48480924	2.58083312	3.49611087	2.86999144	85.6870576
3	1.98189528	1.98687854	3.18965852	2.59340708	2.27897824	2.66635055	2.92371363	3.16755291	2.34254421	2.43621289	2.25533572	3.24269	2.38921812	2.80621629	2.52089441	2.28934078	1.95796433	2.98310056	2.59791167	2.86205125	2.25444844	2.34879792	1.87692675	1.949418	2.641319	2.16783202	64.7106571
4	1.22779814	1.2308013	1.9763734	1.61087245	1.41218464	1.65200683	1.81193833	1.96295796	1.45159538	1.51041153	1.39714338	1.95724797	1.53193714	1.73840384	1.56179592	1.41856406	1.21156917	1.84891488	1.60939125	1.77752374	1.39710705	1.45411739	1.16285306	1.20779125	1.63612616	1.34311358	40.1005398
5	1.23152395	1.23453569	1.98237127	1.61575834	1.41647033	1.65702	1.81673365	1.96936024	1.45600127	1.5149926	1.4013837	1.96318698	1.5365837	1.74367896	1.5665347	1.42286945	1.21524432	1.85451709	1.61427504	1.78286886	1.40134643	1.45852989	1.16638092	1.21145497	1.64109057	1.34718722	40.2219002
6	1.71062759	1.714811	2.75357941	2.24434191	1.96752425	2.30165571	2.52350328	2.73550666	2.02243404	2.10437495	1.94656842	2.7269318	2.1343657	2.42202788	2.17596863	1.97641284	1.68801466	2.57598572	2.24228155	2.47646396	1.94651665	2.02594637	1.62014177	1.68275112	2.27952921	1.87128772	55.8695528
7	1.90212814	1.90677987	3.06183585	2.49559046	2.18778375	2.55932041	2.80600326	3.0417399	2.24884055	2.33995455	2.16448196	3.03220511	2.37330269	2.69316795	2.41956297	2.19766739	1.87698374	2.86436099	2.49329946	2.753698	2.1644244	2.25274608	1.80151265	1.87113097	2.5347169	2.08077377	62.1240118
8	1.23378197	1.23679923	1.98600598	1.61872086	1.41906745	1.66005817	1.82006467	1.97297109	1.45867087	1.51770737	1.40395316	1.96678652	1.53940105	1.74687603	1.56940697	1.42547831	1.2174725	1.85791738	1.61723485	1.78613778	1.40391582	1.46120413	1.1685195	1.2136762	1.64409954	1.34965732	40.2956477
9	1.75643742	1.76102249	2.82656697	2.30305699	2.01942046	2.36117027	2.59126162	2.8070035	2.07378336	2.15846109	1.99915647	2.79904322	2.18971841	2.48701938	2.23180906	2.02570432	1.73322072	2.63943335	2.3001351	2.58774927	1.95276086	2.07972136	1.66452446	1.73061562	2.33955897	1.92378487	57.3421396
10	1.69742567	1.70157679	2.73232842	2.227021	1.9523397	2.28389248	2.50402791	2.71439514	2.00682572	2.08813425	1.9315456	2.70588646	2.11789354	2.40333567	2.1591754	1.9611597	1.67498725	2.55610533	2.22497655	2.45735163	1.93149424	2.01031095	1.60763818	1.66976434	2.26193674	1.85684589	55.4383745
11	2.24584471	2.25135576	3.61514235	3.0070934	2.52147937	3.02180829	3.31306941	3.59141372	2.6552319	2.76279372	2.55561849	3.58013828	2.80217017	3.17984388	2.85679989	2.59479985	2.21616812	3.38198066	2.94386028	3.25131953	2.55558203	2.65986534	2.12706153	2.20926262	2.99340318	2.45682683	73.3499333
12	1.39253059	1.39593607	2.24154198	1.82699891	1.60165644	1.87365502	2.05424928	2.22682992	1.64635556	1.71305929	1.58459742	2.21984958	1.73747315	1.97164358	1.77133988	1.60889217	1.3741226	2.09697244	1.82532169	2.01595708	1.58455528	1.64921477	1.31887091	1.36983784	1.85564302	1.52331542	45.4804199
13	1.73248902	1.73019989	2.80855176	2.28566824	1.99307517	2.32948703	2.55101594	2.77024996	2.04570048	2.1396993	1.97424302	2.75968001	2.15792359	2.44827329	3.26760161	0.87089266	1.70366653	2.57099791	2.26421856	2.50402505	1.9736004	2.04954138	1.63393501	1.70346969	2.30255761	1.89061468	56.4613778
14	1.74354378	1.74780768	2.80656425	2.28752791	2.00538368	2.34594456	2.57206095	2.78814374	2.06135005	2.14486769	1.98402462	2.77940389	2.17543552	2.46863296	2.21783899	2.01444331	1.72049572	2.62555328	2.28542792	2.5241165	1.98397186	2.06492997	1.65131681	1.71513091	2.3233923	1.90729535	56.9446042
15	1.41614503	1.41957778	2.2795265	1.85805613	1.6287716	1.90559462	2.08884828	2.26460691	1.67450261	1.74228189	1.61142059	2.25754169	1.76706675	2.00505201	1.80157148	1.63647406	1.39739257	2.13300825	1.85649368	2.05027501	1.61559226	1.67265293	1.34116744	1.39300108	1.88718422	1.54908332	46.2528887
16	1.62765584	1.63163633	2.62002064	2.13548304	1.87209206	2.19001691	2.40110405	2.60282449	1.92433852	2.00230499	1.85215266	2.59466554	2.03084108	2.30455059	2.07042612	1.88054952	1.60613971	2.45104091	2.13352262	2.35634631	1.85210341	1.92768049	1.54155891	1.60113148	2.16896363	1.78052335	53.1596732
17	1.2858687	1.28901334	2.06984944	1.68705861	1.4789764	1.73014106	1.89690257	2.05626426	1.52025177	1.58184627	1.46322403	2.04981859	1.60439014	1.82062411	1.63566282	1.4856579	1.26887069	1.93635331	1.68550985	1.86154339	1.46318512	1.52289197	1.21785104	1.26491412	1.7135087	1.40663597	41.9968141
18	1.54629097	1.55007565	2.48905911	2.02873755	1.77852069	2.08054204	2.28110063	2.47272771	1.82814345	1.9022147	1.7595663	2.46496477	1.92932534	2.18935081	1.9669301	1.78654488	1.52585326	2.3285163	2.02687252	2.23856419	1.75952189	1.83185209	1.46398626	1.52108654	2.06053548	1.69151865	50.5024019
19	1.85386409	1.85838735	2.98412402	2.43223105	2.13223595	2.49419532	2.73480982	2.9645201	2.1916912	2.28054593	2.10953564	2.95524162	2.31306428	2.62480393	2.35813866	2.14186873	1.8485709	2.76769612	2.43000699	2.68380157	2.10947985	2.19596147	1.7557633	1.82361505	2.47052817	2.02793847	60.5426196
20	1.51166091	1.51535773	2.43330481	1.98329779	1.73867737	2.03394531	2.22998931	2.41733414	1.78720049	1.85961068	1.72015896	2.40975664	1.88611314	2.14031674	1.92287715	1.74653211	1.49167813	2.27636742	1.98147708	2.18842124	1.72011321	1.7903043	1.43169968	1.48702681	2.01439238	1.65363432	49.3712478
21	3.07387375	3.08139102	4.94798254	4.03291967	3.53549841	4.13590843	4.53455241	4.91550712	3.63416732	3.7814092	3.49784231	4.90009873	3.8353004	4.35220849	3.91005786	3.55147057	3.03323994	4.62885957	4.02921737	4.45002617	3.49774929	3.64047873	2.91127729	3.02378176	4.09614871	3.36256835	100.393535
22	1.93506799	1.93980027	3.11485878	2.53880751	2.22567039	2.60364109	2.85459584	3.09441482	2.28778454	2.38047639	2.20196509	3.08471491	2.41440203	2.73980652	2.46146342	2.2357252	1.90948815	2.91396417	2.53647683	2.8013848	2.20190653	2.29175771	1.8327101	1.90353403	2.57861151	2.11680729	63.1998359
23	1.42750407	1.43099508	2.29783843	1.87288409	1.64188213	1.92071197	2.10584186	2.28275687	1.68770387	1.75608286	1.62439467	2.27560122	1.78110989	2.02116152	1.81582718	1.64929958	1.40863377	2.14963802	1.87116475	2.06658795	1.62435147	1.69063489	1.35199442	1.40424139	1.9022476	1.56157357	46.6226631
24	1.75036331	1.75464388	2.81754157	2.29647513	2.01322734	2.35512026	2.58212106	2.79904902	2.06941262	2.15325691	1.99178474	2.79027497	2.18394431	2.47828852	2.22651363	2.02232241	1.7272251	2.63582261	2.29436691	2.53389908	1.99173177	2.07300654	1.65777561	1.7218393	2.33247979	1.91475536	57.1673318
25	2.1843113	2.18978786	3.51599359	2.86588108	2.51224334	2.93895547	3.22233417	3.49292752	2.5824836	2.68709362	2.48559257	3.4820481	2.72545502	3.09279131	2.77871589	2.55889733	2.1230215	3.29041477	2.86338577	3.16312704	2.48545738	2.58625554	2.06898988	2.1487137	2.91061139	2.38952889	71.3450177
26	1.28748312	1.29063171	2.07244817	1.68917673	1.48083328	1.73231327	1.89928415	2.05884593	1.52216046	1.5838323	1.46506113	2.05239217	1.60640447	1.82290993	1.63771642	1.48752317	1.27046377	1.93878443	1.68762603	1.86388058	1.46502216	1.52480398	1.21938006	1.26650224	1.71566003	1.40840202	42.0495417
SUM	47.1748044	47.2841885	75.9551647	61.9583804	54.19662	63.4698248	69.5879217	75.4341873	55.7678362	58.0378125	53.6847469	75.2822775	58.7714967	66.7890195	61.0693906	53.40507	46.534327	70.9720279	61.8280379	68.3295026	53.6397398	55.8650477	44.6729999	46.4077809	62.8575906	51.603029	1540.57883

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix 6
Changes in Linkage Intensities (First Order Effects), PHILIPPINES
1979

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.020346	-0.01993	-0.05882	0.028961	0.011195	0.02192	-0.0126	0.111396	0.132168	0.007655	0.000554	-0.01442	0.045538	-0.16419	-0.01125	-0.01151	0.003089	-0.0044	-0.00234	-0.00537	-0.00011	0.045552	-0.00047	-0.00639	-0.0022	-0.00405	-0.00086	-0.00344	-0.00983	0.0962
2	0.009679	0.037511	0.017893	0.021745	0.012872	0.027963	0.021325	0.025285	0.025562	0.051361	0.026875	0.024285	0.032715	0.028216	0.066498	0.046565	0.167041	0.072642	0.053501	0.031958	0.019746	0.019007	0.032656	0.013918	0.074246	0.011887	0.195642	0.003548	0.009677	1.181821
3	0.039579	0.003003	0.067665	0.129881	0.004411	0.019133	0.003239	0.01607	0.011798	-0.00542	0.002173	0.049958	0.020364	0.087098	0.002886	0.00449	0.002131	0.002342	0.002192	0.005989	0.00222	0.01527	0.003073	-0.00318	-0.00138	-0.00022	0.000191	0.000158	0.019097	0.504209
4	-0.00062	-0.00105	-0.00094	0.023902	-0.00014	-0.001	-0.0013	-0.00096	-0.00045	-0.00189	-0.00277	-0.00066	-0.00085	-0.00164	-0.00091	-0.00117	-0.00084	-0.00099	-0.00095	-0.00123	-0.00107	-0.00065	-0.00189	-0.00176	-0.00204	-0.00166	-0.00167	-0.00167	-0.01449	-0.02336
5	-9.2E-05	-4.4E-06	-5.5E-05	-4.6E-06	0.208218	-3.1E-06	-7E-06	-1.8E-05	8.37E-06	-1.5E-06	-2E-06	-1.4E-05	-5.2E-06	-3.9E-05	-2.8E-06	-3.4E-06	-1.6E-06	-2.5E-06	-2.3E-06	-2.8E-06	-1.2E-06	-3.3E-06	-4.2E-06	-1.6E-06	-2.6E-06	-1.3E-06	-1.4E-06	-1.3E-06	-7.4E-06	0.207941
6	-0.0061	-0.00566	-0.00626	0.000144	0.001082	-0.14633	0.045546	0.001694	0.026441	0.019565	-0.01616	-0.02302	-0.02857	-0.00121	-0.00289	6.23E-05	-0.00033	-0.0132	-0.00163	-0.00182	-0.00058	0.024549	-0.00173	-0.00275	-0.00425	-0.001	-0.00121	0.00079	0.003317	-0.1415
7	1.34E-06	-2.8E-06	-1.1E-06	-1.1E-06	3.7E-07	-2.7E-06	0.036007	-8.5E-07	1.24E-06	-2.3E-06	-1.1E-06	-1E-05	-0.00056	-2.3E-06	-2.3E-06	-5.9E-07	-2.1E-06	-2.8E-06	4.01E-07	-1.8E-05	-5.8E-06	-1.4E-06	9.89E-07	-2.3E-06	-2.7E-05	-1.9E-06	-6.6E-06	1.29E-06	3.45E-05	0.035387
8	-0.00081	-0.00427	-0.00128	-0.00693	-0.00462	-0.00254	-0.00467	-0.00212	0.29877	-0.0048	-0.00052	-0.00934	-0.00065	-0.00037	-0.00257	-0.00717	-0.00656	-0.0095	-0.02975	0.007016	-0.00078	-0.00356	0.017861	-0.00109	-0.00038	8.69E-05	-0.00033	0.0015	0.000122	0.220752
9	0.000185	-8E-05	9.26E-05	0.000149	2.04E-05	0.000242	0.000493	0.000867	-0.0013	1.27E-05	-5.6E-05	0.000231	3.94E-05	3.79E-06	-6E-05	0.002864	-6.8E-06	8.48E-05	0.000211	-0.00747	-2.4E-05	-0.00012	0.001333	8.76E-05	-0.00015	-0.00069	-2.9E-05	-0.00084	-0.00019	-0.0041
10	0.00485	-0.00278	0.003306	-0.01149	0.057393	0.004509	-0.0032	-0.0058	0.003166	0.060188	0.202844	-0.00189	-0.00347	-0.00827	-0.00265	-0.02964	-0.0041	-0.00505	0.001014	-0.00592	8.31E-05	-0.00751	-0.00767	0.002839	0.001204	0.012188	-0.0034	0.00316	0.005129	0.259032
11	0.000302	-0.00185	-0.00196	-0.00392	-0.00268	-0.00234	-0.00731	-0.00228	-0.00212	-0.00315	-0.00118	-0.00211	-0.00687	-0.00705	-0.00183	-0.00355	-0.00359	-0.00432	-0.00305	-0.00068	-0.00211	-0.01186	-0.00138	0.000143	-0.00099	-0.00173	-0.00585	0.002054	-0.0061	-0.08937
12	2.85E-05	-0.00012	4.3E-05	1.31E-05	1.79E-05	0.005216	-0.05727	0.000378	0.000834	7.8E-06	0.000767	0.099952	0.000971	2.15E-05	-4.7E-05	-3.9E-06	-4.8E-05	9.24E-06	-7.2E-05	4.36E-05	8.77E-05	-0.00019	1.83E-05	1.41E-05	6.34E-05	1.59E-05	3.62E-05	5.71E-06	-6.6E-06	0.050784
13	-0.00031	-0.00169	-0.00159	-0.00193	-0.00044	-0.00257	-0.03487	-0.00509	0.00919	-0.00204	-0.00132	-0.00704	0.030753	-0.00287	-0.00239	-0.00066	-0.00175	-0.00255	0.006665	-0.01574	0.016291	-0.00104	0.001656	-0.00161	-0.00926	-0.00241	-0.0057	-0.00019	-0.00035	-0.04086
14	0.053009	-0.01866	0.006724	-0.02737	0.004189	0.033116	0.021556	0.028993	0.017226	0.047544	0.060454	0.014521	0.128592	0.136742	-0.00878	-0.00186	0.037294	0.021806	0.034427	0.009851	0.014495	0.226678	0.018005	-0.00247	0.007439	0.002987	0.01499	-0.00211	0.002859	0.882248
15	0.017201	0.067736	0.040506	0.047536	0.025386	0.053682	0.043015	0.046509	0.034849	0.103723	0.051344	0.05083	0.063582	0.060383	0.001036	0.132135	0.069387	0.067295	0.055195	0.061739	0.032783	0.043242	0.038071	0.028108	0.14518	0.023509	0.382723	0.005163	0.019688	1.811535
16	0.000637	-0.00265	-0.00375	-0.01505	0.000139	0.000272	-0.00128	-0.00088	0.000306	-0.00159	-0.00046	-0.00251	0.000199	0.001202	-0.00277	-0.00696	-0.00377	-0.00341	-0.00365	-0.01026	-0.00258	-0.02424	-0.01766	-0.00241	-0.00081	-0.00139	-0.00676	-0.00166	-0.00362	-0.11737
17	0.00125	-0.01271	0.007888	0.007354	0.00237	0.003989	0.003416	0.010462	-0.00653	0.01325	0.006242	0.002086	0.007047	0.007526	-0.00397	0.00959	0.271961	0.226589	0.175223	0.080122	0.128516	-0.00756	0.05062	0.001041	0.01067	0.00453	-0.00638	-0.00172	0.002601	0.995475
18	0.000718	-0.03154	-0.00516	-7.6E-05	0.001267	0.00158	-0.00251	-0.001	-0.01865	0.013239	0.001685	-0.00858	0.007533	0.002802	-0.02221	-0.00779	-0.04033	-0.01038	-0.08007	0.059729	0.002729	-0.01302	-0.02101	-0.00052	0.000253	0.002174	-0.00055	-0.00032	-0.00114	-0.17116
19	0.000781	-0.00807	0.000237	0.001972	0.000358	0.000313	-0.00072	0.001024	-0.0011	0.004001	0.002289	0.000294	0.000227	0.000141	-0.00426	-0.0003	0.00167	0.00022	0.013236	0.00021	0.002081	-0.00022	0.001906	0.000495	0.000814	0.000118	0.001119	0.00028	3.05E-05	0.019146
20	2.06E-05	-0.00288	-0.00038	-0.00039	0.000121	-0.00026	-0.00079	-0.00083	-0.00056	0.001512	-0.00026	-0.00087	0.000146	-0.00091	-0.00184	-0.00095	-0.0007	0.003837	0.015688	0.035252	-0.00543	-0.00891	-0.00363	-0.00124	-0.0024	-0.02194	0.003981	-0.00068	-0.00139	0.003308
21	-0.00038	-0.0104	-0.00108	0.00708	0.002423	-0.00091	-0.00237	-0.00179	-0.00106	0.006748	-0.00069	-0.00045	-0.00149	-0.0019	-0.00725	-0.00179	-0.00126	-0.00194	-0.00265	0.001452	-0.1993	0.00017	-0.00013	-0.00334	-0.0039	-0.00316	-0.00241	-0.00154	-0.00023	-0.23354
22	0.000679	-0.00283	-0.00404	-0.00532	0.000655	0.023035	0.006402	0.000561	-0.01009	-0.0271	0.002334	-0.02716	0.005389	-0.00183	-0.00326	-0.00644	-0.07635	-0.03782	-0.01861	0.000541	0.008861	0.006838	-0.01013	-0.00039	0.000137	-0.00072	-0.00361	0.000194	-3.3E-05	-0.18011
23	0.000146	0.004619	-0.00029	-0.00034	0.000241	-0.00107	-0.00063	-0.00047	-0.00091	0.002753	0.000175	7.97E-05	-0.00144	-0.0002	-0.00837	-0.00347	-0.00179	-0.00172	-0.00367	0.00024	-0.003	-0.00208	-0.01618	-0.00539	0.00019	-0.00093	-0.00108	-0.02481	0.005961	-0.06344
24	0.034713	-0.01183	0.034272	0.049905	0.100218	0.025855	0.073906	0.047927	0.065499	0.005389	0.02674	0.12098	0.068796	0.07465	0.036114	0.021069	0.013764	0.008904	0.029324	0.041253	-0.01876	0.054561	-0.00842	0.00077	0.056031	0.009953	0.037743	0.001388	0.004118	1.00484
25	0.006119	-0.01183	-0.00477	0.006217	0.007404	0.008231	0.003131	-0.01658	0.008002	0.016854	-0.00682	0.003251	0.019595	0.001746	-0.00243	0.007985	7.58E-05	-0.00518	0.017649	0.012535	0.023178	0.017382	0.000461	-0.02289	0.00684	-0.02249	-0.00626	-0.00418	-0.00419	0.05903
26	-8.4E-05	-0.00112	-0.00059	8.55E-05	0.000293	-0.00032	-0.00275	-0.0007	9.55E-05	-0.00402	-0.00575	0.001706	-0.00054	-0.00024	-0.00092	-0.00041	-0.00057	-0.00028	0.001466	0.003179	-0.00251	0.002819	0.001058	-0.00133	-0.00195	0.041475	-0.00313	0.000371	0.00478	0.030117
27	0.00281	-0.00658	0.005908	0.006852	0.007203	-0.00063	-0.00122	0.002694	-0.00341	0.050256	0.02509	0.009927	0.001756	0.013188	0.0014	-0.00527	0.007284	0.007151	0.003628	0.014941	0.003537	0.011067	0.003741	0.012565	-0.00118	-0.00042	-0.11724	0.008493	0.01292	0.076458
28	0.001277	-0.011	-0.00772	0.000488	0.008001	-0.00647	-0.00438	-0.00397	0.006324	0.001206	0.009728	0.009575	0.011831	0.014835	-0.01298	-0.00861	-0.00036	-0.00272	0.00483	0.026707	-0.02362	0.017007	-0.00544	-0.06594	0.003842	0.011586	-0.01432	-0.01184	0.14786	0.095703
29	-0.00946	-0.01905	-0.0165	-0.01062	0.017843	-0.01935	-0.02953	-0.01442	0.000718	-0.04101	-0.06676	-0.00768	-0.00651	-0.02539	-0.00843	-0.00797	-0.0092	-0.0136	-0.01461	-0.00675	-0.01959	0.003053	-0.03968	-0.04363	-0.02176	-0.031	-0.0423	-0.03073	-0.0193	-0.55322
SUM	0.176481	-0.0757	0.069337	0.248861	0.465442	0.045272	0.090598	0.236953	0.594772	0.314246	0.316546	0.281922	0.394111	0.212439	-0.00414	0.119234	0.422137	0.293812	0.253183	0.337489	-0.02486	0.406229	0.035028	-0.10636	0.25424	0.026708	0.413305	-0.05864	0.177301	5.915954

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1988

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	-0.04868942	-0.0365484	-0.44099	-0.12586	-0.12728	-0.11727	-0.0757	-0.25735	0.027373	-0.03947	-0.03943	-0.26016	-0.12268	-0.2909	-0.03405	-0.04828	-0.03441	-0.04617	-0.04737	-0.04186	-0.03385	-0.089	-0.0701	-0.01428	-0.03764	-0.017	0.009528	-0.02024	-0.08818	-2.567868
2	-0.00614366	0.00032653	-0.01949	-0.02723	-0.00784	-0.03727	0.01543	-0.02811	-0.0071	-0.05028	-0.017	-0.01986	-0.02577	-0.03732	-0.40309	-0.14385	0.027835	-0.02213	-0.02444	-0.0278	-0.01646	-0.00577	-0.05576	-0.00636	-0.01127	0.002647	-0.05592	-0.00433	-0.00098	-1.015323
3	-0.01343093	-0.0078274	-0.09342	-0.08795	-0.01852	-0.01577	-0.15829	-0.0203	-0.00312	-0.02551	-0.01995	-0.24881	-0.01228	-0.01142	-0.00995	-0.01484	-0.01226	-0.01469	-0.01328	-0.01313	-0.01232	-0.01571	-0.01719	-0.01129	-0.02413	-0.0099	-0.011	-0.01081	-0.0621	-0.989207
4	-0.00109929	-0.0017732	-0.00181	-0.0047	-0.00074	-0.00256	-0.00064	-0.00216	-0.00137	-0.00389	-0.00425	-0.00188	-0.00244	-0.00367	-0.00228	-0.00307	-0.00232	-0.0027	-0.00255	-0.00294	-0.0027	-0.00229	-0.00368	-0.00259	-0.00299	-0.00232	-0.00262	-0.0027	-0.01777	-0.088487
5	-0.00013278	1.4753E-06	-0.00011	-1.2E-05	-0.17371	-1.2E-05	-6E-06	-6.2E-05	8.36E-07	8.41E-06	1.4E-05	-4E-05	-1.8E-05	-4.7E-05	3.59E-06	4.86E-06	2.22E-06	1.55E-06	1.18E-06	6.61E-06	4.71E-06	-1.2E-05	2.21E-06	1.04E-05	3.96E-06	1.1E-05	1.15E-05	1.7E-05	0.000162	-0.173893
6	-0.00949222	-0.0085044	-0.01948	-0.00572	-0.00364	-0.66438	1.552128	-0.00862	-0.00477	-0.01219	-0.03373	-0.05686	-0.04109	-0.00654	-0.00751	-0.00613	-0.00364	-0.02371	-0.00834	0.00112	-0.01026	0.03249	-0.0082	-0.00474	-0.01063	-0.00291	-0.0044	0.001335	0.002572	0.6241575
7	0.000178362	0.00051592	0.000781	0.000613	0.000483	0.000882	0.009935	0.000846	0.000654	0.001026	0.000862	0.000709	0.000555	0.00079	0.000438	0.000848	0.001054	0.001065	0.000855	0.000827	0.001893	0.000692	0.000856	0.006776	0.000451	0.000318	0.000565	0.000232	0.001808	0.037509
8	-0.00225798	-0.0015293	-0.00424	-0.01106	-0.00992	-0.00663	-0.00632	-0.03675	-0.0145	-0.01473	-0.00576	-0.01383	-0.00344	-0.0038	-0.00483	-0.01321	-0.0134	-0.01834	-0.04036	-0.00981	-0.00643	-0.01114	-0.04546	-0.00089	-0.00288	-0.00146	-0.00285	-0.00817	-0.00214	-0.316126
9	-6.8024E-05	-0.000184	-0.00018	-0.00026	-0.00012	-0.00026	0.000119	-0.00017	0.006112	-0.0003	-0.00021	-7.2E-05	0.000174	-0.0003	-0.00023	-0.00111	-0.00025	-0.00033	-0.00034	-0.01582	-0.00028	-0.0003	-0.00089	-0.00032	-0.00048	-0.00076	-0.00031	-0.00096	-0.00013	-0.018222
10	-0.00399428	-0.0133352	-0.01934	-0.0436	0.00847	-0.03568	-0.02602	-0.02716	-0.01806	-0.43759	-0.1778	-0.033	-0.0412	-0.07051	-0.01505	-0.09928	-0.02873	-0.03562	-0.02773	-0.04163	-0.01884	-0.07503	-0.04312	-0.02225	-0.01572	-0.02512	-0.02152	-0.01152	-0.0132	-1.433175
11	-0.00147789	-0.0042362	-0.00608	-0.00987	0.001405	-0.01072	-0.00434	-0.00649	-0.00683	-0.0162	-0.00811	-0.01023	-0.01907	-0.02006	-0.00289	-0.00807	-0.0093	-0.01139	-0.0096	-0.00544	-0.00798	-0.02107	-0.00788	-0.00512	-0.00653	-0.01236	-0.00994	-0.00472	-0.00503	-0.24963
12	6.82087E-05	-1.793E-06	0.000281	0.000215	0.000178	0.000567	-0.32183	0.000352	0.002425	0.000326	6.8E-05	0.021452	0.002468	0.000478	-2.1E-05	0.000239	0.000302	0.000275	0.000229	0.000358	0.000603	0.000129	0.000269	0.002486	0.00024	0.000121	0.000189	0.000101	0.000708	-0.286725
13	-0.00203738	-0.0051561	-0.0054	-0.00529	-0.00327	-0.00839	-0.0421	-0.00931	-0.01103	-0.00883	-0.00574	-0.01557	-0.00611	-0.00833	-0.0079	-0.00593	-0.00704	-0.00888	-0.01247	-0.02103	-0.04346	0.001903	-0.00582	-0.0045	-0.02396	-0.00379	-0.01018	-0.00118	-0.0017	-0.292488
14	-0.02273833	-0.0495758	-0.07217	-0.08577	-0.03892	-0.20234	0.097108	-0.06609	-0.08034	-0.06757	-0.03899	-0.15102	-0.21139	-0.22272	-0.0427	-0.08293	-0.05735	-0.07955	-0.05379	-0.0592	-0.0567	-0.18128	-0.07335	-0.01708	-0.03005	-0.01826	-0.0352	-0.01462	-0.02566	-2.040249
15	-0.00210281	-0.0269658	-0.01462	-0.01232	-0.00615	-0.0424	0.041322	-0.02463	-0.00628	-0.05396	-0.01459	-0.02013	-0.01691	-0.02806	-0.03146	-0.04987	-0.05252	-0.0539	-0.04888	-0.02189	-0.02059	-0.02024	-0.04501	-0.00285	0.031915	0.01479	0.006943	-0.00068	0.00922	-0.512832
16	-0.00131261	-0.0037458	-0.00635	-0.05042	-0.00157	-0.00569	-0.00097	-0.00413	-0.00169	-0.00683	-0.00416	-0.00797	-0.00572	-0.00944	-0.00618	-0.04057	-0.0101	-0.01081	-0.01013	-0.01538	-0.00799	-0.02998	-0.08496	-0.00478	-0.00331	-0.00228	-0.01383	-0.00652	-0.0069	-0.363722
17	-0.00547622	-0.1119717	-0.02088	-0.01514	-0.00384	-0.0143	-0.00883	-0.01356	-0.11283	-0.01542	-0.0104	-0.02479	-0.01537	-0.02386	-0.09993	-0.05477	-0.44894	-0.48768	-0.40969	-0.06594	-0.0456	-0.07161	-0.19425	-0.00084	-0.01569	-0.0071	-0.06253	-0.01191	0.005097	-2.368016
18	-0.00422992	-0.0539712	-0.02505	-0.00655	-0.00408	-0.01317	-0.01717	-0.00833	-0.03246	-0.01796	-0.01504	-0.03237	-0.01611	-0.02636	-0.05595	-0.03422	-0.1061	-0.26265	-0.19014	-0.11399	-0.03068	-0.07901	-0.11996	-0.00477	-0.01247	-0.00998	-0.02474	-0.00679	-0.00513	-1.329434
19	0.000151564	-0.0133396	-0.00168	-0.00155	-0.00055	-0.00268	-0.00033	0.001118	-0.00251	-0.00158	-0.00204	-0.00188	-0.00258	-0.00252	-0.01365	-0.00523	-0.00112	-0.003	-0.02981	-0.00129	-0.00158	-0.00163	-0.00182	-0.00019	0.001458	0.000179	-0.00364	-0.00034	0.001364	-0.092278
20	-0.00074638	-0.0004273	-0.00201	-0.00193	-0.00079	-0.00305	0.001453	-0.00058	-0.00159	-0.0041	-0.00098	-0.00306	-0.00083	-0.00337	-0.00296	-0.00113	-0.00362	-0.00584	-0.00264	0.115331	-0.00727	-0.01054	-0.01771	-0.00194	-0.00338	0.00267	-0.00148	-0.00121	0.000286	0.0365561
21	-0.00256829	-0.0159508	-0.00662	-0.00471	-0.00339	-0.00744	-0.00019	-0.00762	-0.00558	-0.0083	-0.00707	-0.00661	-0.00869	-0.00885	-0.01557	-0.00946	-0.00881	-0.01026	-0.01203	-0.00713	-0.65218	-0.00471	-0.00721	-0.00472	-0.03557	-0.00454	0.001348	-0.00205	0.004966	-0.861522
22	-0.00186577	-0.017102	-0.01086	-0.01278	-0.0044	-0.01497	-0.03448	-0.00496	-0.02031	-0.04814	-0.01548	-0.05206	-0.01304	-0.01863	-0.01509	-0.0313	-0.12534	-0.09546	-0.06551	-0.02224	-0.00992	-0.01308	-0.03517	-0.00207	-0.00372	-0.00081	-0.0103	-0.00213	-0.00155	-0.702762
23	-0.00045711	0.0013681	-0.00253	-0.00264	-0.00207	-0.00379	0.003899	-0.0031	-0.00126	-0.00465	-0.00176	-0.00356	-0.00508	-0.00477	-0.01173	-0.00975	-0.00882	-0.00998	-0.01128	-0.00459	-0.00903	-0.00406	-0.02618	-0.00827	-0.00199	-9.1E-05	0.001669	-0.01247	0.000125	-0.14686
24	-0.02101636	-0.077315	-0.11358	-0.08437	-0.06168	-0.16995	0.073053	-0.12056	-0.06636	-0.16946	-0.0894	-0.13159	-0.09458	-0.11695	-0.08167	-0.13369	-0.18567	-0.21623	-0.18096	-0.08801	-0.19879	-0.10175	-0.15679	-0.02025	-0.04799	-0.02487	-0.07381	-0.01995	-0.02765	-2.80184
25	-0.00950001	-0.0292877	-0.03892	-0.02374	-0.01629	-0.04301	0.064182	-0.05093	-0.01973	-0.05042	-0.03165	-0.03807	-0.03283	-0.04832	-0.02743	-0.04272	-0.05244	-0.06687	-0.05916	-0.03138	-0.03547	-0.03258	-0.04482	-0.02868	-0.01715	-0.02136	-0.03683	-0.00807	-0.01025	-0.883727
26	-0.00202337	-0.0043828	-0.00562	-0.0041	-0.0034	-0.00915	0.006884	-0.00616	-0.00433	-0.01322	-0.01487	-0.00523	-0.00736	-0.00888	-0.00564	-0.00701	-0.00851	-0.01013	-0.00851	-0.00413	-0.01033	-0.00359	-0.00688	-0.00575	-0.00587	0.021929	-0.00738	-0.00556	-0.00191	-0.151112
27	-0.00151127	-0.020381	-0.00332	-0.00155	-0.00281	-0.03737	0.080409	-0.01335	-0.00968	-0.03396	-0.00339	-0.01369	-0.01515	-0.01644	-0.01868	-0.02794	-0.03198	-0.0346	-0.03498	-0.01192	-0.01769	-0.01024	-0.01998	-0.00612	-0.00602	0.023495	-0.13097	0.00057	0.009678	-0.409563
28	-0.01904377	-0.0444269	-0.05962	-0.05422	-0.03981	-0.08688	0.043803	-0.06499	-0.04442	-0.0991	-0.06753	-0.06349	-0.06114	-0.08287	-0.06138	-0.07629	-0.08695	-0.10392	-0.0909	-0.06478	-0.09565	-0.0623	-0.07887	-0.13323	-0.04005	-0.02169	-0.05917	-0.05094	-0.02856	-1.798395
29	-0.02997154	-0.0526412	-0.06183	-0.08258	-0.04087	-0.09871	0.015696	-0.07052	-0.045	-0.14115	-0.13468	-0.06909	-0.08485	-0.12198	-0.07969	-0.10571	-0.08486	-0.01068	-0.09523	-0.09321	-0.10409	-0.07973	-0.12917	-0.08208	-0.0256	-0.0578	-0.08511	-0.08362	-0.06545	-2.291193
SUM	-0.21298947	-0.5983685	-1.05514	-0.76508	-0.56512	-1.65237	1.308219	-0.85366	-0.48458	-1.34346	-0.76308	-1.26274	-0.86252	-1.19565	-1.05705	-1.05527	-1.35531	-1.73518	-1.48903	-0.66691	-1.45365	-0.89143	-1.29908	-0.3867	-0.351	-0.17824	-0.64346	-0.28925	-0.3283	-23.48642

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1994

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.072003	-0.00657	0.033268	0.038058	-0.02657	0.059239	-0.04557	0.005495	0.083625	0.0492	0.009426	-0.0654	0.074245	-0.13495	0.008775	-0.00619	-0.00102	-0.0031	0.000133	0.002906	0.01135	-0.0361	-0.02211	0.011035	0.004939	-0.00111	-0.00252	-0.00455	0.00571	0.113659
2	0.025647	0.082897	0.031456	0.04467	0.026334	0.033701	0.030405	0.041641	0.051222	0.052324	0.044914	0.030263	0.043349	0.067036	0.075928	0.153569	0.39487	0.152169	0.101496	0.045165	0.034598	0.078316	0.092291	0.039152	0.169941	0.023949	0.218353	0.013338	0.033098	2.232095
3	0.033421	0.003696	-0.00509	0.021081	-0.00036	0.015397	-0.1165	0.008466	0.011453	-0.00647	0.000334	-0.13916	0.018656	0.056807	0.003633	0.001095	0.000904	0.00346	0.001781	0.002613	0.001317	0.00372	0.000762	-0.00126	-0.00179	-0.00088	-0.00163	-0.0018	0.001781	-0.08458
4	-0.0005	-0.00043	-0.00074	-0.01115	-0.00031	-0.00073	-0.00109	-0.00092	-0.00046	-0.00178	-0.0025	-0.0006	-0.00108	-0.00173	-0.00061	-0.00133	-0.0006	-0.0009	-0.00071	-0.00135	-0.0009	-0.00096	-0.00151	-0.00113	-0.00194	-0.00128	-0.00151	-0.00156	-0.01142	-0.05172
5	-9E-05	9.35E-06	-4E-05	1.31E-05	0.114483	1.29E-05	3.66E-06	-2.1E-05	1.12E-05	2.59E-05	3E-05	-1.2E-05	1.12E-05	-1.7E-05	1.3E-05	1.61E-05	1.03E-05	1.12E-05	1.12E-05	1.87E-05	1.45E-05	9.64E-07	1.59E-05	1.88E-05	1.45E-05	1.97E-05	1.63E-05	2.03E-05	0.000262	0.114883
6	0.00086	0.004398	-0.00318	0.002013	0.001668	0.101702	0.551755	0.012243	0.073148	0.005861	-0.01258	0.129001	0.110343	0.004929	0.003605	0.005052	0.01209	-0.0037	0.010302	0.005694	0.018508	0.123568	0.001267	0.000399	0.006086	-5.5E-05	0.0013	0.000648	0.003311	1.170242
7	0.000153	0.000272	0.000348	0.000298	0.000181	0.012876	0.140525	0.000331	0.000595	0.000463	0.000629	0.00145	0.006961	0.000381	0.000247	0.000365	0.000355	0.000461	0.000349	0.000478	0.000559	0.000455	0.000392	0.001473	0.000539	0.00026	0.000307	0.00022	0.002405	0.174328
8	0.000843	0.00485	0.00051	-0.00654	-0.00346	-0.0012	-0.00542	0.096733	0.06977	-0.00574	0.000873	-0.00522	0.000699	0.002515	0.002349	-0.00333	-0.00567	-0.00663	-0.00548	0.009397	0.000545	-0.00248	-0.01226	-0.00095	0.000873	0.00074	0.000607	-0.0047	9.94E-05	0.122322
9	3.31E-05	0.000429	4.56E-06	-3.9E-05	1.37E-05	0.000167	0.000262	0.002244	0.013579	4.22E-05	6.06E-06	0.000693	6.98E-05	5.01E-05	0.000219	-0.00073	6.74E-05	4.21E-05	0.001913	-0.01161	0.00038	0.000264	-0.00029	1.46E-05	-0.00013	-0.00047	-3.2E-05	-0.00081	0.000235	0.00663
10	0.005372	0.015144	0.008294	0.009421	0.259513	0.017277	-0.00185	0.00333	0.013428	0.391783	0.485567	0.009056	0.002255	0.013419	0.01259	0.057219	0.003386	0.00936	0.016032	0.022502	0.008895	0.009331	0.003905	0.005296	0.007046	0.005288	0.002466	0.005517	0.021539	1.42238
11	0.000691	-0.00011	-0.00151	-0.00438	0.008187	-0.00123	-0.00964	-0.00089	-0.00179	-0.00557	0.000486	-0.00414	-0.01251	-0.01127	0.007803	-0.00055	-0.00251	-0.00234	-0.00163	0.000861	-0.00084	-0.01406	-0.00112	-0.00093	-0.00165	-0.01167	-0.005	-0.00096	0.006762	-0.07152
12	0.000147	0.000238	0.000307	0.000312	0.000191	0.009218	-0.16463	0.003024	0.02127	0.000537	0.000365	0.372352	0.029971	0.000494	0.00026	0.000431	0.000717	0.000624	0.002669	0.001464	0.001017	0.004772	0.000497	0.00071	0.001382	0.000281	0.000417	0.000183	0.0013	0.290518
13	0.000596	0.00146	0.000534	0.000131	0.000954	0.001352	-0.03372	-0.00027	-0.00496	0.003006	0.001973	0.001903	0.03404	0.000356	0.001568	0.002437	0.002477	0.001048	-0.00067	-0.01027	0.096227	0.016772	0.00161	0.004189	0.015857	0.001055	-0.00357	0.001878	0.004471	0.142427
14	0.029339	0.006984	-0.00513	-0.01246	0.007768	0.049176	-0.00273	0.007399	0.004193	0.024076	0.026789	-0.01582	-0.02861	0.109011	0.067387	-0.00369	0.005856	0.00601	0.013542	0.025388	0.021744	-0.06255	-0.00453	0.00393	0.017511	-0.00034	0.010573	-0.00133	0.020934	0.320431
15	0.050498	0.128432	0.064212	0.08919	0.051448	0.0614	0.057929	0.082077	0.060718	0.10615	0.085895	0.053956	0.08699	0.08407	0.170311	0.265154	0.125711	0.110186	0.068662	0.058028	0.050216	0.070427	0.090076	0.079448	0.35003	0.045813	0.437144	0.021297	0.064466	3.069935
16	0.000654	0.001496	-0.00184	-0.02561	0.000868	0.001589	-0.00138	-0.00025	-0.00173	-0.00102	0.000718	-0.00158	0.000586	0.007105	0.000975	0.04884	-0.00334	0.001484	0.000721	-0.00547	0.001771	-0.01757	0.026909	-0.00019	0.000788	0.00013	-0.000878	0.005081	-0.00077	0.030187
17	0.004537	-0.03974	0.006497	0.028961	0.006155	0.00779	0.003167	0.013558	-0.05967	0.015111	0.015373	0.005799	0.009985	0.018592	-0.01131	0.002767	0.057914	0.29726	-0.04289	0.122608	0.185281	0.044089	-0.02687	0.006179	0.024996	0.011656	-0.00753	0.000639	0.011254	0.712146
18	0.0046	-0.02461	-0.00306	0.052758	0.003073	0.003844	-0.01135	0.0178	-0.02199	0.013208	0.002913	-0.0108	0.002797	0.003794	-0.00193	-0.00149	-0.03194	-0.16465	-0.06903	-0.05007	0.006351	-0.04384	-0.03602	0.004249	0.009327	0.002079	0.003991	0.001996	0.009495	-0.32851
19	0.002954	0.016564	0.003006	0.002671	0.001555	0.00413	0.001961	0.017183	0.015275	0.004271	0.002099	0.002422	0.003408	0.00463	0.009945	0.006846	0.010742	0.007232	0.321442	0.013632	0.004344	0.00572	0.006267	0.001976	0.016188	0.004345	0.00959	0.001568	0.00506	0.507026
20	0.002711	0.03308	0.00361	0.003524	0.001872	0.006992	0.002595	0.004761	0.003445	0.00645	0.004519	0.002603	0.006244	0.004227	0.017664	0.009078	0.006131	0.00655	0.05041	0.365931	0.04082	0.006542	-0.00133	0.005431	0.015127	0.015412	0.010956	0.002628	0.009214	0.647201
21	0.003285	0.010697	0.004805	0.005967	0.003046	0.005479	0.004602	0.006603	0.005137	0.006924	0.006926	0.004738	0.004204	0.005987	0.010417	0.008662	0.019064	0.011242	0.007524	0.006851	0.456495	0.014719	0.007842	0.016142	0.038754	0.005184	0.02221	0.003197	0.01811	0.724813
22	0.000534	-0.00787	-0.00474	-0.003	0.004616	-0.00341	-0.02778	0.000182	-0.01402	-0.02035	0.006936	-0.02381	-0.00101	-0.00602	-0.0037	-0.01672	-0.08319	-0.0335	-0.02968	-0.00376	0.010655	0.072444	-0.01583	0.000914	0.002998	0.005033	-0.00311	0.000642	0.005256	-0.19128
23	0.002342	0.02223	0.002108	0.002504	0.001842	0.003752	0.002179	0.002879	0.003314	0.002725	0.002402	0.002376	0.000922	0.002643	0.003958	0.001584	-0.00164	0.000371	-0.00056	0.00187	0.000115	-0.00015	-0.0078	-0.00076	0.005981	0.004518	0.004058	0.009246	0.00494	0.079959
24	0.010146	-0.02082	-0.04175	0.008364	0.01182	-0.01104	0.011317	-0.00738	0.004668	0.008196	0.022337	0.029148	0.02786	0.01407	0.064202	-0.02008	-0.00308	0.002694	0.026596	0.029646	0.01142	0.016579	-0.05091	0.013146	0.030313	0.001852	0.010981	-0.00137	0.012346	0.211283
25	0.018085	0.018331	0.017064	0.027339	0.019699	0.033881	0.026838	0.028686	0.030275	0.022985	0.024666	0.023862	0.024785	0.01489	0.04882	0.01873	0.005443	0.009444	0.010793	0.018071	0.029834	0.02318	0.036871	0.064826	0.014355	0.008767	9.43E-05	0.019061	0.01769	0.657364
26	0.002292	0.003497	0.003884	0.004051	0.004357	0.005037	0.003657	0.005496	0.004214	0.002182	-0.00123	0.006326	0.003436	0.003284	0.003379	0.004904	0.004708	0.005702	0.028332	0.009781	0.004839	0.007078	0.009206	0.036588	0.004069	0.041204	0.000107	0.008768	0.008103	0.227248
27	0.014824	0.05556	0.044214	0.054076	0.025819	0.066879	0.039192	0.036557	0.039027	0.063688	0.038874	0.039864	0.037416	0.043664	0.033699	0.041149	0.070124	0.060474	0.03761	0.041245	0.022633	0.048094	0.026861	0.041019	0.017908	0.016392	-0.06548	0.02168	0.038893	1.051952
28	0.005227	0.005014	-0.01314	-0.00315	0.002003	0.00243	0.010128	-0.00508	0.003973	-0.01521	-0.00168	0.015667	0.005297	-0.01168	0.011998	-0.00882	-0.00807	-0.01321	0.012729	0.005241	-0.01083	0.004155	0.007897	-0.04551	0.017312	0.036071	-0.0118	-0.00497	0.006247	-0.00176
29	-0.00561	0.009098	-0.01604	-0.01814	0.002358	-0.01258	-0.02669	-0.01999	-0.0062	-0.04855	-0.07214	-0.01075	-0.02838	-0.04295	-0.00296	-0.03007	-0.00204	-0.01699	-0.00652	-0.0274	-0.01837	-0.0216	-0.03347	-0.02381	0.014974	-0.0225	-0.04339	-0.03972	-0.01177	-0.58221
SUM	0.285589	0.324234	0.127863	0.310928	0.529126	0.473133	0.438186	0.361893	0.401513	0.674522	0.69492	0.454185	0.462942	0.253338	0.539236	0.534905	0.577459	0.440802	0.555869	0.679456	0.988989	0.350934	0.098631	0.261595	0.781798	0.191758	0.578811	0.055825	0.289022	12.71746

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	-0.0441	-0.03933	-0.35519	-0.10689	-0.13062	-0.0912	0.112357	-0.31936	0.074741	-0.01054	-0.00671	-0.07883	-0.11273	-0.24211	-0.027	-0.02655	-0.01227	-0.02787	-0.00248	0.049009	-0.0031	0.035301	-0.0689	0.01337	-0.02466	0.014464	-0.01361	-0.0122	-0.05568	-1.51269
2	0.000627	0.001225	0.005231	0.002483	0.002278	-0.00592	0.152281	-0.00557	0.032719	-0.00429	0.014128	0.026069	0.059897	0.011469	-0.0882	-0.01098	0.254102	0.071466	0.08522	0.145606	0.034612	0.079187	0.003944	0.024535	0.087704	0.066463	0.206468	0.012389	0.016245	1.281389
3	-0.0078	-0.00474	-0.06202	-0.08409	-0.01626	-0.00645	-0.04363	-0.01377	0.052405	-0.01783	-0.01046	-0.10816	-0.00207	0.026626	-0.00561	-0.00645	-0.00313	-0.00559	0.004273	0.022453	0.000343	0.007191	-0.00944	0.016224	-0.01707	0.000916	-0.00426	-0.00429	-0.03211	-0.33481
4	-0.00089	-0.00147	-0.00132	0.031171	-0.00095	-0.00181	0.002364	-0.00153	-0.00046	-0.00261	-0.00329	-0.00011	-0.0018	-0.00276	-0.00167	-0.00211	-0.00114	-0.00154	-7.6E-06	0.002606	-0.00081	-0.00049	-0.00267	0.001388	-0.00222	-0.0006	-0.00151	-0.00157	-0.01356	-0.01139
5	-0.00013	8.79E-07	-0.0001	-1.1E-05	-0.19347	9.9E-06	1.47E-05	-7E-05	6.04E-06	1.09E-05	1.72E-05	-2E-05	-1.5E-05	-4.2E-05	4E-06	6.78E-06	4.28E-06	3.32E-06	5.82E-06	1.62E-05	7.76E-06	1.9E-06	1.85E-06	1.25E-05	5.06E-06	1.46E-05	8.63E-06	1.18E-05	0.000162	-0.19354
6	-0.00703	-0.0082	-0.01789	-0.00442	-0.00295	-0.63981	3.523071	-0.00514	0.046569	-0.00661	-0.02067	0.207469	-0.15133	-0.00227	-0.00315	-0.00073	0.006794	-0.01718	0.005743	0.010696	-4.5E-05	0.099584	-0.00552	0.001225	-0.01172	0.01236	-0.00237	-0.00026	-0.0028	3.003423
7	8.12E-05	0.000199	0.000331	0.000329	0.000169	0.000269	0.441774	0.002687	0.000595	0.000374	0.000362	0.006224	0.000476	0.000319	0.000183	0.001046	0.000354	0.000356	0.000361	0.000361	0.000318	0.000297	0.000643	0.00163	0.000635	0.000199	0.000233	0.000181	0.001601	0.462589
8	-0.00234	-0.00578	-0.00269	-0.00813	-0.00876	-0.00448	0.008793	0.006062	0.275192	-0.00409	-0.00158	-0.0039	-0.00206	-0.0003	-0.00295	0.002889	-0.00757	-0.01244	-0.02365	0.025733	0.001764	0.028111	-0.04349	-0.00011	0.007237	0.01958	-0.0004	-0.00738	-0.00101	0.232244
9	0.000221	0.001585	0.000667	0.000483	0.000337	0.00057	0.001602	0.000894	0.03134	0.000916	0.001095	0.000874	0.000654	0.00085	0.001047	9.25E-05	0.000943	0.000956	0.004131	0.010459	0.004318	0.001123	0.001199	0.002564	0.009416	0.040433	0.000713	0.001295	0.000536	0.121314
10	-0.0016	-0.00927	-0.00975	-0.02601	0.006144	-0.02414	0.084615	-0.01814	0.00509	-0.12441	-0.01829	0.022938	-0.02776	-0.03307	-0.00798	-0.07378	-0.00859	-0.01843	0.010618	0.077041	0.010505	0.036274	-0.02812	-0.01263	0.001814	0.005849	-0.01107	-0.00211	0.000699	-0.19354
11	-0.00092	-0.00379	-0.00465	-0.00872	-0.00679	-0.0094	0.01238	-0.00518	-0.00264	0.006229	-0.0002	-0.00041	-0.01688	-0.01627	-0.00301	-0.00566	-0.00604	-0.00821	-2.6E-05	0.013127	-0.00186	-0.01141	-0.00549	-0.00145	-0.0041	-0.00724	-0.00676	0.004764	-0.00026	-0.10088
12	8.75E-05	0.00029	0.000324	0.000375	0.000217	0.000478	0.030837	0.007201	0.218302	0.000749	0.000262	0.431608	0.001451	0.000548	0.000222	0.001019	0.001424	0.00098	0.000985	0.00438	0.000299	0.012809	0.000916	0.001392	0.000478	0.000417	0.000313	0.000363	0.000971	0.719696
13	-0.00177	-0.00561	-0.00432	-0.00406	-0.00283	-0.00041	-0.0119	-0.00831	-0.00551	-0.00566	0.00657	-0.00519	-0.04598	-0.00503	-0.00412	-0.00323	-0.00328	-0.00539	0.003125	0.021501	0.00262	0.012973	-0.00328	-0.00042	-0.02089	0.023458	-0.0062	0.000419	0.000849	-0.08187
14	-0.01457	-0.06686	-0.05643	-0.06226	-0.02324	-0.17008	0.495228	-0.04683	-0.00326	-0.01651	0.071659	0.296118	-0.19419	-0.18009	-0.03851	-0.03488	-0.01573	-0.04591	0.079681	0.197528	0.01948	0.03337	-0.05306	0.000482	0.000632	0.051186	-0.00635	0.001846	-0.00999	0.208453
15	0.003368	-0.01625	0.007391	0.016397	0.005579	-0.00568	0.289762	-0.00835	0.033283	-0.00432	0.024349	0.038443	0.138392	0.059359	0.009616	0.017467	-0.00821	-0.0029	0.063866	0.202526	0.049331	0.063323	-0.01517	0.035643	0.189193	0.1234	0.131677	0.023095	0.031817	1.496397
16	-0.00087	-0.00276	-0.00443	-0.04498	-0.00128	-0.00418	0.010052	-0.00318	-0.00058	-0.00396	-0.00134	0.000987	-0.00459	-0.00763	-0.00403	-0.01468	-0.00405	-0.00514	0.00654	0.051529	0.011831	0.006277	-0.07262	-0.00032	-0.00024	0.010396	-0.01082	-0.00305	-0.00432	-0.10144
17	-0.00257	-0.11535	-0.00949	-0.00529	-0.00094	-0.00557	0.032765	-0.00171	-0.09174	-0.00505	0.007518	0.000959	-0.00139	-0.00709	-0.07001	-0.03067	-0.44665	-0.32078	0.093676	0.421396	0.214687	0.090401	-0.16824	0.005201	0.035876	0.17178	-0.02885	-0.00854	0.003232	-0.24243
18	-0.00151	-0.04984	-0.00973	0.002172	-0.00065	-0.00447	0.032313	0.009982	-0.0305	-0.00088	0.018543	-0.00046	-0.00346	-0.00391	-0.0333	-0.01378	-0.01555	-0.19667	0.093133	0.223407	0.05309	0.057508	-0.09678	0.006759	0.015864	0.153876	-0.00339	-0.00192	0.003947	0.20378
19	0.0019	-0.0115	0.003281	0.00365	0.001165	0.002713	0.01557	0.002981	0.008274	0.002269	0.00445	0.003596	0.002097	0.002839	-0.0066	0.003551	0.00809	0.012303	0.067579	0.08985	0.008838	0.013961	0.005473	0.009545	0.026675	0.202034	0.00862	0.002338	0.004524	0.500067
20	0.002411	0.015313	0.005324	0.010694	0.002283	0.004297	0.035124	0.006057	0.009701	0.00744	0.008448	0.010278	0.005704	0.009352	0.010439	0.012744	0.010351	0.01239	0.231254	1.814191	0.253255	0.030573	0.020581	0.01037	0.044562	0.211168	0.012195	0.004683	0.010843	2.822025
21	-0.00202	-0.01089	-0.00254	-0.00084	-0.00226	-0.0044	0.031355	-0.00464	9.51E-05	-0.00319	-0.00288	0.000741	-0.00551	-0.00492	-0.00931	-0.00371	0.006529	-0.00203	0.00625	0.031219	-0.40429	0.009587	-0.00145	0.003248	-0.00182	0.002096	-0.00145	8.61E-06	0.008718	-0.36829
22	-0.00084	-0.01537	-0.00671	-0.00612	-0.00267	-0.0107	0.021939	-0.00089	-0.00543	-0.03385	-0.00404	-0.01598	-0.00844	-0.01025	-0.00923	-0.01882	-0.10972	-0.07395	-0.01607	0.044831	0.018806	0.111601	-0.02707	0.006295	0.005414	0.060457	-0.00468	0.005082	0.001556	-0.10485
23	-0.00072	-0.00334	-0.00349	-0.00373	-0.00282	-0.00559	0.012805	-0.00413	-0.00107	-0.0059	-0.00403	0.000212	-0.00468	-0.00486	-0.01321	-0.01017	-0.01041	-0.00967	-0.00194	0.014945	-0.00264	-0.00039	-0.02455	-0.00963	-0.00028	0.005826	-0.00449	-0.02767	-0.00039	-0.12601
24	-0.01941	-0.06743	-0.10288	-0.07128	-0.05972	-0.14895	0.867293	-0.09804	-0.01236	-0.13497	-0.05958	0.178532	-0.07986	-0.08635	-0.05551	-0.07787	-0.07256	-0.12391	0.402481	1.081082	0.10209	0.154358	-0.10975	-0.00548	-0.01015	0.092871	-0.02207	-0.01036	-0.01477	1.435454
25	-0.01093	-0.03112	-0.0387	-0.02376	-0.01654	-0.03748	0.092829	-0.05527	-0.00633	-0.03608	-0.02609	0.000303	-0.03112	-0.0421	-0.03259	-0.03441	-0.0403	-0.05155	0.046203	0.128828	0.001663	-0.00088	-0.01478	0.021785	-0.01537	0.016495	-0.02131	0.009701	-0.00324	-0.25214
26	-0.00072	0.000276	-0.00075	0.00216	-0.00027	-0.00347	0.045148	-0.00193	0.006681	-0.00367	-0.00674	0.007683	-0.00173	-0.0017	0.001662	0.00214	0.001835	-0.00136	0.027241	0.043051	0.008161	0.013998	-0.00066	0.011831	-0.00107	0.054655	0.012044	0.008273	0.0029	0.225667
27	0.002079	-0.00242	0.002531	0.024486	-0.00021	-0.02084	0.140976	-0.00722	0.029294	0.008727	0.039755	0.017433	-0.01434	-0.00328	-0.00287	0.015028	0.032615	0.04303	0.060437	0.171162	0.030849	0.037719	-6.5E-05	-0.00549	0.002297	0.025776	-0.0042	0.00693	0.017568	0.647764
28	-0.01585	-0.04033	-0.05259	-0.04513	-0.03895	-0.07741	0.192877	-0.05798	-0.00242	-0.07491	-0.04316	0.015251	-0.05108	-0.06348	-0.04413	-0.05565	-0.05173	-0.07187	0.042517	0.192384	0.001094	0.068152	-0.05838	-0.11214	-0.00514	0.067311	-0.04086	-0.02761	-0.019	-0.47023
29	-0.02773	-0.05959	-0.05757	-0.0782	-0.04372	-0.08902	0.156955	-0.06787	-0.01933	-0.11366	-0.12676	0.003016	-0.07903	-0.10799	-0.06654	-0.0896	-0.05744	-0.0772	0.012295	0.187031	-0.0339	-0.00678	-0.11428	-0.06857	-0.03722	0.017692	-0.05016	-0.03517	-0.05127	-1.18159
SUM	-0.15355	-0.55235	-0.77813	-0.48951	-0.53775	-1.36312	6.787549	-0.69923	0.642652	-0.5863	-0.13868	1.055673	-0.63137	-0.71412	-0.50635	-0.45775	-0.55132	-0.93811	1.303455	5.277947	0.381304	0.983722	-0.891	-0.04274	0.275855	1.443335	0.127472	-0.06076	-0.10224	8.084575

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2006

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.11845432	-0.0127041	0.030898	0.016382	0.161774	-0.03344	0.014562	-0.16544	0.103922	0.033842	0.024525	-0.10663	0.139955	-0.12631	-0.00491	0.01781	0.006942	0.007609	-0.00419	-0.00461	0.013521	0.035283	-0.0114	0.022884	-0.00353	-0.00093	-0.00854	-0.00466	-0.01645	0.246185
2	0.014756926	0.08016144	0.030574	0.046411	0.01959	0.069311	0.04363	0.046584	0.059217	0.03467	0.035842	0.049134	0.095358	0.103189	0.206335	0.134081	0.284168	0.547838	0.188189	0.079806	0.04715	0.10324	0.101189	0.029841	0.126929	0.020424	0.04862	0.016889	0.019091	2.6822222
3	0.055843607	-0.000681	0.084719	0.013346	0.004128	0.015675	-0.15301	0.011173	0.01657	-0.00878	-0.0029	-0.20603	0.005801	-1.1E-05	-0.00113	-0.00059	0.000862	0.000453	0.001504	-0.00072	0.003364	-0.00068	-0.00258	0.006149	-0.01173	-0.00224	-0.00404	-0.00094	-0.00064	-0.176543
4	-3.9098E-05	-0.0003123	0.012739	0.114093	0.000469	-0.00013	0.000635	0.000221	0.000185	-0.00038	-0.00143	0.002704	-0.00036	-0.00087	-0.00052	-0.00047	0.000419	0.000342	0.000195	-0.00044	0.000464	-0.00011	-0.00118	0.004541	-0.00139	-0.00093	-0.0011	-0.00085	-0.00773	0.1187396
5	-0.00011143	-1.167E-06	-5.9E-05	-4.1E-06	-0.1101	-7.8E-06	-2.3E-06	-5.6E-05	5.58E-06	6.53E-06	7.96E-06	-2.6E-05	5.27E-06	-3.7E-05	9.36E-07	3.97E-06	1.49E-06	1.6E-06	2.81E-07	1.9E-06	3.7E-06	-3.2E-06	-8.1E-07	6.1E-06	7.55E-07	4.11E-06	1.99E-06	3.86E-06	5.91E-05	-0.110291
6	0.000973069	-0.002363	-0.00176	0.006696	0.008736	-0.15524	0.616488	0.023402	-0.01482	0.040204	0.010478	0.651585	-0.06732	0.008568	-6.3E-05	0.013945	0.009455	-0.00376	0.011041	0.000444	0.00314	0.083059	0.004906	0.002698	0.000957	0.005147	0.000129	0.002236	0.010473	1.2694284
7	4.17407E-05	9.1224E-05	0.000124	0.0001	6.73E-05	0.000181	-0.0122	0.004389	0.00054	0.000119	0.000103	0.000115	-0.00047	0.000237	8.03E-05	0.000125	0.000108	0.000151	0.000316	0.000106	7.03E-05	0.000114	0.001326	0.000191	0.000434	0.000151	0.000172	0.000107	0.000412	-0.002692
8	-8.9328E-05	0.00126314	0.0003	-0.00381	-0.00329	0.00208	-0.0045	-0.009	0.345738	0.015694	0.007357	-0.00561	0.001707	0.007515	0.001365	0.005839	-0.00372	-0.00523	-0.02395	0.004276	0.00412	0.018947	0.036983	-0.00093	0.004613	0.002678	-0.00023	-0.00334	0.001324	0.3980974
9	0.000551992	0.00727104	0.00163	0.009115	0.00104	0.00384	0.009151	0.005123	0.033637	0.009661	0.011072	0.011676	0.001636	0.004078	0.004013	0.006327	0.005025	0.007559	0.005251	-0.00395	0.004226	0.003601	0.002332	0.002219	0.008138	0.003629	0.002844	0.000924	0.002468	0.1640836
10	0.005611516	0.02137908	0.01114	0.013945	0.222768	0.025317	-0.0032	0.024581	0.012701	-0.11972	0.124327	0.015985	0.002198	0.033611	0.013113	-0.04325	0.006538	0.007103	0.032096	0.001589	0.016001	0.01228	-0.00802	-0.00604	0.005826	-0.00642	0.00276	0.007249	0.009035	0.4405015
11	0.000909626	-0.0005146	7E-05	0.002216	0.007845	-0.00224	-0.00942	0.000307	-0.0017	0.052635	0.012604	-0.00264	-0.01099	-0.00634	-5.6E-05	0.001017	-0.00201	-0.00332	-0.00129	-0.00051	0.00012	-0.01138	-0.00131	-0.0001	-0.00258	-0.0109	-0.00665	0.016861	-3.8E-05	0.0205887
12	0.000427468	0.00025478	0.000819	0.000431	0.000282	0.076733	-0.35346	0.001969	0.05011	0.003771	0.001907	0.011215	0.006103	0.000881	0.000265	0.001358	0.00084	0.001264	0.000536	0.001422	0.000279	0.007213	0.001398	0.000376	0.000892	0.000342	0.000319	0.000234	0.001138	-0.180681
13	4.13878E-05	0.00248803	-0.00111	-0.00124	0.000291	0.013172	-0.03422	-0.00336	-0.00513	-0.00196	0.00363	0.00209	0.084973	-0.0023	0.001835	0.000723	0.000913	0.000366	0.001898	-0.00648	0.015773	-0.00051	0.003553	-0.00152	-0.01637	-0.00047	-0.00486	0.000834	-5.6E-05	0.0529697
14	0.046005096	0.00264197	0.021522	0.022771	0.065795	-0.03993	-0.00873	0.084339	0.016034	0.073526	0.146288	-0.02376	-0.1259	0.196726	0.012501	0.118339	0.02256	0.043981	0.029419	-0.00086	0.031387	-0.01562	0.002043	0.002661	0.007461	0.008693	-0.00393	0.005877	0.000366	0.7422116
15	0.02421642	0.11953579	0.038298	0.067181	0.031842	0.128358	0.06475	0.076956	0.074918	0.053655	0.05377	0.069947	0.198726	0.225597	0.195036	0.171032	0.286831	0.283346	0.240067	0.071686	0.066763	0.144161	0.108588	0.025501	0.239601	0.028203	-0.0269	0.029235	0.031466	3.122366
16	0.001066784	0.00497636	0.00045	0.002249	0.001533	0.031335	0.06222	0.001136	-0.00057	0.000257	0.010439	0.089199	0.001603	-0.00225	0.001539	0.025283	-0.00187	-0.00141	0.009218	-0.00541	0.003375	-0.0127	-0.02498	-0.00019	0.001017	0.002428	-0.00938	-0.00141	-0.00033	0.1888179
17	0.001990377	-0.0600823	-0.00743	-0.00421	0.005435	0.007527	0.001434	0.004903	-0.0748	0.017184	0.010153	-0.00417	0.021331	0.004735	-0.01924	-0.00332	-0.05794	-0.33914	-0.07518	-0.04842	0.211774	-0.0386	0.03274	0.005676	0.036957	0.010799	-0.03117	-0.00319	0.001332	-0.392943
18	0.006626652	-0.0094565	-0.00767	-0.00392	0.007839	0.009956	-0.00105	0.014871	-0.02	0.028724	0.013158	-0.00493	0.003051	0.002464	0.000491	0.014233	0.070193	-0.03581	0.102202	-0.03066	0.063259	-0.01682	-0.01395	0.005284	0.025331	0.019445	0.001124	-0.001	0.001107	0.2440897
19	0.000801903	-0.0115445	0.001175	0.001948	0.001176	0.003363	0.000524	0.000983	0.000904	-0.00014	0.002246	0.001578	0.002984	0.001404	-0.00354	-0.00022	0.005312	0.008583	0.011389	0.000865	0.079525	0.002948	0.001598	0.00202	0.014	0.001693	-0.00058	0.000778	0.001235	0.1330063
20	0.009156578	0.02339773	0.008644	0.015263	0.004787	0.013751	0.063239	0.014835	0.01561	0.00916	0.008213	0.008351	0.008381	0.014269	0.015427	0.018425	0.014973	0.022491	0.028052	0.705068	0.201524	0.029973	0.011487	0.008015	0.059607	0.113528	0.038175	0.004191	0.013763	1.5017572
21	-0.00206101	-0.0145367	-0.00535	-0.00291	-0.00122	-0.00397	-0.00552	-0.00596	-0.00402	-0.0048	-0.00589	-0.00383	-0.00651	-0.00583	-0.01018	-0.00561	-0.00431	-0.00255	-0.00561	-0.00464	-0.6986	-0.00326	-0.00406	-0.0051	-0.06125	-0.00673	-0.00863	-0.0021	-0.00333	-0.898372
22	0.000884318	-0.0070109	-0.00493	-0.00452	0.008387	-0.00045	-0.03628	0.004142	-0.01232	-0.02689	0.013492	-0.03805	-0.0015	-0.00517	-0.00391	-0.01583	-0.08406	-0.0703	-0.02692	-0.01299	0.01521	0.094693	-0.01134	0.000265	0.004776	0.001584	-0.00435	0.000144	0.002072	-0.22117
23	0.000199245	-0.0025223	-0.00178	-0.00127	-0.00014	-0.00095	-0.00121	0.00023	-0.00123	-0.00066	-0.00231	-0.00063	-0.00211	-0.00127	-0.01091	-0.00705	-0.00441	-0.00423	-0.00425	-0.00313	-0.00189	-0.00306	-0.02269	-0.00901	0.000793	-0.00133	-0.00796	-0.02851	-0.00285	-0.126151
24	0.03527506	0.01392268	0.043393	0.110132	0.156287	0.119035	0.088696	0.309829	0.06498	0.40502	0.1801	0.084944	0.117225	0.101909	0.044096	0.108357	0.163536	0.088819	0.169716	0.103448	0.47531	0.18349	0.03713	0.217727	0.067164	0.042261	-0.02077	0.006714	0.018056	3.5358029
25	0.009486529	0.00522669	-0.01531	-7.4E-05	0.009554	-0.00589	-0.00578	-0.01744	0.002606	-0.00441	-0.00651	-0.00797	-0.01133	-0.01048	-0.00237	-0.0046	-0.01229	-0.01535	0.018597	0.003271	0.016945	-0.00507	-0.00683	-0.00477	0.007252	-0.01206	-0.02133	0.007981	-0.00326	-0.092206
26	0.00557969	0.01770514	0.010409	0.025754	0.014662	0.014951	0.011589	0.020811	0.006542	0.025513	0.006362	0.010205	0.008079	0.009837	0.011288	0.017582	0.011605	0.014399	0.018024	0.028476	0.034487	0.019126	0.009187	0.018017	0.005977	0.055094	0.012998	0.01275	0.022654	0.4796607
27	0.007420429	0.02680233	0.011555	0.028148	0.022179	0.00665	0.054202	0.015638	0.015216	0.031948	0.039993	0.028242	-0.00183	0.017649	0.016485	0.034903	0.04357	0.05217	0.033423	0.025481	0.020656	0.022379	0.016109	-0.0028	0.008636	0.008125	0.056577	0.011145	0.023401	0.6740666
28	0.018156219	-0.0049622	-0.00231	0.014754	0.019123	0.003456	0.00087	0.027226	0.028019	0.039482	0.009382	0.004695	-0.00184	-0.0028	-0.00786	0.000483	0.00542	-0.00958	0.014519	0.001049	0.031523	0.016016	-0.01189	-0.06931	0.050705	0.057808	-0.02278	0.140966	0.036247	0.3865751
29	-0.00627444	-0.0193666	-0.01998	-0.02624	0.008822	-0.02633	-0.02956	-0.00723	-0.00753	-0.03843	-0.07188	-0.01027	-0.031	-0.05096	-0.02564	-0.03551	-0.00459	-0.00808	-0.00828	-0.02936	0.002909	-0.01886	-0.07054	-0.05607	-0.01058	-0.02916	-0.05837	-0.02007	-0.02525	-0.733698
SUM	0.355901649	0.18105909	0.240756	0.462722	0.669662	0.276098	0.373859	0.485723	0.705322	0.668894	0.634531	0.627114	0.437954	0.518017	0.433558	0.573407	0.764078	0.587718	0.765992	0.874779	0.662395	0.649846	0.179783	0.198239	0.569628	0.310869	-0.07784	0.19903	0.135762	13.464857

Appendix Table 7
Changes in Linkage Intensities (First Order Effects), Malaysia
1983

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.03382046	-0.0027579	0.05245798	0.01664845	-0.0295235	0.01980224	-0.0377346	-0.0077123	-0.0007513	-0.0075258	0.00072346	-0.0340473	-0.0001223	0.00309474	1.9745E-05	-0.0001408	-0.0044894	-0.0023941	-0.0010549	-0.005428	-0.0038615	-0.009585	-0.0007106	0.00081189	-0.0345905	0.00162784
2	0.00508659	0.00713015	0.00734833	0.00818168	0.00330197	0.00960933	0.00800402	0.00604852	0.00622403	0.00875442	0.21656495	0.00234382	0.02789804	-0.1065845	-0.0098589	-0.0047338	-0.0004727	-0.0059991	0.05381512	-0.0132594	0.00681074	0.01355646	0.00159058	0.00049523	0.00485381	0.00235792
3	0.0264022	-0.0001838	0.19263419	0.0543385	0.00301014	0.00142415	0.00801973	0.00247401	0.00028423	-0.0106969	0.00050509	0.01331927	0.00034057	0.00107239	0.00017017	2.5549E-05	0.00029287	-0.0017536	0.00052895	0.00154097	-0.0004567	-0.0012576	0.00078493	0.0009829	-0.0043927	0.0026966
4	7.3138E-05	-4.724E-05	0.0001015	0.00393811	0.0002509	9.4093E-05	7.3877E-05	2.7481E-05	9.7425E-06	-0.0001183	4.2778E-05	6.2343E-05	-1.562E-05	4.8015E-05	-1.307E-05	-8.495E-06	-6.031E-06	0.00024132	3.5477E-05	0.00014758	-0.0001807	-0.0002249	0.00010008	0.00010682	-0.0016073	0.0001657
5	2.6648E-05	3.8819E-05	0.00013945	0.00011613	-0.0015179	0.00023812	0.00012401	0.00014319	0.00015293	0.00022836	6.5382E-05	0.00012856	5.6383E-05	0.00016786	0.00020317	0.00022761	5.2844E-05	0.00018131	0.00030611	0.00019159	5.1422E-05	0.00018449	2.6645E-05	2.8085E-05	0.00010136	4.2429E-05
6	-0.00043	-1.503E-05	-0.0015763	-0.0009659	0.00125571	-0.069827	-9.316E-05	0.02206681	-0.0023192	0.00057983	0.00014233	-0.0041084	-0.0021961	0.00073327	-0.0011363	0.01153941	0.00270676	-0.0262128	-0.0003016	0.00032999	-9.22E-05	-0.0015005	-0.001305	0.00017915	0.00039267	-0.0017122
7	0.0002535	-0.0008247	0.00030039	0.00082096	0.00064963	0.00059574	0.00682583	0.00456847	0.00142989	0.00151968	0.00037938	0.00276748	0.00082299	5.9478E-05	0.00324126	0.00160962	-0.0006632	-0.0042038	5.0833E-05	0.00152912	0.00010997	2.1569E-05	-0.0017879	0.00018452	-0.0003294	-0.0006014
8	1.7835E-05	-1.333E-05	8.9854E-06	0.00015578	-8.224E-05	0.00010896	2.8441E-05	-0.0126955	-0.0025483	8.6689E-05	1.5328E-05	0.00015269	0.00012014	4.9959E-05	-0.0001074	0.00097914	-1.936E-05	0.00010863	4.1047E-06	0.00023467	-0.0001311	-4.946E-05	0.00015453	2.3937E-05	-0.0002058	-6.992E-05
9	0.00097807	-0.0022102	0.00060469	0.01705202	-0.0082341	0.00203229	0.00093097	-0.0011561	-0.0154868	-0.0085384	0.000499	3.6527E-05	0.00066272	0.00013786	-0.0026882	-0.0027407	-0.0005951	-0.0017247	-0.0003716	0.00050344	-0.0135842	-3.829E-06	0.00683911	0.00570438	0.00539264	-0.0011857
10	0.00627731	0.00263791	0.00625295	0.00494015	0.00086096	0.01057136	0.00799606	-0.0166737	0.01004455	0.06920328	0.00294774	0.00946886	0.0066784	0.0029227	0.00345789	0.00076965	0.00256712	0.00898739	0.00378159	-0.0025078	0.00244644	0.00293686	0.00060069	0.00038348	0.00019183	0.00182649
11	0.007388	-0.0065253	0.00862457	0.00312227	0.00307123	0.01763213	0.00961326	0.00122722	0.00091943	0.00042802	0.00758571	-0.0154609	0.0107183	0.00242924	0.00357493	0.00220916	0.00061619	0.00243213	-0.0050754	0.00338181	0.00739178	0.00432305	0.0020704	0.0014069	-0.0009899	0.00024213
12	0.00051331	-0.0003481	-5.229E-05	-0.0003777	-0.0005135	-0.0003265	-0.0013411	0.00863378	-0.0008257	0.00236642	0.00044959	0.00409687	-0.0007613	-0.0006911	-0.0008068	0.00057814	-0.0048214	0.00046943	-0.0009453	0.0002229	-0.0012127	-0.0087263	-0.0011744	-6.924E-05	-0.0030482	-7.521E-05
13	-0.0001248	-0.0014283	-0.0001994	-0.0274966	-0.0044348	-7.474E-05	0.00123837	-0.0108042	-0.0026031	-0.0040126	0.00030097	0.00235879	0.02980897	0.00043115	0.01404683	-0.0008278	0.00227678	-0.0043201	-0.0002346	-0.0024849	-0.0055528	-0.0006761	-0.0035172	0.00021492	-0.0009774	-0.0009194
14	0.0002759	-0.0007368	0.00239789	0.00592309	0.00061232	0.00111281	0.00057885	0.00533034	0.00563564	0.00104469	0.00337928	0.00222696	0.00329549	0.04327214	0.01275551	-0.0086096	-0.0004734	-0.0118228	0.00107952	-0.0058361	0.00057197	-0.0001985	-0.0010633	-9.489E-05	-0.0004065	-0.0009379
15	-0.0008853	0.00038866	-0.005296	0.0032078	-0.0001218	0.00064729	-0.0007938	0.00327413	0.0002986	-0.003783	-0.0018021	0.00337418	0.00153749	0.00955701	0.02708773	0.00236097	0.00268889	0.00634773	0.00028595	0.00065701	-0.0014534	-0.0002145	-0.0016841	-5.179E-05	-0.0009084	-0.0004785
16	-0.0028118	-0.0040286	-6.696E-05	-0.0008565	0.0005626	0.00105742	-0.0057247	0.00186506	-0.0009546	-0.000263	0.00024735	-0.0017923	0.00295878	-0.0008391	0.00090355	-0.0392994	-0.0041999	-0.0378515	-0.0052411	-0.0021558	0.00033692	-0.0021291	-0.0012772	-0.0010551	0.0072086	-0.002866
17	-2.786E-06	0.00113281	0.00156378	0.00158954	0.00060401	0.00198124	0.00060028	0.00120233	0.00093545	0.00130331	0.00086609	0.00125375	0.00290201	0.00179179	0.00366827	0.00150391	0.0985149	0.00539446	0.00046089	0.00221223	0.00100319	-0.0018316	0.00026196	0.00041389	0.00146567	-0.0002822
18	6.9583E-05	-0.0003568	-7.894E-05	-0.0006353	-0.0007852	0.00685286	0.00011981	-0.0005042	-0.0016597	-0.0008908	-7.79E-06	-0.0001329	-3.383E-05	-0.0001353	-0.0001011	-0.0001915	7.8651E-06	-0.2747831	-0.0001194	-0.0002624	-0.0003347	-0.0004463	-0.0003976	0.00161242	-0.0006307	-0.0007964
19	0.0031178	-0.0112057	0.00767862	0.00822341	0.00576679	0.02269417	0.00918246	0.00138104	0.00596531	-0.0028932	0.00303177	0.01064767	0.01808804	0.00973695	0.008441	0.00666929	0.00358954	0.00965886	0.01470907	0.00102387	0.00266145	0.00016998	0.01969276	0.00395094	-0.0025184	0.00504578
20	0.00190813	-0.0026167	0.00169448	0.00044108	0.0008449	0.00137706	0.0053953	0.00199673	0.00099827	1.0571E-06	0.00141752	0.00105995	0.00150717	-0.0003486	0.00064215	-0.0002539	0.00054179	-0.0009094	-0.0023476	-0.0060547	0.00029949	-0.0014206	-0.0031607	0.00101836	0.00052399	-0.0057008
21	0.00563423	-0.0099177	0.00503268	-0.0053221	0.00413465	-0.0014669	0.01264742	-0.009266	-0.0165005	-0.0041061	0.00444466	-0.0047752	-0.0066819	0.01900231	5.2428E-05	-0.0137626	-0.0021456	-0.0855816	0.0103471	-0.0094752	-0.0005425	-0.0094058	-0.0011297	0.00217319	-0.0136644	-0.0064437
22	0.00684634	0.03422694	0.01353961	0.00019857	-0.0053212	0.00276667	-0.0193032	-0.0168609	0.00201622	0.01448903	0.01084262	0.00306432	0.00970037	0.01955606	0.00635735	0.00308455	-0.000332	0.00075224	0.00761816	0.01722158	0.0340502	0.00775878	-0.0043018	0.00150551	0.00533536	0.00198344
23	0.00083067	-0.0004247	0.00077276	0.00012379	-0.0001411	-0.0003129	0.00070014	-0.0004335	-0.0005089	-0.0009494	0.00031852	0.00027271	-0.0004385	0.00103673	0.00013933	-0.0012056	0.00015922	-0.0040017	-0.0029177	0.00298036	-0.0011571	-0.0023777	0.00164075	0.00373311	-0.0033338	-0.001262
24	0.00238388	-0.0018921	0.00424434	-0.0002625	0.00408924	0.00423316	0.00422337	0.0010621	0.0048101	0.00308116	0.00168835	0.00312509	0.00365801	0.00320478	0.00355987	-0.0011925	0.00461159	-0.0011452	-0.0005638	-0.002564	-0.0046716	-0.0063751	0.00351573	-0.0027638	0.00445025	0.00432967
25	0.00564	-0.0023946	0.00525783	0.01946924	0.02585022	0.00788473	0.00842007	0.0047039	0.00291436	-0.0120209	0.00433193	0.00540402	-8.147E-06	0.00400277	-0.0008654	-0.0016616	0.00026743	-0.0099412	0.00245968	0.01509332	-0.0095231	-0.0133044	0.01037959	0.01198947	0.02963722	0.01206914
26	5.731E-05	-0.0004057	-3.795E-05	-9.933E-05	2.8077E-06	0.00082932	0.00021752	-0.0002702	-0.0002586	-0.000487	7.7663E-05	0.00027202	-5.993E-06	0.00128467	0.00023944	-0.0006418	0.00021041	-0.0012261	-3.537E-05	0.00471837	-0.0054696	-0.0029302	0.00023747	0.00039721	5.5849E-05	0.00209357

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1991

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.03745	-0.00304	-0.00472	-0.0101	-0.03351	-0.00382	0.167525	0.065459	-0.00042	-0.00773	0.00293	-0.13944	-0.0045	-0.00662	-0.00214	-0.00343	-0.00596	-0.01447	0.001014	-0.01271	-0.00645	-0.00776	0.001456	0.001484	-0.05693	-0.00171
2	0.006762	0.012576	0.008143	0.009865	0.005113	0.005944	0.010866	0.002521	0.005913	0.088696	0.442348	0.00321	0.027002	-0.38375	-0.03892	-0.01683	-0.00235	-0.02646	0.080099	-0.0341	0.006649	0.021085	0.002377	-0.00151	0.004845	0.0061
3	0.036939	0.000544	0.190909	0.019428	0.00157	-0.00259	0.022049	0.01028	0.000255	0.007467	0.001808	0.015634	0.002597	0.001757	0.000495	-0.00033	0.001526	-0.00546	0.001871	0.000608	-0.00167	0.001168	0.002237	0.002115	-0.01585	0.002528
4	0.000381	4.52E-06	2.45E-05	0.00177	-0.00023	-5E-05	0.000156	-8.3E-05	-0.00012	-0.00023	0.000144	0.00025	5.58E-06	9.29E-05	-0.00011	-0.00013	7.44E-05	-0.00036	0.00015	-0.00015	-0.00032	-0.00022	0.000279	0.00023	-0.00515	9.78E-06
5	-0.00011	6.25E-05	0.000229	0.000771	0.065769	0.000168	0.00016	0.000547	0.004461	-7.3E-05	4.04E-05	0.000217	0.000452	3.53E-05	0.000207	0.000124	5.8E-05	0.000477	-1.2E-05	4.2E-05	0.000515	0.000618	3.39E-05	2.96E-05	5.06E-05	8.47E-05
6	-0.00059	-0.00011	-0.00254	-0.00319	0.000886	-0.20894	0.000926	0.005922	-0.00606	-0.0015	0.000328	0.007769	-0.00315	0.000581	-0.00126	-0.0013	0.00191	-0.04131	-0.00121	-0.00029	-1.1E-05	-0.00131	8.27E-05	0.000257	-0.00098	-0.00295
7	0.000611	-0.00193	0.000105	-0.00391	-0.00012	-0.0011	-0.00276	-0.14381	-0.00141	-0.0028	0.000786	0.000838	-0.00252	-0.00141	-0.00036	-0.00142	-0.00187	-0.01598	4.64E-05	-0.04384	-0.00127	-0.00017	-0.00197	-0.00295	-0.00153	-0.00107
8	6.19E-05	1.89E-05	7.54E-05	-5.5E-08	0.000256	0.001326	0.000943	0.004356	-0.00227	-2.3E-05	6.47E-05	0.000157	9.09E-05	6.69E-05	-0.0001	-0.00102	6.06E-05	-2.8E-05	3.67E-05	-9.2E-06	4.97E-05	0.000151	8.43E-05	3.56E-05	0.00096	0.000454
9	0.003646	0.00031	0.004182	-1E-05	0.045277	0.000547	0.006689	0.009168	-0.00917	-0.01231	0.004375	0.007476	0.004423	0.004778	-0.00198	-0.00179	0.0035	-0.00791	0.00102	0.001597	-0.01356	0.001185	0.002078	0.00877	0.001203	0.003105
10	0.001635	0.000383	0.008569	0.005201	0.000638	-0.00018	0.003548	-0.00994	0.003482	0.004941	0.003654	-0.00597	0.030227	-0.00025	0.009663	-0.00465	0.001132	0.010656	0.0046	-0.00754	-0.00029	0.001052	-0.00041	-9.7E-05	-0.0028	0.001082
11	-0.0036	-0.02975	-0.0025	-0.00794	0.001273	-0.01703	-0.00449	-0.00968	-0.00453	-0.01521	0.010408	-0.04308	-0.00162	-0.01221	-0.00211	-0.00524	-0.00055	-0.00784	-0.13547	-0.00779	-0.00461	-0.01615	-0.00035	1.79E-05	-0.0182	-0.00137
12	-0.00081	-0.00155	-0.00059	-0.00067	-0.00052	-0.0022	-0.00116	0.005742	-0.00079	-0.00153	0.001106	0.0457	-0.00012	-0.00141	-0.00032	-0.00118	-0.00335	-0.00015	-0.00104	-0.00347	-0.00286	-0.00574	-0.00071	-7.7E-05	-0.00419	0.001595
13	-0.00047	-0.0011	0.003563	0.014838	0.021691	0.002267	0.014583	0.000176	0.002716	-0.01323	0.003806	0.005005	0.053477	0.01738	0.021072	-0.00022	0.019208	0.017074	0.000734	0.010104	-0.01203	0.000908	-0.00219	-0.00051	-0.00068	0.003391
14	-0.00064	-0.00392	-0.00109	0.006859	0.001388	-0.00055	-0.00026	-0.00529	-0.00053	-0.00217	0.00269	0.000193	0.005159	0.103083	-0.03119	-0.017	-0.00019	-0.03737	-0.00091	-0.00868	-0.0012	6.59E-06	-0.00109	-0.0016	-0.00249	0.002017
15	0.0007	0.001007	0.00151	0.052476	0.003557	0.00092	0.003526	0.018509	0.002905	-0.00265	0.010685	0.003672	0.004227	0.035919	0.085453	0.015561	0.004106	0.008268	0.005709	0.014384	-0.0011	0.001819	-0.00084	0.000351	0.000812	0.002824
16	0.003808	0.000867	0.008287	0.004381	0.017158	0.005962	0.008745	0.022669	0.006295	0.004445	0.004549	0.006574	0.012159	0.009436	0.014082	0.019595	0.014102	-0.02506	-0.00606	0.006274	0.002937	0.007293	0.000456	-0.00062	0.000189	0.077252
17	0.003658	0.003573	0.005243	0.004112	0.002473	0.003274	0.007433	0.006867	0.003433	0.002717	0.003052	0.005679	0.005974	0.004997	0.005404	0.005777	0.129792	0.003551	0.001929	0.009282	0.002859	0.037779	0.002317	0.002024	-0.00118	0.021556
18	0.002153	0.00239	0.002028	0.001013	-0.00035	-0.00359	0.003479	0.002173	-0.00147	0.000546	0.001285	0.002625	0.003137	0.00221	0.001592	0.000462	0.000689	-0.274	0.000839	0.002321	0.000955	0.002504	0.00193	0.000487	0.007414	0.003629
19	0.004336	-0.01767	0.010477	0.004175	0.006683	-0.01088	0.008243	0.005458	0.002269	0.009921	0.011694	0.014553	0.008349	0.02379	0.01019	0.003042	0.004962	0.00055	0.041267	0.001527	0.02967	0.003574	0.014174	0.003762	-0.01856	0.013146
20	0.000356	-0.00575	0.001224	0.000306	0.001701	-0.00021	0.003109	0.001682	-4.3E-05	0.000149	0.00367	0.000432	0.001574	-0.00181	0.000236	-0.00028	0.001463	-0.00159	0.010031	-0.00594	-0.00566	0.002803	-0.00031	-0.01482	-0.00085	0.006785
21	0.009487	-0.00691	0.012849	0.016185	0.024837	-0.01557	0.022714	0.006144	-0.01005	-0.02305	0.043825	0.007419	0.01059	0.095901	0.026107	0.010091	0.046571	-0.00638	-0.01748	-0.00098	0.010367	0.001337	0.004545	0.005177	-0.00984	0.020229
22	0.005742	0.007445	0.017376	-0.00052	-6.7E-05	0.000666	-0.01157	-0.0185	0.002692	0.000216	0.012395	0.012511	0.013653	0.014233	0.01127	-0.00094	0.00106	0.004781	0.001889	0.001253	0.01913	0.040747	0.005463	0.004211	0.003554	0.027863
23	0.000985	0.000379	0.001604	-0.00035	0.001646	0.00017	0.001905	0.001684	-0.00016	-0.00097	0.002167	0.002394	0.001765	0.003081	0.001337	-0.00066	0.001338	-0.00454	-0.00087	0.003032	-0.00136	0.000633	0.078942	0.013792	0.00145	0.004957
24	0.003099	0.000712	0.00581	0.002553	0.019567	0.002006	0.006072	-0.0009	0.005809	-0.00039	0.008613	0.009606	0.005408	0.008145	0.003965	0.000886	0.003909	-0.00508	0.005955	-0.00776	0.009859	0.01551	0.017536	0.000671	-0.00566	0.012352
25	0.020978	0.009704	0.014737	-0.02787	-0.00538	0.004842	0.017381	0.007171	0.004959	-0.01875	0.016809	0.020179	0.012413	0.014171	0.001813	-0.00254	0.009949	-0.01569	0.025239	0.000809	-0.00548	0.004765	0.025818	0.028334	0.008111	0.031216
26	0.000663	0.000332	0.000436	-0.0006	0.000592	-0.00099	0.000397	-0.00115	-0.00113	-0.00117	0.001094	0.001595	-3.2E-05	0.000963	-0.00078	-0.00109	0.00042	-0.00172	0.007175	-0.00095	-0.00594	-0.00228	0.001224	0.000228	-0.00234	0.001692

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.064708	-0.00484	-0.03859	-0.00843	0.032275	0.00983	0.124281	0.023244	0.030522	0.058851	6.17E-05	-0.32827	-0.00529	-0.00683	0.003158	-0.00096	-0.01586	-0.00817	0.003679	-0.01418	-0.00479	-0.00743	0.000997	-0.00131	-0.04004	-0.00358
2	0.011018	-0.0032	0.011626	0.001701	0.003581	0.002641	0.005993	-0.00376	0.005415	0.018196	0.050175	0.005122	-0.00342	-0.40559	-0.09023	-0.0239	-0.00263	-0.00547	-0.02401	-0.03829	-0.00315	0.010696	-0.00034	-0.00211	0.000526	-0.00148
3	0.032778	0.000398	0.27838	0.030026	0.005706	0.000203	0.018771	0.008563	0.003372	0.066991	0.001262	0.004264	0.004383	0.002309	0.001535	0.000646	0.001619	-0.00309	0.004801	0.003175	0.000949	0.005577	0.002492	0.001305	0.026674	0.010174
4	0.000169	-7.3E-05	0.000581	0.077892	-0.00022	2.62E-05	5.59E-05	-0.00018	-7.5E-05	0.001606	3.46E-05	0.000184	-6.1E-05	4.56E-05	-0.00011	-0.00011	8.1E-05	-0.00032	0.000506	-3.1E-05	-5.9E-05	0.000508	0.000249	0.00011	-0.00314	7.32E-06
5	-0.00018	-3.9E-05	-0.00013	-0.00011	0.028184	-0.00011	-8.8E-05	-0.00017	-0.00013	-0.00049	-1.9E-05	-0.00024	-0.00031	-4.8E-05	-0.00013	-0.00018	-2.4E-05	-0.00025	-9.1E-05	-0.00014	-4.9E-05	-0.0001	2.26E-06	-1.3E-05	-8.8E-05	-4E-05
6	0.000168	-0.00025	-0.00291	-0.00308	-0.00149	-0.15146	-1.4E-05	0.019726	-0.00502	-0.00108	6.67E-05	-0.00145	-0.0032	0.000307	-0.00101	-0.00072	0.019982	-0.04412	-0.0008	0.001347	-0.00053	-0.00136	-0.00098	0.000694	4E-05	-0.00178
7	0.001506	-0.00252	0.000197	-0.00444	-0.00015	-0.00102	-0.03961	-0.23119	0.010946	-0.00439	-0.00032	-0.00037	-0.00336	-0.0015	-0.00112	0.002764	0.001632	-0.01516	-0.00191	-0.05951	-0.00187	-0.00136	-0.00279	-0.00528	-0.00211	-0.00589
8	8.69E-05	2.4E-06	7.34E-05	4.88E-05	-0.00013	0.000232	0.000111	0.052535	-0.00126	-6.2E-05	4.54E-05	0.000798	0.000318	0.00013	-2.9E-05	-4.2E-05	0.000691	0.00054	0.000106	-1E-04	-0.00013	0.000125	0.000153	1.59E-05	-0.00013	-4.2E-05
9	0.000791	-0.00329	0.010445	0.016471	-0.03874	0.002322	0.007612	0.005815	0.086286	-0.0096	0.000982	0.004603	0.00108	0.001799	-0.00059	-0.00609	0.004485	-0.00964	-0.00265	-0.00528	-0.03249	-0.00306	-0.00157	0.003024	0.001479	0.002668
10	0.008603	0.001014	0.010738	0.016417	-0.00017	0.049405	0.007921	-0.01959	0.012481	0.088855	0.017361	0.009617	0.017458	0.015277	0.004667	0.002277	0.005442	0.012972	0.005994	-0.00539	-0.0004	0.003297	0.000425	-0.00061	-0.0027	-0.00055
11	0.047712	-0.02973	0.059109	0.001654	0.01118	-0.00113	0.024317	0.005538	0.018023	0.042115	0.012068	0.007097	0.009895	-0.00262	0.00493	-0.00353	0.006314	-0.00138	-0.16608	-0.00383	-0.01129	0.030316	-0.00206	0.004381	-0.00195	0.002027
12	0.002541	-0.0019	0.000545	-0.00048	-0.00039	0.001779	-5.3E-05	-0.00459	-0.00069	-0.00067	-0.00018	0.142968	-0.00022	-0.00035	0.004605	-0.00149	-0.01306	0.000379	-0.00089	-0.00103	-0.0037	-0.00692	-0.00062	-0.00012	-0.0036	-6.4E-05
13	0.00334	-0.00145	0.000643	-0.02063	-0.00777	0.035349	0.000968	0.015989	-0.00543	-0.01664	0.000528	0.003792	0.064609	0.011745	-0.0022	-0.00101	0.015634	0.000675	0.00017	0.03106	-0.01299	0.000623	-0.00252	-0.00153	0.000161	-0.00232
14	-0.00038	-0.00422	-0.00298	0.006995	-0.00033	0.00047	-0.00083	-0.00251	0.000125	-0.00119	-0.0016	0.001266	-0.00025	0.11741	-0.05314	-0.02198	0.001839	0.020943	-0.00193	0.011226	-0.00168	-0.00036	0.000774	-0.00228	-0.00202	-0.00325
15	-0.00105	2.78E-05	-0.00772	0.056723	-0.00015	0.002317	0.006147	0.021837	0.003331	3.04E-05	-0.00351	0.002828	0.005596	0.016642	0.061076	0.016003	0.004561	0.024525	0.001623	0.008572	-0.00294	0.000897	-0.00067	-0.00061	0.00122	-0.00067
16	0.002213	0.002324	0.004226	0.026315	0.005671	0.010195	7.54E-05	0.007321	0.003689	0.005267	0.010692	0.002772	0.005101	0.013969	0.022901	-0.01725	0.019618	0.027282	0.014367	0.004333	0.002526	0.013666	0.080561	-0.00033	0.007232	0.006473
17	0.003952	0.00227	0.002056	0.000359	0.000582	0.00063	0.001794	0.009052	0.000516	0.000589	0.00081	0.002309	7.68E-05	0.00136	0.000713	0.001128	0.196219	0.002687	0.003384	0.002041	0.002104	0.015443	0.001612	0.000577	-0.00283	0.013129
18	0.000253	0.002372	0.000472	0.00039	-0.00105	0.005838	0.000609	0.003518	-0.00215	0.000535	0.000765	0.000744	0.001661	0.00213	0.001779	0.000559	0.000872	-0.24347	0.003786	0.001393	-0.00015	0.000742	0.002699	0.003829	0.005056	0.006407
19	0.006124	-0.0192	0.048749	0.00912	0.01385	0.017573	0.023362	0.009132	0.027692	0.020725	0.008914	0.033282	0.021109	0.036716	0.028476	0.003747	0.015441	0.007085	0.068394	0.010504	0.011754	0.014533	0.009209	0.018044	-0.00205	0.017962
20	0.000419	-0.00684	0.001878	0.002543	0.002504	0.001306	0.000225	-0.00218	0.00522	0.003958	0.000214	0.006158	0.009393	-0.00319	-0.00076	-0.0022	0.00433	-0.0016	-0.01095	-0.00587	-0.00833	-0.00234	-0.00777	-0.03713	-0.00138	-0.04335
21	0.021095	-0.01493	0.016637	0.012813	0.012061	-0.00247	0.025451	0.003624	-0.00205	-0.00474	0.035292	0.015427	-0.00221	0.04916	-0.00426	-0.01443	0.055173	-0.0773	-0.04587	-0.00654	-0.00859	0.000758	0.01472	0.003101	-0.01153	-0.00283
22	0.007101	0.004139	0.003267	-0.00433	3.3E-05	-0.00042	-0.00195	-0.00224	0.005919	0.005981	0.002502	0.004473	0.001249	0.005758	4.01E-05	-0.00555	0.00235	-0.00166	-0.00698	0.000468	-0.01611	0.073233	0.013673	0.00362	0.006976	0.002861
23	0.001442	0.00027	0.002712	0.002125	0.006791	0.006565	0.002119	0.009001	0.002571	0.002789	0.001765	0.002755	0.006005	0.002221	0.003979	-0.0008	0.002394	-0.0056	0.00225	0.006577	0.002428	0.008997	0.010516	0.029827	0.009432	0.005077
24	0.000947	-0.00557	-0.0021	-0.00741	-0.00366	-0.00754	-0.00697	-0.01752	-0.00896	-0.0057	0.000159	-0.00141	-0.0088	-0.00284	-0.00887	-0.00729	0.000734	-0.02016	0.004962	-0.00081	-0.01077	-0.01369	0.026045	0.023285	-0.0141	0.005922
25	0.007362	-0.00107	0.006177	-0.02512	-0.01131	0.006985	0.005478	-0.01416	-0.00157	-0.01818	0.004942	0.013389	-0.00385	0.005077	-0.00458	-0.0056	0.007757	-0.01927	0.054538	0.002008	0.010116	0.063172	0.024446	0.009724	0.029468	0.028526
26	0.000338	-0.00044	-0.00059	-0.00148	-0.00076	-0.00221	-0.0008	-0.0032	-0.00251	-0.00185	0.000239	0.000353	-0.00204	-0.00058	-0.00247	-0.00211	3.87E-05	-0.00375	0.002327	-0.00241	-0.00889	-0.00328	0.001389	0.001525	-0.00285	0.012565

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.106957	0.002852	0.004153	0.012897	-0.00515	0.09428	-0.00029	0.092738	0.040399	0.023846	0.017373	-0.23862	0.006092	-0.00166	0.008476	0.012203	-0.00875	-0.00154	0.006908	-0.01188	0.017021	-0.01232	0.008811	0.007254	-0.08615	0.005186
2	0.004156	0.003408	0.008917	0.005826	0.009079	0.012034	0.015415	0.007676	0.011822	0.032674	0.022111	0.013789	-0.00116	-0.35371	-0.04544	-0.01143	0.030008	-0.01091	0.011047	-0.05992	0.00094	0.024683	0.003591	0.003181	0.010784	0.006316
3	0.024028	0.008602	0.235482	0.018168	0.081797	0.009938	0.011654	0.012181	0.010899	0.053738	0.020411	0.007804	0.010915	0.008536	0.007473	0.01439	0.007886	0.004931	0.008391	0.010975	0.0087	0.00029	0.007537	0.006622	-0.04202	0.00915
4	0.000279	0.000161	0.000739	0.191103	0.000165	0.000175	9.16E-05	-0.00013	1.22E-05	-1.1E-05	0.000754	0.000376	3.82E-05	0.000159	2.17E-05	0.000342	0.000315	-0.00013	0.000258	0.000422	0.000171	-5.6E-06	0.000764	0.000508	-0.00609	0.000362
5	0.000513	0.000891	0.001051	0.041151	0.163374	0.00083	0.000704	0.000781	0.000829	0.000437	0.001593	0.000915	0.00063	0.000799	0.000709	0.001166	0.000664	0.001002	0.000689	0.000855	0.001064	0.000489	0.000415	0.000431	0.001008	0.001005
6	0.001263	0.001786	-0.00091	-0.00062	0.003102	-0.08698	0.002095	-0.00142	0.021678	0.000787	0.003919	0.002681	-0.001	0.001787	0.000382	0.001827	0.006873	-0.03936	0.000707	0.002496	0.002493	-0.00086	-0.0006	0.001327	-0.00072	0.001618
7	-8.3E-05	-0.0003	0.000355	-0.00316	0.001576	0.000103	-0.00642	-0.03477	0.009577	-0.0038	0.002197	-0.00058	-0.00279	-0.00077	-0.00074	0.001714	-0.00066	-0.01215	0.00162	-0.04362	-0.0004	0.001659	-0.00139	-0.00048	-0.00188	0.001154
8	0.000179	0.000275	0.000312	0.000297	0.000612	0.000268	0.001694	-0.01279	0.005045	0.000234	0.000433	0.000307	0.00029	0.000231	0.00014	-0.00064	0.00026	0.000769	0.000401	0.013437	0.000497	0.000156	0.000228	0.000699	-0.00019	0.001014
9	0.002188	7.44E-05	0.005908	0.011797	0.048004	0.002088	0.005024	0.006818	0.198289	-0.01094	0.008403	0.008384	0.00434	0.003558	0.000424	7.88E-06	0.006695	-0.00133	-0.00224	-0.00041	-0.03279	0.003783	0.001992	0.002794	-0.0008	0.012462
10	0.020544	0.009105	0.018856	0.018758	0.01299	0.035799	0.004701	-0.02183	0.016552	0.070007	0.043522	0.016209	0.059986	0.012973	0.021253	0.018694	0.019463	0.029864	0.015575	0.006833	0.01085	0.007456	0.003357	0.004793	-0.00277	0.015069
11	0.013996	0.02622	0.037641	0.027789	0.023467	0.038755	0.065633	0.070085	0.022833	0.153713	0.064765	0.050318	0.086417	0.093549	0.05705	0.014712	0.036746	0.030893	0.009776	0.053967	0.001618	0.097755	0.018937	0.018688	0.055766	0.024714
12	0.002253	0.001669	0.003542	0.003261	0.003536	0.017825	0.001968	-0.00238	0.004959	0.003595	0.005791	0.455777	0.006288	0.001344	0.010772	0.00432	-0.0012	0.003773	0.001923	0.001905	0.001555	-0.00031	0.001301	0.002498	-0.00078	0.003569
13	0.002598	0.003901	0.003525	-0.01598	0.002063	0.02049	0.002426	-0.0084	0.017808	-0.00747	0.011743	0.005832	0.122616	0.004553	0.017519	0.003455	0.005866	-0.00288	0.006107	0.053592	-0.00672	0.006273	-0.00024	0.005506	-0.00089	0.009965
14	0.001452	-0.00102	0.000565	0.005131	0.004032	0.002489	0.000619	-0.00546	0.011587	0.002725	0.003455	0.002364	0.010418	0.205876	0.021058	-0.01022	0.058627	-0.0099	0.002554	-0.03746	0.001047	0.003347	-0.00033	0.00027	-0.00131	0.002435
15	0.002608	0.004641	-0.00548	0.026085	0.008129	0.007152	0.003503	0.008329	0.010568	0.002785	0.004469	0.005713	0.016871	0.052538	0.162947	0.026482	0.055928	0.107434	0.014346	0.021765	0.002346	0.00424	0.000447	0.003103	0.001261	0.00801
16	0.032506	0.030216	0.045185	0.034765	0.04837	0.034009	0.027399	0.031638	0.037836	0.029828	0.062361	0.045146	0.034989	0.02739	0.025544	0.168915	0.120532	0.040946	0.023206	0.045021	0.036249	0.016522	0.002047	0.014682	0.010934	0.03076
17	0.008931	0.00463	0.008263	0.00542	0.006976	0.006405	0.005285	0.005296	0.006805	0.004667	0.009838	0.009928	0.004818	0.004558	0.006048	0.008697	0.14455	0.012605	0.00436	0.008375	0.007447	-0.00763	0.002922	0.003883	-0.00017	0.00874
18	0.007961	0.000851	0.004152	0.000575	0.001006	0.001492	0.003511	0.000177	0.001304	0.000771	0.001875	0.005208	0.000869	0.000927	0.001937	0.001674	0.004435	-0.21057	0.001573	0.001225	0.000558	0.002317	0.000173	8.59E-05	0.000498	0.004788
19	0.012713	-0.01164	0.015705	0.008608	0.011529	0.028261	0.032513	0.029388	0.017885	0.015277	0.011295	0.027352	0.012533	0.081743	0.0723	0.00659	0.027657	0.027326	0.250458	0.017308	0.008448	0.01522	0.026208	0.016415	0.025637	0.02845
20	-0.00038	0.007256	1.94E-06	-0.00109	0.002403	0.000137	0.000198	-0.0013	-0.00144	-0.00018	0.004108	-0.00054	-0.00072	0.005317	0.000478	0.013442	0.002376	-0.00331	0.02197	-0.00172	-0.00819	0.028583	0.003511	0.011092	-0.00039	0.03312
21	0.016328	0.02282	0.013956	0.000901	0.031076	-0.02873	0.011224	-0.03203	-0.02194	-0.02901	0.076413	0.016564	-0.0149	0.01874	-0.02482	-0.02068	0.033851	-0.11381	-0.03072	-0.03062	0.035302	-0.00459	0.011715	0.02718	-0.02559	0.034804
22	0.018919	0.011608	0.021236	0.016745	0.008379	0.034706	0.032712	0.043164	0.030933	0.027511	0.031962	0.029023	0.039114	0.021464	0.028008	0.021433	0.023516	0.022054	0.014016	0.039513	0.02506	0.284377	0.023357	0.061038	0.027105	0.048501
23	0.004393	0.004964	0.010615	0.006373	0.01361	0.0086	0.009905	0.008481	0.003574	0.005851	0.009678	0.008274	0.007349	0.0074	0.007091	0.005945	0.008882	0.001489	0.006912	0.02085	0.010995	0.096591	0.073236	0.018217	0.025768	0.016101
24	0.012246	-0.0016	0.009117	0.002428	0.019716	0.010645	0.012191	0.004801	0.007575	0.022374	0.006184	0.013775	0.00383	0.070579	0.014781	0.001932	0.010118	0.000963	0.00266	0.016714	-0.00048	0.05413	0.177604	0.163302	0.029992	0.023515
25	0.006466	0.000736	0.002187	-0.0169	-0.0032	0.003674	-0.00127	-0.01288	-0.00531	-0.0161	0.016635	0.008352	-0.00038	-0.00056	-0.00274	0.00067	0.015109	-0.01807	0.017565	0.037082	0.026665	0.002293	0.071743	0.043762	0.235749	0.047362
26	0.000438	0.000793	9.15E-07	-5.3E-05	0.009048	-0.0009	0.000139	-0.00149	-0.00042	-0.00044	0.001483	0.00027	-0.00029	0.000158	-0.00092	-0.00033	0.001538	-0.00146	0.00375	0.002859	-0.0023	0.003823	0.047352	0.0068	0.006978	0.069837

Appendix Table 8
Changes in Linkage Intensities (First Order Effects), Thailand
1985

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.092366	0.004207	0.00612	0.017184	-0.00061	0.009944	-0.07222	-0.00183	0.008981	0.038135	-0.00205	0.222268	-0.00197	0.000439	0.001076	0.009144	0.007688	-0.00287	0.001492	-0.00034	0.046344	0.004943	-0.00126	0.00076	0.005516	0.054308
2	0.000449	0.037752	0.000494	0.005335	5.75E-05	0.059815	0.003728	0.004908	0.000914	0.007898	4.12E-05	0.001656	0.000392	0.000277	0.000328	0.00055	0.002862	-2.8E-06	0.000423	0.000227	0.009937	0.000375	-2.8E-05	0.000104	0.000939	0.016784
3	-0.00114	0.000618	-0.00908	0.002062	-0.00701	0.00204	-0.00013	-0.00108	-0.00425	-0.01327	-0.00474	0.002446	-0.01062	-0.00355	-0.0035	-0.00366	-0.13936	-0.00392	-0.02488	-0.00362	-0.00937	-0.00211	-0.00713	-0.00668	-0.00117	-0.00261
4	3.16E-05	-0.01069	0.000236	0.019029	-0.00069	-0.01202	-0.00136	1.16E-05	-0.00162	0.003291	-0.00089	7.54E-05	-0.00152	-0.0008	-0.00077	-0.00091	-0.00015	-0.00101	-0.0013	-0.00124	-0.00759	-0.00922	-0.00133	-0.00016	0.000916	-0.0045
5	0.01118	0.016803	0.014156	0.087683	0.109742	0.019151	0.014563	0.008396	0.020355	0.006949	0.113994	0.025588	0.058501	0.078611	0.033539	0.03105	0.027165	0.078607	0.033518	0.00684	0.022637	0.070657	0.007411	0.00805	0.00792	0.014737
6	0.003513	-0.01461	0.003776	0.021817	-0.00195	0.051048	0.002503	0.008349	-0.00433	0.073869	-0.00341	0.012588	-0.00125	0.00081	0.000161	0.001507	0.010325	-0.00309	0.000642	-0.00347	0.064079	-0.00081	-0.00307	0.000412	0.005245	0.043229
7	0.000204	-0.00014	0.001164	0.000462	-0.00065	-0.00094	-0.07861	-0.00142	-0.00195	-0.0021	-0.0012	-0.00119	-0.0013	-0.00145	-0.0007	-0.00107	0.000815	-0.00149	-0.00059	-0.00238	-0.04201	0.002752	-0.00208	0.000182	-0.0008	0.058392
8	0.00125	0.005753	0.008396	0.065418	-0.00382	0.007382	-0.00261	-0.09765	-0.00232	0.021206	-0.00647	-0.067	-0.01547	-0.00337	-0.00152	-0.02579	0.01015	-0.00855	-0.00296	0.000241	-0.00293	-0.00733	-0.0059	0.002953	-0.00341	-0.07271
9	0.002086	0.003332	0.001851	0.002267	0.000245	0.00515	0.016713	-0.00105	0.003851	0.017893	-0.00068	0.009352	-0.00297	-0.00363	-0.00142	0.002983	0.004774	-0.00427	-0.00238	-0.01546	-0.00073	-0.00063	-0.00666	0.000558	0.016685	-0.00129
10	0.040918	0.028475	0.005387	0.015081	-0.00324	0.022673	0.000498	-0.00031	-0.00621	0.013049	-0.01999	0.01238	-0.04223	-0.01537	-0.0129	-0.00541	0.014106	-0.03205	-0.01507	-0.00057	0.003931	0.002512	-0.00761	0.000176	0.002743	0.068331
11	0.014877	0.022766	0.022011	0.155087	0.023363	0.025657	0.012695	-0.00682	0.007136	-0.01014	0.003253	0.035953	0.028164	0.019209	0.012094	0.012787	0.012854	-0.2213	0.026564	0.008141	0.032487	0.084322	0.006209	0.014312	0.008216	-0.01567
12	0.001539	0.003535	0.002278	0.006281	-0.00231	0.002288	-0.00054	-0.00493	-0.0097	0.003631	-0.00591	0.010397	-0.01074	-0.00914	-0.01027	-0.09471	0.001382	-0.01738	-0.01021	-0.0001	-0.00095	0.004126	-0.00268	-0.00064	-0.00337	0.004457
13	0.000634	0.000957	0.004811	0.001171	-9.4E-05	0.000718	0.005274	-0.00173	-0.00076	-0.01441	-0.00088	-0.00199	0.048373	-0.00054	-0.0002	-0.00134	-0.00032	-0.0019	0.099796	-0.00066	0.001302	-0.00034	-0.00075	0.004623	-0.00219	-0.00385
14	0.001755	0.003656	0.00557	0.013866	-0.00302	0.004359	0.004014	-0.00519	0.002072	-0.00094	-0.01069	-0.00378	0.00918	0.079208	-0.05469	0.051684	-0.00035	-0.01681	-0.02792	-0.00403	-0.00208	0.004111	-0.00716	-0.00731	-0.00174	-0.02359
15	0.001028	0.003097	0.002841	0.004449	-0.00397	0.00394	0.000621	-0.00287	0.004337	0.000305	-0.00823	-0.00137	-0.00268	-0.00163	-0.01576	0.012095	0.000456	-0.00649	-0.02409	-0.00348	-0.00364	-0.00121	-0.00522	-0.00137	-0.0015	-0.00744
16	0.005294	0.011662	0.021714	0.042298	0.006071	0.00851	-0.00721	-0.01256	-0.02902	0.005059	-0.01367	0.000434	-0.04803	-0.03628	-0.02215	-0.10815	0.008097	-0.08551	-0.02514	-0.00277	0.003949	0.001357	-0.00587	0.001891	-0.00729	-0.08938
17	-0.00086	0.001377	0.005092	-0.00208	0.000262	-0.00065	-0.00123	0.007922	-0.00518	-0.00207	-0.00195	-0.0013	-0.00469	-0.00334	-0.00212	0.002241	0.101156	-0.00435	-0.01498	-0.00361	-0.00158	0.0001	-0.01291	-0.00544	0.003641	0.01937
18	0.004282	0.017849	0.00438	0.018097	0.014101	0.013873	-0.00021	0.016147	0.006213	0.007067	0.036009	0.022949	0.039212	0.018418	0.007102	0.019052	0.015847	0.163471	0.013617	0.011019	0.019992	0.013741	0.010842	0.017496	0.014209	0.004848
19	-0.00127	-0.00634	-0.00098	0.001525	-0.00711	-0.00474	-0.00526	-0.01169	-0.01623	-0.01781	-0.00902	-0.00661	-0.01722	-0.00992	-0.00813	-0.0097	-0.00607	-0.01054	-0.00482	-0.00376	-0.00235	-0.00813	-0.00811	-0.02815	-0.005	-0.02028
20	0.006001	0.038028	0.006544	0.016223	-0.00832	0.001139	-0.02068	-0.01005	-0.04844	-0.00728	-0.01577	-9.8E-05	-0.05057	-0.03419	-0.04263	-0.06938	-0.00102	-0.07141	-0.03513	-0.01152	-0.01458	-0.0271	-0.01415	-0.00308	-0.00219	-0.03432
21	7.9E-05	-0.00029	0.004671	0.001874	-0.0077	-0.00324	-0.00853	-0.00945	-0.0189	-0.01937	-0.01009	-0.00923	-0.01443	-0.01008	-0.00834	-0.00966	0.002205	-0.01223	-0.00716	-0.01326	-0.008	0.000818	-0.01757	-0.00067	-0.00566	-0.07254
22	0.00014	0.014352	0.005861	0.016226	0.005117	0.010673	0.016995	0.007353	0.013365	0.012772	-0.00269	0.02149	-0.00859	-0.00864	0.005158	0.010132	0.017967	-0.01013	0.039807	0.007127	0.013296	0.003083	-0.0075	0.003647	0.002201	0.019776
23	0.003236	0.012308	0.012408	0.012672	-0.00143	0.014417	0.003883	0.007338	0.020428	0.011919	-0.00353	0.019959	0.014919	0.017156	0.025834	0.029836	0.018095	-0.00887	0.022789	0.051261	0.01161	0.005367	-0.00014	0.005433	0.002884	0.025262
24	-6.4E-06	9.63E-05	0.000152	0.000301	0.00098	-2.3E-06	0.000219	0.000238	0.000817	0.000751	0.000233	0.000751	-0.00157	0.000384	0.000923	0.000488	0.000436	-0.00227	0.000259	0.000293	0.00144	5.33E-05	-0.00086	0.014136	-0.00076	0.002566
25	0.002285	0.003643	0.004859	0.007285	0.056014	0.003723	0.009389	-0.00746	0.003592	0.003846	0.028098	0.006646	0.006495	0.01236	0.007929	0.014104	0.007806	0.009888	0.011327	-0.00094	-0.00325	0.006111	0.000936	0.00144	0.007879	0.008604
26	-0.00226	-0.00226	0.006448	-0.00098	-0.01062	-0.00379	-0.00704	-0.00632	-0.01243	-0.01592	-0.01128	-0.00604	-0.02069	-0.00663	-0.01045	-0.01201	-0.00493	-0.01279	-0.00882	-0.01351	-0.00576	-0.00982	-0.0117	-0.00109	-0.00475	-0.00758

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1995

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.039359	-0.02582	0.000965	0.018806	-0.00344	-0.12011	-0.10484	-0.06187	-0.00782	-0.00346	-0.00748	0.050441	-0.01105	-0.00296	-0.00387	-0.01163	-0.00283	-0.00923	-0.00424	-0.00644	0.007891	-0.00131	-0.0056	-0.00043	0.001324	-0.16087	-0.43651
2	0.000355	0.044599	0.000195	0.007715	-1E-04	0.060315	0.004855	0.002953	0.001639	0.005394	-0.0003	0.001422	1.68E-05	0.000187	0.000123	0.000279	0.002866	-0.00031	0.000164	-9.9E-05	0.008461	0.000187	-0.00014	2.62E-05	0.000704	0.000234	0.141726
3	-0.00169	-0.00135	-0.03512	-0.00272	-0.00644	4.76E-05	-0.00074	0.004241	-0.00596	-0.01352	-0.00493	0.001753	-0.01127	-0.00404	-0.0056	-0.00609	-0.19002	-0.00359	-0.02696	-0.00347	-0.01167	-0.00187	-0.0077	-0.00759	-0.00071	-0.00046	-0.34745
4	0.000147	0.006839	0.000243	0.011408	-0.00026	0.025971	0.002014	0.000622	0.000294	0.001441	-0.00058	0.000416	-0.0005	-0.00016	-0.00019	-0.00018	0.00112	-0.0006	-0.00014	-0.00053	0.006741	0.000167	-0.00049	-3.8E-05	0.00057	-0.00744	0.04688
5	0.006696	0.010733	0.001604	0.043398	0.035846	0.014817	0.011011	0.005036	0.009788	0.012065	0.04218	-0.02347	0.119944	-0.07116	-0.03588	-0.01052	0.011067	0.096662	0.010568	0.004452	0.015557	-0.00707	-5.2E-05	-0.00215	0.006886	0.01406	0.322074
6	0.000963	0.079809	-0.00046	0.057308	-0.00467	0.119724	0.019369	0.006087	0.002334	0.007506	-0.00801	0.004198	-0.00796	-0.00211	-0.00445	-0.0035	0.005469	-0.00798	-0.00385	-0.00627	0.070054	-0.00302	-0.0047	-0.00028	0.0032	-0.18916	0.129604
7	-9.3E-06	-0.00029	0.001282	-5.9E-05	-0.0013	-0.00116	-0.0544	-0.00166	-0.00332	-0.00397	-0.00267	-0.00149	-0.0031	-0.00191	-0.00141	-0.00209	6.32E-05	-0.00268	-0.00164	-0.00421	-0.04381	-2.5E-05	-0.00333	-0.00065	-0.00098	-0.00508	-0.13991
8	0.001443	-0.00068	0.003977	-0.00689	-0.0015	-0.00638	-0.00022	-0.08389	-0.00483	0.055966	-0.00547	-0.05714	-0.02105	-9.3E-05	0.002468	-0.02016	0.015114	-0.00805	-0.00334	-0.00659	-0.00171	-0.00982	-0.00524	0.000448	-0.00097	-0.08524	-0.24987
9	0.003181	0.007898	0.002489	0.00332	0.003059	0.014081	0.0176	0.014223	0.231222	0.003641	0.000196	0.01043	0.005684	0.005863	0.010583	0.009332	0.017764	0.001293	0.002444	-0.00632	0.004013	0.007249	0.000951	0.003844	0.033769	0.009822	0.417628
10	0.059177	0.035895	0.010412	0.018013	0.009449	0.038434	0.035421	0.095188	0.018058	0.15108	-0.00291	0.1903	-0.00608	0.023345	0.03241	0.043563	0.068137	-0.02267	0.006671	0.006803	0.016817	0.015085	0.002841	0.000697	0.026606	0.130088	1.002827
11	0.007051	0.011701	-0.00365	0.082123	0.02262	0.016324	0.001621	-0.01732	-0.03671	-0.00487	-0.02631	-0.07201	0.005636	0.011303	0.001035	-0.02525	-0.00403	-0.2376	-0.01431	0.00345	0.018138	-0.04913	-0.00896	-0.0016	0.005746	-0.04453	-0.35953
12	0.003459	0.009879	0.005219	0.028717	0.005815	0.013644	0.010908	0.007968	-0.00053	0.007104	-0.00086	0.037608	0.00037	-0.00082	0.002881	-0.0582	0.024098	-0.01046	0.004994	0.006938	0.005421	0.015806	0.001782	-0.00045	0.001195	0.143633	0.266116
13	0.001038	0.001645	0.005826	0.000158	0.001129	0.002782	0.001986	0.000543	-0.00048	-0.01052	-0.00037	0.001219	0.053127	0.009855	0.004683	0.006252	0.004104	-0.00181	0.080612	-0.00043	-0.001	0.000937	-0.00045	-0.00055	-0.00165	0.006926	0.165558
14	0.00726	0.012227	0.022427	0.006387	0.012413	0.020739	0.026132	0.005904	0.008124	0.007799	-0.00183	0.00308	0.08949	0.477429	0.187691	0.077792	0.089473	-0.00997	0.039666	0.001801	0.007784	0.016009	7.4E-05	-0.01274	0.00527	0.079716	1.180141
15	0.004771	0.008666	0.016218	0.000939	0.000898	0.01706	0.024278	0.000871	0.00392	0.001247	-0.00613	-0.0008	0.001066	0.005415	-1E-05	0.01268	0.006382	-0.00494	-0.01507	-0.00236	0.002566	6.82E-05	-0.00397	-0.00427	0.000435	0.007656	0.077581
16	0.011771	0.023904	0.041823	0.03025	0.073317	0.028248	0.014616	0.018282	0.010614	0.026064	0.021004	0.013109	0.016139	0.028844	0.024869	0.370016	0.02951	-0.0443	0.053326	0.009378	0.018688	0.091831	0.013641	0.000367	0.012975	0.087646	1.025932
17	0.000559	0.003682	0.005888	-0.00303	0.002899	0.002418	0.00096	0.030202	-0.00097	0.002037	-0.00054	0.004033	-0.00213	0.000843	0.003129	0.000372	0.202022	-0.00178	-0.01031	0.001614	0.0008	0.005257	-0.00944	-0.00487	0.008386	0.041911	0.283947
18	0.004866	0.017414	0.004101	0.007054	0.019127	0.018025	0.002043	0.032945	0.002329	0.037779	-0.02234	0.03293	0.044947	0.063203	0.035705	0.019654	0.01677	0.082524	0.015155	0.014635	0.043875	0.001884	0.002438	0.011777	0.019846	-0.01062	0.518062
19	-0.00121	-0.00639	-0.00215	0.000386	-0.00496	-0.00407	-0.00533	-0.01013	-0.01779	-0.0184	-0.00909	-0.00671	-0.01422	-0.00806	-0.00612	-0.00808	-0.00456	-0.00846	-0.0037	-0.00289	-0.00168	-0.00826	-0.00813	-0.05648	-0.0044	-0.01379	-0.23466
20	0.014121	0.069356	0.010326	0.014262	0.005154	0.039272	-0.00441	0.023873	0.015701	0.030697	-0.00796	0.034976	-0.02908	-0.01145	-0.01291	-0.01765	0.050202	-0.06547	-0.00968	-0.00386	0.010944	-0.01652	-0.00513	-0.0045	0.017542	0.033658	0.181459
21	0.000168	0.000436	0.008716	3.65E-05	-0.00734	-0.00228	-0.00819	-0.00826	-0.01819	-0.02202	-0.01498	-0.00746	-0.01711	-0.00983	-0.00723	-0.01071	0.002406	-0.01529	-0.00812	-0.02021	-0.00901	-0.00498	-0.01857	-0.00299	-0.00457	-0.11888	-0.32446
22	-0.00074	0.003817	0.006533	0.00494	0.027707	0.004502	0.011007	0.004062	-0.00174	0.001364	0.004547	0.008273	-0.02081	-0.00437	0.002961	-0.00095	0.010834	-0.01196	-0.00716	0.013652	0.004649	0.047787	-0.00082	-0.00091	0.006454	0.007116	0.120734
23	0.023489	0.038503	0.015862	0.038666	0.021513	0.0502	0.028811	0.059182	0.067513	0.075038	0.010509	0.06669	0.063461	0.054902	0.079867	0.065961	0.056626	0.042121	0.053191	0.110041	0.043935	0.038156	0.080794	0.140369	0.013495	0.192342	1.531237
24	0.000441	0.001255	0.000405	0.000852	0.002551	0.001374	0.001826	0.003783	0.002858	0.003603	0.001247	0.002931	0.001413	0.002258	0.00347	0.003877	0.003245	-0.0012	0.002808	0.008872	0.004924	0.003729	0.005236	0.002721	0.000243	0.013706	0.078426
25	0.002498	0.004676	0.004019	0.009861	0.067693	0.006294	0.010673	0.004074	0.001376	-0.01268	0.030011	0.007319	0.012543	0.015547	0.012931	0.007782	0.010492	0.007513	0.007367	-0.00593	-0.00163	0.010317	0.002426	-0.00051	0.009354	0.018814	0.242832
26	-0.00162	-0.00054	-0.00483	-0.00133	-0.00972	-0.00134	-0.00039	-0.00086	-0.01662	-0.01096	-0.01133	-0.0036	-0.01756	-0.00447	-0.01066	-0.00817	-0.0072	-0.01086	-0.00725	-0.0072	-0.00361	-0.00342	-0.00632	-3.8E-05	-0.00324	-0.0025	-0.15561
SUM	0.18755	0.357863	0.12231	0.370575	0.271462	0.358921	0.046607	0.13604	0.26081	0.329437	-0.02443	0.298444	0.251932	0.577551	0.31649	0.434383	0.419128	-0.24909	0.161208	0.10481	0.217148	0.149055	0.021127	0.05921	0.157482	0.148752	5.484773

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.07285	0.009746	0.004461	0.046807	-0.00221	-0.04244	-0.08162	-0.03959	0.00167	0.00499	-0.00479	0.045514	-0.00211	-0.00118	-1.3E-05	-0.00132	0.004607	-0.00633	0.002305	0.001302	0.086272	0.005672	0.000987	0.001913	0.009532	-0.0942	0.022841
2	0.000909	0.069912	0.000248	0.012478	6.97E-05	0.076361	0.006502	0.005786	0.002487	0.00941	2.15E-05	0.002753	0.001056	0.000445	0.000447	0.000934	0.005066	3.95E-05	0.000747	0.000512	0.014175	0.000703	0.000397	9.73E-05	0.00132	0.007735	0.220611
3	-5.8E-06	-0.00113	-0.03382	-0.00218	-0.00691	0.00037	0.000254	0.006862	-0.00065	-0.00907	-0.00421	0.00199	-0.00984	-0.00459	-0.00512	-0.00495	-0.19148	-0.00349	-0.02892	-0.00384	-0.00972	-0.00126	-0.00656	-0.00819	0.001282	-0.00361	-0.32879
4	0.000744	0.014686	0.000261	0.019998	0.000237	0.038041	0.003522	0.00169	0.00166	0.005958	8.68E-05	0.001805	0.001298	0.00059	0.000489	0.000985	0.002087	0.000184	0.001392	0.000428	0.020293	0.010766	0.000532	0.000131	0.001288	-0.00156	0.12759
5	0.025793	0.021852	0.00872	0.071701	0.058453	0.03088	0.028505	0.028627	0.017625	0.052638	0.164448	0.009237	0.118542	-0.06333	-0.01292	0.013238	0.034789	0.113958	0.080616	0.012189	0.033024	0.068595	0.010105	0.005158	0.018886	0.035684	0.987016
6	0.004471	0.112138	-0.00056	0.108674	-0.00432	0.190717	0.028897	0.008305	0.00201	0.00315	-0.00697	0.007757	-0.00231	-0.00216	-0.00411	-0.00134	0.00334	-0.00714	-0.00196	-0.00182	0.111895	0.000438	-0.00137	8.77E-05	0.007316	-0.16495	0.390185
7	0.000395	-0.0008	0.000765	0.000155	-0.00149	-0.00129	-0.03109	-0.00189	-0.00358	-0.00452	-0.00255	-0.00153	-0.00317	-0.0025	-0.00226	-0.00228	-0.00051	-0.00273	-0.00178	-0.00385	-0.03577	0.000788	-0.00214	-0.0009	-0.00051	-0.00346	-0.10849
8	0.004874	-0.00051	0.007164	0.001865	-0.00221	-0.00428	0.001314	0.069519	-0.00972	0.042701	-0.00518	-0.03357	-0.01266	-0.00197	-0.00158	-0.01139	0.026521	-0.0087	0.000785	-0.00262	0.008497	-0.00537	0.003264	0.000217	0.000719	-0.07174	-0.00407
9	0.007657	0.008961	0.00263	0.004269	0.002742	0.016053	0.03268	0.022153	0.362444	0.008376	0.001052	0.017739	0.0145	0.002103	0.008329	0.01092	0.018978	0.000691	0.006031	-0.00272	0.007958	0.00776	0.023926	0.001607	0.055213	0.023028	0.665085
10	0.159246	0.092557	0.018281	0.047686	0.012628	0.093492	0.110696	0.15451	0.144973	0.359651	-0.0014	0.377517	0.136085	0.04684	0.078865	0.104787	0.122021	-0.01299	0.063243	0.017759	0.055726	0.033173	0.01699	0.005203	0.102988	0.204501	2.54503
11	0.03521	0.023231	0.005135	0.111562	0.057525	0.035501	0.0159	0.015968	-0.02197	0.047934	0.009602	-0.02641	0.032959	0.014118	0.01748	0.002057	0.014558	-0.22795	0.034773	0.015279	0.043205	0.052254	0.00554	0.006922	0.022321	-0.01441	0.328284
12	0.012723	0.015916	0.006641	0.02548	0.005839	0.022795	0.015371	0.018924	0.011615	0.007006	0.001508	0.085824	0.010125	0.001525	0.014902	-0.01248	0.044948	-0.00536	0.020478	0.017199	0.012563	0.030919	0.006064	0.00144	0.007765	0.195142	0.574876
13	0.003291	0.002855	0.008131	0.001184	0.001439	0.00364	0.005645	0.002494	0.002929	-0.0102	0.000525	0.004723	0.06296	0.005582	0.001522	0.010613	0.011512	-0.00113	0.152824	0.000454	0.001956	0.003144	0.001056	0.003826	0.000568	0.022243	0.303783
14	0.015334	0.014561	0.026708	0.012076	0.004425	0.029247	0.080428	0.009405	0.003398	0.005798	-0.00401	0.009185	0.012471	0.101744	0.088788	0.054068	0.144173	-0.01183	-0.00226	0.002667	0.018431	0.024601	0.002225	-0.01627	0.008357	0.06875	0.702473
15	0.013345	0.01453	0.026666	0.003613	0.002408	0.029723	0.097309	0.006515	0.008115	0.006693	-0.00317	0.009378	0.006403	0.006239	0.009873	0.020769	0.017422	-0.00201	-0.008	-0.00106	0.016091	0.005908	-0.00216	-0.00387	0.002971	0.023465	0.307154
16	0.027495	0.028423	0.04112	0.060797	0.053395	0.03647	0.024381	0.029837	0.012416	0.03472	0.025864	0.028828	0.033026	0.022223	0.023678	0.650107	0.040528	-0.00998	0.121996	0.021022	0.039906	0.177119	0.029918	0.008968	0.044747	0.173873	1.78088
17	0.00226	0.002015	0.0121	-0.00234	0.00287	0.001983	0.002005	0.037326	-0.00331	0.001023	9.26E-05	0.00783	9.71E-05	-0.00061	0.004767	0.004471	0.252467	-0.00155	-0.01436	7.35E-05	0.001144	0.005342	-0.00509	-0.00664	0.013542	0.034978	0.352478
18	0.011863	0.018328	0.005262	0.013547	0.014515	0.02262	0.011385	0.073753	0.008836	0.064093	-0.00996	0.061775	0.085973	0.062369	0.041959	0.039823	0.027417	0.151515	0.029461	0.023414	0.06474	0.017545	0.009414	0.025525	0.030076	0.005481	0.910729
19	0.000288	-0.00842	-0.00388	0.001765	-0.0089	-0.00429	-0.00434	-0.00933	-0.02136	-0.0184	-0.01019	-0.00496	-0.01659	-0.01091	-0.00849	-0.00776	-0.00533	-0.01109	-0.00372	-0.00478	-0.0037	-0.00775	-0.00884	-0.06088	-0.00704	-0.01898	-0.26786
20	-0.00324	-0.06791	-0.00287	-0.0225	-0.01642	-0.06056	-0.037	-0.08706	-0.10327	-0.09095	-0.02963	-0.06964	-0.08249	-0.07067	-0.10273	-0.10189	-0.05156	-0.09067	-0.097	-0.02252	-0.09201	-0.04752	-0.02508	-0.01478	-0.01699	-0.14441	-1.55137
21	0.0023	-0.00433	0.004908	0.000304	-0.00945	-0.00529	-0.00833	-0.01138	-0.02218	-0.02699	-0.01559	-0.00898	-0.01979	-0.01509	-0.01432	-0.01405	-0.00278	-0.01722	-0.01126	-0.02366	-0.0129	-0.00652	-0.02062	-0.00554	-0.0029	-0.12805	-0.39968
22	0.002336	-0.01291	0.00425	0.000152	0.004874	-0.00859	-0.00275	-0.00209	-0.02465	-0.01502	-0.00287	-0.00195	-0.0528	-0.02256	-0.01282	-0.00929	0.007228	-0.0204	-0.00538	0.019338	0.000434	0.087296	0.007484	-0.00406	0.017333	0.006188	-0.04123
23	0.005845	0.005165	0.007013	0.007372	-0.00136	0.009339	0.002856	0.013559	0.008285	0.009086	-0.0101	0.011237	0.006142	0.007382	0.014183	0.010351	0.013568	0.010638	0.008703	0.017146	0.004694	0.005832	0.026752	0.036571	0.003412	0.038688	0.272362
24	0.001701	0.001747	0.000359	0.000848	0.002031	0.003077	0.001655	0.004576	0.001975	0.004184	0.000986	0.003006	0.000588	0.00318	0.003066	0.002898	0.002793	-0.00126	0.002313	0.005558	0.003798	0.001999	0.006143	0.00212	0.000286	0.010683	0.07031
25	0.005779	0.003772	0.003814	0.007753	0.074451	0.006126	0.009844	0.006113	0.003172	-0.01363	0.035915	0.011427	0.015537	0.018346	0.011127	0.007383	0.009232	0.008941	0.00911	-0.00893	-0.00145	0.016625	0.009715	0.002533	0.015984	0.012183	0.280876
26	0.002137	0.002731	-0.00442	0.00898	-0.00939	0.003963	0.003975	0.004078	-0.01188	-0.0092	-0.00928	-0.00061	-0.01406	-0.00387	-0.00964	-0.0049	-0.00564	-0.00903	-0.00444	-0.00156	-0.00157	-0.00154	-0.00047	0.001613	0.000895	0.026825	-0.0463
SUM	0.415603	0.367112	0.149087	0.542042	0.235245	0.523657	0.317996	0.368665	0.371033	0.469432	0.120189	0.549876	0.321949	0.093257	0.145478	0.761739	0.545943	-0.16488	0.355702	0.076986	0.387699	0.486516	0.088181	-0.0172	0.339371	0.244081	8.09476

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.013588	-0.05929	0.009427	0.036596	-0.00477	-0.12658	-0.10476	-0.07327	-0.01621	-0.01539	-0.00741	0.014033	-0.00874	-0.00276	-0.00372	-0.01521	-0.00572	-0.0084	-0.00221	-0.00601	0.014833	-0.00431	-0.00499	-0.00032	0.005403	-0.1847	-0.56089
2	0.000543	0.064998	0.000221	0.009346	-0.00027	0.039295	0.003914	0.002302	1.65E-05	0.002601	-0.00044	0.001175	5.97E-06	4.95E-05	-0.00012	5.01E-05	0.000865	-0.00036	-4.7E-05	-0.0005	0.005075	-9.5E-06	-0.00038	-5.7E-05	0.00074	-0.00632	0.122693
3	-0.00027	-0.00252	-0.03154	-0.0022	-0.00711	-0.00061	-0.00028	0.007576	0.012441	-0.01049	-0.00379	0.000859	-0.01016	-0.00347	-0.00512	-0.00547	-0.19976	-0.0026	-0.03294	-0.004	-0.01177	-0.00164	-0.00697	-0.00826	0.001587	-0.0025	-0.33099
4	0.000717	0.006059	0.000426	0.035804	-2.2E-05	0.012685	0.001902	0.001402	0.000637	0.00751	-0.00017	0.001868	0.000713	0.000506	0.000311	0.000619	0.000715	4.12E-05	0.000887	-0.00039	0.010466	0.006213	-6.1E-05	2.54E-05	0.000851	-0.00878	0.08093
5	0.028001	0.028106	0.014432	0.071744	0.07918	0.038821	0.03354	0.036996	0.027605	0.04968	0.244025	0.015962	0.139318	-0.01448	0.024359	0.034317	0.051594	0.195685	0.066274	0.016332	0.041783	0.086131	0.018207	0.008904	0.027249	0.063863	1.427629
6	0.003589	0.048028	0.000492	0.099391	-0.00455	0.18474	0.029109	0.003316	-0.00897	-0.00715	-0.00674	0.004906	-0.00377	-0.00157	-0.00417	-0.00267	-9.6E-05	-0.00589	-0.00234	-0.00625	0.065033	-0.00223	-0.00464	-0.00045	0.006983	-0.15608	0.228046
7	0.000614	-0.00052	0.001878	0.000227	-0.00153	-0.00105	-0.07575	-0.00187	-0.00314	-0.00508	-0.00264	-0.00129	-0.00312	-0.00194	-0.00177	-0.00226	0.000129	-0.00255	-0.00114	-0.00535	-0.06471	0.000809	-0.00366	-0.00107	-0.0006	0.005797	-0.17159
8	0.00262	-0.00243	0.003983	0.001956	-0.00382	-0.00647	-0.00219	-0.08676	-0.02267	0.002357	-0.00704	-0.07632	-0.02085	-0.00164	-0.00395	-0.02671	0.004948	-0.01109	-0.00373	-0.00918	-0.00448	-0.01817	-0.00117	-0.00032	-0.00456	-0.0853	-0.38298
9	0.006534	0.005435	0.003033	0.003706	0.00144	0.009335	-0.00022	0.003269	0.069476	-0.02648	-0.00089	0.005552	-0.01091	0.001669	0.002683	0.002334	0.006571	-0.00248	0.000271	-0.01173	0.000271	-0.00039	0.019963	0.001163	0.036633	0.01237	0.138611
10	0.122282	0.062235	0.013847	0.040111	0.007549	0.06849	0.069387	0.052731	0.073892	0.178911	-0.0042	0.283226	0.087001	0.03478	0.052832	0.060445	0.071165	-0.02302	0.040853	0.009253	0.037446	0.015514	0.003333	0.003829	0.060867	0.099164	1.521925
11	0.037334	0.033497	0.010675	0.096692	0.074986	0.048679	0.024928	0.025719	-0.01343	0.039735	0.026273	-0.01785	0.057723	0.061175	0.046159	0.013675	0.025565	-0.21899	0.053556	0.020726	0.0557	0.053559	0.017464	0.016088	0.037584	0.014801	0.642025
12	0.011941	0.013247	0.009326	0.020389	0.00119	0.020672	0.017639	0.018763	0.009345	-0.00172	-0.00221	0.035671	0.002008	0.000177	0.007992	-0.05323	0.030246	-0.01048	0.013747	0.012367	0.010048	0.0043	0.003103	0.001026	0.004441	0.031763	0.211753
13	0.002447	0.001693	0.000879	0.001093	0.000868	0.002339	0.010244	0.000429	0.00112	-0.01377	0.000177	0.003116	0.055059	0.00281	-9.3E-05	0.006673	0.007892	-0.00151	0.123481	-0.00013	0.000478	0.00156	0.000571	0.002106	-0.00038	0.026946	0.236096
14	0.020918	0.01873	0.04937	0.014917	0.01045	0.034068	0.074831	0.015575	0.018593	0.015455	0.00422	0.019297	0.029197	0.379925	0.302807	0.16513	0.212029	0.00467	0.082908	0.006292	0.022346	0.026613	0.008071	-0.00866	0.014011	0.130233	1.672004
15	0.016859	0.013083	0.043712	0.003491	0.001673	0.025959	0.085582	0.005703	0.008344	0.007695	-0.00322	0.01058	0.006987	0.008549	0.012964	0.023887	0.021916	-0.00058	0.005655	-0.00095	0.014079	0.004384	-0.00155	-0.00271	0.003042	0.039324	0.354461
16	0.023346	0.029027	0.064002	0.056472	0.037442	0.039062	0.019477	0.029959	0.022549	0.031506	0.016447	0.031692	0.019043	0.022474	0.023943	0.420367	0.048109	-0.01798	0.108416	0.018107	0.041586	0.08484	0.029459	0.01057	0.043476	0.095229	1.348617
17	0.002164	0.001673	0.002861	-0.00234	0.002512	0.002013	0.001309	0.041789	-0.00454	0.000378	-0.00018	0.006637	-0.00012	0.001788	0.003509	0.002066	0.179374	-0.0012	-0.03097	-0.00147	0.001584	0.003309	-0.00869	-0.00745	0.014834	0.040192	0.251028
18	0.012462	0.0258	0.00811	0.014446	0.016042	0.039728	0.013224	0.096058	0.012605	0.064065	-0.0201	0.072014	0.085601	0.084957	0.058575	0.046161	0.03609	0.119871	0.042718	0.027206	0.08697	0.019221	0.016802	0.042209	0.033796	0.021783	1.076419
19	0.000193	-0.0085	-0.00316	0.002076	-0.00871	-0.00409	-0.00479	-0.01027	-0.02457	-0.0204	-0.00928	-0.00535	-0.01546	-0.00868	-0.00673	-0.00758	-0.00484	-0.00971	-0.00267	-0.00475	-0.00233	-0.00757	-0.00802	-0.05887	-0.00628	-0.01907	-0.25938
20	0.055159	0.035659	0.027182	0.038818	0.008985	0.046052	0.025401	0.028755	0.052456	0.01466	-0.00392	0.04858	-0.01438	0.002372	-0.01793	0.001524	0.067168	-0.05286	0.023902	-0.0018	0.010446	0.000218	0.012514	-0.00035	0.02362	0.020881	0.453106
21	0.004096	-0.00052	0.012285	0.001727	-0.00841	-0.00101	-0.0071	-0.00835	-0.01589	-0.02546	-0.01389	-0.00479	-0.01695	-0.00891	-0.00919	-0.01087	0.00312	-0.01403	-0.00472	-0.02375	-0.00873	-0.00499	-0.01833	-0.00432	-0.00132	-0.12838	-0.31868
22	0.022033	0.016513	0.018386	0.019741	0.011832	0.032346	0.026734	0.027965	0.029743	0.020129	0.006995	0.036091	0.003236	0.017698	0.021552	0.019754	0.037668	-3.8E-05	0.06829	0.034182	0.038778	0.148227	0.042373	0.005796	0.039302	0.110377	0.855703
23	0.017903	0.019179	0.009434	0.015994	0.001173	0.025574	0.01214	0.028535	0.021546	0.019252	-0.00594	0.024607	0.022836	0.032343	0.032028	0.022096	0.024168	0.025488	0.023798	0.028488	0.016718	0.021118	0.062211	0.054349	0.009719	0.037295	0.602052
24	0.00225	0.002272	0.000617	0.001166	0.003204	0.003757	0.002303	0.006544	0.004535	0.005437	0.001841	0.004067	0.0022	0.003717	0.005287	0.003825	0.004491	-0.00022	0.00654	0.007031	0.009017	0.006581	0.009296	0.004139	0.004403	0.020579	0.124877
25	0.007098	0.007427	0.006448	0.009217	0.076398	0.012514	0.020688	0.008027	0.028276	-0.00639	0.036038	0.015692	0.030153	0.02429	0.015456	0.01147	0.014226	0.012598	0.018451	-0.00699	0.008874	0.022869	0.016977	0.011084	0.044752	0.024604	0.470249
26	0.000972	0.002063	-0.0044	0.001667	-0.00953	0.001897	-0.00051	0.003935	-0.01643	-0.01207	-0.00867	-0.00111	-0.01398	-0.00273	-0.00915	-0.00465	-0.00557	-0.00401	-0.0043	-0.00595	-0.00117	-0.00545	-0.00639	0.000159	-0.00111	0.002667	-0.10381
SUM	0.415392	0.360947	0.271928	0.592245	0.286206	0.548213	0.276755	0.26483	0.267334	0.31498	0.235297	0.528926	0.422638	0.633108	0.548531	0.705744	0.632071	-0.02962	0.594671	0.090796	0.398344	0.4607	0.195481	0.068611	0.399044	0.206729	9.689895

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 9
Synergetic or Second Round Effects, Philippines
1979

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.03297	-0.03229	-0.09532	0.046932	0.018141	0.035521	-0.02042	0.180515	0.214177	0.012405	0.000898	-0.02337	0.073794	-0.26607	-0.01822	-0.01866	0.005005	-0.00712	-0.00379	-0.00871	-0.00017	0.073817	-0.00077	-0.01036	-0.00356	-0.00656	-0.0014	-0.00557	-0.01593	0.155891
2	0.015685	0.060786	0.028996	0.035238	0.020859	0.045314	0.034557	0.040974	0.041424	0.083229	0.04355	0.039353	0.053014	0.045723	0.10776	0.075458	0.270689	0.117716	0.086697	0.051787	0.031998	0.030801	0.052918	0.022554	0.120315	0.019263	0.317036	0.00575	0.015682	1.915127
3	0.064138	0.004867	0.109651	0.21047	0.007148	0.031004	0.005249	0.026041	0.019119	-0.00878	0.003521	0.080957	0.032999	0.141141	0.004676	0.007277	0.003453	0.003796	0.003551	0.009705	0.003598	0.024745	0.004979	-0.00516	-0.00224	-0.00035	0.00031	0.000256	0.030947	0.817064
4	-0.001	-0.0017	-0.00152	0.038733	-0.00022	-0.00161	-0.00211	-0.00156	-0.00073	-0.00307	-0.0045	-0.00106	-0.00138	-0.00266	-0.00147	-0.00189	-0.00136	-0.0016	-0.00154	-0.00199	-0.00174	-0.00105	-0.00306	-0.00285	-0.0033	-0.00269	-0.00271	-0.00271	-0.02348	-0.03785
5	-0.00015	-7.2E-06	-8.9E-05	-7.5E-06	0.337415	-5E-06	-1.1E-05	-3E-05	1.36E-05	-2.5E-06	-3.3E-06	-2.3E-05	-8.3E-06	-6.4E-05	-4.5E-06	-5.5E-06	-2.6E-06	-4E-06	-3.7E-06	-4.5E-06	-1.9E-06	-5.3E-06	-6.7E-06	-2.5E-06	-4.2E-06	-2.1E-06	-2.3E-06	-2.2E-06	-1.2E-05	0.336966
6	-0.00988	-0.00918	-0.01014	0.000234	0.001753	-0.23712	0.073807	0.002745	0.042848	0.031704	-0.02618	-0.0373	-0.04629	-0.00196	-0.00469	0.000101	-0.00054	-0.02139	-0.00264	-0.00295	-0.00094	0.039782	-0.0028	-0.00445	-0.00689	-0.00162	-0.00197	0.001281	0.005376	-0.2293
7	2.17E-06	-4.6E-06	-1.7E-06	-1.7E-06	5.99E-07	-4.4E-06	0.058348	-1.4E-06	2.01E-06	-3.8E-06	-1.7E-06	-1.6E-05	-0.00091	-3.7E-06	-3.8E-06	-9.6E-07	-3.4E-06	-4.5E-06	6.5E-07	-3E-05	-9.4E-06	-2.2E-06	1.6E-06	-3.7E-06	-4.4E-05	-3.1E-06	-1.1E-05	2.09E-06	5.59E-05	0.057344
8	-0.00132	-0.00692	-0.00208	-0.01122	-0.00749	-0.00412	-0.00757	-0.00344	0.484153	-0.00778	-0.00084	-0.01514	-0.00106	-0.00059	-0.00416	-0.01161	-0.01062	-0.0154	-0.04821	0.011369	-0.00126	-0.00577	0.028943	-0.00177	-0.00061	0.000141	-0.00054	0.002431	0.000198	0.357726
9	0.0003	-0.00013	0.00015	0.000241	3.31E-05	0.000392	0.0008	0.001405	-0.00211	2.05E-05	-9E-05	0.000375	6.39E-05	6.14E-06	-9.7E-05	0.00464	-1.1E-05	0.000137	0.000341	-0.01211	-3.9E-05	-0.00019	0.00216	0.000142	-0.00025	-0.00111	-4.6E-05	-0.00137	-0.00031	-0.00665
10	0.007859	-0.00451	0.005357	-0.01861	0.093004	0.007306	-0.00519	-0.0094	0.00513	0.097534	0.328706	-0.00307	-0.00562	-0.01341	-0.00429	-0.04803	-0.00664	-0.00819	0.001642	-0.0096	0.000135	-0.01216	-0.01243	0.004601	0.001952	0.019751	-0.00551	0.005121	0.008312	0.419759
11	0.00049	-0.003	-0.00318	-0.00635	-0.00434	-0.00379	-0.01185	-0.0037	-0.00343	-0.0051	-0.0019	-0.00342	-0.01114	-0.01143	-0.00296	-0.00575	-0.00582	-0.00701	-0.00494	-0.00111	-0.00343	-0.01922	-0.00224	0.000231	-0.0016	-0.00281	-0.00948	0.003328	-0.00989	-0.14483
12	4.61E-05	-0.00019	6.96E-05	2.13E-05	2.9E-05	0.008452	-0.09281	0.000613	0.001352	1.26E-05	0.001243	0.16197	0.001574	3.49E-05	-7.7E-05	-6.3E-06	-7.8E-05	1.5E-05	-0.00012	7.06E-05	0.000142	-0.00031	2.96E-05	2.29E-05	0.000103	2.58E-05	5.86E-05	9.25E-06	-1.1E-05	0.082295
13	-0.0005	-0.00273	-0.00258	-0.00313	-0.00072	-0.00416	-0.05651	-0.00824	0.014893	-0.0033	-0.00214	-0.01141	0.049835	-0.00465	-0.00387	-0.00107	-0.00283	-0.00413	0.010801	-0.0255	0.026399	-0.00169	0.002683	-0.00261	-0.01501	-0.0039	-0.00924	-0.00031	-0.00056	-0.06621
14	0.0859	-0.03024	0.010896	-0.04434	0.006789	0.053665	0.034931	0.046983	0.027914	0.077045	0.097965	0.023531	0.208382	0.221589	-0.01423	-0.00301	0.060435	0.035337	0.055788	0.015963	0.023488	0.367329	0.029176	-0.004	0.012055	0.004841	0.024291	-0.00342	0.004634	1.429674
15	0.027875	0.109765	0.06564	0.077032	0.041137	0.086991	0.069705	0.075367	0.056472	0.168083	0.083202	0.082369	0.103034	0.097849	0.001679	0.214124	0.11244	0.10905	0.089444	0.100047	0.053124	0.070074	0.061694	0.045549	0.235263	0.038095	0.620199	0.008367	0.031903	2.935573
16	0.001033	-0.00429	-0.00608	-0.02439	0.000226	0.000441	-0.00208	-0.00142	0.000497	-0.00258	-0.00075	-0.00407	0.000323	0.001948	-0.00448	-0.01127	-0.00611	-0.00553	-0.00592	-0.01663	-0.00418	-0.03928	-0.02862	-0.0039	-0.00131	-0.00225	-0.01095	-0.00269	-0.00587	-0.19019
17	0.002025	-0.0206	0.012782	0.011917	0.003841	0.006464	0.005536	0.016954	-0.01059	0.021472	0.010114	0.00338	0.011419	0.012196	-0.00643	0.01554	0.440709	0.367185	0.283947	0.129837	0.208259	-0.01226	0.08203	0.001688	0.017291	0.00734	-0.01033	-0.00278	0.004215	1.613156
18	0.001164	-0.05111	-0.00836	-0.00012	0.002052	0.00256	-0.00407	-0.00162	-0.03023	0.021454	0.00273	-0.01391	0.012208	0.00454	-0.03599	-0.01262	-0.06535	-0.01683	-0.12976	0.09679	0.004423	-0.0211	-0.03404	-0.00084	0.00041	0.003522	-0.00089	-0.00053	-0.00185	-0.27737
19	0.001265	-0.01307	0.000384	0.003195	0.000579	0.000508	-0.00116	0.001659	-0.00178	0.006483	0.003709	0.000477	0.000367	0.000229	-0.00691	-0.00049	0.002706	0.000356	0.021449	0.00034	0.003372	-0.00036	0.003089	0.000803	0.001319	0.000191	0.001813	0.000454	4.94E-05	0.031026
20	3.34E-05	-0.00466	-0.00062	-0.00063	0.000196	-0.00042	-0.00127	-0.00134	-0.00091	0.00245	-0.00042	-0.00141	0.000236	-0.00147	-0.00298	-0.00154	-0.00114	0.006218	0.025422	0.057125	-0.00881	-0.01445	-0.00588	-0.00202	-0.00388	-0.03556	0.006451	-0.0011	-0.00225	0.00536
21	-0.00061	-0.01685	-0.00175	0.011473	0.003927	-0.00147	-0.00384	-0.0029	-0.00171	0.010935	-0.00112	-0.00072	-0.00241	-0.00307	-0.01175	-0.0029	-0.00205	-0.00314	-0.00429	0.002353	-0.32296	0.000275	-0.0002	-0.00542	-0.00633	-0.00513	-0.00391	-0.0025	-0.00038	-0.37845
22	0.001101	-0.00459	-0.00654	-0.00861	0.001062	0.037327	0.010375	0.00091	-0.01635	-0.04392	0.003782	-0.04402	0.008732	-0.00296	-0.00528	-0.01044	-0.12373	-0.06129	-0.03015	0.000877	0.014359	0.011081	-0.01642	-0.00063	0.000222	-0.00116	-0.00585	0.000314	-5.3E-05	-0.29187
23	0.000237	0.007486	-0.00048	-0.00055	0.000391	-0.00173	-0.00103	-0.00076	-0.00148	0.004462	0.000284	0.000129	-0.00233	-0.00032	-0.01356	-0.00562	-0.00291	-0.00278	-0.00595	0.00039	-0.00486	-0.00336	-0.02622	-0.00874	0.000308	-0.0015	-0.00176	-0.0402	0.009659	-0.1028
24	0.056252	-0.01916	0.055537	0.080871	0.162401	0.041898	0.119763	0.077665	0.10614	0.008733	0.043331	0.196046	0.111483	0.120969	0.058523	0.034143	0.022304	0.014429	0.047519	0.06685	-0.03039	0.088416	-0.01364	0.001247	0.090797	0.016129	0.061162	0.002249	0.006673	1.628332
25	0.009915	-0.01917	-0.00773	0.010074	0.011998	0.013338	0.005074	-0.02686	0.012967	0.027312	-0.01106	0.005269	0.031754	0.002829	-0.00394	0.01294	0.000123	-0.0084	0.0286	0.020313	0.037559	0.028167	0.000748	-0.03709	0.011084	-0.03644	-0.01015	-0.00677	-0.00679	0.095657
26	-0.00014	-0.00181	-0.00096	0.000139	0.000475	-0.00052	-0.00446	-0.00113	0.000155	-0.00651	-0.00932	0.002765	-0.00087	-0.00039	-0.00149	-0.00066	-0.00092	-0.00045	0.002376	0.005151	-0.00406	0.004568	0.001715	-0.00216	-0.00315	0.067209	-0.00508	0.000601	0.007747	0.048805
27	0.004553	-0.01066	0.009574	0.011104	0.011673	-0.00102	-0.00198	0.004365	-0.00553	0.081439	0.040659	0.016086	0.002846	0.021371	0.002269	-0.00853	0.011803	0.011588	0.005879	0.024212	0.005732	0.017933	0.006062	0.020362	-0.00192	-0.00068	-0.18998	0.013764	0.020936	0.123899
28	0.00207	-0.01783	-0.01251	0.000791	0.012966	-0.01048	-0.0071	-0.00644	0.010247	0.001954	0.015763	0.015516	0.019172	0.024039	-0.02104	-0.01396	-0.00058	-0.00441	0.007826	0.043279	-0.03828	0.027559	-0.00882	-0.10685	0.006225	0.018774	-0.02321	-0.01919	0.239605	0.155085
29	-0.01533	-0.03087	-0.02673	-0.01721	0.028915	-0.03135	-0.04785	-0.02337	0.001163	-0.06646	-0.10819	-0.01244	-0.01056	-0.04115	-0.01367	-0.01292	-0.0149	-0.02203	-0.02368	-0.01095	-0.03174	0.004948	-0.06431	-0.07069	-0.03526	-0.05023	-0.06855	-0.0498	-0.03128	-0.89649
SUM	0.285986	-0.12267	0.11236	0.403277	0.754244	0.073362	0.146814	0.38398	0.963821	0.509231	0.512959	0.456851	0.638653	0.344255	-0.0067	0.193217	0.684069	0.476119	0.410281	0.546898	-0.04028	0.658289	0.056763	-0.17236	0.411993	0.043281	0.669756	-0.09502	0.287315	9.586737

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1988

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	-0.00721292	-0.0054143	-0.06533	-0.01864	-0.01886	-0.01737	-0.01121	-0.03812	0.004055	-0.00585	-0.00584	-0.03854	-0.01817	-0.04309	-0.00504	-0.00715	-0.0051	-0.00684	-0.00702	-0.0062	-0.00501	-0.01318	-0.01038	-0.00212	-0.00558	-0.00252	0.001412	-0.003	-0.01306	-0.380408
2	-0.00091013	4.8372E-05	-0.00289	-0.00403	-0.00116	-0.00552	0.002286	-0.00416	-0.00105	-0.00745	-0.00252	-0.00294	-0.00382	-0.00553	-0.05971	-0.02131	0.004124	-0.00328	-0.00362	-0.00412	-0.00244	-0.00085	-0.00826	-0.00094	-0.00167	0.000392	-0.00828	-0.00064	-0.00014	-0.150411
3	-0.00198968	-0.0011596	-0.01384	-0.01303	-0.00274	-0.00234	-0.02345	-0.00301	-0.00046	-0.00378	-0.00296	-0.03686	-0.00182	-0.00169	-0.00147	-0.0022	-0.00182	-0.00218	-0.00197	-0.00195	-0.00183	-0.00233	-0.00255	-0.00167	-0.00357	-0.00147	-0.00163	-0.0016	-0.0092	-0.146542
4	-0.00016285	-0.0002627	-0.00027	-0.0007	-0.00011	-0.00038	-9.4E-05	-0.00032	-0.0002	-0.00058	-0.00063	-0.00028	-0.00036	-0.00054	-0.00034	-0.00045	-0.00034	-0.0004	-0.00038	-0.00044	-0.0004	-0.00034	-0.00054	-0.00038	-0.00044	-0.00034	-0.00039	-0.0004	-0.00263	-0.013109
5	-1.9671E-05	2.1856E-07	-1.6E-05	-1.8E-06	-0.02573	-1.7E-06	-8.9E-07	-9.2E-06	1.24E-07	1.25E-06	2.08E-06	-5.9E-06	-2.6E-06	-6.9E-06	5.32E-07	7.19E-07	3.29E-07	2.3E-07	1.75E-07	9.8E-07	6.98E-07	-1.7E-06	3.27E-07	1.54E-06	5.86E-07	1.63E-06	1.71E-06	2.52E-06	2.4E-05	-0.025761
6	-0.00140619	-0.0012599	-0.00289	-0.00085	-0.00054	-0.09842	0.229934	-0.00128	-0.00071	-0.00181	-0.005	-0.00842	-0.00609	-0.00097	-0.00111	-0.00091	-0.00054	-0.00351	-0.00124	0.000166	-0.00152	0.004813	-0.00122	-0.0007	-0.00157	-0.00043	-0.00065	0.000198	0.000381	0.0924636
7	2.64227E-05	7.6429E-05	0.000116	9.09E-05	7.16E-05	0.000131	0.001472	0.000125	9.69E-05	0.000152	0.000128	0.000105	8.23E-05	0.000117	6.49E-05	0.000126	0.000156	0.000158	0.000127	0.000123	0.00028	0.000103	0.000127	0.001004	6.68E-05	4.71E-05	8.37E-05	3.43E-05	0.000268	0.0055566
8	-0.0003345	-0.0002266	-0.00063	-0.00164	-0.00147	-0.00098	-0.00094	-0.00544	-0.00215	-0.00218	-0.00085	-0.00205	-0.00051	-0.00056	-0.00072	-0.00196	-0.00198	-0.00272	-0.00598	-0.00145	-0.00095	-0.00165	-0.00673	-0.00013	-0.00043	-0.00022	-0.00042	-0.00121	-0.00032	-0.046831
9	-1.0077E-05	-2.725E-05	-2.6E-05	-3.8E-05	-1.8E-05	-3.8E-05	1.76E-05	-2.6E-05	0.000905	-4.4E-05	-3.2E-05	-1.1E-05	2.58E-05	-4.4E-05	-3.3E-05	-0.00016	-3.7E-05	-5E-05	-5E-05	-0.00234	-4.2E-05	-4.5E-05	-0.00013	-4.7E-05	-7E-05	-0.00011	-4.5E-05	-0.00014	-2E-05	-0.002699
10	-0.00059172	-0.0019755	-0.00287	-0.00646	0.001255	-0.00529	-0.00385	-0.00402	-0.00268	-0.06483	-0.02634	-0.00489	-0.0061	-0.01045	-0.00223	-0.01471	-0.00426	-0.00528	-0.00411	-0.00617	-0.00279	-0.01112	-0.00639	-0.0033	-0.00233	-0.00372	-0.00319	-0.00171	-0.00196	-0.212313
11	-0.00021894	-0.0006276	-0.0009	-0.00146	0.000208	-0.00159	-0.00064	-0.00096	-0.00101	-0.0024	-0.0012	-0.00152	-0.00282	-0.00297	-0.00043	-0.0012	-0.00138	-0.00169	-0.00142	-0.00081	-0.00118	-0.00312	-0.00117	-0.00076	-0.00097	-0.00183	-0.00147	-0.0007	-0.00075	-0.036981
12	1.01045E-05	-2.656E-07	4.16E-05	3.19E-05	2.63E-05	8.39E-05	-0.04768	5.21E-05	0.000359	4.83E-05	1.01E-05	0.003178	0.000366	7.07E-05	-3E-06	3.54E-05	4.47E-05	4.08E-05	3.39E-05	5.3E-05	8.93E-05	1.9E-05	3.98E-05	0.000368	3.55E-05	1.79E-05	2.81E-05	1.5E-05	0.000105	-0.042476
13	-0.00030182	-0.0007638	-0.0008	-0.00078	-0.00048	-0.00124	-0.00624	-0.00138	-0.00163	-0.00131	-0.00085	-0.00231	-0.0009	-0.00123	-0.00117	-0.00088	-0.00104	-0.00132	-0.00185	-0.00312	-0.00644	0.000282	-0.00086	-0.00067	-0.00355	-0.00056	-0.00151	-0.00017	-0.00025	-0.04333
14	-0.00336849	-0.0073442	-0.01069	-0.01271	-0.00577	-0.02998	0.014386	-0.00979	-0.0119	-0.01001	-0.00578	-0.02237	-0.03132	-0.03299	-0.00633	-0.01229	-0.0085	-0.01178	-0.00797	-0.00877	-0.0084	-0.02685	-0.01087	-0.00253	-0.00445	-0.00271	-0.00521	-0.00217	-0.0038	-0.302245
15	-0.00031151	-0.0003948	-0.00217	-0.00183	-0.00091	-0.00628	0.006121	-0.00365	-0.00093	-0.00799	-0.00216	-0.00298	-0.0025	-0.00416	-0.00466	-0.00739	-0.00778	-0.00799	-0.00724	-0.00324	-0.00305	-0.003	-0.00667	-0.00042	0.004728	0.002191	0.001029	-0.0001	0.001366	-0.075972
16	-0.00019445	-0.0005549	-0.00094	-0.00747	-0.00023	-0.00084	-0.00014	-0.00061	-0.00025	-0.00101	-0.00062	-0.00118	-0.00085	-0.0014	-0.00092	-0.00601	-0.0015	-0.0016	-0.0015	-0.00228	-0.00118	-0.00444	-0.01259	-0.00071	-0.00049	-0.00034	-0.00205	-0.00097	-0.00102	-0.053882
17	-0.00081125	-0.0165876	-0.00309	-0.00224	-0.00057	-0.00212	-0.00131	-0.00201	-0.01671	-0.00228	-0.00154	-0.00367	-0.00228	-0.00354	-0.0148	-0.00811	-0.06651	-0.07225	-0.06069	-0.00977	-0.00676	-0.01061	-0.02878	-0.00012	-0.00232	-0.00105	-0.00926	-0.00176	0.000755	-0.350801
18	-0.00062663	-0.0079954	-0.00371	-0.00097	-0.0006	-0.00195	-0.00254	-0.00123	-0.00481	-0.00266	-0.00223	-0.00479	-0.00239	-0.00391	-0.00829	-0.00507	-0.01572	-0.03891	-0.02817	-0.01689	-0.00455	-0.0117	-0.01777	-0.00071	-0.00185	-0.00148	-0.00366	-0.00101	-0.00076	-0.196944
19	2.24529E-05	-0.0019762	-0.00025	-0.00023	-8.2E-05	-0.0004	-5E-05	0.000166	-0.00037	-0.00023	-0.0003	-0.00028	-0.00038	-0.00037	-0.00202	-0.00078	-0.00017	-0.00044	-0.00442	-0.00019	-0.00023	-0.00024	-0.00027	-2.9E-05	0.000216	2.65E-05	-0.00054	-5E-05	0.000202	-0.01367
20	-0.00011057	-6.329E-05	-0.0003	-0.00029	-0.00012	-0.00045	0.000215	-8.5E-05	-0.00024	-0.00061	-0.00014	-0.00045	-0.00012	-0.0005	-0.00044	-0.00017	-0.00054	-0.00087	-0.00039	0.017085	-0.00108	-0.00156	-0.00262	-0.00029	-0.0005	0.000396	-0.00022	-0.00018	4.23E-05	0.0054155
21	-0.00038047	-0.002363	-0.00098	-0.0007	-0.0005	-0.0011	-2.8E-05	-0.00113	-0.00083	-0.00123	-0.00105	-0.00098	-0.00129	-0.00131	-0.00231	-0.0014	-0.00131	-0.00152	-0.00178	-0.00106	-0.09662	-0.0007	-0.00107	-0.0007	-0.00527	-0.00067	0.0002	-0.0003	0.000736	-0.127627
22	-0.0002764	-0.0025335	-0.00161	-0.00189	-0.00065	-0.00222	-0.00511	-0.00073	-0.00301	-0.00713	-0.00229	-0.00771	-0.00193	-0.00276	-0.00224	-0.00464	-0.01857	-0.01414	-0.0097	-0.00329	-0.00147	-0.00194	-0.00521	-0.00031	-0.00055	-0.00012	-0.00153	-0.00032	-0.00023	-0.104108
23	-6.7718E-05	0.00020267	-0.00037	-0.00039	-0.00031	-0.00056	0.000578	-0.00046	-0.00019	-0.00069	-0.00026	-0.00053	-0.00075	-0.00071	-0.00174	-0.00145	-0.00131	-0.00148	-0.00167	-0.00068	-0.00134	-0.0006	-0.00388	-0.00123	-0.0003	-1.3E-05	0.000247	-0.00185	1.86E-05	-0.021756
24	-0.00311339	-0.0114535	-0.01683	-0.0125	-0.00914	-0.02518	0.010822	-0.01786	-0.00983	-0.0251	-0.01324	-0.01949	-0.01401	-0.01733	-0.0121	-0.0198	-0.02751	-0.03203	-0.02681	-0.01304	-0.02945	-0.01507	-0.02323	-0.003	-0.00711	-0.00368	-0.01094	-0.00296	-0.0041	-0.415069
25	-0.00140734	-0.0043387	-0.00577	-0.00352	-0.00241	-0.00637	0.009508	-0.00755	-0.00292	-0.00747	-0.00469	-0.00564	-0.00486	-0.00716	-0.00406	-0.00633	-0.00777	-0.00991	-0.00876	-0.00465	-0.00525	-0.00483	-0.00664	-0.00425	-0.00254	-0.00316	-0.00546	-0.0012	-0.00152	-0.130917
26	-0.00029974	-0.0006493	-0.00083	-0.00061	-0.0005	-0.00135	0.00102	-0.00091	-0.00064	-0.00196	-0.0022	-0.00078	-0.00109	-0.00131	-0.00084	-0.00104	-0.00126	-0.0015	-0.00126	-0.00061	-0.00153	-0.00053	-0.00102	-0.00085	-0.00087	0.003249	-0.00109	-0.00082	-0.00028	-0.022386
27	-0.00022388	-0.0030193	-0.00049	-0.00023	-0.00042	-0.00554	0.011912	-0.00198	-0.00143	-0.00503	-0.0005	-0.00203	-0.00224	-0.00244	-0.00277	-0.00414	-0.00474	-0.00513	-0.00518	-0.00177	-0.00262	-0.00152	-0.00296	-0.00091	-0.00089	0.003481	-0.0194	8.45E-05	0.001434	-0.060673
28	-0.00282117	-0.0065815	-0.00883	-0.00803	-0.0059	-0.01287	0.006489	-0.00963	-0.00658	-0.01468	-0.01	-0.0094	-0.00906	-0.01228	-0.00909	-0.0113	-0.01288	-0.01539	-0.01347	-0.0096	-0.01417	-0.00923	-0.01168	-0.01974	-0.00593	-0.00321	-0.00877	-0.00755	-0.00423	-0.266417
29	-0.00444003	-0.0077983	-0.00916	-0.01223	-0.00605	-0.01462	0.002325	-0.01045	-0.00667	-0.02091	-0.01995	-0.01023	-0.01257	-0.01807	-0.0118	-0.01566	-0.01257	-0.01506	-0.01411	-0.01381	-0.01542	-0.01181	-0.01913	-0.01216	-0.00379	-0.00856	-0.01261	-0.01239	-0.0097	-0.339421
SUM	-0.03155257	-0.0886432	-0.15631	-0.11334	-0.08372	-0.24478	0.193801	-0.12646	-0.07179	-0.19902	-0.11304	-0.18706	-0.12778	-0.17712	-0.15659	-0.15633	-0.20078	-0.25705	-0.22059	-0.0988	-0.21535	-0.13206	-0.19245	-0.05729	-0.052	-0.0264	-0.09532	-0.04285	-0.04863	-3.479313

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1994

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.993894	-0.09065	0.45922	0.525332	-0.36678	0.817713	-0.62901	0.075848	1.154328	0.679132	0.130117	-0.90274	1.024848	-1.86279	0.12113	-0.08548	-0.01407	-0.0428	0.001839	0.040114	0.156671	-0.49826	-0.30514	0.152321	0.06817	-0.0153	-0.03478	-0.06278	0.078812	1.568908
2	0.354018	1.144271	0.434208	0.616608	0.363503	0.465194	0.419694	0.5748	0.707055	0.722256	0.619981	0.417744	0.598373	0.925342	1.048076	2.11981	5.450631	2.100478	1.401013	0.623446	0.477584	1.081049	1.27395	0.540445	2.345794	0.330579	3.014063	0.184116	0.45687	30.81095
3	0.461329	0.051013	-0.07025	0.290999	-0.00497	0.212536	-1.60815	0.116863	0.158093	-0.08937	0.004604	-1.92098	0.257518	0.784148	0.050151	0.015108	0.012482	0.047764	0.024585	0.03607	0.018178	0.051352	0.010516	-0.0174	-0.02473	-0.01211	-0.02257	-0.02484	0.02459	-1.16747
4	-0.00697	-0.00588	-0.01021	-0.15389	-0.00422	-0.01001	-0.01498	-0.01272	-0.0064	-0.02452	-0.03454	-0.0083	-0.01495	-0.0239	-0.00839	-0.01833	-0.00833	-0.01247	-0.00981	-0.0187	-0.0124	-0.01322	-0.02087	-0.01555	-0.02681	-0.01761	-0.02083	-0.02151	-0.15763	-0.71395
5	-0.00124	0.000129	-0.00056	0.000181	1.580273	0.000179	5.05E-05	-0.00029	0.000155	0.000357	0.000413	-0.00017	0.000154	-0.00023	0.000179	0.000222	0.000142	0.000154	0.000154	0.000259	0.0002	1.33E-05	0.00022	0.000259	0.0002	0.000271	0.000225	0.000281	0.003616	1.5858
6	0.011865	0.060703	-0.04383	0.027788	0.023021	1.40385	7.616202	0.168996	1.009707	0.080909	-0.17358	1.780672	1.523131	0.068037	0.049758	0.069736	0.166886	-0.05109	0.142207	0.078596	0.255479	1.705679	0.017494	0.005514	0.084013	-0.00076	0.01794	0.008939	0.045703	16.15356
7	0.002112	0.003761	0.004804	0.004107	0.002502	0.177734	1.939749	0.004565	0.008213	0.006392	0.008683	0.02002	0.096082	0.005257	0.003412	0.005036	0.004906	0.006358	0.004813	0.006601	0.007712	0.006285	0.005412	0.020334	0.007438	0.003594	0.004238	0.003035	0.0332	2.406355
8	0.011643	0.066953	0.007035	-0.09029	-0.04779	-0.01661	-0.07475	1.335259	0.963076	-0.07924	0.012052	-0.07212	0.009655	0.034719	0.032428	-0.0459	-0.07823	-0.09148	-0.0757	0.129706	0.007523	-0.03419	-0.16918	-0.01317	0.012046	0.01022	0.008377	-0.06492	0.001373	1.688478
9	0.000457	0.005922	6.3E-05	-0.00054	0.00019	0.002306	0.003622	0.030979	0.187441	0.000583	8.37E-05	0.009571	0.000963	0.000691	0.00302	-0.01002	0.000931	0.000581	0.026412	-0.16021	0.00524	0.003649	-0.00401	0.000202	-0.00175	-0.00653	-0.00044	-0.01113	0.003244	0.091512
10	0.07416	0.209037	0.114484	0.130048	3.582221	0.238491	-0.02555	0.045972	0.18535	5.408015	6.702578	0.125007	0.031121	0.185233	0.17379	0.789826	0.046735	0.1292	0.221301	0.310604	0.122782	0.128805	0.053896	0.073103	0.097256	0.072996	0.034038	0.076152	0.297315	19.63396
11	0.009539	-0.00153	-0.02082	-0.06041	0.113013	-0.01695	-0.13309	-0.01224	-0.02475	-0.07695	0.006711	-0.05708	-0.17271	-0.15552	0.107711	-0.00764	-0.03471	-0.03234	-0.02254	0.011887	-0.01165	-0.19404	-0.01551	-0.01279	-0.02278	-0.16103	-0.06901	-0.0133	0.093346	-0.98719
12	0.00203	0.003283	0.004244	0.004304	0.002639	0.127239	-2.27249	0.041744	0.293596	0.007416	0.005032	5.139794	0.413704	0.006819	0.003593	0.005947	0.009898	0.008616	0.036836	0.020202	0.014036	0.065874	0.006863	0.009795	0.019074	0.003879	0.005754	0.002526	0.017939	4.01019
13	0.008232	0.020159	0.007366	0.001807	0.013176	0.01866	-0.4654	-0.00377	-0.06846	0.041496	0.027234	0.02627	0.469875	0.00492	0.021651	0.033645	0.034195	0.01447	-0.0093	-0.14183	1.328276	0.231515	0.022231	0.057823	0.218887	0.014557	-0.0493	0.025926	0.061714	1.966011
14	0.404981	0.09641	-0.0708	-0.17203	0.107224	0.678806	-0.0377	0.102132	0.057874	0.332332	0.369783	-0.21839	-0.39486	1.504739	0.93019	-0.05093	0.080835	0.082959	0.186933	0.350447	0.300142	-0.86335	-0.06246	0.054255	0.24172	-0.00465	0.145951	-0.0184	0.288969	4.423108
15	0.697059	1.772831	0.88636	1.231137	0.710173	0.847545	0.799634	1.132957	0.838121	1.465252	1.185661	0.744793	1.200778	1.160465	2.350907	3.660085	1.73526	1.520958	0.947785	0.800989	0.693157	0.97214	1.243374	1.096664	4.831681	0.632388	6.03416	0.293971	0.889868	42.37615
16	0.009028	0.020654	-0.02543	-0.35356	0.011981	0.021934	-0.01899	-0.0034	-0.0239	-0.01403	0.009916	-0.02176	0.008086	0.098069	0.013461	0.674171	-0.04616	0.020481	0.009955	-0.07557	0.024453	-0.24253	0.371434	-0.00258	0.010878	0.001798	-0.12121	0.070134	-0.01061	0.416694
17	0.06263	-0.54855	0.089684	0.399763	0.084968	0.107528	0.043713	0.187149	-0.82372	0.20859	0.212201	0.08004	0.137833	0.256633	-0.15615	0.038193	0.799422	4.103265	-0.59204	1.69243	2.557545	0.608582	-0.37095	0.08529	0.345038	0.160891	-0.10396	0.008826	0.155344	9.830185
18	0.063494	-0.33977	-0.04227	0.728256	0.042425	0.053066	-0.15662	0.245702	-0.30349	0.182322	0.040215	-0.14909	0.038605	0.052371	-0.02669	-0.02054	-0.44095	-2.27274	-0.95283	-0.69109	0.087666	-0.60519	-0.49719	0.058656	0.128744	0.028698	0.055086	0.027555	0.131066	-4.53455
19	0.040772	0.228642	0.041492	0.036874	0.021458	0.057006	0.027074	0.23718	0.21085	0.058955	0.028969	0.033426	0.04704	0.063915	0.137281	0.094503	0.148274	0.099833	4.437057	0.188176	0.059965	0.078955	0.08651	0.027279	0.223458	0.059978	0.132379	0.02164	0.069845	6.998788
20	0.037428	0.45662	0.049825	0.048641	0.025844	0.096519	0.035827	0.065717	0.047555	0.089035	0.06238	0.035931	0.086189	0.058343	0.243822	0.125311	0.084632	0.09041	0.695842	5.051164	0.563458	0.090305	-0.0183	0.074966	0.208812	0.212744	0.151225	0.036269	0.127182	8.933698
21	0.045346	0.147652	0.066323	0.082369	0.04204	0.075631	0.063522	0.091149	0.070907	0.095572	0.095604	0.065406	0.058035	0.082641	0.143798	0.119561	0.263148	0.155176	0.103864	0.094575	6.301269	0.20318	0.108244	0.222812	0.534947	0.071563	0.306575	0.044137	0.249986	10.00503
22	0.007376	-0.10861	-0.06539	-0.04139	0.063715	-0.04709	-0.38345	0.002513	-0.19356	-0.28085	0.095748	-0.32866	-0.01391	-0.08317	-0.05104	-0.2308	-1.14836	-0.46238	-0.40968	-0.05191	0.147072	0.999994	-0.21847	0.012616	0.041378	0.069469	-0.04296	0.008865	0.072548	-2.64039
23	0.032334	0.30685	0.029097	0.034569	0.025432	0.051796	0.030084	0.03974	0.045745	0.037611	0.033154	0.0328	0.012732	0.036479	0.054636	0.021865	-0.02262	0.00512	-0.00772	0.025813	0.001587	-0.002	-0.10763	-0.01051	0.082553	0.062371	0.056017	0.127631	0.068189	1.103718
24	0.140046	-0.28732	-0.57626	0.115448	0.163161	-0.15243	0.156212	-0.10181	0.064434	0.113138	0.308336	0.402349	0.38457	0.194212	0.886214	-0.27714	-0.04246	0.037189	0.367123	0.409225	0.157633	0.228848	-0.70273	0.181464	0.418428	0.025566	0.151584	-0.01897	0.17042	2.91646
25	0.249639	0.25303	0.235542	0.377383	0.271911	0.467675	0.370466	0.395974	0.417902	0.31727	0.340484	0.329375	0.342123	0.20553	0.67389	0.25854	0.075129	0.130365	0.148985	0.249439	0.411811	0.319969	0.508948	0.894832	0.198158	0.121018	0.001302	0.263109	0.244189	9.07399
26	0.031644	0.048268	0.053616	0.055924	0.060148	0.06953	0.050485	0.075863	0.058165	0.030125	-0.01704	0.087321	0.04743	0.045331	0.04664	0.067698	0.06499	0.078711	0.391088	0.13501	0.066796	0.097702	0.127073	0.505045	0.056164	0.568761	0.001477	0.121031	0.111845	3.136839
27	0.204628	0.766932	0.610314	0.74645	0.356396	0.923176	0.540993	0.50462	0.538709	0.879128	0.5366	0.550263	0.516481	0.602724	0.465162	0.568007	0.967968	0.834753	0.519149	0.569335	0.312414	0.663868	0.370772	0.566208	0.247197	0.226271	-0.9039	0.299258	0.536858	14.52073
28	0.072157	0.069215	-0.18142	-0.04349	0.027648	0.033542	0.139797	-0.07013	0.054848	-0.20991	-0.02316	0.216264	0.073114	-0.16117	0.165621	-0.1218	-0.11146	-0.18232	0.175709	0.072348	-0.14946	0.057348	0.109012	-0.62822	0.238962	0.497913	-0.16282	-0.06863	0.086235	-0.02426
29	-0.07747	0.125587	-0.22145	-0.25046	0.032549	-0.17362	-0.36838	-0.27593	-0.08551	-0.67018	-0.99581	-0.14837	-0.39174	-0.59288	-0.04084	-0.41506	-0.0281	-0.23457	-0.09004	-0.37818	-0.25353	-0.29817	-0.46205	-0.32871	0.206696	-0.31057	-0.59891	-0.54834	-0.16248	-8.03653
SUM	3.94216	4.475598	1.764974	4.291924	7.30385	6.530943	6.04855	4.995425	5.542326	9.310829	9.592405	6.269389	6.390267	3.49697	7.443397	7.383615	7.971014	6.084656	7.67299	9.378943	13.65161	4.844147	1.361458	3.610955	10.79162	2.646957	7.989676	0.770591	3.989544	175.5468

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.066384	0.059194	0.534613	0.160879	0.196595	0.13727	-0.16911	0.480674	-0.1125	0.015867	0.010097	0.118646	0.169677	0.364403	0.040638	0.039963	0.018461	0.041953	0.003726	-0.07376	0.004673	-0.05313	0.103706	-0.02012	0.037118	-0.02177	0.02049	0.018365	0.083799	2.276793
2	-0.00094	-0.00184	-0.00787	-0.00374	-0.00343	0.008909	-0.2292	0.008384	-0.04925	0.006463	-0.02126	-0.03924	-0.09015	-0.01726	0.132746	0.016523	-0.38246	-0.10757	-0.12827	-0.21916	-0.0521	-0.11919	-0.00594	-0.03693	-0.13201	-0.10004	-0.31076	-0.01865	-0.02445	-1.92866
3	0.011746	0.007136	0.093344	0.126568	0.02448	0.009708	0.065664	0.020727	-0.07888	0.02684	0.015743	0.16279	0.003121	-0.04008	0.008441	0.009716	0.00471	0.008415	-0.00643	-0.0338	-0.00052	-0.01082	0.014205	-0.02442	0.025685	-0.00138	0.006409	0.006461	0.048332	0.503927
4	0.00134	0.002219	0.00198	-0.04692	0.00143	0.00273	-0.00356	0.002303	0.000698	0.003924	0.004956	0.000168	0.002705	0.004153	0.002516	0.003179	0.001712	0.002324	1.15E-05	-0.00392	0.00122	0.000742	0.004025	-0.00209	0.003347	0.000904	0.00227	0.002365	0.020409	0.017144
5	0.000202	-1.3E-06	0.000152	1.64E-05	0.2912	-1.5E-05	-2.2E-05	0.000105	-9.1E-06	-1.6E-05	-2.6E-05	2.99E-05	2.33E-05	6.38E-05	-6E-06	-1E-05	-6.4E-06	-5E-06	-8.8E-06	-2.4E-05	-1.2E-05	-2.9E-06	-2.8E-06	-1.9E-05	-7.6E-06	-2.2E-05	-1.3E-05	-1.8E-05	-0.00024	0.2913
6	0.010574	0.012343	0.02693	0.006654	0.004444	0.962998	-5.30268	0.007738	-0.07009	0.009951	0.031116	-0.31227	0.227767	0.003414	0.004736	0.001101	-0.01023	0.025851	-0.00864	-0.0161	6.76E-05	-0.14989	0.008308	-0.00184	0.017634	-0.0186	0.003563	0.000391	0.004221	-4.52054
7	-0.00012	-0.0003	-0.0005	-0.0005	-0.00025	-0.0004	-0.66493	-0.00404	-0.0009	-0.00056	-0.00054	-0.00937	-0.00072	-0.00048	-0.00028	-0.00157	-0.00053	-0.00054	-0.00054	-0.00054	-0.00048	-0.00045	-0.00097	-0.00245	-0.00096	-0.0003	-0.00035	-0.00027	-0.00241	-0.69626
8	0.003518	0.008699	0.004055	0.012241	0.013189	0.006742	-0.01323	-0.00912	-0.4142	0.006158	0.002384	0.00587	0.003105	0.000456	0.004446	-0.00435	0.011389	0.01873	0.03559	-0.03873	-0.00265	-0.04231	0.065452	0.000161	-0.01089	-0.02947	0.000595	0.011103	0.001527	-0.34956
9	-0.00033	-0.00239	-0.001	-0.00073	-0.00051	-0.00086	-0.00241	-0.00135	-0.04717	-0.00138	-0.00165	-0.00132	-0.00098	-0.00128	-0.00158	-0.00014	-0.00142	-0.00144	-0.00622	-0.01574	-0.0065	-0.00169	-0.0018	-0.00386	-0.01417	-0.06086	-0.00107	-0.00195	-0.00081	-0.18259
10	0.002413	0.013948	0.014671	0.03915	-0.00925	0.036326	-0.12736	0.027305	-0.00766	0.18725	0.027527	-0.03453	0.041779	0.049775	0.012004	0.111048	0.012929	0.027739	-0.01598	-0.11596	-0.01581	-0.0546	0.042326	0.019004	-0.00273	-0.0088	0.01666	0.00317	-0.00105	0.291299
11	0.001389	0.005711	0.006994	0.013122	0.010223	0.014152	-0.01863	0.007799	0.003977	-0.00938	0.000306	0.00062	0.025404	0.024483	0.004531	0.008518	0.00909	0.012355	3.99E-05	-0.01976	0.002804	0.01717	0.008267	0.002176	0.006177	0.010894	0.010173	-0.00717	0.000395	0.151834
12	-0.00013	-0.00044	-0.00049	-0.00056	-0.00033	-0.00072	-0.04641	-0.01084	-0.32857	-0.00113	-0.0004	-0.64963	-0.00218	-0.00082	-0.00033	-0.00153	-0.00214	-0.00147	-0.00148	-0.00659	-0.00045	-0.01928	-0.00138	-0.00209	-0.00072	-0.00063	-0.00047	-0.00055	-0.00146	-1.08324
13	0.002658	0.008437	0.006497	0.006109	0.004266	0.000615	0.017917	0.012514	0.008293	0.008524	-0.00989	0.007818	0.069207	0.007565	0.006206	0.004859	0.004936	0.008106	-0.0047	-0.03236	-0.00394	-0.01953	0.004938	0.000631	0.031435	-0.03531	0.009327	-0.00063	-0.00128	0.123218
14	0.02193	0.100639	0.084938	0.09371	0.034982	0.255992	-0.74538	0.070486	0.004902	0.024857	-0.10786	-0.4457	0.292276	0.271055	0.05796	0.052506	0.02367	0.069106	-0.11993	-0.2973	-0.02932	-0.05023	0.079869	-0.00073	-0.00095	-0.07704	0.009556	-0.00278	0.015032	-0.31375
15	-0.00507	0.024456	-0.01112	-0.02468	-0.0084	0.008552	-0.43613	0.012562	-0.0501	0.006504	-0.03665	-0.05786	-0.2083	-0.08934	-0.01447	-0.02629	0.012359	0.004369	-0.09613	-0.30483	-0.07425	-0.09531	0.022828	-0.05365	-0.28476	-0.18573	-0.19819	-0.03476	-0.04789	-2.25227
16	0.001303	0.004148	0.006663	0.067702	0.001923	0.006296	-0.01513	0.00478	0.000878	0.005964	0.002016	-0.00149	0.006905	0.011478	0.006064	0.022102	0.006099	0.00774	-0.00984	-0.07756	-0.01781	-0.00945	0.109297	0.000488	0.000357	-0.01565	0.016289	0.004595	0.006505	0.152673
17	0.003873	0.17361	0.014279	0.007966	0.001422	0.008383	-0.04932	0.00257	0.138081	0.007604	-0.01132	-0.00144	0.002093	0.010668	0.105368	0.046158	0.672261	0.482814	-0.14099	-0.63426	-0.32313	-0.13607	0.253219	-0.00783	-0.054	-0.25855	0.043428	0.012858	-0.00486	0.364889
18	0.002267	0.075017	0.014646	-0.00327	0.000981	0.006722	-0.04864	-0.01502	0.045904	0.001325	-0.02791	0.000699	0.005214	0.00589	0.050122	0.020741	0.023412	0.296011	-0.14018	-0.33626	-0.07991	-0.08656	0.145667	-0.01017	-0.02388	-0.2316	0.005107	0.002891	-0.00594	-0.30672
19	-0.00286	0.017312	-0.00494	-0.00549	-0.00175	-0.00408	-0.02343	-0.00449	-0.01245	-0.00342	-0.0067	-0.00541	-0.00316	-0.00427	0.00993	-0.00534	-0.01218	-0.01852	-0.10171	-0.13524	-0.0133	-0.02101	-0.00824	-0.01437	-0.04015	-0.30409	-0.01297	-0.00352	-0.00681	-0.75267
20	-0.00363	-0.02305	-0.00801	-0.0161	-0.00344	-0.00647	-0.05287	-0.00912	-0.0146	-0.0112	-0.01272	-0.01547	-0.00859	-0.01408	-0.01571	-0.01918	-0.01558	-0.01865	-0.34807	-2.7306	-0.38118	-0.04602	-0.03098	-0.01561	-0.06707	-0.31784	-0.01835	-0.00705	-0.01632	-4.24752
21	0.003043	0.016393	0.003819	0.001261	0.003405	0.006623	-0.04719	0.006698	-0.00014	0.004795	0.004337	-0.00111	0.00829	0.00741	0.014012	0.005579	-0.00983	0.003049	-0.00941	-0.04699	0.608515	-0.01443	0.002175	-0.00489	0.002745	-0.00316	0.002181	-1.3E-05	-0.01312	0.55433
22	0.00127	0.023141	0.010092	0.009205	0.004023	0.016109	-0.03302	0.001334	0.008176	0.050949	0.006082	0.024045	0.012703	0.015427	0.013899	0.02833	0.165147	0.111301	0.024182	-0.06748	-0.0283	-0.16797	0.040746	-0.00947	-0.00815	-0.091	0.007041	-0.00765	-0.00234	0.157816
23	0.001077	0.005034	0.005253	0.005608	0.004251	0.00841	-0.01927	0.006217	0.001611	0.008881	0.006065	-0.00032	0.007044	0.00731	0.019889	0.015314	0.015666	0.014557	0.002914	-0.02249	0.003974	0.00059	0.036945	0.014499	0.000419	-0.00877	0.006762	0.041647	0.000587	0.189667
24	0.029214	0.101498	0.154843	0.107286	0.089882	0.224184	-1.30539	0.147567	0.0186	0.203147	0.089671	-0.26871	0.120204	0.129962	0.083547	0.117197	0.109216	0.186504	-0.60579	-1.62717	-0.15366	-0.23233	0.165187	0.008251	0.015284	-0.13978	0.03322	0.015595	0.022225	-2.16055
25	0.016456	0.046834	0.058244	0.035757	0.02489	0.056415	-0.13972	0.083187	0.009535	0.054309	0.039276	-0.00046	0.046837	0.063362	0.049056	0.051789	0.060651	0.07759	-0.06954	-0.1939	-0.0025	0.00133	0.022246	-0.03279	0.02313	-0.02483	0.032073	-0.0146	0.004881	0.379507
26	0.001079	-0.00042	0.001129	-0.00325	0.00041	0.005225	-0.06795	0.0029	-0.01006	0.005519	0.010146	-0.01156	0.002607	0.002553	-0.0025	-0.00322	-0.00276	0.00205	-0.041	-0.0648	-0.01228	-0.02107	0.000998	-0.01781	0.001617	-0.08226	-0.01813	-0.01245	-0.00437	-0.33966
27	-0.00313	0.003635	-0.00381	-0.03686	0.000317	0.031363	-0.21219	0.010864	-0.04409	-0.01314	-0.05984	-0.02624	0.021585	0.004941	0.00432	-0.02262	-0.04909	-0.06477	-0.09097	-0.25762	-0.04643	-0.05677	9.79E-05	0.008262	-0.00346	-0.0388	0.00632	-0.01043	-0.02644	-0.97497
28	0.023857	0.060703	0.07915	0.067931	0.058621	0.116512	-0.29031	0.087265	0.003643	0.112756	0.064963	-0.02296	0.07688	0.095545	0.066428	0.083757	0.077859	0.108177	-0.06399	-0.28956	-0.00165	-0.10258	0.087877	0.168788	0.00774	-0.10131	0.061496	0.041561	0.028597	0.707751
29	0.041739	0.089688	0.086644	0.117695	0.065805	0.133981	-0.23624	0.10215	0.02909	0.17108	0.190786	-0.00454	0.118947	0.162543	0.100148	0.134861	0.086455	0.116196	-0.0185	-0.28151	0.051025	0.010209	0.171999	0.103212	0.056015	-0.02663	0.075494	0.052937	0.07717	1.778453
SUM	0.231114	0.831366	1.171186	0.736773	0.809387	2.051671	-10.2162	1.052433	-0.96728	0.882456	0.208726	-1.58893	0.950296	1.074842	0.762128	0.688979	0.829807	1.411984	-1.96187	-7.944	-0.57391	-1.48063	1.341074	0.064333	-0.4152	-2.17241	-0.19186	0.091453	0.153885	-12.1683

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2006

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.520461387	-0.0558189	0.135757	0.071977	0.710797	-0.14692	0.063982	-0.72689	0.45661	0.148696	0.107755	-0.46852	0.614929	-0.55498	-0.02156	0.078252	0.030504	0.03343	-0.01841	-0.02026	0.05941	0.155025	-0.05011	0.100545	-0.01551	-0.00408	-0.03752	-0.02048	-0.07227	1.0747981
2	0.06483858	0.35222116	0.134337	0.203919	0.086074	0.304537	0.191702	0.20468	0.260187	0.15233	0.157482	0.215882	0.418982	0.45339	0.90659	0.589123	1.248572	2.407075	0.82686	0.350649	0.207167	0.453614	0.4446	0.131117	0.557699	0.089739	0.213627	0.074207	0.083883	11.785075
3	0.24536413	-0.0029922	0.372236	0.05864	0.018138	0.068872	-0.67227	0.051541	0.072803	-0.03857	-0.01272	-0.90525	0.025487	-4.7E-05	-0.00496	-0.0026	0.003785	0.001991	0.006608	-0.00314	0.014782	-0.00299	-0.01136	0.027017	-0.05153	-0.00983	-0.01774	-0.00413	-0.00282	-0.77569
4	-0.00017179	-0.0013722	0.055973	0.501297	0.002062	-0.00059	0.00279	0.00097	0.000814	-0.00168	-0.0063	0.011879	-0.00158	-0.00382	-0.00228	-0.00208	0.001839	0.001502	0.000856	-0.00195	0.00204	-0.0005	-0.00517	0.019953	-0.00612	-0.00408	-0.00484	-0.00374	-0.03398	0.5217151
5	-0.00048959	-5.129E-06	-0.00026	-1.8E-05	-0.48374	-3.4E-05	-1E-05	-0.00024	2.45E-05	2.87E-05	3.5E-05	-0.00012	2.32E-05	-0.00016	4.11E-06	1.74E-05	6.55E-06	7.05E-06	1.23E-06	8.36E-06	1.63E-05	-1.4E-05	-3.6E-06	2.68E-05	3.32E-06	1.81E-05	8.77E-06	1.69E-05	0.00026	-0.484594
6	0.004275443	-0.0103826	-0.00772	0.029422	0.038384	-0.68211	2.708709	0.102823	-0.06513	0.176649	0.046038	2.862914	-0.2958	0.037646	-0.00028	0.061271	0.041545	-0.01651	0.048512	0.00195	0.013795	0.364942	0.021555	0.011852	0.004203	0.022614	0.000567	0.009826	0.046016	5.5775804
7	0.000183399	0.00040082	0.000546	0.000441	0.000296	0.000794	-0.0536	0.019285	0.002371	0.000521	0.000453	0.000506	-0.00205	0.001043	0.000353	0.000549	0.000475	0.000661	0.00139	0.000468	0.000309	0.000501	0.005826	0.000839	0.001908	0.000664	0.000757	0.000471	0.00181	-0.01183
8	-0.00039249	0.00554995	0.00132	-0.01673	-0.01445	0.009138	-0.01979	-0.03953	1.519096	0.068957	0.032326	-0.02466	0.007499	0.033017	0.005995	0.025654	-0.01633	-0.02299	-0.10522	0.018787	0.0181	0.083248	0.162494	-0.00407	0.020269	0.011767	-0.00103	-0.01468	0.005817	1.7491495
9	0.002425328	0.03194729	0.00716	0.040049	0.00457	0.016871	0.040206	0.022509	0.147795	0.042447	0.048648	0.051303	0.007188	0.017918	0.017634	0.027799	0.022079	0.033213	0.023073	-0.01737	0.018568	0.015821	0.010245	0.009749	0.035758	0.015944	0.012495	0.004058	0.010842	0.7209461
10	0.024655728	0.09393484	0.048945	0.061272	0.978793	0.111236	-0.01404	0.108004	0.055805	-0.52604	0.546264	0.070233	0.009658	0.147677	0.057615	-0.19005	0.028275	0.031211	0.141023	0.00698	0.070307	0.053957	-0.03523	-0.02654	0.025596	-0.0282	0.012127	0.031848	0.0397	1.9354636
11	0.003996691	-0.0022611	0.000308	0.009737	0.03447	-0.00983	-0.0414	0.001351	-0.00749	0.231267	0.05538	-0.01161	-0.04828	-0.02787	-0.00025	0.004467	-0.00881	-0.01459	-0.00566	-0.00225	0.000528	-0.04999	-0.00574	-0.00046	-0.01136	-0.0479	-0.02922	0.074084	-0.00017	0.0904621
12	0.001878199	0.00111946	0.003599	0.001896	0.001239	0.337147	-1.55302	0.008653	0.220172	0.016567	0.008377	0.049275	0.026815	0.003872	0.001165	0.005966	0.003689	0.005554	0.002357	0.006249	0.001226	0.031691	0.006141	0.001653	0.003918	0.001503	0.001403	0.001027	0.004999	-0.793873
13	0.000181849	0.01093183	-0.00488	-0.00546	0.001279	0.057873	-0.15034	-0.01478	-0.02255	-0.00862	0.015947	0.009183	0.373353	-0.01013	0.008064	0.003178	0.00401	0.001609	0.00834	-0.02849	0.069303	-0.00225	0.01561	-0.00669	-0.07194	-0.00207	-0.02134	0.003662	-0.00024	0.2327367
14	0.202135948	0.01160822	0.094561	0.100049	0.289087	-0.17543	-0.03836	0.370565	0.070448	0.323057	0.642757	-0.10439	-0.55318	0.86437	0.054926	0.519956	0.099125	0.19324	0.12926	-0.00377	0.137907	-0.06863	0.008974	0.011691	0.032783	0.038194	-0.01726	0.025823	0.001608	3.2611093
15	0.10640145	0.52521311	0.168274	0.295178	0.139908	0.563977	0.284497	0.338128	0.329173	0.235748	0.236255	0.307333	0.873156	0.991221	0.856945	0.751474	1.260269	1.244958	1.054798	0.314973	0.293343	0.633409	0.477109	0.112047	1.052753	0.123917	-0.1182	0.128453	0.138256	13.718967
16	0.004687209	0.02186501	0.001979	0.009881	0.006734	0.137678	0.273382	0.004992	-0.00252	0.00113	0.045866	0.391922	0.007043	-0.00989	0.006762	0.111088	-0.00821	-0.00619	0.040501	-0.02378	0.014829	-0.05579	-0.10978	-0.00082	0.004469	0.010667	-0.04122	-0.00622	-0.00143	0.829623
17	0.008745263	-0.263988	-0.03266	-0.01851	0.023879	0.033072	0.006299	0.021543	-0.32867	0.075503	0.044609	-0.01832	0.093722	0.020807	-0.08453	-0.01461	-0.25459	-1.4901	-0.3303	-0.21276	0.930485	-0.16962	0.14385	0.024941	0.162382	0.047449	-0.13695	-0.01404	0.005851	-1.7265
18	0.029116002	-0.0415497	-0.03369	-0.01724	0.034443	0.043744	-0.00462	0.065342	-0.08786	0.126206	0.057815	-0.02165	0.013406	0.010825	0.002158	0.062536	0.308411	-0.15734	0.449053	-0.13473	0.277947	-0.07391	-0.06131	0.023216	0.1113	0.085439	0.004941	-0.0044	0.004866	1.0724746
19	0.00352338	-0.0507241	0.005161	0.008561	0.005166	0.014776	0.002303	0.004319	0.00397	-0.00061	0.009866	0.006931	0.013113	0.006168	-0.01556	-0.00095	0.023341	0.037713	0.050042	0.003799	0.349415	0.012955	0.007021	0.008876	0.061514	0.007437	-0.00256	0.003418	0.005425	0.5843994
20	0.040231923	0.1028043	0.037978	0.067062	0.021034	0.060417	0.27786	0.065181	0.068586	0.040249	0.036084	0.036692	0.036826	0.062694	0.067785	0.080957	0.06579	0.098822	0.123252	3.09791	0.885453	0.131696	0.050472	0.035215	0.261899	0.498817	0.167731	0.018414	0.06047	6.5983801
21	-0.0090556	-0.0638711	-0.02351	-0.0128	-0.00537	-0.01745	-0.02425	-0.02617	-0.01767	-0.02109	-0.02586	-0.01683	-0.02861	-0.02564	-0.04471	-0.02465	-0.01894	-0.0112	-0.02464	-0.02041	-3.06948	-0.01433	-0.01784	-0.0224	-0.26914	-0.02956	-0.0379	-0.00924	-0.01465	-3.947242
22	0.003885493	-0.0308043	-0.02167	-0.01987	0.036849	-0.002	-0.1594	0.018197	-0.05411	-0.11814	0.059282	-0.16717	-0.00659	-0.02272	-0.01719	-0.06954	-0.36933	-0.3089	-0.11827	-0.05708	0.06683	0.416062	-0.04983	0.001164	0.020983	0.006958	-0.0191	0.000632	0.009105	-0.971769
23	0.000875438	-0.0110826	-0.00783	-0.00558	-0.00061	-0.00418	-0.00533	0.00101	-0.00541	-0.0029	-0.01016	-0.00278	-0.00929	-0.0056	-0.04794	-0.03097	-0.01937	-0.01857	-0.01869	-0.01375	-0.00829	-0.01343	-0.00972	-0.03957	0.003485	-0.00585	-0.03499	-0.12527	-0.0125	-0.554278
24	0.154990604	0.06117308	0.19066	0.483897	0.686689	0.523011	0.389708	1.361316	0.285508	1.779567	0.791319	0.373227	0.515059	0.447763	0.193748	0.476096	0.718539	0.390249	0.745692	0.454526	2.088403	0.806213	0.16314	0.956645	0.295103	0.185684	-0.09124	0.029498	0.079335	15.535515
25	0.041681653	0.0229649	-0.06728	-0.00032	0.041977	-0.02588	-0.02538	-0.07663	0.011451	-0.01939	-0.02859	-0.03501	-0.04978	-0.04606	-0.01039	-0.02021	-0.05399	-0.06745	0.081711	0.014371	0.074451	-0.02227	-0.03002	-0.02094	0.031863	-0.053	-0.09373	0.035065	-0.01435	-0.405133
26	0.02451589	0.07779235	0.045733	0.113156	0.064419	0.065693	0.050919	0.091438	0.028745	0.112098	0.027952	0.04484	0.035498	0.043222	0.049598	0.077249	0.050989	0.063266	0.079194	0.125117	0.151529	0.084035	0.040364	0.079161	0.026263	0.242069	0.057109	0.056019	0.099535	2.1075203
27	0.032603679	0.11776334	0.050768	0.123675	0.09745	0.029218	0.238151	0.068708	0.066854	0.140374	0.175722	0.124087	-0.00805	0.077546	0.072432	0.153357	0.191436	0.229221	0.146851	0.111956	0.090758	0.098328	0.070779	-0.01232	0.037946	0.035701	0.248586	0.04897	0.10282	2.9616956
28	0.079774305	-0.0218027	-0.01015	0.064827	0.084024	0.015184	0.003822	0.119626	0.123109	0.173477	0.041224	0.020628	-0.00809	-0.01231	-0.03453	0.00212	0.023813	-0.04209	0.063794	0.004611	0.138505	0.070371	-0.05223	-0.30453	0.222788	0.253997	-0.10007	0.619374	0.15926	1.6985233
29	-0.02756848	-0.0850926	-0.08781	-0.11531	0.038761	-0.1157	-0.12987	-0.03178	-0.03309	-0.16887	-0.31583	-0.04514	-0.13619	-0.22392	-0.11265	-0.15604	-0.02018	-0.03548	-0.03638	-0.12902	0.012781	-0.08288	-0.30994	-0.24635	-0.04647	-0.12812	-0.25646	-0.08818	-0.11093	-3.223701
SUM	1.563751032	0.79553254	1.057828	2.033095	2.942344	1.213113	1.642653	2.134158	3.099024	2.938968	2.787986	2.755396	1.924268	2.276051	1.904956	2.519422	3.357186	2.582298	3.365595	3.843579	2.910414	2.855277	0.789927	0.871015	2.502818	1.365887	-0.34202	0.874492	0.596509	59.161525

Appendix Table 10
Synergetic or Second Round Effects, Malaysia
1983

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	28	29	SUM
1	0.041932	-0.00342	0.06504	0.020642	-0.0366	0.024552	-0.04679	-0.00956	-0.00093	-0.00933	0.000897	-0.04221	-0.00015	0.003837	2.45E-05	-0.00017	-0.00557	-0.00297	-0.00131	-0.00673	-0.00479	-0.01188	-0.00088	0.001007	-0.04289	0.002018	-0.06624
2	0.006307	0.00884	0.009111	0.010144	0.004094	0.011914	0.009924	0.007499	0.007717	0.010854	0.268508	0.002906	0.034589	-0.13215	-0.01222	-0.00587	-0.00059	-0.00744	0.066723	-0.01644	0.008444	0.016808	0.001972	0.000614	0.006018	0.002923	0.321205
3	0.032735	-0.00023	0.238838	0.067372	0.003732	0.001766	0.009943	0.003067	0.000352	-0.01326	0.000626	0.016514	0.000422	0.00133	0.000211	3.17E-05	0.000363	-0.00217	0.000656	0.001911	-0.00057	-0.00156	0.000973	0.001219	-0.00545	0.003343	0.362168
4	9.07E-05	-5.9E-05	0.000126	0.004883	0.000311	0.000117	9.16E-05	3.41E-05	1.21E-05	-0.00015	5.3E-05	7.73E-05	-1.9E-05	5.95E-05	-1.6E-05	-1.1E-05	-7.5E-06	0.000299	4.4E-05	0.000183	-0.00022	-0.00028	0.000124	0.000132	-0.00199	0.000205	0.004088
5	3.3E-05	4.81E-05	0.000173	0.000144	-0.00188	0.000295	0.000154	0.000178	0.00019	0.000283	8.11E-05	0.000159	6.99E-05	0.000208	0.000252	0.000282	6.55E-05	0.000225	0.00038	0.000238	6.38E-05	0.000229	3.3E-05	3.48E-05	0.000126	5.26E-05	0.002114
6	-0.00053	-1.9E-05	-0.00195	-0.0012	0.001557	-0.08658	-0.00012	0.02736	-0.00288	0.000719	0.000176	-0.00509	-0.00272	0.000909	-0.00141	0.014307	0.003356	-0.0325	-0.00037	0.000409	-0.00011	-0.00186	-0.00162	0.000222	0.000487	-0.00212	-0.09158
7	0.000314	-0.00102	0.000372	0.001018	0.000805	0.000739	0.008463	0.005664	0.001773	0.001884	0.00047	0.003431	0.00102	7.37E-05	0.004019	0.001996	-0.00082	-0.00521	6.3E-05	0.001896	0.000136	2.67E-05	-0.00222	0.000229	-0.00041	-0.00075	0.023966
8	2.21E-05	-1.7E-05	1.11E-05	0.000193	-0.0001	0.000135	3.53E-05	-0.01574	-0.00316	0.000107	1.9E-05	0.000189	0.000149	6.19E-05	-0.00013	0.001214	-2.4E-05	0.000135	5.09E-06	0.000291	-0.00016	-6.1E-05	0.000192	2.97E-05	-0.00026	-8.7E-05	-0.01695
9	0.001213	-0.00274	0.00075	0.021142	-0.01021	0.00252	0.001154	-0.00143	-0.0192	-0.01059	0.000619	4.53E-05	0.000822	0.000171	-0.00333	-0.0034	-0.00074	-0.00214	-0.00046	0.000624	-0.01684	-4.7E-06	0.008479	0.007073	0.006686	-0.00147	-0.02126
10	0.007783	0.003271	0.007753	0.006125	0.001067	0.013107	0.009914	-0.02067	0.012454	0.085802	0.003655	0.01174	0.00828	0.003624	0.004287	0.000954	0.003183	0.011143	0.004689	-0.00311	0.003033	0.003641	0.000745	0.000475	0.000238	0.002265	0.185445
11	0.00916	-0.00809	0.010693	0.003871	0.003808	0.021861	0.011919	0.001522	0.00114	0.000531	0.009405	-0.01917	0.013289	0.003012	0.004432	0.002739	0.000764	0.003015	-0.00629	0.004193	0.009165	0.00536	0.002567	0.001744	-0.00123	0.0003	0.089711
12	0.000636	-0.00043	-6.5E-05	-0.00047	-0.00064	-0.0004	-0.00166	0.010705	-0.00102	0.002934	0.000557	0.00508	-0.00094	-0.00086	-0.001	0.000717	-0.00598	0.000582	-0.00117	0.000276	-0.0015	-0.01082	-0.00146	-8.6E-05	-0.00378	-9.3E-05	-0.01089
13	-0.00015	-0.00177	-0.00025	-0.03409	-0.0055	-9.3E-05	0.001535	-0.0134	-0.00323	-0.00498	0.000373	0.002925	0.036959	0.000535	0.017416	-0.00103	0.002823	-0.00536	-0.00029	-0.00308	-0.00688	-0.00084	-0.00436	0.000266	-0.00121	-0.00114	-0.02481
14	0.000342	-0.00091	0.002973	0.007344	0.000759	0.00138	0.000718	0.006609	0.006987	0.001295	0.00419	0.002761	0.004086	0.053651	0.015815	-0.01067	-0.00059	-0.01466	0.001338	-0.00724	0.000709	-0.00025	-0.00132	-0.00012	-0.0005	-0.00116	0.073539
15	-0.0011	0.000482	-0.00657	0.003977	-0.00015	0.000803	-0.00098	0.004059	0.00037	-0.00469	-0.00223	0.004183	0.001906	0.011849	0.033585	0.002927	0.003334	0.00787	0.000355	0.000815	-0.0018	-0.00027	-0.00209	-6.4E-05	-0.00113	-0.00059	0.054852
16	-0.00349	-0.00499	-8.3E-05	-0.00106	0.000698	0.001311	-0.0071	0.002312	-0.00118	-0.00033	0.000307	-0.00222	0.003668	-0.00104	0.00112	-0.04873	-0.00521	-0.04693	-0.0065	-0.00267	0.000418	-0.00264	-0.00158	-0.00131	0.008938	-0.00355	-0.12184
17	-3.5E-06	0.001405	0.001939	0.001971	0.000749	0.002456	0.000744	0.001491	0.00116	0.001616	0.001074	0.001554	0.003598	0.002222	0.004548	0.001865	0.122144	0.006688	0.000571	0.002743	0.001244	-0.00227	0.000325	0.000513	0.001817	-0.00035	0.161812
18	8.63E-05	-0.00044	-9.8E-05	-0.00079	-0.00097	0.008497	0.000149	-0.00063	-0.00206	-0.0011	-9.7E-06	-0.00016	-4.2E-05	-0.00017	-0.00013	-0.00024	9.75E-06	-0.34069	-0.00015	-0.00033	-0.00041	-0.00055	-0.00049	0.001999	-0.00078	-0.00099	-0.34049
19	0.003866	-0.01389	0.00952	0.010196	0.00715	0.028137	0.011385	0.001712	0.007396	-0.00359	0.003759	0.013202	0.022426	0.012072	0.010466	0.008269	0.00445	0.011976	0.018237	0.001269	0.0033	0.000211	0.024416	0.004899	-0.00312	0.006256	0.203967
20	0.002366	-0.00324	0.002101	0.000547	0.001048	0.001707	0.006689	0.002476	0.001238	1.31E-06	0.001758	0.001314	0.001869	-0.00043	0.000796	-0.00031	0.000672	-0.00113	-0.00291	-0.00751	0.000371	-0.00176	-0.00392	0.001263	0.00065	-0.00707	-0.00142
21	0.006986	-0.0123	0.00624	-0.0066	0.005126	-0.00182	0.015681	-0.01149	-0.02046	-0.00509	0.005511	-0.00592	-0.00828	0.02356	6.5E-05	-0.01706	-0.00266	-0.10611	0.012829	-0.01175	-0.00067	-0.01166	-0.0014	0.002694	-0.01694	-0.00799	-0.16951
22	0.008488	0.042436	0.016787	0.000246	-0.0066	0.00343	-0.02393	-0.02091	0.0025	0.017964	0.013443	0.003799	0.012027	0.024247	0.007882	0.003824	-0.00041	0.000933	0.009445	0.021352	0.042217	0.00962	-0.00533	0.001867	0.006615	0.002459	0.194402
23	0.00103	-0.00053	0.000958	0.000153	-0.00017	-0.00039	0.000868	-0.00054	-0.00063	-0.00118	0.000395	0.000338	-0.00054	0.001285	0.000173	-0.00149	0.000197	-0.00496	-0.00362	0.003695	-0.00143	-0.00295	0.002034	0.004628	-0.00413	-0.00156	-0.00838
24	0.002956	-0.00235	0.005262	-0.00033	0.00507	0.005248	0.005236	0.001317	0.005964	0.00382	0.002093	0.003875	0.004535	0.003973	0.004414	-0.00148	0.005718	-0.00142	-0.0007	-0.00318	-0.00579	-0.0079	0.004359	-0.00343	0.005518	0.005368	0.048156
25	0.006993	-0.00297	0.006519	0.024139	0.03205	0.009776	0.01044	0.005832	0.003613	-0.0149	0.005371	0.0067	-1E-05	0.004963	-0.00107	-0.00206	0.000332	-0.01233	0.00305	0.018713	-0.01181	-0.0165	0.012869	0.014865	0.036746	0.014964	0.15629
26	7.11E-05	-0.0005	-4.7E-05	-0.00012	3.48E-06	0.001028	0.00027	-0.00033	-0.00032	-0.0006	9.63E-05	0.000337	-7.4E-06	0.001593	0.000297	-0.0008	0.000261	-0.00152	-4.4E-05	0.00585	-0.00678	-0.00363	0.000294	0.000492	6.92E-05	0.002596	-0.00146
SUM	0.128134	-0.00344	0.376105	0.139451	0.005198	0.0515	0.024734	-0.01286	-0.0022	0.058026	0.321193	0.006347	0.136991	0.018589	0.090489	-0.0542	0.125084	-0.54466	0.094568	0.002431	0.009311	-0.04179	0.032714	0.041264	-0.00991	0.013824	1.006882

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

1991

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.065385	-0.0053	-0.00825	-0.01764	-0.05851	-0.00667	0.292484	0.114285	-0.00073	-0.01349	0.005115	-0.24346	-0.00786	-0.01156	-0.00374	-0.00598	-0.01041	-0.02527	0.00177	-0.02219	-0.01127	-0.01354	0.002541	0.002591	-0.09939	-0.00298	-0.08408
2	0.011806	0.021957	0.014217	0.017223	0.008927	0.010377	0.01897	0.004402	0.010323	0.154855	0.772302	0.005605	0.047143	-0.67	-0.06796	-0.02938	-0.00411	-0.04619	0.139846	-0.05953	0.011608	0.036812	0.00415	-0.00264	0.008459	0.010649	0.429813
3	0.064493	0.00095	0.333311	0.033919	0.00274	-0.00452	0.038495	0.017947	0.000445	0.013037	0.003157	0.027295	0.004535	0.003068	0.000865	-0.00058	0.002663	-0.00952	0.003267	0.001062	-0.00292	0.00204	0.003906	0.003692	-0.02767	0.004414	0.520087
4	0.000665	7.89E-06	4.28E-05	0.003091	-0.00039	-8.7E-05	0.000273	-0.00015	-0.00021	-0.00041	0.000252	0.000437	9.75E-06	0.000162	-0.00018	-0.00022	0.00013	-0.00063	0.000262	-0.00027	-0.00057	-0.00038	0.000487	0.000402	-0.00899	1.71E-05	-0.00625
5	-0.00018	0.000109	0.0004	0.001345	0.114827	0.000294	0.00028	0.000954	0.007789	-0.00013	7.05E-05	0.000378	0.000789	6.17E-05	0.000362	0.000216	0.000101	0.000833	-2E-05	7.34E-05	0.000899	0.001079	5.92E-05	5.17E-05	8.83E-05	0.000148	0.130878
6	-0.00103	-0.0002	-0.00443	-0.00556	0.001546	-0.36479	0.001616	0.010339	-0.01058	-0.00263	0.000572	0.013565	-0.0055	0.001014	-0.0022	-0.00227	0.003334	-0.07212	-0.00212	-0.00051	-2E-05	-0.00228	0.000144	0.000448	-0.00171	-0.00516	-0.45052
7	0.001067	-0.00338	0.000183	-0.00683	-0.00021	-0.00192	-0.00482	-0.25108	-0.00246	-0.00488	0.001372	0.001464	-0.0044	-0.00246	-0.00063	-0.00248	-0.00326	-0.02791	8.1E-05	-0.07653	-0.00222	-0.0003	-0.00344	-0.00514	-0.00268	-0.00187	-0.40473
8	0.000108	3.3E-05	0.000132	-9.5E-08	0.000447	0.002315	0.001647	0.007606	-0.00397	-4E-05	0.000113	0.000274	0.000159	0.000117	-0.00018	-0.00178	0.000106	-5E-05	6.4E-05	-1.6E-05	8.67E-05	0.000264	0.000147	6.21E-05	0.001676	0.000793	0.010106
9	0.006366	0.000541	0.007301	-1.8E-05	0.07905	0.000955	0.011679	0.016007	-0.016	-0.0215	0.007638	0.013052	0.007721	0.008342	-0.00345	-0.00312	0.006111	-0.01382	0.001782	0.002788	-0.02367	0.002068	0.003628	0.015311	0.002101	0.00542	0.116281
10	0.002854	0.000668	0.014961	0.00908	0.001114	-0.00032	0.006195	-0.01736	0.00608	0.008626	0.006379	-0.01041	0.052774	-0.00044	0.016872	-0.00811	0.001976	0.018604	0.008032	-0.01317	-0.00051	0.001836	-0.00072	-0.00017	-0.00489	0.001889	0.101841
11	-0.00629	-0.05194	-0.00437	-0.01386	0.002222	-0.02973	-0.00783	-0.0169	-0.00791	-0.02656	0.018172	-0.07522	-0.00282	-0.02133	-0.00369	-0.00915	-0.00097	-0.01369	-0.23652	-0.0136	-0.00805	-0.02819	-0.00062	3.12E-05	-0.03177	-0.0024	-0.59299
12	-0.00141	-0.0027	-0.00103	-0.00116	-0.00091	-0.00385	-0.00202	0.010025	-0.00137	-0.00267	0.001931	0.079787	-0.00022	-0.00246	-0.00056	-0.00205	-0.00585	-0.00026	-0.00182	-0.00606	-0.00499	-0.01003	-0.00123	-0.00013	-0.00731	0.002785	0.034434
13	-0.00082	-0.00193	0.00622	0.025906	0.037871	0.003958	0.025461	0.000308	0.004743	-0.02309	0.006645	0.008738	0.093367	0.030345	0.03679	-0.00039	0.033536	0.029809	0.001281	0.017641	-0.021	0.001585	-0.00382	-0.00088	-0.00119	0.005921	0.317005
14	-0.00112	-0.00685	-0.00189	0.011975	0.002423	-0.00096	-0.00045	-0.00924	-0.00093	-0.00379	0.004696	0.000337	0.009007	0.179975	-0.05445	-0.02967	-0.00033	-0.06525	-0.00158	-0.01516	-0.0021	1.15E-05	-0.00189	-0.0028	-0.00435	0.003522	0.009139
15	0.001221	0.001759	0.002636	0.091618	0.00621	0.001606	0.006156	0.032315	0.005072	-0.00463	0.018655	0.006411	0.00738	0.062712	0.149193	0.027168	0.007169	0.014435	0.009967	0.025114	-0.00193	0.003176	-0.00147	0.000612	0.001418	0.00493	0.478896
16	0.006648	0.001514	0.014469	0.007648	0.029956	0.010409	0.015269	0.039578	0.01099	0.007761	0.007943	0.011478	0.021229	0.016474	0.024585	0.034211	0.024621	-0.04375	-0.01057	0.010954	0.005128	0.012734	0.000797	-0.00109	0.00033	0.134876	0.394191
17	0.006386	0.006239	0.009155	0.007179	0.004318	0.005716	0.012977	0.01199	0.005993	0.004743	0.005329	0.009916	0.01043	0.008725	0.009435	0.010087	0.226606	0.006199	0.003367	0.016205	0.004991	0.06596	0.004045	0.003534	-0.00205	0.037635	0.495102
18	0.003759	0.004173	0.00354	0.001769	-0.00061	-0.00627	0.006073	0.003794	-0.00256	0.000953	0.002243	0.004583	0.005476	0.003859	0.00278	0.000807	0.001203	-0.47838	0.001465	0.004052	0.001667	0.004371	0.003369	0.00085	0.012944	0.006335	-0.40775
19	0.00757	-0.03085	0.018293	0.00729	0.011667	-0.01899	0.014392	0.009528	0.003962	0.017321	0.020417	0.025408	0.014577	0.041535	0.017791	0.005312	0.008663	0.00096	0.072049	0.002666	0.0518	0.00624	0.024746	0.006568	-0.0324	0.022952	0.329469
20	0.000622	-0.01005	0.002137	0.000535	0.00297	-0.00036	0.005428	0.002936	-7.5E-05	0.000261	0.006408	0.000754	0.002747	-0.00316	0.000412	-0.00049	0.002555	-0.00277	0.017513	-0.01037	-0.00988	0.004894	-0.00055	-0.02587	-0.00148	0.011846	-0.00304
21	0.016564	-0.01206	0.022434	0.028258	0.043363	-0.02718	0.039657	0.010728	-0.01755	-0.04024	0.076514	0.012953	0.01849	0.167435	0.045581	0.017618	0.081309	-0.01114	-0.03051	-0.0017	0.0181	0.002334	0.007935	0.009038	-0.01718	0.035318	0.496061
22	0.010025	0.012999	0.030337	-0.00092	-0.00012	0.001163	-0.0202	-0.0323	0.0047	0.000377	0.021641	0.021844	0.023836	0.02485	0.019676	-0.00164	0.001851	0.008348	0.003299	0.002188	0.0334	0.07114	0.009538	0.007352	0.006206	0.048646	0.308243
23	0.001719	0.000661	0.002801	-0.00062	0.002874	0.000297	0.003326	0.002941	-0.00027	-0.0017	0.003783	0.00418	0.003082	0.005379	0.002335	-0.00116	0.002336	-0.00793	-0.00151	0.005293	-0.00237	0.001105	0.137826	0.02408	0.002531	0.008654	0.19965
24	0.005411	0.001242	0.010145	0.004458	0.034163	0.003502	0.010601	-0.00157	0.010142	-0.00069	0.015037	0.016772	0.009443	0.014221	0.006922	0.001547	0.006825	-0.00888	0.010398	-0.01355	0.017213	0.027079	0.030617	0.001172	-0.00988	0.021566	0.22392
25	0.036626	0.016942	0.02573	-0.04866	-0.00939	0.008454	0.030345	0.012519	0.008658	-0.03274	0.029347	0.03523	0.021673	0.02474	0.003165	-0.00443	0.01737	-0.0274	0.044066	0.001412	-0.00958	0.008318	0.045076	0.049469	0.014161	0.054501	0.35561
26	0.001158	0.00058	0.00076	-0.00105	0.001034	-0.00173	0.000693	-0.00201	-0.00197	-0.00205	0.001909	0.002784	-5.5E-05	0.001681	-0.00137	-0.0019	0.000733	-0.00301	0.012527	-0.00165	-0.01037	-0.00398	0.002136	0.000398	-0.00408	0.002954	-0.00588
SUM	0.239605	-0.05487	0.499231	0.154985	0.317575	-0.41834	0.506702	-0.0224	0.012295	0.026712	1.03764	-0.02585	0.333024	-0.11671	0.198357	-0.00785	0.404262	-0.77878	0.046368	-0.14488	0.033468	0.19434	0.267406	0.086938	-0.20713	0.413374	2.99549

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	28	29	SUM
1	0.206498	-0.01544	-0.12314	-0.02689	0.102995	0.031368	0.396609	0.074175	0.097401	0.187807	0.000197	-1.04759	-0.01688	-0.02179	0.010079	-0.00307	-0.0506	-0.02606	0.011741	-0.04524	-0.01529	-0.02372	0.00318	-0.00418	-0.12777	-0.01141	-0.43703
2	0.03516	-0.0102	0.0371	0.005428	0.011429	0.008428	0.019125	-0.012	0.017282	0.058066	0.160118	0.016344	-0.01091	-1.29432	-0.28794	-0.07629	-0.00841	-0.01746	-0.07662	-0.12219	-0.01006	0.034134	-0.00108	-0.00673	0.001679	-0.00474	-1.53466
3	0.104601	0.00127	0.888371	0.09582	0.01821	0.000649	0.059903	0.027326	0.010761	0.213781	0.004026	0.013607	0.013986	0.007367	0.004897	0.002061	0.005166	-0.00986	0.015319	0.010132	0.003028	0.017796	0.007953	0.004164	0.085122	0.032469	1.637926
4	0.000538	-0.00023	0.001853	0.248572	-0.00072	8.37E-05	0.000178	-0.00059	-0.00024	0.005126	0.00011	0.000588	-0.00019	0.000146	-0.00034	-0.00034	0.000258	-0.00102	0.001614	-1E-04	-0.00019	0.001622	0.000796	0.000351	-0.01002	2.34E-05	0.247893
5	-0.00056	-0.00013	-0.0004	-0.00036	0.089943	-0.00035	-0.00028	-0.00054	-0.00043	-0.00157	-6.1E-05	-0.00077	-0.00098	-0.00015	-0.00042	-0.00057	-7.5E-05	-0.0008	-0.00029	-0.00046	-0.00016	-0.00032	7.2E-06	-4.2E-05	-0.00028	-0.00013	0.079822
6	0.000536	-0.00079	-0.00927	-0.00984	-0.00474	-0.48335	-4.6E-05	0.062949	-0.01602	-0.00346	0.000213	-0.00462	-0.0102	0.00098	-0.00323	-0.00229	0.063768	-0.14081	-0.00256	0.004298	-0.00171	-0.00433	-0.00313	0.002216	0.000128	-0.00566	-0.57098
7	0.004804	-0.00805	0.00063	-0.01417	-0.00048	-0.00325	-0.1264	-0.73777	0.03493	-0.014	-0.00103	-0.00117	-0.01071	-0.0048	-0.00359	0.008822	0.005208	-0.04838	-0.0061	-0.18992	-0.00598	-0.00433	-0.0089	-0.01686	-0.00673	-0.0188	-1.17702
8	0.000277	7.65E-06	0.000234	0.000156	-0.00041	0.00074	0.000353	0.167652	-0.00401	-0.0002	0.000145	0.002547	0.001014	0.000415	-9.3E-05	-0.00013	0.002204	0.001722	0.000339	-0.00032	-0.00042	0.000398	0.000487	5.08E-05	-0.00041	-0.00014	0.172617
9	0.002523	-0.01049	0.033332	0.052561	-0.12362	0.007409	0.024291	0.018558	0.275358	-0.03063	0.003133	0.014688	0.003445	0.00574	-0.00188	-0.01944	0.014313	-0.03077	-0.00846	-0.01685	-0.10368	-0.00977	-0.005	0.009651	0.00472	0.008513	0.117643
10	0.027456	0.003237	0.034266	0.05239	-0.00056	0.157663	0.025279	-0.06252	0.039831	0.283557	0.055404	0.030691	0.055713	0.048752	0.014894	0.007267	0.017367	0.041396	0.019129	-0.01721	-0.00128	0.010522	0.001356	-0.00194	-0.0086	-0.00176	0.832307
11	0.152258	-0.09489	0.18863	0.005277	0.035677	-0.00359	0.077601	0.017674	0.057516	0.1344	0.03851	0.022648	0.031576	-0.00836	0.015734	-0.01126	0.020148	-0.00439	-0.53001	-0.01222	-0.03601	0.096746	-0.00658	0.013982	-0.00623	0.006468	0.201306
12	0.008109	-0.00605	0.001739	-0.00154	-0.00125	0.005677	-0.00017	-0.01466	-0.00221	-0.00213	-0.00056	0.456243	-0.00069	-0.00112	0.014697	-0.00476	-0.04167	0.001211	-0.00285	-0.00329	-0.0118	-0.02207	-0.00198	-0.00039	-0.0115	-0.00021	0.356764
13	0.010658	-0.00462	0.002051	-0.06584	-0.0248	0.112806	0.003088	0.051023	-0.01734	-0.05309	0.001685	0.012101	0.20618	0.03748	-0.00703	-0.00323	0.049891	0.002155	0.000541	0.099118	-0.04145	0.001989	-0.00803	-0.00489	0.000514	-0.00741	0.353554
14	-0.00122	-0.01348	-0.0095	0.022323	-0.00104	0.001499	-0.00264	-0.00802	0.000399	-0.0038	-0.00512	0.004039	-0.00079	0.374681	-0.16958	-0.07013	0.00587	0.066833	-0.00616	0.035826	-0.00535	-0.00116	0.00247	-0.00728	-0.00646	-0.01037	0.191857
15	-0.00336	8.8E-05	-0.02464	0.181017	-0.00047	0.007393	0.019616	0.069685	0.01063	9.7E-05	-0.01119	0.009025	0.017859	0.053108	0.194907	0.05107	0.014557	0.078264	0.005181	0.027355	-0.00938	0.002864	-0.00214	-0.00194	0.003892	-0.00215	0.691344
16	0.007061	0.007417	0.013485	0.083976	0.018097	0.032533	0.000241	0.023362	0.011774	0.016808	0.034121	0.008846	0.016278	0.044578	0.073081	-0.05505	0.062604	0.087062	0.045847	0.013829	0.008061	0.043613	0.257088	-0.00104	0.023078	0.020655	0.897403
17	0.012611	0.007243	0.006562	0.001146	0.001858	0.00201	0.005724	0.028886	0.001647	0.001881	0.002586	0.007369	0.000245	0.004338	0.002276	0.0036	0.626177	0.008575	0.010799	0.006514	0.006713	0.049282	0.005143	0.00184	-0.00902	0.041898	0.837909
18	0.000808	0.007571	0.001507	0.001245	-0.00334	0.018631	0.001944	0.011227	-0.00686	0.001707	0.002443	0.002374	0.005301	0.006798	0.005679	0.001783	0.002784	-0.77698	0.012081	0.004445	-0.00049	0.002367	0.008613	0.01222	0.016136	0.020447	-0.63956
19	0.019542	-0.06127	0.155568	0.029104	0.044198	0.05608	0.074553	0.029141	0.08837	0.066137	0.028446	0.106211	0.067363	0.117169	0.090874	0.011957	0.049276	0.022611	0.21826	0.033521	0.037509	0.046379	0.029388	0.057583	-0.00655	0.057319	1.468749
20	0.001339	-0.02183	0.005992	0.008117	0.007991	0.004167	0.000718	-0.00695	0.016659	0.012631	0.000684	0.019653	0.029974	-0.01018	-0.00243	-0.00702	0.013817	-0.00511	-0.03494	-0.01874	-0.02658	-0.00748	-0.02478	-0.11848	-0.00441	-0.13834	-0.30552
21	0.067317	-0.04765	0.053091	0.040888	0.03849	-0.00789	0.081221	0.011566	-0.00655	-0.01512	0.112625	0.049231	-0.00705	0.156879	-0.01361	-0.04605	0.176069	-0.24667	-0.1464	-0.02088	-0.02742	0.002419	0.046974	0.009897	-0.03679	-0.00902	0.215572
22	0.02266	0.013209	0.010427	-0.01382	0.000105	-0.00134	-0.00623	-0.00715	0.018888	0.019086	0.007984	0.014274	0.003986	0.018375	0.000128	-0.01772	0.007498	-0.00528	-0.02229	0.001492	-0.05142	0.233701	0.043633	0.011551	0.022263	0.009129	0.333134
23	0.004603	0.000863	0.008654	0.006782	0.021671	0.020951	0.006762	0.028724	0.008204	0.008899	0.005632	0.008791	0.019164	0.007088	0.012699	-0.00256	0.007641	-0.01788	0.007181	0.020989	0.007748	0.028711	0.03356	0.095183	0.0301	0.016203	0.396358
24	0.003021	-0.01778	-0.0067	-0.02364	-0.01169	-0.02405	-0.02225	-0.0559	-0.0286	-0.0182	0.000509	-0.00448	-0.02807	-0.00908	-0.0283	-0.02327	0.002342	-0.06434	0.015835	-0.0026	-0.03438	-0.04367	0.083114	0.074306	-0.04499	0.018898	-0.29396
25	0.023492	-0.00341	0.019713	-0.08016	-0.03611	0.022292	0.017481	-0.04519	-0.00501	-0.05803	0.015772	0.042727	-0.01227	0.016203	-0.01462	-0.01788	0.024753	-0.0615	0.174042	0.006407	0.032283	0.201597	0.078011	0.031032	0.094039	0.091033	0.556701
26	0.00108	-0.00139	-0.0019	-0.00472	-0.00243	-0.00705	-0.00254	-0.0102	-0.008	-0.0059	0.000762	0.001128	-0.0065	-0.00184	-0.0079	-0.00672	0.000123	-0.01196	0.007426	-0.0077	-0.02836	-0.01048	0.004434	0.004867	-0.0091	0.040098	-0.07476
SUM	0.711815	-0.2768	1.287641	0.593826	0.179017	-0.0405	0.654134	-0.33953	0.59438	0.803864	0.457149	-0.2155	0.366834	-0.45154	-0.10101	-0.28123	1.071081	-1.15945	-0.29134	-0.19379	-0.31605	0.64679	0.544585	0.165128	-0.00718	0.153035	4.555369

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	28	29	SUM
1	3.461541	0.092314	0.134403	0.417388	-0.16654	3.051272	-0.00931	3.001374	1.307474	0.771761	0.562253	-7.72262	0.197155	-0.0538	0.2743	0.39495	-0.28315	-0.04998	0.223568	-0.38436	0.550855	-0.39864	0.285171	0.234752	-2.78822	0.167824	3.271729
2	0.134495	0.110308	0.288588	0.188561	0.293843	0.389477	0.498877	0.24841	0.382611	1.057467	0.715607	0.446273	-0.0375	-11.4476	-1.47077	-0.37	0.971176	-0.35305	0.357508	-1.93937	0.030435	0.798832	0.116209	0.102948	0.349026	0.204412	-7.93319
3	0.777627	0.278408	7.621118	0.58798	2.647282	0.321617	0.377174	0.394235	0.352728	1.739176	0.660584	0.252578	0.353239	0.276248	0.241842	0.465726	0.255216	0.15959	0.27155	0.355184	0.281556	0.009377	0.243916	0.214299	-1.35978	0.296135	18.07461
4	0.009031	0.005212	0.023903	6.184849	0.00533	0.005657	0.002963	-0.00407	0.000394	-0.00036	0.024399	0.012176	0.001235	0.005148	0.000703	0.011053	0.010198	-0.00428	0.008342	0.013666	0.005546	-0.00018	0.024731	0.016442	-0.19694	0.011714	6.176869
5	0.016613	0.028852	0.034027	1.331821	5.287427	0.026855	0.022797	0.025266	0.026825	0.01413	0.05155	0.029605	0.020375	0.025849	0.022957	0.037733	0.021478	0.032413	0.022309	0.027682	0.034422	0.015811	0.01344	0.013942	0.032634	0.03252	7.249331
6	0.040863	0.057816	-0.02935	-0.02004	0.100408	-2.81491	0.067794	-0.04596	0.701599	0.02548	0.12683	0.086776	-0.03238	0.057841	0.012373	0.059117	0.22245	-1.27398	0.022872	0.080782	0.080692	-0.02772	-0.01954	0.042957	-0.0233	0.052367	-2.44815
7	-0.00268	-0.00976	0.01148	-0.10216	0.050991	0.003326	-0.20774	-1.12541	0.309961	-0.12298	0.071102	-0.01865	-0.09016	-0.02501	-0.02403	0.055456	-0.02143	-0.39306	0.052416	-1.41187	-0.01309	0.053707	-0.04484	-0.01548	-0.06088	0.037335	-3.04346
8	0.005804	0.008905	0.010113	0.009597	0.019804	0.008689	0.054816	-0.41394	0.163273	0.007567	0.014016	0.009939	0.009393	0.007483	0.004525	-0.02084	0.008402	0.024872	0.012962	0.434865	0.016082	0.005039	0.007388	0.02263	-0.00615	0.032808	0.458043
9	0.070821	0.002408	0.19122	0.381807	1.553611	0.067578	0.1626	0.220659	6.417402	-0.35414	0.271962	0.271342	0.140457	0.115147	0.013735	0.000255	0.216678	-0.04296	-0.07258	-0.01332	-1.06123	0.12244	0.06448	0.090435	-0.026	0.403313	9.208121
10	0.664868	0.294683	0.610251	0.607079	0.420405	1.158591	0.152152	-0.70638	0.535703	2.265688	1.408526	0.524572	1.941375	0.419857	0.687823	0.605026	0.629885	0.966519	0.504066	0.221143	0.351133	0.241307	0.10866	0.155136	-0.08973	0.487697	15.16604
11	0.452965	0.848593	1.218207	0.89935	0.759488	1.25427	2.124136	2.268218	0.73895	4.974767	2.096044	1.628482	2.796778	3.027612	1.846361	0.476134	1.189255	0.99983	0.316388	1.746582	0.052365	3.163724	0.612881	0.604822	1.804812	0.799837	38.70085
12	0.072911	0.054023	0.11462	0.105532	0.114444	0.576902	0.063704	-0.07692	0.160507	0.116363	0.187407	14.75073	0.203499	0.043482	0.348617	0.1398	-0.03896	0.12211	0.062227	0.061654	0.050324	-0.01007	0.042108	0.080835	-0.0251	0.115501	17.43625
13	0.084083	0.126268	0.114089	-0.51705	0.066769	0.663141	0.078506	-0.27181	0.576341	-0.24182	0.380037	0.188753	3.968334	0.147366	0.56698	0.11181	0.189841	-0.09325	0.19764	1.734442	-0.21737	0.203003	-0.00767	0.178206	-0.02885	0.322505	8.520297
14	0.046998	-0.03297	0.018291	0.166069	0.130476	0.080543	0.02004	-0.1768	0.374999	0.088177	0.111822	0.076506	0.337159	6.662959	0.681531	-0.33063	1.897401	-0.32034	0.082661	-1.21227	0.033877	0.108307	-0.01081	0.008754	-0.04247	0.078803	8.879084
15	0.084413	0.15019	-0.17742	0.844226	0.263086	0.231453	0.113367	0.269556	0.342016	0.090128	0.144633	0.184889	0.545998	1.70032	5.273608	0.857048	1.810059	3.476975	0.464277	0.704397	0.075934	0.137224	0.014469	0.100416	0.040825	0.259232	18.00132
16	1.052032	0.977901	1.462373	1.125117	1.565427	1.100674	0.886725	1.023922	1.224535	0.965347	2.018231	1.461105	1.132381	0.886455	0.826699	5.466739	3.900879	1.325188	0.751052	1.457043	1.173148	0.534716	0.066245	0.475163	0.353863	0.995521	34.20848
17	0.28904	0.149855	0.267429	0.175425	0.225758	0.207282	0.171041	0.171394	0.220222	0.151053	0.318397	0.321325	0.155922	0.147515	0.195735	0.281484	4.67821	0.407934	0.14111	0.271047	0.241022	-0.24684	0.094561	0.125667	-0.00546	0.282862	9.438986
18	0.25764	0.027557	0.134378	0.018601	0.032573	0.04828	0.113636	0.005723	0.042215	0.024967	0.060671	0.168554	0.028121	0.030005	0.062675	0.054167	0.143547	-6.81474	0.050906	0.039637	0.018046	0.074978	0.005585	0.002779	0.016101	0.154952	-5.19845
19	0.411449	-0.37675	0.508264	0.278593	0.373133	0.914622	1.052259	0.951125	0.578825	0.494428	0.365536	0.88521	0.405603	2.645515	2.339909	0.213294	0.895077	0.884368	8.105799	0.560143	0.2734	0.492586	0.848182	0.531265	0.829713	0.920749	26.3823
20	-0.01245	0.234825	6.29E-05	-0.03524	0.077782	0.004445	0.006407	-0.04208	-0.04657	-0.00588	0.132955	-0.01759	-0.02342	0.172081	0.015458	0.435027	0.076899	-0.10727	0.711046	-0.0556	-0.26515	0.925053	0.113624	0.358981	-0.01272	1.071892	3.712578
21	0.528443	0.738545	0.45168	0.029174	1.005751	-0.9299	0.363237	-1.0366	-0.70997	-0.93872	2.47304	0.536085	-0.48235	0.606487	-0.80322	-0.66936	1.095559	-3.6834	-0.99437	-0.99097	1.14251	-0.14842	0.379143	0.879647	-0.82823	1.126383	-0.85982
22	0.6123	0.375694	0.687281	0.541943	0.271185	1.12323	1.058692	1.39696	1.001113	0.890358	1.034417	0.939298	1.265884	0.694652	0.906446	0.69365	0.761065	0.71374	0.453613	1.27878	0.811046	9.20355	0.755923	1.975424	0.877211	1.569692	31.89315
23	0.142188	0.160666	0.343538	0.206252	0.440464	0.278345	0.320549	0.274489	0.115668	0.18937	0.31323	0.267765	0.237836	0.23949	0.229477	0.192419	0.287444	0.0482	0.223714	0.674792	0.355832	3.126061	2.370194	0.589582	0.833965	0.521087	12.98262
24	0.39633	-0.05194	0.29507	0.078593	0.638075	0.34451	0.394541	0.155391	0.24515	0.72411	0.200128	0.445828	0.123956	2.284225	0.478362	0.062525	0.327468	0.031156	0.086087	0.54094	-0.0154	1.751873	5.747953	5.28508	0.970643	0.761026	22.30168
25	0.209253	0.023819	0.070766	-0.54689	-0.10344	0.118907	-0.04096	-0.41688	-0.17182	-0.52105	0.538364	0.270288	-0.01221	-0.01811	-0.08868	0.021687	0.488992	-0.58474	0.568477	1.200133	0.862973	0.074201	2.321885	1.416301	7.629752	1.532817	14.84382
26	0.014184	0.02565	2.96E-05	-0.0017	0.292841	-0.02926	0.004492	-0.0482	-0.01346	-0.01417	0.047993	0.008749	-0.0093	0.005099	-0.02983	-0.01058	0.04978	-0.04733	0.121356	0.092527	-0.07437	0.123716	1.532485	0.220083	0.225837	2.260197	4.746824
SUM	9.820761	4.301071	14.40441	12.95488	16.36637	8.205605	7.852493	6.041674	14.87669	12.39122	14.32974	16.00798	13.17737	8.656352	12.61357	9.233689	19.78342	-4.57549	12.74499	5.487676	4.794598	20.33363	15.68637	13.71107	8.470562	14.49918	292.1699

Appendix Table 11
Synergetic or Second Round Effects, Thailand
1985

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.145028	0.006605	0.009609	0.026981	-0.00095	0.015613	-0.11339	-0.00288	0.014101	0.059877	-0.00322	0.348992	-0.00309	0.000689	0.00169	0.014358	0.012072	-0.00451	0.002343	-0.00053	0.072767	0.007762	-0.00197	0.001193	0.008661	0.085271	0.703067
2	0.000704	0.059276	0.000776	0.008376	9.02E-05	0.093918	0.005853	0.007706	0.001435	0.0124	6.46E-05	0.0026	0.000615	0.000435	0.000515	0.000864	0.004494	-4.5E-06	0.000664	0.000357	0.015602	0.000589	-4.4E-05	0.000164	0.001474	0.026353	0.245279
3	-0.00178	0.00097	-0.01426	0.003237	-0.011	0.003203	-0.0002	-0.0017	-0.00667	-0.02084	-0.00744	0.00384	-0.01667	-0.00558	-0.00549	-0.00575	-0.21881	-0.00616	-0.03907	-0.00569	-0.01472	-0.00332	-0.01119	-0.01049	-0.00183	-0.0041	-0.40152
4	4.96E-05	-0.01679	0.000371	0.029878	-0.00108	-0.01888	-0.00213	1.82E-05	-0.00255	0.005167	-0.00139	0.000118	-0.00238	-0.00125	-0.0012	-0.00142	-0.00024	-0.00158	-0.00205	-0.00195	-0.01191	-0.01448	-0.00209	-0.00025	0.001437	-0.00707	-0.05366
5	0.017554	0.026383	0.022226	0.137674	0.17231	0.03007	0.022866	0.013183	0.03196	0.010911	0.178986	0.040176	0.091854	0.12343	0.05266	0.048753	0.042653	0.123424	0.052628	0.01074	0.035543	0.110941	0.011637	0.01264	0.012436	0.023139	1.456778
6	0.005516	-0.02294	0.00593	0.034255	-0.00306	0.080152	0.003931	0.013109	-0.00679	0.115985	-0.00536	0.019765	-0.00197	0.001272	0.000253	0.002366	0.016212	-0.00486	0.001009	-0.00545	0.100613	-0.00127	-0.00482	0.000648	0.008236	0.067875	0.420611
7	0.00032	-0.00022	0.001828	0.000726	-0.00102	-0.00147	-0.12342	-0.00222	-0.00306	-0.0033	-0.00189	-0.00187	-0.00204	-0.00227	-0.0011	-0.00169	0.00128	-0.00234	-0.00092	-0.00374	-0.06596	0.004321	-0.00326	0.000286	-0.00126	0.091683	-0.1226
8	0.001963	0.009033	0.013182	0.102716	-0.00599	0.011591	-0.0041	-0.15333	-0.00364	0.033297	-0.01016	-0.10519	-0.02429	-0.00529	-0.00239	-0.0405	0.015937	-0.01342	-0.00464	0.000379	-0.00461	-0.01151	-0.00926	0.004637	-0.00536	-0.11416	-0.32511
9	0.003275	0.005231	0.002906	0.003559	0.000385	0.008087	0.026242	-0.00165	0.006047	0.028095	-0.00106	0.014683	-0.00467	-0.00571	-0.00222	0.004684	0.007495	-0.0067	-0.00374	-0.02427	-0.00114	-0.00098	-0.01046	0.000876	0.026198	-0.00202	0.073137
10	0.064247	0.04471	0.008458	0.023679	-0.00508	0.0356	0.000782	-0.00048	-0.00976	0.020488	-0.03139	0.019438	-0.06631	-0.02413	-0.02026	-0.00849	0.022149	-0.05032	-0.02367	-0.0009	0.006172	0.003944	-0.01195	0.000276	0.004307	0.107289	0.108796
11	0.02336	0.035745	0.034561	0.243509	0.036683	0.040286	0.019932	-0.01071	0.011205	-0.01592	0.005107	0.056451	0.044221	0.030162	0.01899	0.020078	0.020182	-0.34747	0.041709	0.012783	0.051009	0.132397	0.00975	0.022472	0.0129	-0.0246	0.52479
12	0.002417	0.00555	0.003577	0.009863	-0.00363	0.003592	-0.00085	-0.00774	-0.01522	0.005701	-0.00929	0.016325	-0.01686	-0.01435	-0.01612	-0.14871	0.00217	-0.02728	-0.01604	-0.00016	-0.00149	0.006478	-0.00421	-0.001	-0.0053	0.006997	-0.2256
13	0.000996	0.001502	0.007554	0.001838	-0.00015	0.001127	0.008281	-0.00272	-0.0012	-0.02262	-0.00138	-0.00313	0.075952	-0.00085	-0.00032	-0.0021	-0.0005	-0.00298	0.156694	-0.00103	0.002044	-0.00053	-0.00117	0.007259	-0.00343	-0.00604	0.213099
14	0.002756	0.005741	0.008745	0.021772	-0.00474	0.006845	0.006302	-0.00814	0.003254	-0.00147	-0.01678	-0.00594	0.014414	0.124367	-0.08587	0.081151	-0.00055	-0.02639	-0.04383	-0.00633	-0.00326	0.006455	-0.01125	-0.01147	-0.00273	-0.03704	0.015984
15	0.001613	0.004863	0.004461	0.006985	-0.00624	0.006187	0.000976	-0.0045	0.006809	0.000479	-0.01293	-0.00215	-0.00421	-0.00256	-0.02474	0.018991	0.000715	-0.0102	-0.03783	-0.00547	-0.00571	-0.00189	-0.00819	-0.00215	-0.00236	-0.01168	-0.09073
16	0.008313	0.018312	0.034095	0.066414	0.009532	0.013362	-0.01132	-0.01972	-0.04557	0.007943	-0.02147	0.000681	-0.07541	-0.05696	-0.03479	-0.16981	0.012713	-0.13426	-0.03947	-0.00435	0.0062	0.002131	-0.00922	0.00297	-0.01145	-0.14035	-0.59147
17	-0.00135	0.002163	0.007996	-0.00326	0.000411	-0.00102	-0.00193	0.012438	-0.00814	-0.00326	-0.00307	-0.00205	-0.00736	-0.00525	-0.00332	0.003518	0.158828	-0.00684	-0.02352	-0.00566	-0.00248	0.000158	-0.02027	-0.00853	0.005716	0.030414	0.11432
18	0.006723	0.028025	0.006877	0.028416	0.022141	0.021782	-0.00032	0.025353	0.009756	0.011097	0.056538	0.036033	0.061568	0.028918	0.011151	0.029914	0.024883	0.256673	0.02138	0.017301	0.03139	0.021575	0.017024	0.027471	0.02231	0.007612	0.831586
19	-0.00199	-0.00995	-0.00154	0.002394	-0.01117	-0.00745	-0.00827	-0.01836	-0.02548	-0.02797	-0.01416	-0.01038	-0.02703	-0.01557	-0.01276	-0.01523	-0.00953	-0.01655	-0.00757	-0.00591	-0.00368	-0.01276	-0.01274	-0.04421	-0.00785	-0.03183	-0.35754
20	0.009422	0.059709	0.010276	0.025473	-0.01307	0.001788	-0.03246	-0.01578	-0.07606	-0.01144	-0.02476	-0.00015	-0.0794	-0.05368	-0.06693	-0.10893	-0.0016	-0.11212	-0.05515	-0.01809	-0.02289	-0.04255	-0.02222	-0.00484	-0.00344	-0.05389	-0.71279
21	0.000124	-0.00046	0.007334	0.002943	-0.01208	-0.00509	-0.01339	-0.01483	-0.02967	-0.03041	-0.01584	-0.01449	-0.02266	-0.01582	-0.01309	-0.01517	0.003462	-0.0192	-0.01124	-0.02082	-0.01256	0.001285	-0.02759	-0.00104	-0.00888	-0.11389	-0.4031
22	0.00022	0.022535	0.009202	0.025477	0.008034	0.016758	0.026684	0.011545	0.020985	0.020053	-0.00422	0.033743	-0.01348	-0.01356	0.008098	0.015909	0.028211	-0.01591	0.062502	0.01119	0.020876	0.004842	-0.01177	0.005727	0.003456	0.031052	0.328156
23	0.005082	0.019326	0.019482	0.019897	-0.00224	0.022636	0.006096	0.011521	0.032074	0.018715	-0.00555	0.031338	0.023425	0.026937	0.040563	0.046846	0.028411	-0.01392	0.035782	0.080487	0.018229	0.008427	-0.00022	0.008531	0.004528	0.039665	0.526064
24	-1E-05	0.000151	0.000238	0.000472	0.001539	-3.7E-06	0.000343	0.000374	0.001283	0.001178	0.000366	0.00118	-0.00246	0.000603	0.001449	0.000766	0.000685	-0.00357	0.000407	0.00046	0.002261	8.37E-05	-0.00134	0.022196	-0.00119	0.00403	0.031483
25	0.003588	0.005719	0.007629	0.011439	0.087949	0.005845	0.014743	-0.01171	0.00564	0.006039	0.044117	0.010435	0.010197	0.019407	0.012449	0.022145	0.012256	0.015525	0.017785	-0.00148	-0.0051	0.009595	0.00147	0.002261	0.012371	0.01351	0.333823
26	-0.00355	-0.00355	0.010125	-0.00153	-0.01667	-0.00595	-0.01105	-0.00993	-0.01951	-0.02499	-0.01772	-0.00949	-0.03249	-0.01042	-0.01641	-0.01885	-0.00774	-0.02008	-0.01384	-0.02121	-0.00905	-0.01542	-0.01838	-0.00171	-0.00746	-0.01191	-0.31878
SUM	0.294588	0.307634	0.22164	0.833181	0.240875	0.378574	-0.17981	-0.19117	-0.10876	0.195195	0.076128	0.480974	-0.08055	0.122977	-0.1592	-0.22632	0.175833	-0.45103	0.070329	0.000647	0.198156	0.216258	-0.16374	0.033918	0.061468	-0.02371	2.324077

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1995

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	28	29	SUM
1	0.170462	-0.11183	0.004181	0.081448	-0.0149	-0.52018	-0.45407	-0.26793	-0.03385	-0.01498	-0.0324	0.218458	-0.04787	-0.01282	-0.01675	-0.05039	-0.01228	-0.03997	-0.01834	-0.02788	0.034177	-0.00568	-0.02426	-0.00185	0.005734	-0.6967	-1.89048
2	0.001536	0.193154	0.000843	0.033414	-0.00043	0.26122	0.021027	0.012789	0.007098	0.02336	-0.00132	0.006158	7.28E-05	0.000809	0.000534	0.001208	0.012411	-0.00136	0.000708	-0.00043	0.036645	0.000809	-0.00062	0.000113	0.003048	0.001012	0.613806
3	-0.0073	-0.00586	-0.15212	-0.01177	-0.0279	0.000206	-0.0032	0.018368	-0.02581	-0.05856	-0.02137	0.00759	-0.04879	-0.01752	-0.02423	-0.02636	-0.82295	-0.01553	-0.11675	-0.01502	-0.05052	-0.00808	-0.03333	-0.03287	-0.00307	-0.002	-1.50477
4	0.000635	0.029618	0.001051	0.049405	-0.00112	0.112479	0.00872	0.002694	0.001272	0.006241	-0.0025	0.001802	-0.00214	-0.00069	-0.00084	-0.00078	0.004849	-0.00259	-0.00062	-0.00231	0.029194	0.000722	-0.00213	-0.00016	0.002469	-0.03224	0.203032
5	0.029002	0.046486	0.006947	0.187954	0.155246	0.064171	0.047688	0.02181	0.042391	0.052253	0.182678	-0.10164	0.51947	-0.30819	-0.15538	-0.04556	0.047931	0.418634	0.045768	0.019279	0.067378	-0.03063	-0.00022	-0.00929	0.029823	0.060891	1.394878
6	0.004169	0.345646	-0.002	0.248197	-0.02022	0.518517	0.083886	0.026363	0.01011	0.032509	-0.0347	0.018182	-0.03446	-0.00915	-0.01926	-0.01516	0.023685	-0.03458	-0.01667	-0.02715	0.303398	-0.01307	-0.02037	-0.0012	0.013857	-0.81923	0.561305
7	-4E-05	-0.00126	0.005554	-0.00026	-0.00565	-0.00502	-0.2356	-0.00719	-0.01438	-0.01718	-0.01156	-0.00647	-0.01341	-0.00829	-0.00612	-0.00905	0.000274	-0.01159	-0.0071	-0.01825	-0.18974	-0.00011	-0.01444	-0.00282	-0.00424	-0.02202	-0.60594
8	0.006249	-0.00293	0.017226	-0.02984	-0.00647	-0.02764	-0.00095	-0.36334	-0.02092	0.242386	-0.02371	-0.24746	-0.09117	-0.0004	0.010687	-0.08732	0.065459	-0.03486	-0.01448	-0.02855	-0.00741	-0.04255	-0.02271	0.00194	-0.0042	-0.36918	-1.08215
9	0.013778	0.034208	0.01078	0.014379	0.013248	0.060982	0.076225	0.061599	1.001407	0.015767	0.00085	0.045173	0.024619	0.025392	0.045833	0.040417	0.076934	0.005602	0.010584	-0.02739	0.017379	0.031396	0.00412	0.016649	0.146253	0.042538	1.808719
10	0.256292	0.155457	0.045094	0.078015	0.040924	0.166453	0.153405	0.412252	0.07821	0.654317	-0.01262	0.824175	-0.02631	0.101104	0.140366	0.18867	0.295096	-0.09819	0.02889	0.029462	0.072834	0.065331	0.012303	0.003017	0.115228	0.563402	4.343173
11	0.030536	0.050677	-0.01582	0.355671	0.097965	0.070697	0.00702	-0.07502	-0.15898	-0.02108	-0.11396	-0.31186	0.024411	0.048953	0.004484	-0.10936	-0.01744	-1.02903	-0.06197	0.014942	0.078556	-0.21277	-0.03879	-0.00692	0.024885	-0.19288	-1.5571
12	0.014981	0.042787	0.022602	0.124369	0.025185	0.059091	0.047242	0.03451	-0.00231	0.030769	-0.00375	0.162876	0.001601	-0.00356	0.012478	-0.25205	0.104365	-0.04529	0.021629	0.03005	0.023477	0.068453	0.007717	-0.00194	0.005174	0.622064	1.152529
13	0.004497	0.007123	0.025231	0.000685	0.004891	0.012049	0.0086	0.002351	-0.00207	-0.04556	-0.00161	0.005278	0.230087	0.04268	0.020282	0.027075	0.017776	-0.00786	0.349124	-0.00188	-0.00431	0.004058	-0.00196	-0.00237	-0.00714	0.029995	0.71702
14	0.031442	0.052955	0.097132	0.02766	0.053758	0.089819	0.113176	0.025571	0.035186	0.033778	-0.00793	0.013338	0.387573	2.067711	0.812879	0.33691	0.387499	-0.04319	0.17179	0.007799	0.033711	0.069332	0.000321	-0.05518	0.022824	0.345244	5.11111
15	0.020664	0.037533	0.070238	0.004068	0.00389	0.073887	0.105145	0.003771	0.016979	0.0054	-0.02657	-0.00347	0.004616	0.023451	-4.4E-05	0.054917	0.027639	-0.0214	-0.06525	-0.01021	0.011114	0.000295	-0.01721	-0.01851	0.001883	0.033159	0.335999
16	0.050978	0.103527	0.181132	0.131011	0.317532	0.12234	0.063302	0.07918	0.045968	0.112881	0.090967	0.056775	0.069895	0.124922	0.107707	1.602513	0.127804	-0.19186	0.230953	0.040613	0.080937	0.397712	0.05908	0.00159	0.056192	0.379589	4.443238
17	0.002423	0.015948	0.025501	-0.01311	0.012555	0.010474	0.004157	0.130802	-0.0042	0.008821	-0.00233	0.017466	-0.00924	0.003653	0.013553	0.00161	0.874941	-0.00769	-0.04466	0.006992	0.003465	0.022769	-0.04087	-0.0211	0.036321	0.181513	1.229755
18	0.021072	0.07542	0.017761	0.030552	0.08284	0.078067	0.008849	0.142682	0.010088	0.163617	-0.09675	0.142619	0.194664	0.273727	0.154635	0.085119	0.072631	0.357404	0.065634	0.063383	0.190019	0.00816	0.010557	0.051007	0.085951	-0.04602	2.243691
19	-0.00524	-0.02769	-0.00932	0.001673	-0.0215	-0.01764	-0.02308	-0.04388	-0.07704	-0.07968	-0.03936	-0.02907	-0.0616	-0.03489	-0.02649	-0.03498	-0.01974	-0.03663	-0.01601	-0.01252	-0.00727	-0.03575	-0.03522	-0.24461	-0.01904	-0.05971	-1.01629
20	0.061156	0.300377	0.04472	0.061766	0.02232	0.170082	-0.0191	0.103392	0.068	0.132949	-0.0345	0.151476	-0.12593	-0.0496	-0.05592	-0.07644	0.217423	-0.28353	-0.04193	-0.01674	0.0474	-0.07153	-0.0222	-0.0195	0.075973	0.145772	0.785887
21	0.000728	0.001888	0.037749	0.000158	-0.03179	-0.00989	-0.03548	-0.03579	-0.0788	-0.09538	-0.06488	-0.03231	-0.07411	-0.04258	-0.0313	-0.04639	0.010421	-0.06621	-0.03516	-0.08754	-0.03901	-0.02157	-0.08041	-0.01293	-0.01978	-0.51484	-1.40522
22	-0.0032	0.016529	0.028293	0.021395	0.119998	0.019498	0.04767	0.017593	-0.00755	0.005905	0.019694	0.035831	-0.09013	-0.01894	0.012824	-0.0041	0.046923	-0.05181	-0.031	0.059126	0.020133	0.206963	-0.00356	-0.00396	0.027954	0.03082	0.522892
23	0.101729	0.166752	0.068698	0.167458	0.09317	0.217413	0.124779	0.256312	0.292394	0.324984	0.045515	0.288831	0.274846	0.237775	0.345897	0.285674	0.245242	0.182424	0.230366	0.476579	0.190281	0.16525	0.349912	0.607926	0.058448	0.833021	6.631679
24	0.001911	0.005434	0.001754	0.003689	0.011048	0.005949	0.007909	0.016386	0.012379	0.015604	0.005401	0.012692	0.006119	0.009781	0.015028	0.016792	0.014053	-0.00521	0.012161	0.038424	0.021324	0.016152	0.022679	0.011786	0.001053	0.059359	0.339656
25	0.010818	0.02025	0.017406	0.042706	0.293176	0.027258	0.046222	0.017642	0.005961	-0.0549	0.129976	0.031697	0.054325	0.067335	0.056001	0.033703	0.045441	0.032536	0.031905	-0.02567	-0.00707	0.044682	0.010508	-0.00221	0.04051	0.081481	1.051687
26	-0.00701	-0.00233	-0.02092	-0.00576	-0.04208	-0.00582	-0.00168	-0.00373	-0.07197	-0.04745	-0.04907	-0.0156	-0.07604	-0.01934	-0.04617	-0.03538	-0.03117	-0.04702	-0.03139	-0.03118	-0.01564	-0.01479	-0.02738	-0.00017	-0.01405	-0.01081	-0.67395
SUM	0.812267	1.549879	0.529714	1.604933	1.175682	1.554461	0.201852	0.589178	1.129552	1.42677	-0.1058	1.29254	1.091098	2.501332	1.370698	1.881282	1.815212	-1.0788	0.69818	0.453926	0.940455	0.645547	0.091498	0.256433	0.682045	0.644235	23.75417

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.660595	0.088377	0.040453	0.424435	-0.02	-0.38481	-0.74009	-0.35896	0.015141	0.045246	-0.04346	0.412712	-0.01914	-0.0107	-0.00012	-0.01198	0.04178	-0.05737	0.020899	0.011802	0.782306	0.051434	0.008954	0.017348	0.086438	-0.85417	0.207117
2	0.008243	0.633949	0.002245	0.113152	0.000632	0.692429	0.058955	0.052469	0.022549	0.085328	0.000195	0.024963	0.009577	0.004036	0.004058	0.008472	0.045934	0.000358	0.00677	0.004646	0.128538	0.006376	0.003603	0.000883	0.01197	0.07014	2.00047
3	-5.3E-05	-0.01026	-0.30671	-0.01981	-0.06263	0.003351	0.002307	0.062224	-0.00593	-0.08221	-0.03817	0.018042	-0.0892	-0.0416	-0.04645	-0.04487	-1.73632	-0.03164	-0.26226	-0.03483	-0.08812	-0.01147	-0.05951	-0.07424	0.011626	-0.03273	-2.98146
4	0.006747	0.133168	0.002368	0.181342	0.002152	0.344947	0.031937	0.015329	0.015051	0.054022	0.000787	0.016363	0.011774	0.00535	0.004437	0.008932	0.018923	0.001669	0.012625	0.003884	0.184014	0.097628	0.004824	0.001186	0.011679	-0.01417	1.156963
5	0.233885	0.198151	0.079072	0.650172	0.530045	0.280016	0.258481	0.259589	0.159818	0.477316	1.491189	0.083759	1.074921	-0.57424	-0.11716	0.120042	0.315457	1.033355	0.731011	0.110524	0.29946	0.622013	0.091628	0.046771	0.171255	0.323581	8.950114
6	0.040543	1.016854	-0.00504	0.98544	-0.0392	1.729389	0.262032	0.075305	0.018226	0.028565	-0.06316	0.070341	-0.02098	-0.01962	-0.03728	-0.01218	0.030286	-0.06473	-0.01775	-0.01651	1.014649	0.00397	-0.01239	0.000795	0.066344	-1.49576	3.538139
7	0.003585	-0.0073	0.006935	0.001403	-0.01356	-0.01171	-0.28191	-0.01712	-0.03245	-0.04101	-0.02317	-0.01385	-0.02873	-0.02263	-0.02045	-0.0207	-0.00463	-0.02478	-0.0161	-0.03489	-0.32432	0.007147	-0.01939	-0.00815	-0.00462	-0.03137	-0.98377
8	0.044193	-0.00463	0.064964	0.016913	-0.02008	-0.03884	0.011912	0.630385	-0.08816	0.387207	-0.04701	-0.30442	-0.11479	-0.01785	-0.01436	-0.10328	0.240485	-0.07885	0.007114	-0.02375	0.07705	-0.04871	0.029593	0.001965	0.00652	-0.6505	-0.03693
9	0.069435	0.081257	0.023848	0.038712	0.024865	0.145564	0.296336	0.200881	3.286585	0.075953	0.009536	0.160855	0.131488	0.019072	0.07553	0.099017	0.172088	0.006261	0.054686	-0.02462	0.072166	0.070369	0.216961	0.014573	0.500663	0.208815	6.030893
10	1.444015	0.839292	0.165767	0.432411	0.114505	0.847771	1.003772	1.401075	1.314597	3.261265	-0.01273	3.423266	1.234003	0.42474	0.715139	0.950192	1.106472	-0.11776	0.573482	0.161035	0.50532	0.300811	0.154067	0.047181	0.933882	1.854383	23.07796
11	0.319275	0.210651	0.046561	1.011631	0.521624	0.321921	0.144175	0.144799	-0.19927	0.43466	0.087072	-0.23948	0.298868	0.128024	0.158504	0.018651	0.132011	-2.06705	0.315319	0.138552	0.391772	0.473829	0.050232	0.062771	0.202404	-0.13068	2.976827
12	0.115372	0.144326	0.060219	0.231053	0.052951	0.206698	0.139384	0.171596	0.10532	0.063528	0.013676	0.778242	0.091809	0.01383	0.135131	-0.11317	0.407577	-0.04856	0.185693	0.155959	0.113917	0.280365	0.054987	0.013059	0.070413	1.769518	5.212891
13	0.029844	0.025888	0.07373	0.010733	0.013045	0.033011	0.051184	0.022614	0.026562	-0.09252	0.004759	0.04283	0.570909	0.050615	0.013798	0.096235	0.104388	-0.01022	1.38579	0.004117	0.017738	0.028505	0.009574	0.034692	0.005149	0.201695	2.754663
14	0.139049	0.132036	0.24218	0.109503	0.040128	0.265212	0.729307	0.08528	0.03081	0.052578	-0.03633	0.083289	0.113081	0.922604	0.805121	0.49028	1.307341	-0.10731	-0.02046	0.024185	0.167129	0.223075	0.020177	-0.14754	0.075784	0.623414	6.369925
15	0.121014	0.131756	0.241806	0.032765	0.021839	0.26952	0.882387	0.059074	0.073582	0.060688	-0.02877	0.08504	0.058063	0.056577	0.089525	0.188332	0.157977	-0.01823	-0.07254	-0.00963	0.145913	0.053576	-0.01963	-0.03512	0.026937	0.21278	2.785231
16	0.249321	0.25774	0.372872	0.551298	0.484179	0.330707	0.221082	0.270556	0.112584	0.314839	0.234529	0.261405	0.299476	0.201512	0.214711	5.895076	0.367498	-0.09047	1.106238	0.190624	0.361865	1.606085	0.27129	0.081325	0.405761	1.576659	16.14876
17	0.020494	0.018273	0.109717	-0.02126	0.026028	0.017981	0.018179	0.338468	-0.02998	0.00928	0.00084	0.071001	0.000881	-0.00556	0.043223	0.040538	2.289335	-0.01407	-0.13022	0.000667	0.010375	0.048442	-0.04617	-0.06021	0.122798	0.317177	3.196216
18	0.107574	0.166193	0.047715	0.122846	0.131618	0.205114	0.103239	0.66878	0.080121	0.581182	-0.09031	0.560164	0.779587	0.565556	0.380481	0.361111	0.248616	1.373919	0.267145	0.212315	0.587052	0.159091	0.085362	0.231457	0.272727	0.0497	8.258357
19	0.002616	-0.07633	-0.03515	0.016004	-0.08072	-0.03891	-0.03938	-0.08459	-0.19365	-0.16682	-0.09236	-0.04501	-0.15044	-0.09892	-0.07696	-0.07038	-0.04836	-0.1006	-0.03373	-0.04333	-0.03356	-0.07027	-0.08014	-0.55207	-0.06381	-0.17208	-2.42895
20	-0.02938	-0.61584	-0.02604	-0.20399	-0.14887	-0.54919	-0.33548	-0.78945	-0.93641	-0.82472	-0.2687	-0.63149	-0.74799	-0.64081	-0.93153	-0.92392	-0.46757	-0.82215	-0.87959	-0.20421	-0.83432	-0.43091	-0.22741	-0.13405	-0.15405	-1.3095	-14.0676
21	0.020854	-0.03925	0.044502	0.002755	-0.08568	-0.04793	-0.07557	-0.1032	-0.20113	-0.24473	-0.14135	-0.08139	-0.17945	-0.13683	-0.12984	-0.12744	-0.02518	-0.15615	-0.10207	-0.21453	-0.11697	-0.0591	-0.187	-0.05019	-0.02627	-1.16111	-3.62425
22	0.021187	-0.11703	0.038542	0.001376	0.044201	-0.07787	-0.02491	-0.01895	-0.22357	-0.13624	-0.02605	-0.01767	-0.47875	-0.2046	-0.11621	-0.08428	0.065545	-0.18497	-0.04881	0.17535	0.003931	0.791585	0.067868	-0.03681	0.157169	0.056112	-0.37385
23	0.053005	0.046832	0.063595	0.066846	-0.01231	0.084684	0.025895	0.122949	0.075131	0.082392	-0.09158	0.101892	0.055692	0.066935	0.128609	0.093865	0.12303	0.096464	0.078917	0.155474	0.042567	0.052888	0.242579	0.331625	0.030942	0.350814	2.469736
24	0.015427	0.015843	0.003256	0.007691	0.018414	0.027903	0.015004	0.041491	0.017908	0.037939	0.008938	0.027256	0.005336	0.02884	0.027804	0.026282	0.02533	-0.01143	0.020971	0.0504	0.03444	0.018129	0.055703	0.019223	0.002595	0.096868	0.637558
25	0.052404	0.034203	0.034584	0.070306	0.675111	0.055548	0.089268	0.055429	0.028767	-0.12357	0.32567	0.103619	0.140883	0.166363	0.1009	0.066945	0.083713	0.08108	0.082613	-0.08102	-0.01311	0.150752	0.088092	0.022971	0.144944	0.110476	2.546941
26	0.019376	0.024767	-0.04009	0.081427	-0.08513	0.035939	0.036047	0.036976	-0.10773	-0.08342	-0.08419	-0.00553	-0.12749	-0.03506	-0.08743	-0.04441	-0.05118	-0.08189	-0.0403	-0.01413	-0.01421	-0.01395	-0.00425	0.014622	0.008117	0.243245	-0.41988
SUM	3.768622	3.328915	1.351896	4.915157	2.133171	4.748448	2.883544	3.342996	3.36447	4.256736	1.089855	4.986191	2.919388	0.845642	1.319176	6.907338	4.950533	-1.49513	3.225449	0.698102	3.515599	4.411659	0.799615	-0.15594	3.077364	2.213294	73.40209

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	28	29	SUM
1	0.067395	-0.2941	0.04676	0.181516	-0.02367	-0.62783	-0.5196	-0.36343	-0.0804	-0.07632	-0.03674	0.069603	-0.04334	-0.01367	-0.01844	-0.07545	-0.02838	-0.04164	-0.01097	-0.02979	0.073572	-0.02139	-0.02477	-0.00159	0.026797	-0.91614	-2.782
2	0.002691	0.322391	0.001096	0.046357	-0.00133	0.194903	0.019413	0.011417	8.17E-05	0.0129	-0.00216	0.005826	2.96E-05	0.000246	-0.0006	0.000248	0.004288	-0.00181	-0.00023	-0.00246	0.02517	-4.7E-05	-0.00189	-0.00028	0.003672	-0.03136	0.608557
3	-0.00133	-0.01249	-0.15643	-0.01092	-0.03526	-0.00305	-0.0014	0.037575	0.061707	-0.05201	-0.01882	0.004262	-0.05039	-0.01719	-0.02538	-0.02712	-0.99081	-0.01288	-0.16337	-0.01986	-0.05838	-0.00814	-0.03457	-0.04095	0.007874	-0.01241	-1.64173
4	0.003558	0.03005	0.002111	0.17759	-0.00011	0.062918	0.009432	0.006953	0.003159	0.037251	-0.00085	0.009268	0.003535	0.002509	0.001545	0.003072	0.003548	0.000204	0.004399	-0.00193	0.05191	0.030818	-0.0003	0.000126	0.004223	-0.04357	0.401414
5	0.138886	0.139405	0.071583	0.355849	0.392733	0.192554	0.166359	0.183501	0.13692	0.246412	1.210366	0.079172	0.691016	-0.07182	0.120823	0.170214	0.255907	0.9706	0.328719	0.081007	0.207242	0.427209	0.090309	0.044162	0.135154	0.316759	7.081043
6	0.0178	0.23822	0.00244	0.492981	-0.02256	0.916311	0.144379	0.016449	-0.04451	-0.03544	-0.03342	0.024336	-0.01872	-0.00779	-0.02066	-0.01322	-0.00048	-0.0292	-0.01163	-0.03099	0.322563	-0.01104	-0.02299	-0.00223	0.034638	-0.77413	1.131109
7	0.003046	-0.00256	0.009315	0.001126	-0.0076	-0.00521	-0.3757	-0.00926	-0.01559	-0.02522	-0.01307	-0.00641	-0.0155	-0.00963	-0.00878	-0.01121	0.000639	-0.01264	-0.00564	-0.02655	-0.32096	0.004011	-0.01817	-0.00529	-0.00299	0.028752	-0.8511
8	0.012994	-0.01204	0.019753	0.009702	-0.01894	-0.03208	-0.01085	-0.43032	-0.11244	0.01169	-0.03494	-0.37856	-0.10341	-0.00814	-0.0196	-0.13249	0.024542	-0.05498	-0.01851	-0.04551	-0.02223	-0.09013	-0.00578	-0.0016	-0.02263	-0.42308	-1.8996
9	0.032409	0.026956	0.015043	0.018382	0.007142	0.046303	-0.00107	0.016216	0.344603	-0.13135	-0.00444	0.027538	-0.05413	0.008277	0.013307	0.011578	0.032591	-0.01228	0.001343	-0.05816	0.001346	-0.00194	0.099014	0.005771	0.181699	0.061353	0.68751
10	0.606519	0.308687	0.068681	0.198953	0.037442	0.339712	0.344159	0.261544	0.366506	0.887398	-0.02085	1.404801	0.431526	0.172509	0.262048	0.299805	0.352979	-0.11417	0.202633	0.045896	0.185733	0.076951	0.016533	0.018993	0.3019	0.491854	7.548752
11	0.185174	0.166146	0.052948	0.479595	0.371931	0.24145	0.123641	0.127565	-0.06659	0.197088	0.130312	-0.08851	0.286307	0.303429	0.228948	0.067827	0.126801	-1.08621	0.265635	0.1028	0.276272	0.265651	0.086623	0.079794	0.186417	0.073411	3.184447
12	0.059229	0.065707	0.046256	0.101127	0.005901	0.102532	0.087488	0.093064	0.046352	-0.00855	-0.01097	0.176928	0.00996	0.00088	0.039638	-0.26401	0.150022	-0.052	0.068187	0.061341	0.04984	0.021327	0.015389	0.005087	0.022026	0.157546	1.050294
13	0.012135	0.0084	0.004359	0.005423	0.004305	0.0116	0.050808	0.002126	0.005553	-0.06831	0.000878	0.015453	0.273091	0.013936	-0.00046	0.033097	0.039145	-0.00749	0.612466	-0.00062	0.002372	0.007735	0.002832	0.010444	-0.00189	0.133651	1.171039
14	0.103753	0.092902	0.244876	0.07399	0.051833	0.168979	0.37116	0.077253	0.092223	0.076659	0.020929	0.095713	0.144819	1.884429	1.501924	0.819047	1.051665	0.023164	0.411223	0.031209	0.110836	0.131999	0.040034	-0.04293	0.069497	0.645957	8.293142
15	0.08362	0.064891	0.216811	0.017316	0.008299	0.128757	0.424486	0.028289	0.041388	0.038166	-0.01595	0.052479	0.034656	0.042402	0.064301	0.118478	0.108703	-0.00285	0.028048	-0.00471	0.069833	0.021746	-0.0077	-0.01346	0.015086	0.195045	1.758126
16	0.115795	0.143974	0.317451	0.280101	0.185713	0.193746	0.096604	0.148596	0.111842	0.156268	0.081578	0.15719	0.094455	0.111469	0.118759	2.085022	0.238618	-0.08918	0.537741	0.08981	0.206268	0.420809	0.146116	0.052428	0.215639	0.472334	6.689143
17	0.010735	0.008298	0.01419	-0.01162	0.012461	0.009984	0.006493	0.207273	-0.02253	0.001875	-0.00088	0.03292	-0.00058	0.008868	0.017403	0.010248	0.889696	-0.00594	-0.15363	-0.0073	0.007857	0.016412	-0.0431	-0.03697	0.073575	0.199351	1.245099
18	0.061813	0.127968	0.040224	0.071653	0.079567	0.197053	0.065591	0.476447	0.062522	0.317764	-0.09968	0.357191	0.42458	0.421386	0.290532	0.228958	0.179009	0.59456	0.211883	0.13494	0.43137	0.095338	0.083339	0.209356	0.167627	0.108046	5.339039
19	0.000959	-0.04215	-0.01567	0.010297	-0.0432	-0.0203	-0.02376	-0.05095	-0.12187	-0.10119	-0.04601	-0.02651	-0.07666	-0.04303	-0.03336	-0.03762	-0.02398	-0.04817	-0.01325	-0.02354	-0.01155	-0.03753	-0.03979	-0.29199	-0.03113	-0.09458	-1.28655
20	0.273587	0.176868	0.134824	0.192537	0.044565	0.228416	0.125989	0.142623	0.260184	0.072713	-0.01945	0.240956	-0.07134	0.011765	-0.08892	0.007561	0.333155	-0.26219	0.118555	-0.00893	0.051812	0.001082	0.062068	-0.00174	0.117154	0.10357	2.247408
21	0.020316	-0.0026	0.060933	0.008567	-0.04169	-0.00501	-0.03524	-0.0414	-0.07881	-0.12627	-0.06887	-0.02374	-0.08407	-0.04419	-0.04556	-0.05393	0.015475	-0.06958	-0.02341	-0.11782	-0.0433	-0.02477	-0.09094	-0.02143	-0.00652	-0.63677	-1.58064
22	0.109283	0.081903	0.091194	0.097917	0.058687	0.160438	0.1326	0.138706	0.147524	0.099842	0.034695	0.179014	0.01605	0.087781	0.1069	0.097981	0.186833	-0.00019	0.338717	0.169543	0.192341	0.735206	0.210169	0.028749	0.194936	0.54747	4.244288
23	0.088798	0.09513	0.046795	0.079329	0.005819	0.126848	0.060216	0.141532	0.106868	0.095491	-0.02946	0.122052	0.113266	0.16042	0.158857	0.109596	0.119875	0.126422	0.11804	0.1413	0.082922	0.104744	0.308566	0.269569	0.048204	0.184982	2.986179
24	0.011161	0.011268	0.003059	0.005783	0.015893	0.018636	0.011423	0.032457	0.022494	0.026968	0.009132	0.020172	0.010912	0.018434	0.026222	0.018972	0.022277	-0.0011	0.032438	0.034876	0.044724	0.032643	0.046109	0.020531	0.021837	0.102073	0.619389
25	0.035204	0.036836	0.031984	0.045716	0.378936	0.062071	0.102611	0.039816	0.140248	-0.03168	0.178748	0.077835	0.149557	0.120477	0.076661	0.05689	0.07056	0.062486	0.091519	-0.03468	0.044015	0.11343	0.084208	0.054977	0.221969	0.122035	2.332433
26	0.004821	0.010232	-0.02183	0.008268	-0.04727	0.00941	-0.00253	0.019518	-0.08148	-0.05985	-0.043	-0.0055	-0.06934	-0.01355	-0.0454	-0.02305	-0.0276	-0.01987	-0.02133	-0.02951	-0.0058	-0.02706	-0.03172	0.000788	-0.0055	0.013227	-0.5149
SUM	2.060345	1.790297	1.348765	2.937534	1.419584	2.719137	1.372705	1.313556	1.325975	1.5623	1.167074	2.623471	2.096284	3.140218	2.720712	3.500491	3.135075	-0.14694	2.949569	0.45035	1.975787	2.285072	0.969584	0.34031	1.979256	1.025377	48.06189

Appendix Table 12
Multiplier Product Matrix, Philippines
1979

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.00344	-0.0034	-0.0099	0.0049	0.00189	0.00371	-0.0021	0.01883	0.02234	0.00129	9.4E-05	-0.0024	0.0077	-0.0278	-0.0019	-0.0019	0.00052	-0.0007	-0.0004	-0.0009	-2E-05	0.0077	-8E-05	-0.0011	-0.0004	-0.0007	-0.0001	-0.0006	-0.0017	0.016261
2	0.00164	0.00634	0.00302	0.00368	0.00218	0.00473	0.0036	0.00427	0.00432	0.00868	0.00454	0.0041	0.00553	0.00477	0.01124	0.00787	0.02824	0.01228	0.00904	0.0054	0.00334	0.00321	0.00552	0.00235	0.01255	0.00201	0.03307	0.0006	0.00164	0.199768
3	0.00669	0.00051	0.01144	0.02195	0.00075	0.00323	0.00055	0.00272	0.00199	-0.0009	0.00037	0.00844	0.00344	0.01472	0.00049	0.00076	0.00036	0.0004	0.00037	0.00101	0.00038	0.00258	0.00052	-0.0005	-0.0002	-4E-05	3.2E-05	2.7E-05	0.00323	0.085229
4	-0.0001	-0.0002	-0.0002	0.00404	-2E-05	-0.0002	-0.0002	-0.0002	-8E-05	-0.0003	-0.0005	-0.0001	-0.0001	-0.0003	-0.0002	-0.0002	-0.0001	-0.0002	-0.0002	-0.0002	-0.0002	-0.0001	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003	-0.0024	-0.00395
5	-2E-05	-7E-07	-9E-06	-8E-07	0.0352	-5E-07	-1E-06	-3E-06	1.4E-06	-3E-07	-3E-07	-2E-06	-9E-07	-7E-06	-5E-07	-6E-07	-3E-07	-4E-07	-4E-07	-5E-07	-2E-07	-6E-07	-7E-07	-3E-07	-4E-07	-2E-07	-2E-07	-2E-07	-1E-06	0.035149
6	-0.001	-0.001	-0.0011	2.4E-05	0.00018	-0.0247	0.0077	0.00029	0.00447	0.00331	-0.0027	-0.0039	-0.0048	-0.0002	-0.0005	1.1E-05	-6E-05	-0.0022	-0.0003	-0.0003	-1E-04	0.00415	-0.0003	-0.0005	-0.0007	-0.0002	-0.0002	0.00013	0.00056	-0.02392
7	2.3E-07	-5E-07	-2E-07	-2E-07	6.3E-08	-5E-07	0.00609	-1E-07	2.1E-07	-4E-07	-2E-07	-2E-06	-1E-04	-4E-07	-4E-07	-1E-07	-4E-07	-5E-07	6.8E-08	-3E-06	-1E-06	-2E-07	1.7E-07	-4E-07	-5E-06	-3E-07	-1E-06	2.2E-07	5.8E-06	0.005982
8	-0.0001	-0.0007	-0.0002	-0.0012	-0.0008	-0.0004	-0.0008	-0.0004	0.0505	-0.0008	-9E-05	-0.0016	-0.0001	-6E-05	-0.0004	-0.0012	-0.0011	-0.0016	-0.005	0.00119	-0.0001	-0.0006	0.00302	-0.0002	-6E-05	1.5E-05	-6E-05	0.00025	2.1E-05	0.037315
9	3.1E-05	-1E-05	1.6E-05	2.5E-05	3.5E-06	4.1E-05	8.3E-05	0.00015	-0.0002	2.1E-06	-9E-06	3.9E-05	6.7E-06	6.4E-07	-1E-05	0.00048	-1E-06	1.4E-05	3.6E-05	-0.0013	-4E-06	-2E-05	0.00023	1.5E-05	-3E-05	-0.0001	-5E-06	-0.0001	-3E-05	-0.00069
10	0.00082	-0.0005	0.00056	-0.0019	0.0097	0.00076	-0.0005	-0.001	0.00054	0.01017	0.03429	-0.0003	-0.0006	-0.0014	-0.0004	-0.005	-0.0007	-0.0009	0.00017	-0.001	1.4E-05	-0.0013	-0.0013	0.00048	0.0002	0.00206	-0.0006	0.00053	0.00087	0.043785
11	5.1E-05	-0.0003	-0.0003	-0.0007	-0.0005	-0.0004	-0.0012	-0.0004	-0.0004	-0.0005	-0.0002	-0.0004	-0.0012	-0.0012	-0.0003	-0.0006	-0.0006	-0.0007	-0.0005	-0.0001	-0.0004	-0.002	-0.0002	2.4E-05	-0.0002	-0.0003	-0.001	0.00035	-0.001	-0.01511
12	4.8E-06	-2E-05	7.3E-06	2.2E-06	3E-06	0.00088	-0.0097	6.4E-05	0.00014	1.3E-06	0.00013	0.0169	0.00016	3.6E-06	-8E-06	-7E-07	-8E-06	1.6E-06	-1E-05	7.4E-06	1.5E-05	-3E-05	3.1E-06	2.4E-06	1.1E-05	2.7E-06	6.1E-06	9.7E-07	-1E-06	0.008584
13	-5E-05	-0.0003	-0.0003	-0.0003	-8E-05	-0.0004	-0.0059	-0.0009	0.00155	-0.0003	-0.0002	-0.0012	0.0052	-0.0005	-0.0004	-0.0001	-0.0003	-0.0004	0.00113	-0.0027	0.00275	-0.0002	0.00028	-0.0003	-0.0016	-0.0004	-0.001	-3E-05	-6E-05	-0.00691
14	0.00896	-0.0032	0.00114	-0.0046	0.00071	0.0056	0.00364	0.0049	0.00291	0.00804	0.01022	0.00245	0.02174	0.02311	-0.0015	-0.0003	0.0063	0.00369	0.00582	0.00167	0.00245	0.03832	0.00304	-0.0004	0.00126	0.0005	0.00253	-0.0004	0.00048	0.14913
15	0.00291	0.01145	0.00685	0.00804	0.00429	0.00907	0.00727	0.00786	0.00589	0.01753	0.00868	0.00859	0.01075	0.01021	0.00018	0.02234	0.01173	0.01138	0.00933	0.01044	0.00554	0.00731	0.00644	0.00475	0.02454	0.00397	0.06469	0.00087	0.00333	0.306212
16	0.00011	-0.0004	-0.0006	-0.0025	2.4E-05	4.6E-05	-0.0002	-0.0001	5.2E-05	-0.0003	-8E-05	-0.0004	3.4E-05	0.0002	-0.0005	-0.0012	-0.0006	-0.0006	-0.0006	-0.0017	-0.0004	-0.0041	-0.003	-0.0004	-0.0001	-0.0002	-0.0011	-0.0003	-0.0006	-0.01984
17	0.00021	-0.0021	0.00133	0.00124	0.0004	0.00067	0.00058	0.00177	-0.0011	0.00224	0.00106	0.00035	0.00119	0.00127	-0.0007	0.00162	0.04597	0.0383	0.02962	0.01354	0.02172	-0.0013	0.00856	0.00018	0.0018	0.00077	-0.0011	-0.0003	0.00044	0.16827
18	0.00012	-0.0053	-0.0009	-1E-05	0.00021	0.00027	-0.0004	-0.0002	-0.0032	0.00224	0.00028	-0.0015	0.00127	0.00047	-0.0038	-0.0013	-0.0068	-0.0018	-0.0135	0.0101	0.00046	-0.0022	-0.0036	-9E-05	4.3E-05	0.00037	-9E-05	-5E-05	-0.0002	-0.02893
19	0.00013	-0.0014	4E-05	0.00033	6E-05	5.3E-05	-0.0001	0.00017	-0.0002	0.00068	0.00039	5E-05	3.8E-05	2.4E-05	-0.0007	-5E-05	0.00028	3.7E-05	0.00224	3.5E-05	0.00035	-4E-05	0.00032	8.4E-05	0.00014	2E-05	0.00019	4.7E-05	5.2E-06	0.003236
20	3.5E-06	-0.0005	-7E-05	-7E-05	2E-05	-4E-05	-0.0001	-0.0001	-1E-04	0.00026	-4E-05	-0.0001	2.5E-05	-0.0002	-0.0003	-0.0002	-0.0001	0.00065	0.00265	0.00596	-0.0009	-0.0015	-0.0006	-0.0002	-0.0004	-0.0037	0.00067	-0.0001	-0.0002	0.000559
21	-6E-05	-0.0018	-0.0002	0.0012	0.00041	-0.0002	-0.0004	-0.0003	-0.0002	0.00114	-0.0001	-8E-05	-0.0003	-0.0003	-0.0012	-0.0003	-0.0002	-0.0003	-0.0004	0.00025	-0.0337	2.9E-05	-2E-05	-0.0006	-0.0007	-0.0005	-0.0004	-0.0003	-4E-05	-0.03948
22	0.00011	-0.0005	-0.0007	-0.0009	0.00011	0.00389	0.00108	9.5E-05	-0.0017	-0.0046	0.00039	-0.0046	0.00091	-0.0003	-0.0006	-0.0011	-0.0129	-0.0064	-0.0031	9.1E-05	0.0015	0.00116	-0.0017	-7E-05	2.3E-05	-0.0001	-0.0006	3.3E-05	-6E-06	-0.03044
23	2.5E-05	0.00078	-5E-05	-6E-05	4.1E-05	-0.0002	-0.0001	-8E-05	-0.0002	0.00047	3E-05	1.3E-05	-0.0002	-3E-05	-0.0014	-0.0006	-0.0003	-0.0003	-0.0006	4.1E-05	-0.0005	-0.0004	-0.0027	-0.0009	3.2E-05	-0.0002	-0.0002	-0.0042	0.00101	-0.01072
24	0.00587	-0.002	0.00579	0.00844	0.01694	0.00437	0.01249	0.0081	0.01107	0.00091	0.00452	0.02045	0.01163	0.01262	0.0061	0.00356	0.00233	0.00151	0.00496	0.00697	-0.0032	0.00922	-0.0014	0.00013	0.00947	0.00168	0.00638	0.00023	0.0007	0.169853
25	0.00103	-0.002	-0.0008	0.00105	0.00125	0.00139	0.00053	-0.0028	0.00135	0.00285	-0.0012	0.00055	0.00331	0.0003	-0.0004	0.00135	1.3E-05	-0.0009	0.00298	0.00212	0.00392	0.00294	7.8E-05	-0.0039	0.00116	-0.0038	-0.0011	-0.0007	-0.0007	0.009978
26	-1E-05	-0.0002	-0.0001	1.4E-05	5E-05	-5E-05	-0.0005	-0.0001	1.6E-05	-0.0007	-0.001	0.00029	-9E-05	-4E-05	-0.0002	-7E-05	-1E-04	-5E-05	0.00025	0.00054	-0.0004	0.00048	0.00018	-0.0002	-0.0003	0.00701	-0.0005	6.3E-05	0.00081	0.005091
27	0.00047	-0.0011	0.001	0.00116	0.00122	-0.0001	-0.0002	0.00046	-0.0006	0.00849	0.00424	0.00168	0.0003	0.00223	0.00024	-0.0009	0.00123	0.00121	0.00061	0.00253	0.0006	0.00187	0.00063	0.00212	-0.0002	-7E-05	-0.0198	0.00144	0.00218	0.012924
28	0.00022	-0.0019	-0.0013	8.3E-05	0.00135	-0.0011	-0.0007	-0.0007	0.00107	0.0002	0.00164	0.00162	0.002	0.00251	-0.0022	-0.0015	-6E-05	-0.0005	0.00082	0.00451	-0.004	0.00287	-0.0009	-0.0111	0.00065	0.00196	-0.0024	-0.002	0.02499	0.016177
29	-0.0016	-0.0032	-0.0028	-0.0018	0.00302	-0.0033	-0.005	-0.0024	0.00012	-0.0069	-0.0113	-0.0013	-0.0011	-0.0043	-0.0014	-0.0013	-0.0016	-0.0023	-0.0025	-0.0011	-0.0033	0.00052	-0.0067	-0.0074	-0.0037	-0.0052	-0.0072	-0.0052	-0.0033	-0.09351
SUM	0.02983	-0.0128	0.01172	0.04207	0.07868	0.00765	0.01531	0.04005	0.10054	0.05312	0.05351	0.04765	0.06662	0.03591	-0.0007	0.02015	0.07136	0.04966	0.0428	0.05705	-0.0042	0.06867	0.00592	-0.018	0.04298	0.00451	0.06986	-0.0099	0.02997	1

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1988

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.0020731	0.0015561	0.0187765	0.0053587	0.0054195	0.004993	0.003223	0.0109575	-0.001165	0.0016807	0.001679	0.0110769	0.0052234	0.0123859	0.0014497	0.0020558	0.0014652	0.0019659	0.002017	0.0017823	0.0014412	0.0037893	0.0029846	0.000608	0.0016026	0.0007239	-0.000406	0.0008619	0.0037543	0.1093341
2	0.0002616	-1.39E-05	0.0008296	0.0011596	0.0003337	0.0015867	-0.000657	0.0011968	0.0003022	0.0021408	0.0007238	0.0008457	0.0010974	0.0015892	0.0171628	0.0061247	-0.001185	0.0009421	0.0010405	0.0011835	0.0007009	0.0002456	0.002374	0.0002709	0.0004799	-0.000113	0.0023811	0.0001844	4.152E-05	0.0432302
3	0.0005719	0.0003333	0.0039774	0.0037446	0.0007885	0.0006713	0.0067396	0.0008644	0.000133	0.0010862	0.0008496	0.0105939	0.0005231	0.0004864	0.0004235	0.0006318	0.0005221	0.0006256	0.0005655	0.0005592	0.0005246	0.0006689	0.0007318	0.0004807	0.0010272	0.0004214	0.0004684	0.0004603	0.002644	0.0421182
4	4.681E-05	7.55E-05	7.712E-05	0.0002003	3.168E-05	0.0001089	2.708E-05	9.176E-05	5.822E-05	0.0001656	0.0001811	7.991E-05	0.0001037	0.0001561	9.723E-05	0.0001305	9.868E-05	0.0001148	0.0001087	0.0001252	0.0001151	9.755E-05	0.0001566	0.0001103	0.0001275	9.873E-05	0.0001115	0.0001149	0.0007566	0.0037676
5	5.654E-06	-6.28E-08	4.633E-06	5.301E-07	0.0073962	4.987E-07	2.544E-07	2.65E-06	-3.56E-08	-3.58E-07	-5.97E-07	1.691E-06	7.491E-07	1.99E-06	-1.53E-07	-2.07E-07	-9.45E-08	-6.61E-08	-5.02E-08	-2.82E-07	-2.01E-07	4.994E-07	-9.4E-08	-4.44E-07	-1.68E-07	-4.7E-07	-4.92E-07	-7.25E-07	-6.89E-06	0.007404
6	0.0004042	0.0003621	0.0008294	0.0002434	0.0001549	0.0282878	-0.066086	0.0003671	0.0002033	0.0005188	0.0014361	0.0024208	0.0017497	0.0002784	0.0003198	0.0002612	0.0001552	0.0010096	0.0003551	-4.77E-05	0.000437	-0.001383	0.0003492	0.0002018	0.0004526	0.0001238	0.0001872	-5.68E-05	-0.00011	-0.026575
7	-7.59E-06	-2.2E-05	-3.33E-05	-2.61E-05	-2.06E-05	-3.75E-05	-0.000423	-3.6E-05	-2.78E-05	-4.37E-05	-3.67E-05	-3.02E-05	-2.36E-05	-3.36E-05	-1.86E-05	-3.61E-05	-4.49E-05	-4.53E-05	-3.64E-05	-3.52E-05	-8.06E-05	-2.95E-05	-3.64E-05	-0.000288	-1.92E-05	-1.35E-05	-2.41E-05	-9.87E-06	-7.7E-05	-0.001597
8	9.614E-05	6.511E-05	0.0001805	0.000471	0.0004223	0.0002823	0.0002691	0.0015646	0.0006172	0.000627	0.0002453	0.000589	0.0001466	0.0001617	0.0002057	0.0005624	0.0005705	0.0007808	0.0017187	0.0004176	0.0002738	0.0004742	0.0019354	3.783E-05	0.0001228	6.214E-05	0.0001212	0.000348	9.114E-05	0.01346
9	2.896E-06	7.833E-06	7.51E-06	1.106E-05	5.045E-06	1.1E-05	-5.06E-06	7.406E-06	-0.00026	1.274E-05	9.127E-06	3.049E-06	-7.4E-06	1.268E-05	9.606E-06	4.712E-05	1.063E-05	1.424E-05	1.432E-05	0.0006735	1.197E-05	1.289E-05	3.806E-05	1.362E-05	2.026E-05	3.244E-05	1.307E-05	4.077E-05	5.741E-06	0.0007758
10	0.0001701	0.0005678	0.0008236	0.0018565	-0.000361	0.0015191	0.0011077	0.0011565	0.0007691	0.0186316	0.0075701	0.001405	0.0017542	0.0030021	0.000641	0.0042273	0.0012232	0.0015167	0.0011808	0.0017723	0.000802	0.0031946	0.0018359	0.0009472	0.0006692	0.0010694	0.0009164	0.0004907	0.0005619	0.0610214
11	6.293E-05	0.0001804	0.000259	0.0004203	-5.98E-05	0.0004563	0.0001848	0.0002763	0.0002907	0.0006899	0.0003452	0.0004357	0.0008119	0.0008539	0.0001231	0.0003436	0.000396	0.000485	0.0004088	0.0002318	0.0003397	0.0008972	0.0003354	0.0002182	0.0002779	0.0005262	0.0004231	0.0002008	0.0002142	0.0106287
12	-2.9E-06	7.635E-08	-1.19E-05	-9.17E-06	-7.57E-06	-2.41E-05	0.0137028	-1.5E-05	-0.000103	-1.39E-05	-2.9E-06	-0.000913	-0.000105	-2.03E-05	8.747E-07	-1.02E-05	-1.28E-05	-1.17E-05	-9.74E-06	-1.52E-05	-2.57E-05	-5.47E-06	-1.14E-05	-0.000106	-1.02E-05	-5.16E-06	-8.06E-06	-4.32E-06	-3.02E-05	0.0122081
13	8.675E-05	0.0002195	0.0002301	0.0002252	0.0001394	0.0003574	0.0017925	0.0003962	0.0004697	0.0003761	0.0002443	0.0006628	0.0002601	0.0003547	0.0003362	0.0002523	0.0002996	0.0003782	0.000531	0.0008956	0.0018504	-8.1E-05	0.0002477	0.0001916	0.0010202	0.0001612	0.0004333	5.017E-05	7.237E-05	0.0124535
14	0.0009681	0.0021108	0.003073	0.0036517	0.0016573	0.0086153	-0.004135	0.002814	0.0034209	0.002877	0.0016601	0.0064301	0.0090004	0.009483	0.0018182	0.0035309	0.002442	0.0033869	0.0022901	0.0025206	0.002414	0.0077185	0.0031231	0.0007272	0.0012794	0.0007776	0.0014987	0.0006225	0.0010925	0.0868693
15	8.953E-05	0.0011481	0.0006223	0.0005248	0.0002618	0.0018054	-0.001759	0.0010488	0.0002674	0.0022976	0.0006214	0.000857	0.0007198	0.0011948	0.0013393	0.0021234	0.002236	0.00022951	0.0020811	0.0009321	0.0008767	0.000862	0.0019164	0.0001215	-0.001359	-0.00063	-0.000296	2.909E-05	-0.000393	0.0218353
16	5.589E-05	0.0001595	0.0002702	0.0021469	6.689E-05	0.0002423	4.116E-05	0.0001757	7.202E-05	0.0002909	0.0001772	0.0003392	0.0002434	0.0004018	0.0002631	0.0017274	0.0004301	0.0004604	0.0004312	0.0006549	0.0003401	0.0012765	0.0036175	0.0002035	0.0001409	9.727E-05	0.0005888	0.0002777	0.000294	0.0154865
17	0.0002332	0.0047675	0.000889	0.0006445	0.0001634	0.0006089	0.0003758	0.0005772	0.0048041	0.0006567	0.000443	0.0010553	0.0006544	0.0010161	0.0042546	0.0023319	0.0191147	0.0207642	0.0174436	0.0028076	0.0019417	0.003049	0.0082707	3.579E-05	0.0006678	0.0003022	0.0026622	0.0005069	-0.000217	0.1008249
18	0.0001801	0.002298	0.0010668	0.0002788	0.0001736	0.0005606	0.000731	0.0003547	0.0013822	0.0007649	0.0006404	0.0013781	0.000686	0.0011224	0.0023821	0.001457	0.0045177	0.011183	0.0080958	0.0048535	0.0013065	0.0033641	0.0051075	0.000203	0.0005307	0.000425	0.0010533	0.0002891	0.0002184	0.0566044
19	-6.45E-06	0.000568	7.159E-05	6.62E-05	2.345E-05	0.0001141	1.424E-05	-4.76E-05	0.0001067	6.748E-05	6.686E-05	8E-05	0.0001097	0.0001073	0.0005813	0.0002228	4.782E-05	0.0001278	0.0012691	5.503E-05	6.713E-05	6.932E-05	7.74E-05	8.209E-06	-6.21E-05	-7.62E-06	0.0001548	1.45E-05	-5.81E-05	0.003929
20	3.178E-05	1.819E-05	8.574E-05	8.205E-05	3.345E-05	0.0001297	-6.19E-05	2.453E-05	6.775E-05	0.0001745	4.167E-05	0.0001303	3.517E-05	0.0001435	0.0001261	4.817E-05	0.000154	0.0002488	0.0001125	-0.004911	0.0003097	0.0004486	0.0007542	8.255E-05	0.000144	-0.000114	6.32E-05	5.158E-05	-1.22E-05	-0.001556
21	0.0001094	0.0006791	0.0002818	0.0002004	0.0001445	0.0003167	8.143E-06	0.0003245	0.0002374	0.0003532	0.0003009	0.0002815	0.00037	0.000377	0.0006631	0.0004029	0.0003752	0.0004369	0.0005121	0.0003037	0.0227684	0.0002004	0.0003068	0.0002012	0.0015144	0.0001934	-5.74E-05	8.748E-05	-0.000211	0.0366817
22	7.944E-05	0.0007282	0.0004626	0.0005442	0.0001872	0.0006372	0.0014682	0.000211	0.0008647	0.0020495	0.0006589	0.0022167	0.0005552	0.0007931	0.0006424	0.0013328	0.0053368	0.0040643	0.0027892	0.000947	0.0004224	0.000557	0.0014974	8.831E-05	0.0001582	3.462E-05	0.0004386	9.087E-05	6.595E-05	0.029922
23	1.946E-05	-5.83E-05	0.0001076	0.0001123	8.808E-05	0.0001612	-0.000166	0.0001322	5.348E-05	0.000198	7.506E-05	0.0001518	0.0002165	0.0002033	0.0004994	0.0004153	0.0003756	0.000425	0.0004803	0.0001956	0.0003843	0.0001728	0.0011145	0.0003523	8.494E-05	3.878E-06	-7.11E-05	0.000531	-5.34E-06	0.006253
24	0.0008948	0.0032919	0.0048361	0.0035922	0.0026262	0.0072361	-0.00311	0.0051331	0.0028253	0.007215	0.0038065	0.005603	0.0040271	0.0049794	0.0034771	0.0056921	0.0079056	0.0092067	0.0077051	0.0037472	0.008464	0.0043325	0.0066756	0.0008621	0.0020433	0.0010589	0.0031429	0.0008495	0.0011773	0.1192961
25	0.0004045	0.001247	0.001657	0.0010106	0.0006937	0.0018313	-0.002733	0.0021686	0.0008401	0.0021469	0.0013477	0.0016207	0.0013977	0.0020572	0.0011677	0.0018189	0.0022328	0.0028473	0.0025187	0.0013361	0.0015101	0.0013873	0.0019085	0.0012213	0.0007302	0.0009094	0.0015681	0.0003436	0.0004365	0.0376271
26	8.615E-05	0.0001866	0.0002395	0.0001744	0.000145	0.0003894	-0.000293	0.0002621	0.0001844	0.0005629	0.0006331	0.0002228	0.0003135	0.0003779	0.0002403	0.0002983	0.0003624	0.0004312	0.0003625	0.0001757	0.00044	0.0001527	0.0002931	0.0002449	0.00025	-0.000934	0.0003142	0.0002366	8.144E-05	0.006434
27	6.435E-05	0.0008678	0.0001415	6.595E-05	0.0001196	0.0015913	-0.003424	0.0005683	0.0004123	0.0014459	0.0001443	0.0005827	0.000645	0.0007	0.0007951	0.0011897	0.0013618	0.0014731	0.0014893	0.0005077	0.0007533	0.0004361	0.0008506	0.0002604	0.0002562	-0.001	0.0055765	-2.43E-05	-0.000412	0.0174383
28	0.0008108	0.0018916	0.0025383	0.0023085	0.0016949	0.0036991	-0.001865	0.002767	0.0018912	0.0042196	0.0028754	0.0027031	0.0026031	0.0035283	0.0026133	0.0032483	0.0037022	0.0044246	0.0038703	0.0027582	0.0040727	0.0026524	0.0033582	0.0056728	0.0017052	0.0009236	0.0025193	0.0021687	0.0012161	0.0765717
29	0.0012761	0.0022413	0.0026326	0.0035162	0.00174	0.004203	-0.000668	0.0030027																						

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1994

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.0056617	-0.000516	0.0026159	0.0029925	-0.002089	0.0046581	-0.003583	0.0004321	0.0065756	0.0038687	0.0007412	-0.005142	0.005838	-0.010611	0.00069	-0.000487	-8.02E-05	-0.000244	1.048E-05	0.0002285	0.0008925	-0.002838	-0.001738	0.0008677	0.0003883	-8.72E-05	-0.000198	-0.000358	0.000449	0.0089373
2	0.0020167	0.0065183	0.0024735	0.0035125	0.0020707	0.00265	0.0023908	0.0032743	0.0040277	0.0041143	0.0035317	0.0023797	0.0034086	0.0052712	0.0059704	0.0120755	0.0310494	0.0119653	0.0079809	0.0035515	0.0027205	0.0061582	0.007257	0.0030786	0.0133628	0.0018831	0.0171696	0.0010488	0.0026026	0.1755142
3	0.002628	0.0002906	-0.0004	0.0016577	-2.83E-05	0.0012107	-0.009161	0.0006657	0.0009006	-0.000509	2.623E-05	-0.010943	0.0014669	0.0044669	0.0002857	8.606E-05	7.11E-05	0.0002721	0.00014	0.0002055	0.0001035	0.0002925	5.991E-05	-9.91E-05	-0.000141	-6.9E-05	-0.000129	-0.000142	0.0001401	-0.00665
4	-3.97E-05	-3.35E-05	-5.82E-05	-0.000877	-2.4E-05	-5.7E-05	-8.53E-05	-7.24E-05	-3.65E-05	-0.00014	-0.000197	-4.73E-05	-8.52E-05	-0.000136	-4.78E-05	-0.000104	-4.74E-05	-7.1E-05	-5.59E-05	-0.000107	-7.06E-05	-7.53E-05	-0.000119	-8.86E-05	-0.000153	-0.0001	-0.000119	-0.000123	-0.000898	-0.004067
5	-7.08E-06	7.352E-07	-3.18E-06	1.032E-06	0.009002	1.017E-06	2.876E-07	-1.67E-06	8.842E-07	2.036E-06	2.355E-06	-9.44E-07	8.783E-07	-1.31E-06	1.022E-06	1.267E-06	8.117E-07	8.798E-07	8.791E-07	1.473E-06	1.141E-06	7.579E-08	1.253E-06	1.475E-06	1.139E-06	1.546E-06	1.283E-06	1.598E-06	2.06E-05	0.0090335
6	6.759E-05	0.0003458	-0.00025	0.0001583	0.0001311	0.007997	0.0433856	0.0009627	0.0057518	0.0004609	-0.000989	0.0101436	0.0086765	0.0003876	0.0002834	0.0003973	0.0009507	-0.000291	0.0008101	0.0004477	0.0014553	0.0097164	9.965E-05	3.141E-05	0.0004786	-4.32E-06	0.0001022	5.092E-05	0.0002603	0.0920185
7	1.203E-05	2.142E-05	2.737E-05	2.339E-05	1.425E-05	0.0010125	0.0110498	2.601E-05	4.678E-05	3.641E-05	4.946E-05	0.000114	0.0005473	2.994E-05	1.944E-05	2.869E-05	2.795E-05	3.622E-05	2.742E-05	3.76E-05	4.393E-05	3.58E-05	3.083E-05	0.0001158	4.237E-05	2.048E-05	2.414E-05	1.729E-05	0.0001891	0.0137078
8	6.632E-05	0.0003814	4.007E-05	-0.000514	-0.000272	-9.46E-05	-0.000426	0.0076063	0.0054861	-0.000451	6.865E-05	-0.000411	5.5E-05	0.0001978	0.0001847	-0.000261	-0.000446	-0.000521	-0.000431	0.0007389	4.285E-05	-0.000195	-0.000964	-7.5E-05	6.862E-05	5.822E-05	4.772E-05	-0.00037	7.82E-06	0.0096184
9	2.603E-06	3.373E-05	3.587E-07	-3.07E-06	1.081E-06	1.314E-05	2.063E-05	0.0001765	0.0010678	3.32E-06	4.766E-07	5.452E-05	5.486E-06	3.938E-06	1.72E-05	-5.71E-05	5.303E-06	3.309E-06	0.0001505	-0.000913	2.985E-05	2.078E-05	-2.29E-05	1.151E-06	-9.97E-06	-3.72E-05	-2.53E-06	-6.34E-05	1.848E-05	0.0005213
10	0.0004224	0.0011908	0.0006522	0.0007408	0.0204061	0.0013586	-0.000146	0.0002619	0.0010558	0.0308067	0.0381811	0.0007121	0.0001773	0.0010552	0.00099	0.0044992	0.0002662	0.000736	0.0012606	0.0017694	0.0006994	0.0007337	0.000307	0.0004164	0.000554	0.0004158	0.0001939	0.0004338	0.0016936	0.118446
11	5.434E-05	-8.71E-06	-0.000119	-0.000344	0.0006438	-9.66E-05	-0.000758	-6.97E-05	-0.000141	-0.000438	3.823E-05	-0.000325	-0.000984	-0.000886	0.0006136	-4.35E-05	-0.000198	-0.000184	-0.000128	6.771E-05	-6.64E-05	-0.001105	-8.84E-05	-7.28E-05	-0.00013	-0.000917	-0.000393	-7.57E-05	0.0005317	-0.005624
12	1.156E-05	1.87E-05	2.418E-05	2.452E-05	1.504E-05	0.0007248	-0.012945	0.0002378	0.0016725	4.225E-05	2.867E-05	0.0292788	0.0023567	3.885E-05	2.047E-05	3.388E-05	5.638E-05	4.908E-05	0.0002098	0.0001151	7.995E-05	0.0003753	3.91E-05	5.58E-05	0.0001087	2.21E-05	3.278E-05	1.439E-05	0.0001022	0.022844
13	4.69E-05	0.0001148	4.196E-05	1.03E-05	7.505E-05	0.0001063	-0.002651	-2.15E-05	-0.00039	0.0002364	0.0001551	0.0001496	0.0026766	2.803E-05	0.0001233	0.0001917	0.0001948	8.243E-05	-5.3E-05	-0.000808	0.0075665	0.0013188	0.0001266	0.0003294	0.0012469	8.292E-05	-0.000281	0.0001477	0.0003516	0.0111994
14	0.002307	0.0005492	-0.000403	-0.00098	0.0006108	0.0038668	-0.000215	0.0005818	0.0003297	0.0018931	0.0021065	-0.001244	-0.002249	0.0085717	0.0052988	-0.00029	0.0004605	0.0004726	0.0010649	0.0019963	0.0017098	-0.004918	-0.000356	0.0003091	0.001377	-2.65E-05	0.0008314	-0.000105	0.0016461	0.0251962
15	0.0039708	0.0100989	0.0050491	0.0070132	0.0040455	0.004828	0.0045551	0.0064539	0.0047743	0.0083468	0.0067541	0.0042427	0.0068402	0.0066106	0.0133919	0.0208496	0.0098849	0.0086641	0.005399	0.0045628	0.0039486	0.0055378	0.0070829	0.0062471	0.0275236	0.0036024	0.0343735	0.0016746	0.0050691	0.2413952
16	5.143E-05	0.0001177	-0.000145	-0.002014	6.825E-05	0.0001249	-0.000108	-1.94E-05	-0.000136	-7.99E-05	5.648E-05	-0.000124	4.606E-05	0.0005586	7.668E-05	0.0038404	-0.000263	0.0001167	5.671E-05	-0.00043	0.0001393	-0.001382	0.0021159	-1.47E-05	6.196E-05	1.024E-05	-0.00069	0.0003995	-6.04E-05	0.0023737
17	0.0003568	-0.003125	0.0005109	0.0022772	0.000484	0.0006125	0.000249	0.0010661	-0.004692	0.0011882	0.0012088	0.0004559	0.0007852	0.0014619	-0.00089	0.0002176	0.0045539	0.0233742	-0.003373	0.0096409	0.014569	0.0034668	-0.002113	0.0004859	0.0019655	0.0009165	-0.000592	5.028E-05	0.0008849	0.0559975
18	0.0003617	-0.001936	-0.000241	0.0041485	0.0002417	0.0003023	-0.000892	0.0013996	-0.001729	0.0010386	0.0002291	-0.000849	0.0002199	0.0002983	-0.000152	-0.000117	-0.002512	-0.012947	-0.005428	-0.003937	0.0004994	-0.003447	-0.002832	0.0003341	0.0007334	0.0001635	0.0003138	0.000157	0.0007466	-0.025831
19	0.0002323	0.0013025	0.0002364	0.0002101	0.0001222	0.0003247	0.0001542	0.0013511	0.0012011	0.0003358	0.000165	0.0001904	0.000268	0.0003641	0.000782	0.0005383	0.0008446	0.0005687	0.0252756	0.0010719	0.0003416	0.0004498	0.0004928	0.0001554	0.0012729	0.0003417	0.0007541	0.0001233	0.0003979	0.0398685
20	0.0002132	0.0026011	0.0002838	0.0002771	0.0001472	0.0005498	0.0002041	0.0003744	0.0002709	0.0005072	0.0003553	0.0002047	0.000491	0.0003324	0.0013889	0.0007138	0.0004821	0.000515	0.0039639	0.0287739	0.0032097	0.0005144	-0.000104	0.000427	0.0011895	0.0012119	0.0008615	0.0002066	0.0007245	0.0508907
21	0.0002583	0.0008411	0.0003778	0.0004692	0.0002395	0.0004308	0.0003619	0.0005192	0.0004039	0.0005444	0.0005446	0.0003726	0.0003306	0.0004708	0.0008191	0.0006811	0.001499	0.000884	0.0005917	0.0005387	0.0358951	0.0011574	0.0006166	0.0012692	0.0030473	0.0004077	0.0017464	0.0002514	0.001424	0.0569935
22	4.202E-05	-0.000619	-0.000372	-0.000236	0.000363	-0.000268	-0.002184	1.432E-05	-0.001103	-0.0016	0.0005454	-0.001872	-7.93E-05	-0.000474	-0.000291	-0.001315	-0.006542	-0.002634	-0.002334	-0.000296	0.0008378	0.0056965	-0.001245	7.186E-05	0.0002357	0.0003957	-0.000245	5.05E-05	0.0004133	-0.015041
23	0.0001842	0.001748	0.0001658	0.0001969	0.0001449	0.0002951	0.0001714	0.0002264	0.0002606	0.0002143	0.0001889	0.0001868	7.253E-05	0.0002078	0.0003112	0.0001246	-0.000129	2.917E-05	-4.4E-05	0.000147	9.043E-06	-1.14E-05	-0.000613	-5.99E-05	0.0004703	0.0003553	0.0003191	0.000727	0.0003884	0.0062873
24	0.0007978	-0.001637	-0.003283	0.0006576	0.0009294	-0.000868	0.0008989	-0.00058	0.000367	0.0006445	0.0017564	0.002292	0.0021907	0.0011063	0.0050483	-0.001579	-0.000242	0.0002118	0.0020913	0.0023311	0.000898	0.0013036	-0.004003	0.0010337	0.0023836	0.0001456	0.0008635	-0.000108	0.0009708	0.0166136
25	0.0014221	0.0014414	0.0013418	0.0021498	0.0015489	0.0026641	0.0021104	0.0022557	0.0023806	0.0018073	0.0019396	0.0018763	0.0019489	0.0011708	0.0038388	0.0014728	0.000428	0.0007426	0.0008487	0.0014209	0.0023459	0.0018227	0.0028992	0.0050974	0.0011288	0.0006894	7.417E-06	0.0014988	0.001391	0.0516899
26	0.0001803	0.000275	0.0003054	0.0003186	0.0003426	0.0003961	0.0002876	0.0004322	0.0003313	0.0001716	-9.71E-05	0.0004974	0.0002702	0.0002582	0.0002657	0.0003856	0.0003702	0.0004484	0.0022278	0.0007691	0.0003805	0.0005566	0.0007239	0.002877	0.0003199	0.0032399	8.413E-06	0.0006895	0.0006371	0.017869
27	0.0011657	0.0043688	0.0034766	0.0042521	0.0020302	0.0052589	0.0030818	0.0028746	0.0030688	0.0050079	0.0030567	0.0031346	0.0029421	0.0034334	0.0026498	0.0032356	0.005514	0.0047552	0.0029573	0.0032432	0.0017797	0.0037817	0.0021121	0.0032254	0.0014082	0.0012889	-0.005149	0.0017047	0.0030582	0.0827171
28	0.000411	0.0003943	-0.001033	-0.000248	0.0001575	0.0001911	0.0007964	-0.000399	0.0003124	-0.001196	-0.000132	0.0012319	0.0004165	-0.000918	0.0009435	-0.000694	-0.000635	-0.001039	0.0010009	0.0004121	-0.000851	0.0003267	0.000621	-0.003579	0.0013612	0.0028364	-0.000928	-0.000391	0.0004912	-0.000138
29	-0.000441	0.0007154	-0.001261	-0.001427	0.0001854	-0.000989	-0.002098	-0.001572	-0.000487	-0.003818	-0.005673	-0.000845	-0.00223																	

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	-0.005455	-0.004865	-0.043935	-0.013221	-0.016156	-0.011281	0.0138976	-0.039502	0.0092449	-0.001304	-0.00083	-0.00975	-0.013944	-0.029947	-0.00334	-0.003284	-0.001517	-0.003448	-0.000306	0.006062	-0.000384	0.0043665	-0.008523	0.0016538	-0.00305	0.0017891	-0.001684	-0.001509	-0.006887	-0.187108
2	7.753E-05	0.0001515	0.000647	0.0003072	0.0002817	-0.000732	0.018836	-0.000689	0.0040471	-0.000531	0.0017475	0.0032246	0.0074088	0.0014186	-0.010909	-0.001358	0.0314304	0.0088397	0.010541	0.0180103	0.0042813	0.0097948	0.0004879	0.0030347	0.0108483	0.008221	0.0255385	0.0015324	0.0020094	0.1584981
3	-0.000965	-0.000586	-0.007671	-0.010401	-0.002012	-0.000798	-0.005396	-0.001703	0.0064821	-0.002206	-0.001294	-0.013378	-0.000257	0.0032934	-0.000694	-0.000798	-0.000387	-0.000692	0.0005286	0.0027773	4.237E-05	0.0008895	-0.001167	0.0020067	-0.002111	0.0001133	-0.000527	-0.000531	-0.003972	-0.041413
4	-0.00011	-0.000182	-0.000163	0.0038556	-0.000117	-0.000224	0.0002924	-0.000189	-5.73E-05	-0.000322	-0.000407	-1.38E-05	-0.000222	-0.000341	-0.000207	-0.000261	-0.000141	-0.000191	-9.46E-07	0.0003223	-0.0001	-6.09E-05	-0.000331	0.0001717	-0.000275	-7.43E-05	-0.000187	-0.000194	-0.001677	-0.001409
5	-1.66E-05	1.087E-07	-1.25E-05	-1.35E-06	-0.023931	1.225E-06	1.82E-06	-8.64E-06	7.466E-07	1.352E-06	2.131E-06	-2.45E-06	-1.92E-06	-5.24E-06	4.946E-07	8.384E-07	5.299E-07	4.103E-07	7.201E-07	2.006E-06	9.594E-07	2.347E-07	2.285E-07	1.549E-06	6.26E-07	1.806E-06	1.068E-06	1.459E-06	2.008E-05	-0.023939
6	-0.000869	-0.001014	-0.002213	-0.000547	-0.000365	-0.07914	0.4357769	-0.000636	0.0057602	-0.000818	-0.002557	0.0256624	-0.018718	-0.000281	-0.000389	-9.05E-05	0.0008404	-0.002124	0.0007104	0.001323	-5.55E-06	0.0123178	-0.000683	0.0001516	-0.001449	0.0015288	-0.000293	-3.21E-05	-0.000347	0.3715004
7	1.004E-05	2.457E-05	4.099E-05	4.07E-05	2.09E-05	3.326E-05	0.0546441	0.0003324	7.358E-05	4.624E-05	4.473E-05	0.0007699	5.891E-05	3.944E-05	2.266E-05	0.0001294	4.374E-05	4.402E-05	4.468E-05	4.468E-05	3.934E-05	3.678E-05	7.952E-05	0.0002017	7.855E-05	2.462E-05	2.885E-05	2.239E-05	0.0001981	0.0572187
8	-0.000289	-0.000715	-0.000333	-0.001006	-0.001084	-0.000554	0.0010876	0.0007498	0.0340391	-0.000506	-0.000196	-0.000482	-0.000255	-3.74E-05	-0.000365	0.0003573	-0.000936	-0.001539	-0.002925	0.0031829	0.0002182	0.0034772	-0.005379	-1.32E-05	0.0008951	0.002422	-4.89E-05	-0.000912	-0.000125	0.0287268
9	2.728E-05	0.000196	8.246E-05	5.978E-05	4.168E-05	7.054E-05	0.0001981	0.0001106	0.0038766	0.0001133	0.0001354	0.0001081	8.094E-05	0.0001052	0.0001295	1.144E-05	0.0001166	0.0001182	0.000511	0.0012937	0.0005341	0.0001389	0.0001483	0.0003172	0.0011647	0.0050012	8.815E-05	0.0001602	6.636E-05	0.0150057
10	-0.000198	-0.001146	-0.001206	-0.003217	0.00076	-0.002985	0.0104662	-0.002244	0.0006296	-0.015388	-0.002262	0.0028373	-0.003433	-0.004091	-0.000986	-0.009126	-0.001062	-0.00228	0.0013133	0.0095294	0.0012994	0.0044868	-0.003478	-0.001562	0.0002244	0.0007235	-0.001369	-0.00026	8.644E-05	-0.023939
11	-0.000114	-0.000469	-0.000575	-0.001078	-0.00084	-0.001163	0.0015313	-0.000641	-0.000327	0.0007704	-2.52E-05	-5.1E-05	-0.002088	-0.002012	-0.000372	-0.0007	-0.000747	-0.001015	-3.28E-06	0.0016236	-0.00023	-0.001411	-0.000679	-0.000179	-0.000508	-0.000895	-0.000836	0.0005892	-3.25E-05	-0.012478
12	1.083E-05	3.582E-05	4.002E-05	4.635E-05	2.682E-05	5.917E-05	0.0038143	0.0008908	0.0270023	9.267E-05	3.247E-05	0.0533866	0.0001794	6.774E-05	2.741E-05	0.000126	0.0001761	0.0001212	0.0001219	0.0005418	3.698E-05	0.0015844	0.0001133	0.0001722	5.917E-05	5.158E-05	3.867E-05	4.495E-05	0.0001201	0.0890209
13	-0.000218	-0.000693	-0.000534	-0.000502	-0.000351	-5.06E-05	-0.001472	-0.001028	-0.000682	-0.0007	0.0008127	-0.000642	-0.005687	-0.000622	-0.00051	-0.000399	-0.000406	-0.000666	0.0003865	0.0026595	0.0003241	0.0016047	-0.000406	-5.19E-05	-0.002583	0.0029016	-0.000767	5.177E-05	0.000105	-0.010126
14	-0.001802	-0.008271	-0.00698	-0.007701	-0.002875	-0.021038	0.0612559	-0.005793	-0.000403	-0.002043	0.0088637	0.0366275	-0.024019	-0.022275	-0.004763	-0.004315	-0.001945	-0.005679	0.0098559	0.0244326	0.0024096	0.0041276	-0.006564	5.959E-05	7.823E-05	0.0063313	-0.000785	0.0002284	-0.001235	0.025784
15	0.0004167	-0.00201	0.0009143	0.0020282	0.0006901	-0.000703	0.0358414	-0.001032	0.0041169	-0.000535	0.0030117	0.0047551	0.017118	0.0073422	0.0011894	0.0021605	-0.001016	-0.000359	0.0078997	0.0250509	0.0061018	0.0078325	-0.001876	0.0044087	0.0234018	0.0152636	0.0162875	0.0028567	0.0039355	0.1850929
16	-0.000107	-0.000341	-0.000548	-0.0005564	-0.000158	-0.000517	0.0012434	-0.000393	-7.21E-05	-0.00049	-0.000166	0.0001221	-0.000567	-0.000943	-0.000498	-0.001816	-0.000501	-0.000636	0.000809	0.0063738	0.0014634	0.0007765	-0.000892	-4.01E-05	-2.93E-05	0.00012859	-0.001339	-0.000378	-0.000535	-0.012547
17	-0.000318	-0.014267	-0.001173	-0.000655	-0.000117	-0.000689	0.0040528	-0.000211	-0.011348	-0.000625	0.0009299	0.0001186	-0.000172	-0.000877	-0.008659	-0.003793	-0.055247	-0.039678	0.011587	0.0521235	0.0265552	0.0111819	-0.02081	0.0006434	0.0044376	0.0212479	-0.003569	-0.001057	0.0003998	-0.029987
18	-0.000186	-0.006165	-0.001204	0.0002686	-8.06E-05	-0.000552	0.0039969	0.0012347	-0.003772	-0.000109	0.0022936	-5.74E-05	-0.000429	-0.000484	-0.004119	-0.001705	-0.001924	-0.024326	0.0115198	0.0276337	0.0065668	0.0071133	-0.011971	0.0008361	0.0019622	0.0190333	-0.00042	-0.000238	0.0004882	0.025206
19	0.000235	-0.001423	0.0004059	0.0004515	0.0001441	0.0003355	0.0019258	0.0003688	0.0010234	0.0002807	0.0005505	0.0004448	0.0002593	0.0003512	-0.000816	0.0004392	0.0010006	0.0015218	0.008359	0.0111138	0.0010932	0.0017269	0.0006769	0.0011807	0.0032995	0.02499	0.0010662	0.0002892	0.0005596	0.0618544
20	0.0002982	0.001894	0.0006585	0.0013228	0.0002823	0.0005315	0.0043446	0.0007492	0.0012	0.0009203	0.001045	0.0012713	0.0007056	0.0011568	0.0012913	0.0015764	0.0012803	0.0015326	0.0286044	0.2244015	0.0313258	0.0037816	0.0025458	0.0012827	0.005512	0.0261199	0.00015084	0.0005793	0.0013411	0.3490629
21	-0.00025	-0.001347	-0.000314	-0.000104	-0.00028	-0.000544	0.0038784	-0.000574	1.177E-05	-0.000394	-0.000356	9.163E-05	-0.000681	-0.000609	-0.001152	-0.000458	0.0008075	-0.000251	0.0007731	0.0038616	-0.050008	0.0011858	-0.000179	0.0004017	-0.000226	0.0002593	-0.000179	1.065E-06	0.0010783	-0.045555
22	-0.000104	-0.001902	-0.000829	-0.000756	-0.000331	-0.001324	0.0027137	-0.00011	-0.000672	-0.004187	-0.0005	-0.001976	-0.001044	-0.001268	-0.001142	-0.002328	-0.013572	-0.009147	-0.001987	0.0055452	0.0023261	0.0138042	-0.003349	0.0007786	0.0006696	0.0074781	-0.000579	0.0006285	0.0001925	-0.012969
23	-8.85E-05	-0.000414	-0.000432	-0.000461	-0.000349	-0.000691	0.0015839	-0.000511	-0.000132	-0.00073	-0.000498	2.623E-05	-0.000579	-0.000601	-0.001634	-0.001258	-0.001287	-0.001196	-0.000239	0.0018486	-0.000327	-4.85E-05	-0.0003036	-0.001192	-3.44E-05	0.0007206	-0.000556	-0.003423	-4.82E-05	-0.015587
24	-0.002401	-0.008341	-0.012725	-0.008817	-0.007387	-0.018424	0.1072775	-0.012127	-0.001529	-0.016695	-0.007369	0.022083	-0.009878	-0.01068	-0.006866	-0.009631	-0.008975	-0.015327	0.0497838	0.1337216	0.0126278	0.0190928	-0.013575	-0.000678	-0.001256	0.0114875	-0.00273	-0.001282	-0.001826	0.1775547
25	-0.001352	-0.003849	-0.004786	-0.002939	-0.002045	-0.004636	0.0114822	-0.006836	-0.000784	-0.004463	-0.003228	3.752E-05	-0.003849	-0.005207	-0.004031	-0.004256	-0.004984	-0.006376	0.005715	0.015935	0.0002057	-0.000109	-0.001828	0.0026946	-0.001901	0.0020403	-0.002636	0.0011999	-0.000401	-0.031188
26	-8.87E-05	3.416E-05	-9.28E-05	0.0002672	-3.37E-05	-0.000429	0.0055844	-0.000238	0.0008264	-0.000454	-0.000834	0.0009504	-0.000214	-0.00021	0.0002056	0.0002648	0.000227	-0.000168	0.0033695	0.005325	0.0010094	0.0017314	-8.21E-05	0.0014634	-0.000133	0.0067605	0.00014898	0.0010233	0.0003587	0.0279133
27	0.0002571	-0.000299	0.0003131	0.0030288	-2.61E-05	-0.002577	0.0174376	-0.000893	0.0036235	0.0010795	0.0049173	0.0021563	-0.001774	-0.000406	-0.000355	0.0018588	0.0040342	0.0053225	0.0074756	0.0211714	0.0038157	0.0046655	-8.05E-06	-0.000679	0.0002841	0.0031883	-0.000519	0.0008572	0.0021731	0.0801234
28	-0.001961	-0.004989	-0.006505	-0.005583	-0.004817	-0.009575	0.0238574	-0.007171	-0.000299	-0.009266	-0.005339	0.0018865	-0.006318	-0.007852	-0.005459	-0.006883	-0.006398	-0.00889	0.005259	0.0237965	0.0001353	0.0084299	-0.007222	-0.013871	-0.000636	0.0083258	-0.005054	-0.003416	-0.00235	-0.058163
29	-0.00343	-0.007371	-0.00712	-0.009672	-0.005408	-0.011011	0.0194141	-0.008395	-0.002391	-0.014059	-0.015679	0.0003731	-0.009775	-0.013358	-0.00823	-0.011083	-0.007105	-0.009549	0.0015207	0.0231343	-0.004193	-0.000839	-0.014135	-0.008482	-0.004603	0.0021883	-0.006204	-0.00435		

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2006

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0.0087973	-0.000944	0.0022947	0.0012166	0.0120145	-0.002483	0.0010815	-0.012286	0.007718	0.0025134	0.0018214	-0.007919	0.0103941	-0.009381	-0.000364	0.0013227	0.0005156	0.0005651	-0.000311	-0.000342	0.0010042	0.0026204	-0.000847	0.0016995	-0.000262	-6.9E-05	-0.000634	-0.000346	-0.001222	0.0181672
2	0.001096	0.0059534	0.0022707	0.0034468	0.0014549	0.0051476	0.0032403	0.0034597	0.0043979	0.0025748	0.0026619	0.003649	0.007082	0.0076636	0.015324	0.0099579	0.0211045	0.0406865	0.0139763	0.005927	0.0035017	0.0076674	0.007515	0.0022162	0.0094267	0.0015168	0.0036109	0.0012543	0.0014179	0.1992017
3	0.0041474	-5.06E-05	0.0062919	0.0009912	0.0003066	0.0011641	-0.011363	0.0008712	0.0012306	-0.000652	-0.000215	-0.015301	0.0004308	-8E-07	-8.38E-05	-4.39E-05	6.398E-05	3.365E-05	0.0001117	-5.31E-05	0.0002499	-5.05E-05	-0.000192	0.0004567	-0.000871	-0.000166	-0.0003	-6.98E-05	-4.77E-05	-0.013111
4	-2.9E-06	-2.32E-05	0.0009461	0.0084734	3.486E-05	-9.98E-06	4.716E-05	1.64E-05	1.377E-05	-2.83E-05	-0.000107	0.0002008	-2.66E-05	-6.46E-05	-3.85E-05	-3.52E-05	3.109E-05	2.539E-05	1.447E-05	-3.3E-05	3.448E-05	-8.46E-06	-8.74E-05	0.0003373	-0.000103	-6.89E-05	-8.19E-05	-6.32E-05	-0.000574	0.0088185
5	-8.28E-06	-8.67E-08	-4.38E-06	-3.03E-07	-0.008177	-5.76E-07	-1.74E-07	-4.12E-06	4.144E-07	4.846E-07	5.91E-07	-1.95E-06	3.916E-07	-2.74E-06	6.949E-08	2.949E-07	1.107E-07	1.192E-07	2.084E-08	1.413E-07	2.751E-07	-2.41E-07	-6.03E-08	4.533E-07	5.608E-08	3.055E-07	1.482E-07	2.865E-07	4.387E-06	-0.008191
6	7.227E-05	-0.000175	-0.00013	0.0004973	0.0006488	-0.01153	0.045785	0.001738	-0.001101	0.0029859	0.0007782	0.0483915	-0.005	0.0006363	-4.68E-06	0.0010357	0.0007022	-0.000279	0.00082	3.295E-05	0.0002332	0.0061686	0.0003643	0.0002003	7.104E-05	0.0003822	9.577E-06	0.0001661	0.0007778	0.0942772
7	3.1E-06	6.775E-06	9.227E-06	7.45E-06	4.999E-06	1.342E-05	-0.000906	0.000326	4.007E-05	8.807E-06	7.649E-06	8.549E-06	-3.47E-05	1.764E-05	5.967E-06	9.285E-06	8.021E-06	1.118E-05	2.35E-05	7.907E-06	5.223E-06	8.461E-06	9.847E-05	1.418E-05	3.225E-05	1.122E-05	1.28E-05	7.963E-06	3.06E-05	-0.0002
8	-6.63E-06	9.381E-05	2.23E-05	-0.000283	-0.000244	0.0001545	-0.000335	-0.000668	0.0256771	0.0011656	0.0005464	-0.000417	0.0001268	0.0005581	0.0001013	0.0004336	-0.000276	-0.000389	-0.001779	0.0003175	0.0003059	0.0014071	0.0027466	-6.87E-05	0.0003426	0.0001989	-1.73E-05	-0.000248	9.833E-05	0.0295657
9	4.1E-05	0.00054	0.000121	0.0006769	7.725E-05	0.0002852	0.0006796	0.0003805	0.0024982	0.0007175	0.0008223	0.0008672	0.0001215	0.0003029	0.0002981	0.0004699	0.0003732	0.0005614	0.00039	-0.000294	0.0003138	0.0002674	0.0001732	0.0001648	0.0006044	0.0002695	0.0002112	6.859E-05	0.0001833	0.0121861
10	0.0004168	0.0015878	0.0008273	0.0010357	0.0165444	0.0018802	-0.000237	0.0018256	0.0009433	-0.008892	0.0092334	0.0011871	0.0001632	0.0024962	0.0009739	-0.003212	0.0004855	0.0005276	0.0023837	0.000118	0.0011884	0.000912	-0.000595	-0.000449	0.0004327	-0.000477	0.000205	0.0005383	0.000671	0.0327149
11	6.756E-05	-3.82E-05	5.201E-06	0.0001646	0.0005826	-0.000166	-0.0007	2.283E-05	-0.000127	0.0039091	0.0009361	-0.000196	-0.000816	-0.000471	-4.14E-06	7.551E-05	-0.000149	-0.000247	-9.57E-05	-3.8E-05	8.919E-06	-0.000845	-9.7E-05	-7.78E-06	-0.000192	-0.00081	-0.000494	0.0012522	-2.79E-06	0.0015291
12	3.175E-05	1.892E-05	6.083E-05	3.204E-05	2.095E-05	0.0056988	-0.026251	0.0001463	0.0037215	0.00028	0.0001416	0.0008329	0.0004532	6.545E-05	1.969E-05	0.0001008	6.236E-05	9.388E-05	3.984E-05	0.0001056	2.072E-05	0.0005357	0.0001038	2.794E-05	6.622E-05	2.54E-05	2.371E-05	1.736E-05	8.45E-05	-0.013419
13	3.074E-06	0.0001848	-8.25E-05	-9.23E-05	2.162E-05	0.0009782	-0.002541	-0.00025	-0.000381	-0.000146	0.0002696	0.0001552	0.0063107	-0.000171	0.0001363	5.372E-05	6.778E-05	2.72E-05	0.000141	-0.000482	0.0011714	-3.8E-05	0.0002639	-0.000113	-0.001216	-3.49E-05	-0.000361	6.191E-05	-4.13E-06	0.0039339
14	0.0034167	0.0001962	0.0015984	0.0016911	0.0048864	-0.002965	-0.000648	0.0062636	0.0011908	0.0054606	0.0108644	-0.001764	-0.00935	0.0146103	0.0009284	0.0087888	0.0016755	0.0032663	0.0021849	-6.38E-05	0.002331	-0.00116	0.0001517	0.0001976	0.0005541	0.0006456	-0.000292	0.0004365	2.717E-05	0.0551221
15	0.0017985	0.0088776	0.0028443	0.0049894	0.0023648	0.0095328	0.0048088	0.0057153	0.005564	0.0039848	0.0039934	0.0051948	0.0147589	0.0167545	0.0144848	0.0127021	0.0213022	0.0210434	0.0178291	0.0053239	0.0049583	0.0107064	0.0080645	0.0018939	0.0177946	0.0020946	-0.001998	0.0021712	0.0023369	0.23189
16	7.923E-05	0.0003696	3.345E-05	0.000167	0.0001138	0.0023271	0.0046209	8.438E-05	-4.26E-05	1.909E-05	0.0007753	0.0066246	0.000119	-0.000167	0.0001143	0.0018777	-0.000139	-0.000105	0.0006846	-0.000402	0.0002507	-0.000943	-0.001856	-1.39E-05	7.553E-05	0.0001803	-0.000697	-0.000105	-2.42E-05	0.014023
17	0.0001478	-0.0004462	-0.000552	-0.000313	0.0004036	0.000559	0.0001065	0.0003641	-0.005555	0.0012762	0.000754	-0.00031	0.0015842	0.0003517	-0.001429	-0.000247	-0.004303	-0.025187	-0.005583	-0.003596	0.0157279	-0.002867	0.0024315	0.0004216	0.0027447	0.000802	-0.002315	-0.000237	9.89E-05	-0.029183
18	0.0004921	-0.000702	-0.00057	-0.000291	0.0005822	0.0007394	-7.8E-05	0.0011045	-0.001485	0.0021332	0.0009772	-0.000366	0.0002266	0.000183	3.648E-05	0.001057	0.005213	-0.002659	0.0075903	-0.002277	0.0046981	-0.001249	-0.001036	0.0003924	0.0018813	0.0014442	8.351E-05	-7.43E-05	8.225E-05	0.0181279
19	5.956E-05	-0.000857	8.723E-05	0.0001447	8.732E-05	0.0002498	3.892E-05	7.301E-05	6.711E-05	-1.04E-05	0.0001668	0.0001172	0.0002216	0.0001043	-0.000263	-1.61E-05	0.0003945	0.0006375	0.0008459	6.421E-05	0.0059061	0.000219	0.0001187	0.00015	0.0010398	0.0001257	-4.33E-05	5.778E-05	9.171E-05	0.009878
20	0.00068	0.0017377	0.0006419	0.0011335	0.0003555	0.0010212	0.0046966	0.0011017	0.0011593	0.0006803	0.0006099	0.0006202	0.0006225	0.0010597	0.0011458	0.0013684	0.001112	0.0016704	0.0020833	0.0523636	0.0149667	0.002226	0.0008531	0.0005952	0.0044269	0.0084314	0.0028351	0.0003112	0.0010221	0.1115316
21	-0.000153	-0.00108	-0.000397	-0.000216	-9.07E-05	-0.000295	-0.00041	-0.000442	-0.000299	-0.000356	-0.000437	-0.000284	-0.000484	-0.000433	-0.000756	-0.000417	-0.00032	-0.000189	-0.000416	-0.000345	-0.051883	-0.000242	-0.000302	-0.000379	-0.004549	-0.0005	-0.000641	-0.000156	-0.000248	-0.06672
22	6.568E-05	-0.000521	-0.000366	-0.000336	0.0006229	-3.38E-05	-0.002694	0.0003076	-0.000915	-0.001997	0.001002	-0.002826	-0.000111	-0.000384	-0.000291	-0.001175	-0.006243	-0.005221	-0.001999	-0.000965	0.0011296	0.0070326	-0.000842	1.967E-05	0.0003547	0.0001176	-0.000323	1.068E-05	0.0001539	-0.016426
23	1.48E-05	-0.000187	-0.000132	-9.42E-05	-1.04E-05	-7.07E-05	-9E-05	1.708E-05	-9.15E-05	-4.89E-05	-0.000172	-4.69E-05	-0.000157	-9.46E-05	-0.00081	-0.000523	-0.000327	-0.000314	-0.000316	-0.000232	-0.00014	-0.000227	-0.001685	-0.000669	5.891E-05	-9.88E-05	-0.000591	-0.002117	-0.000211	-0.009369
24	0.0026198	0.001034	0.0032227	0.0081793	0.011607	0.0088404	0.0065872	0.0230102	0.0048259	0.0300798	0.0133756	0.0063086	0.008706	0.0075685	0.0032749	0.0080474	0.0121454	0.0065963	0.0126043	0.0076828	0.0353	0.0136273	0.0027575	0.0161701	0.0049881	0.0031386	-0.001542	0.0004986	0.001341	0.2625949
25	0.0007045	0.0003882	-0.001137	-5.49E-06	0.0007095	-0.000438	-0.000429	-0.001295	0.0001936	-0.000328	-0.000483	-0.000592	-0.000841	-0.000778	-0.000176	-0.000342	-0.000913	-0.00114	0.0013811	0.0002429	0.0012584	-0.000376	-0.000507	-0.000354	0.0005386	-0.000896	-0.001584	0.0005927	-0.000242	-0.006848
26	0.0004144	0.0013149	0.000773	0.0019127	0.0010889	0.0011104	0.0008607	0.0015456	0.0004859	0.0018948	0.0004725	0.0007579	0.0006	0.0007306	0.0008384	0.0013057	0.0008619	0.0010694	0.0013386	0.0021148	0.0025613	0.0014204	0.0006823	0.0013381	0.0004439	0.0040917	0.0009653	0.0009469	0.0016824	0.0356232
27	0.0005511	0.0019905	0.0008581	0.0020905	0.0016472	0.0004939	0.0040254	0.0011614	0.00113	0.0023727	0.0029702	0.0020974	-0.000136	0.0013108	0.0012243	0.0025922	0.0032358	0.0038745	0.0024822	0.0018924	0.0015341	0.001662	0.0011964	-0.000208	0.0006414	0.0006035	0.0042018	0.0008277	0.001738	0.0500612
28	0.0013484	-0.000369	-0.000172	0.0010958	0.0014202	0.0002566	6.461E-05	0.002022	0.0020809	0.0029323	0.0006968	0.0003487	-0.000137	-0.000208	-0.000584	3.584E-05	0.0004025	-0.000711	0.0010783	7.794E-05	0.0023411	0.0011895	-0.000883	-0.005147	0.0037658	0.0042933	-0.001692	0.0104692	0.002692	0.0287099
29	-0.000466	-0.001438	-0.001484	-0.001949	0.0006552	-0.001956	-0.002195	-0.000537	-0.000559	-0.002854	-0.005338	-0.000763	-0.002302	-0.003785	-0.001904	-0.002638	-0.000341	-0.0006	-0.000615	-0.002181	0.000									

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 13
Multiplier Product Matrix, Malaysia
1983

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.041645702	-0.0034	0.064595	0.020501	-0.03635	0.024384	-0.04647	-0.00949673	-0.00093	-0.00927	0.000891	-0.04193	-0.00015	0.003810786	2.43E-05	-0.00017	-0.00553	-0.00295	-0.0013	-0.00668	-0.00475	-0.0118	-0.00088	0.001	-0.04259	0.002004	-0.06578392
2	0.006263502	0.00878	0.009049	0.010075	0.004066	0.011833	0.009856	0.007448006	0.007664	0.01078	0.266673	0.002886	0.034353	-0.1312456	-0.01214	-0.00583	-0.00058	-0.00739	0.066267	-0.01633	0.008387	0.016693	0.001959	0.00061	0.005977	0.002903	0.319009236
3	0.032511033	-0.00023	0.237205	0.066911	0.003707	0.001754	0.009875	0.003046433	0.00035	-0.01317	0.000622	0.016401	0.000419	0.00132052	0.00021	3.15E-05	0.000361	-0.00216	0.000651	0.001898	-0.00056	-0.00155	0.000967	0.00121	-0.00541	0.003321	0.359692444
4	9.0061E-05	-5.8E-05	0.000125	0.004849	0.000309	0.000116	9.1E-05	3.38391E-05	1.2E-05	-0.00015	5.27E-05	7.68E-05	-1.9E-05	5.91244E-05	-1.6E-05	-1E-05	-7.4E-06	0.000297	4.37E-05	0.000182	-0.00022	-0.00028	0.000123	0.000132	-0.00198	0.000204	0.004060257
5	3.28134E-05	4.78E-05	0.000172	0.000143	-0.00187	0.000293	0.000153	0.000176325	0.000188	0.000281	8.05E-05	0.000158	6.94E-05	0.000206697	0.00025	0.00028	6.51E-05	0.000223	0.000377	0.000236	6.33E-05	0.000227	3.28E-05	3.46E-05	0.000125	5.22E-05	0.002099543
6	-0.00052947	-1.9E-05	-0.00194	-0.00119	-0.001546	-0.08598	-0.00011	0.027172536	-0.00286	0.000714	0.000175	-0.00506	-0.0027	0.000902936	-0.0014	0.014209	0.003333	-0.03228	-0.00037	0.000406	-0.00011	-0.00185	-0.00161	0.000221	0.000484	-0.00211	-0.09095671
7	0.000312155	-0.00102	0.00037	0.001011	0.0008	0.000734	0.008405	0.005625504	0.001761	0.001871	0.000467	0.003408	0.001013	7.32396E-05	0.003991	0.001982	-0.00082	-0.00518	6.26E-05	0.001883	0.000135	2.66E-05	-0.0022	0.000227	-0.00041	-0.00074	0.023802411
8	2.19612E-05	-1.6E-05	1.11E-05	0.000192	-0.0001	0.000134	3.5E-05	-0.01563297	-0.00314	0.000107	1.89E-05	0.000188	0.000148	6.15186E-05	-0.00013	0.001206	-2.4E-05	0.000134	5.05E-06	0.000289	-0.00016	-6.1E-05	0.00019	2.95E-05	-0.00025	-8.6E-05	-0.0168361
9	0.001204369	-0.00272	0.000745	0.020997	-0.01014	0.002503	0.001146	-0.00142356	-0.01907	-0.01051	0.000614	4.5E-05	0.000816	0.000169756	-0.00331	-0.00337	-0.00073	-0.00212	-0.00046	0.00062	-0.01673	-4.7E-06	0.008422	0.007024	0.00664	-0.00146	-0.02111326
10	0.007729733	0.003248	0.0077	0.006083	0.00106	0.013017	0.009846	-0.02053164	0.012369	0.085215	0.00363	0.01166	0.008224	0.00359894	0.004258	0.000948	0.003161	0.011067	0.004657	-0.00309	0.003012	0.003616	0.00074	0.000472	0.000236	0.002249	0.184177053
11	0.009097404	-0.00804	0.01062	0.003845	0.003782	0.021712	0.011838	0.001511166	0.001132	0.000527	0.009341	-0.01904	0.013198	0.002991309	0.004402	0.00272	0.000759	0.002995	-0.00625	0.004164	0.009102	0.005323	0.002549	0.001732	-0.00122	0.000298	0.089097833
12	0.000632073	-0.00043	-6.4E-05	-0.00047	-0.00063	-0.0004	-0.00165	0.010631433	-0.00102	0.002914	0.000554	0.005045	-0.00094	-0.00085098	-0.00099	0.000712	-0.00594	0.000578	-0.00116	0.000274	-0.00149	-0.01075	-0.00145	-8.5E-05	-0.00375	-9.3E-05	-0.01081922
13	-0.00015367	-0.00176	-0.00025	-0.03386	-0.00546	-9.2E-05	0.001525	-0.01330403	-0.00321	-0.00494	0.000371	0.002905	0.036706	0.000530902	0.017297	-0.00102	0.002804	-0.00532	-0.00029	-0.00306	-0.00684	-0.00083	-0.00433	0.000265	-0.0012	-0.00113	-0.02464252
14	0.000339738	-0.00091	0.002953	0.007294	0.000754	0.00137	0.000713	0.006563654	0.00694	0.001286	0.004161	0.002742	0.004058	0.05328427	0.015707	-0.0106	-0.00058	-0.01456	0.001329	-0.00719	0.000704	-0.00024	-0.00131	-0.00012	-0.0005	-0.00115	0.073036065
15	-0.0010901	0.000479	-0.00652	0.00395	-0.00015	0.000797	-0.00098	0.004031683	0.000368	-0.00466	-0.00222	0.004155	0.001893	0.011768268	0.033355	0.002907	0.003311	0.007816	0.000352	0.000809	-0.00179	-0.00026	-0.00207	-6.4E-05	-0.00112	-0.00059	0.054477078
16	-0.00346234	-0.00496	-8.2E-05	-0.00105	0.000693	0.001302	-0.00705	0.002296584	-0.00118	-0.00032	0.000305	-0.00221	0.003643	-0.00103319	0.001113	-0.04839	-0.00517	-0.04661	-0.00645	-0.00265	0.000415	-0.00262	-0.00157	-0.0013	0.008876	-0.00353	-0.12101022
17	-3.43E-06	0.001395	0.001926	0.001957	0.000744	0.00244	0.000739	0.001480523	0.001152	0.001605	0.001066	0.001544	0.003573	0.002206364	0.004517	0.001852	0.121309	0.006643	0.000568	0.002724	0.001235	-0.00226	0.000323	0.00051	0.001805	-0.00035	0.160705793
18	8.56829E-05	-0.00044	-9.7E-05	-0.00078	-0.00097	0.008438	0.000148	-0.00062088	-0.00204	-0.0011	-9.6E-06	-0.00016	-4.2E-05	-0.00016663	-0.00012	-0.00024	9.68E-06	-0.33836	-0.00015	-0.00032	-0.00041	-0.00055	-0.00049	0.001985	-0.00078	-0.00098	-0.33816214
19	0.003839185	-0.0138	0.009455	0.010126	0.007101	0.027945	0.011307	0.001700582	0.007346	-0.00356	0.003733	0.013111	0.022273	0.01198985	0.010394	0.008212	0.00442	0.011894	0.018112	0.001261	0.003277	0.000209	0.024249	0.004865	-0.0031	0.006213	0.202572705
20	0.002349625	-0.00322	0.002087	0.000543	0.00104	0.001696	0.006644	0.00245872	0.001229	1.3E-06	0.001746	0.001305	0.001856	-0.00042923	0.000791	-0.00031	0.000667	-0.00112	-0.00289	-0.00746	0.000369	-0.00175	-0.00389	0.001254	0.000645	-0.00702	-0.00141041
21	0.00693786	-0.01221	0.006197	-0.00655	0.005091	-0.00181	0.015574	-0.01140992	-0.02032	-0.00506	0.005473	-0.00588	-0.00823	0.023398987	6.46E-05	-0.01695	-0.00264	-0.10538	0.012741	-0.01167	-0.00067	-0.01158	-0.00139	0.002676	-0.01683	-0.00793	-0.16835221
22	0.008430413	0.042146	0.016672	0.000245	-0.00655	0.003407	-0.02377	-0.02076213	0.002483	0.017841	0.013351	0.003773	0.011945	0.024080858	0.007828	0.003798	-0.00041	0.000926	0.009381	0.021206	0.041929	0.009554	-0.0053	0.001854	0.00657	0.002442	0.193073413
23	0.001022865	-0.00052	0.000952	0.000152	-0.00017	-0.00039	0.000862	-0.0005338	-0.00063	-0.00117	0.000392	0.000336	-0.00054	0.001276604	0.000172	-0.00148	0.000196	-0.00493	-0.00359	0.00367	-0.00142	-0.00293	0.00202	0.004597	-0.00411	-0.00155	-0.00831953
24	0.00293545	-0.00233	0.005226	-0.00032	0.005035	0.005213	0.005201	0.001307845	0.005923	0.003794	0.002079	0.003848	0.004504	0.003946293	0.004384	-0.00147	0.005679	-0.00141	-0.00069	-0.00316	-0.00575	-0.00785	0.004329	-0.0034	0.00548	0.005331	0.047826626
25	0.006944961	-0.00295	0.006474	0.023974	0.031831	0.009709	0.010368	0.005792269	0.003589	-0.0148	0.005334	0.006654	-1E-05	0.004928913	-0.00107	-0.00205	0.000329	-0.01224	0.003029	0.018586	-0.01173	-0.01638	0.012781	0.014764	0.036495	0.014862	0.155221745
26	7.05705E-05	-0.0005	-4.7E-05	-0.00012	3.46E-06	0.001021	0.000268	-0.00033269	-0.00032	-0.0006	9.56E-05	0.000335	-7.4E-06	0.001581913	0.000295	-0.00079	0.000259	-0.00151	-4.4E-05	0.00581	-0.00674	-0.00361	0.000292	0.000489	6.88E-05	0.002578	-0.00144596
SUM	0.127258152	-0.00342	0.373534	0.138498	0.005163	0.051148	0.024565	-0.01277125	-0.00219	0.057629	0.318997	0.006303	0.136055	0.0184624	0.08987	-0.05383	0.124229	-0.54094	0.093922	0.002414	0.009247	-0.04151	0.032491	0.040982	-0.00984	0.013729	1

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1991

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.021828	-0.00177	-0.00275	-0.00589	-0.01953	-0.00223	0.097641	0.038152	-0.00024	-0.0045	0.001707	-0.08128	-0.00262	-0.00386	-0.00125	-0.002	-0.00348	-0.00844	0.000591	-0.00741	-0.00376	-0.00452	0.000848	0.000865	-0.03318	-0.00099	-0.02807
2	0.003941	0.00733	0.004746	0.00575	0.00298	0.003464	0.006333	0.00147	0.003446	0.051696	0.257822	0.001871	0.015738	-0.22367	-0.02269	-0.00981	-0.00137	-0.01542	0.046685	-0.01987	0.003875	0.012289	0.001385	-0.00088	0.002824	0.003555	0.143487
3	0.02153	0.000317	0.111271	0.011323	0.000915	-0.00151	0.012851	0.005991	0.000148	0.004352	0.001054	0.009112	0.001514	0.001024	0.000289	-0.00019	0.000889	-0.00318	0.001091	0.000355	-0.00097	0.000681	0.001304	0.001232	-0.00924	0.001473	0.173623
4	0.000222	2.63E-06	1.43E-05	0.001032	-0.00013	-2.9E-05	9.12E-05	-4.9E-05	-7.1E-05	-0.00014	8.4E-05	0.000146	3.26E-06	5.42E-05	-6.2E-05	-7.3E-05	4.34E-05	-0.00021	8.74E-05	-8.9E-05	-0.00019	-0.00013	0.000162	0.000134	-0.003	5.7E-06	-0.00209
5	-6.1E-05	3.64E-05	0.000134	0.000449	0.038333	9.81E-05	9.34E-05	0.000319	0.0026	-4.3E-05	2.35E-05	0.000126	0.000264	2.06E-05	0.000121	7.23E-05	3.38E-05	0.000278	-6.7E-06	2.45E-05	0.0003	0.00036	1.98E-05	1.72E-05	2.95E-05	4.94E-05	0.043692
6	-0.00034	-6.5E-05	-0.00148	-0.00186	0.000516	-0.12178	0.000539	0.003451	-0.00353	-0.00088	0.000191	0.004528	-0.00183	0.000338	-0.00074	-0.00076	0.001113	-0.02408	-0.00071	-0.00017	-6.6E-06	-0.00076	4.82E-05	0.00015	-0.00057	-0.00172	-0.1504
7	0.000356	-0.00113	6.1E-05	-0.00228	-7.1E-05	-0.00064	-0.00161	-0.08382	-0.00082	-0.00163	0.000458	0.000489	-0.00147	-0.00082	-0.00021	-0.00083	-0.00109	-0.00932	2.7E-05	-0.02555	-0.00074	-0.0001	-0.00115	-0.00172	-0.00089	-0.00062	-0.13511
8	3.61E-05	1.1E-05	4.39E-05	-3.2E-08	0.000149	0.000773	0.00055	0.002539	-0.00133	-1.3E-05	3.77E-05	9.15E-05	5.3E-05	3.9E-05	-6.1E-05	-0.0006	3.53E-05	-1.7E-05	2.14E-05	-5.3E-06	2.89E-05	8.8E-05	4.91E-05	2.07E-05	0.000559	0.000265	0.003374
9	0.002125	0.000181	0.002437	-5.9E-06	0.02639	0.000319	0.003899	0.005344	-0.00534	-0.00718	0.00255	0.004357	0.002578	0.002785	-0.00115	-0.00104	0.00204	-0.00461	0.000595	0.000931	-0.0079	0.00069	0.001211	0.005111	0.000701	0.001809	0.038819
10	0.000953	0.000223	0.004994	0.003031	0.000372	-0.00011	0.002068	-0.0058	0.00203	0.00288	0.00213	-0.00348	0.017618	-0.00015	0.005632	-0.00271	0.00066	0.006211	0.002681	-0.0044	-0.00017	0.000613	-0.00024	-5.7E-05	-0.00163	0.000631	0.033998
11	-0.0021	-0.01734	-0.00146	-0.00463	0.000742	-0.00993	-0.00261	-0.00564	-0.00264	-0.00887	0.006066	-0.02511	-0.00094	-0.00712	-0.00123	-0.00306	-0.00032	-0.00457	-0.07896	-0.00454	-0.00269	-0.00941	-0.00021	1.04E-05	-0.01061	-0.0008	-0.19796
12	-0.00047	-0.0009	-0.00034	-0.00039	-0.0003	-0.00128	-0.00067	0.003347	-0.00046	-0.00089	0.000645	0.026636	-7.3E-05	-0.00082	-0.00019	-0.00069	-0.00195	-8.6E-05	-0.00061	-0.00202	-0.00167	-0.00335	-0.00041	-4.5E-05	-0.00244	0.00093	0.011495
13	-0.00027	-0.00064	0.002076	0.008648	0.012643	0.001321	0.0085	0.000103	0.001583	-0.00771	0.002218	0.002917	0.031169	0.01013	0.012282	-0.00013	0.011196	0.009951	0.000428	0.005889	-0.00701	0.000529	-0.00127	-0.0003	-0.0004	0.001977	0.105827
14	-0.00037	-0.00229	-0.00063	0.003998	0.000809	-0.00032	-0.00015	-0.00308	-0.00031	-0.00126	0.001568	0.000113	0.003007	0.060082	-0.01818	-0.00991	-0.00011	-0.02178	-0.00053	-0.00506	-0.0007	3.84E-06	-0.00063	-0.00093	-0.00145	0.001176	0.003051
15	0.000408	0.000587	0.00088	0.030585	0.002073	0.000536	0.002055	0.010788	0.001693	-0.00155	0.006228	0.00214	0.002464	0.020935	0.049806	0.00907	0.002393	0.004819	0.003327	0.008384	-0.00064	0.00106	-0.00049	0.000204	0.000473	0.001646	0.159872
16	0.002219	0.000505	0.00483	0.002553	0.01	0.003475	0.005097	0.013213	0.003669	0.002591	0.002652	0.003832	0.007087	0.005499	0.008207	0.011421	0.008219	-0.01461	-0.00353	0.003657	0.001712	0.004251	0.000266	-0.00036	0.00011	0.045026	0.131595
17	0.002132	0.002083	0.003056	0.002397	0.001441	0.001908	0.004332	0.004003	0.002001	0.001583	0.001779	0.00331	0.003482	0.002913	0.00315	0.003367	0.075649	0.00207	0.001124	0.00541	0.001666	0.02202	0.00135	0.00118	-0.00069	0.012564	0.165282
18	0.001255	0.001393	0.001182	0.00059	-0.0002	-0.00209	0.002027	0.001267	-0.00086	0.000318	0.000749	0.00153	0.001828	0.001288	0.000928	0.000269	0.000402	-0.1597	0.000489	0.001353	0.000557	0.001459	0.001125	0.000284	0.004321	0.002115	-0.13612
19	0.002527	-0.0103	0.006107	0.002434	0.003895	-0.00634	0.004804	0.003181	0.001323	0.005782	0.006816	0.008482	0.004866	0.013866	0.005939	0.001773	0.002892	0.00032	0.024053	0.00089	0.017293	0.002083	0.008261	0.002193	-0.01082	0.007662	0.109988
20	0.000208	-0.00335	0.000713	0.000179	0.000992	-0.00012	0.001812	0.00098	-2.5E-05	8.71E-05	0.002139	0.000252	0.000917	-0.00106	0.000137	-0.00016	0.000853	-0.00093	0.005846	-0.00346	-0.0033	0.001634	-0.00018	-0.00864	-0.0005	0.003955	-0.00101
21	0.00553	-0.00403	0.007489	0.009434	0.014476	-0.00907	0.013239	0.003581	-0.00586	-0.01343	0.025543	0.004324	0.006173	0.055896	0.015217	0.005882	0.027144	-0.00372	-0.01019	-0.00057	0.006042	0.000779	0.002649	0.003017	-0.00574	0.01179	0.165603
22	0.003347	0.00434	0.010128	-0.00031	-3.9E-05	0.000388	-0.00674	-0.01078	0.001569	0.000126	0.007224	0.007292	0.007957	0.008296	0.006569	-0.00055	0.000618	0.002787	0.001101	0.00073	0.01115	0.023749	0.003184	0.002454	0.002072	0.01624	0.102902
23	0.000574	0.000221	0.000935	-0.00021	0.000959	9.93E-05	0.00111	0.000982	-9.1E-05	-0.00057	0.001263	0.001396	0.001029	0.001796	0.000779	-0.00039	0.00078	-0.00265	-0.00051	0.001767	-0.00079	0.000369	0.046011	0.008039	0.000845	0.002889	0.06665
24	0.001806	0.000415	0.003387	0.001488	0.011405	0.001169	0.003539	-0.00052	0.003386	-0.00023	0.00502	0.005599	0.003152	0.004747	0.002311	0.000516	0.002278	-0.00296	0.003471	-0.00452	0.005746	0.00904	0.010221	0.000391	-0.0033	0.007199	0.074752
25	0.012227	0.005656	0.00859	-0.01624	-0.00314	0.002822	0.01013	0.004179	0.00289	-0.01093	0.009797	0.011761	0.007235	0.008259	0.001057	-0.00148	0.005799	-0.00915	0.014711	0.000471	-0.0032	0.002777	0.015048	0.016515	0.004728	0.018194	0.118715
26	0.000387	0.000194	0.000254	-0.00035	0.000345	-0.00058	0.000231	-0.00067	-0.00066	-0.00068	0.000637	0.000929	-1.8E-05	0.000561	-0.00046	-0.00063	0.000245	-0.001	0.004182	-0.00055	-0.00346	-0.00133	0.000713	0.000133	-0.00136	0.000986	-0.00196
SUM	0.079989	-0.01832	0.166661	0.05174	0.106018	-0.13966	0.169155	-0.00748	0.004104	0.008918	0.346401	-0.00863	0.111175	-0.03896	0.066219	-0.00262	0.134957	-0.25998	0.015479	-0.04836	0.011173	0.064878	0.08927	0.029023	-0.06915	0.137999	1

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.0453308	-0.00339	-0.027032	-0.005903	0.0226096	0.006886	0.087064	0.0162831	0.0213816	0.0412275	4.324E-05	-0.229968	-0.003705	-0.004784	0.0022126	-0.000674	-0.011108	-0.005721	0.0025773	-0.009932	-0.003356	-0.005208	0.0006981	-0.000917	-0.028048	-0.002506	-0.09594
2	0.0077184	-0.00224	0.0081442	0.0011915	0.0025089	0.0018501	0.0041982	-0.002635	0.0037937	0.0127468	0.0351494	0.0035879	-0.002395	-0.284131	-0.06321	-0.016746	-0.001845	-0.003832	-0.01682	-0.026824	-0.002208	0.0074932	-0.000237	-0.001478	0.0003686	-0.00104	-0.33689
3	0.0229621	0.0002788	0.1950162	0.0210346	0.0039976	0.0001425	0.01315	0.0059987	0.0023623	0.0469295	0.0008839	0.0029871	0.0030702	0.0016173	0.0010751	0.0004525	0.0011341	-0.002165	0.003363	0.0022243	0.0006648	0.0039066	0.0017459	0.0009141	0.018686	0.0071275	0.359559
4	0.0001181	-5.11E-05	0.0004067	0.0545668	-0.000157	1.838E-05	3.918E-05	-0.000129	-5.25E-05	0.0011252	2.421E-05	0.000129	-4.24E-05	3.195E-05	-7.37E-05	-7.41E-05	5.671E-05	-0.000224	0.0003543	-2.19E-05	-4.11E-05	0.0003561	0.0001748	7.709E-05	-0.0022	5.129E-06	0.054418
5	-0.000124	-2.76E-05	-8.88E-05	-7.96E-05	0.0197443	-7.77E-05	-6.19E-05	-0.000118	-9.37E-05	-0.000345	-1.33E-05	-0.000168	-0.000215	-3.36E-05	-9.29E-05	-0.000126	-1.65E-05	-0.000175	-6.37E-05	-9.99E-05	-3.44E-05	-7.07E-05	1.581E-06	-9.26E-06	-6.14E-05	-2.82E-05	0.017523
6	0.0001177	-0.000173	-0.002036	-0.00216	-0.001042	-0.106106	-1E-05	0.0138187	-0.003516	-0.000759	4.67E-05	-0.001015	-0.00224	0.000215	-0.000709	-0.000502	0.0139985	-0.030911	-0.000563	0.0009435	-0.000374	-0.000951	-0.000687	0.0004865	2.803E-05	-0.001243	-0.12534
7	0.0010547	-0.001767	0.0001382	-0.00311	-0.000106	-0.000714	-0.027747	-0.161956	0.0076679	-0.003073	-0.000225	-0.000256	-0.002352	-0.001054	-0.000787	0.0019365	0.0011432	-0.01062	-0.00134	-0.041691	-0.001312	-0.000951	-0.001954	-0.003702	-0.001478	-0.004126	-0.25838
8	6.086E-05	1.679E-06	5.14E-05	3.42E-05	-8.95E-05	0.0001625	7.747E-05	0.0368031	-0.000881	-4.36E-05	3.179E-05	0.0005592	0.0002225	9.106E-05	-2.04E-05	-2.92E-05	0.0004839	0.0003781	7.445E-05	-6.99E-05	-9.17E-05	8.743E-05	0.0001069	1.115E-05	-8.93E-05	-2.97E-05	0.037893
9	0.0005539	-0.002303	0.007317	0.0115383	-0.027136	0.0016265	0.0053324	0.0040738	0.0604468	-0.006725	0.0006878	0.0032244	0.0007563	0.00126	-0.000412	-0.004267	0.0031421	-0.006755	-0.001857	-0.003699	-0.02276	-0.002146	-0.001097	0.0021185	0.0010361	0.0018688	0.025825
10	0.0060271	0.0007105	0.0075222	0.0115006	-0.000122	0.0346103	0.0055493	-0.013724	0.0087437	0.0622468	0.0121624	0.0067373	0.0122301	0.0107022	0.0032696	0.0015953	0.0038125	0.0090873	0.0041993	-0.003779	-0.000281	0.0023099	0.0002976	-0.000426	-0.001888	-0.000386	0.182709
11	0.0334239	-0.02083	0.0414082	0.0011584	0.0078319	-0.000788	0.0170351	0.0038799	0.0126259	0.0295035	0.0084538	0.0049718	0.0069315	-0.001834	0.0034539	-0.002471	0.0044229	-0.000964	-0.116349	-0.002682	-0.007906	0.0212378	-0.001445	0.0030693	-0.001367	0.0014198	0.044191
12	0.0017801	-0.001328	0.0003817	-0.000339	-0.000275	0.0012463	-3.69E-05	-0.003218	-0.000485	-0.000468	-0.000124	0.00101551	-0.000152	-0.000246	0.0032262	-0.001044	-0.009148	0.0002657	-0.000625	-0.000722	-0.002591	-0.004846	-0.000434	-8.46E-05	-0.002525	-4.51E-05	0.078317
13	0.0023397	-0.001015	0.0004501	-0.014453	-0.005443	0.0247634	0.0006779	0.0112006	-0.003806	-0.011655	0.0003699	0.0026565	0.045261	0.0082276	-0.001543	-0.000709	0.0109521	0.000473	0.0001188	0.0217585	-0.009099	0.0004365	-0.001763	-0.001074	0.0001128	-0.001627	0.077613
14	-0.000268	-0.002958	-0.002086	0.0049003	-0.000228	-0.000329	-0.000579	-0.00176	8.763E-05	-0.000834	-0.001123	0.0008866	-0.000173	0.0822504	-0.037227	-0.015395	0.0012886	0.0146712	-0.001352	0.0078646	-0.001175	-0.000254	0.0005423	-0.001599	-0.001418	-0.002276	0.042117
15	-0.000737	1.95E-05	-0.005408	0.039737	-0.000104	0.001623	0.0043061	0.0152973	0.0023336	2.13E-05	-0.002456	0.0019811	0.0039205	0.0116583	0.0427861	0.011211	0.0031955	0.0171807	0.0011372	0.006005	-0.00206	0.0006287	-0.00047	-0.000425	0.0008543	-0.000471	0.151765
16	0.0015501	0.0016281	0.0029602	0.0184345	0.0039727	0.0071418	5.285E-05	0.0051285	0.0025845	0.0036898	0.0074904	0.0019419	0.0035733	0.0097858	0.0160429	-0.012085	0.0137429	0.0191119	0.0100645	0.0030357	0.0017696	0.0095739	0.0564363	-0.000229	0.005066	0.0045343	0.196999
17	0.0027684	0.0015901	0.0014405	0.0002516	0.0004078	0.0004412	0.0012566	0.006341	0.0003616	0.0004129	0.0005676	0.0016177	5.383E-05	0.0009524	0.0004996	0.0007904	0.1374592	0.0018825	0.0023707	0.00143	0.0014737	0.0108184	0.001129	0.000404	-0.001979	0.0091975	0.183939
18	0.0001773	0.0016619	0.0003308	0.0002733	-0.000732	0.00409	0.0004268	0.0024646	-0.001507	0.0003747	0.0005362	0.0005212	0.0011637	0.0014923	0.0012466	0.0003915	0.0006112	-0.170563	0.002652	0.0009757	-0.000107	0.0005195	0.0018907	0.0026826	0.0035422	0.0044885	-0.1404
19	0.0042899	-0.013449	0.0341506	0.0063889	0.0097023	0.0123106	0.0163659	0.006397	0.0193992	0.0145185	0.0062446	0.0233156	0.0147877	0.025721	0.0199488	0.0026249	0.0108171	0.0049635	0.0479127	0.0073586	0.0082341	0.0101811	0.0064514	0.0126406	-0.001437	0.0125828	0.322422
20	0.0002939	-0.004793	0.0013153	0.0017818	0.0017543	0.0009148	0.0001577	-0.001525	0.0036569	0.0027729	0.0001502	0.0043142	0.0065798	-0.002234	-0.000533	-0.001542	0.0030332	-0.001123	-0.007669	-0.004113	-0.005836	-0.001642	-0.00544	-0.026008	-0.000968	-0.030368	-0.06707
21	0.0147775	-0.010461	0.0116545	0.0089759	0.0084494	-0.001733	0.0178298	0.002539	-0.001439	-0.003319	0.0247236	0.0108072	-0.001547	0.0344383	-0.002987	-0.010109	0.0386509	-0.054415	-0.032137	-0.004583	-0.006019	0.0005311	0.0103118	0.0021726	-0.008077	-0.00198	0.047323
22	0.0049745	0.0028996	0.0022889	-0.003033	2.308E-05	-0.000294	-0.001369	-0.00157	0.0041464	0.0041898	0.0017526	0.0031335	0.0008751	0.0040338	2.809E-05	-0.00389	0.0016459	-0.00116	-0.004893	0.0003275	-0.011288	0.0513023	0.0095785	0.0025358	0.0048872	0.0020041	0.07313
23	0.0010104	0.0001894	0.0018998	0.0014888	0.0047573	0.0045993	0.0014845	0.0063055	0.0018009	0.0019535	0.0012364	0.0019299	0.0042069	0.0015559	0.0027876	-0.000562	0.0016773	-0.003926	0.0015764	0.0046076	0.0017009	0.0063027	0.0073672	0.0208948	0.0066075	0.003557	0.087009
24	0.0006632	-0.003902	-0.001472	-0.005189	-0.002565	-0.005279	-0.004885	-0.012271	-0.006277	-0.003995	0.0001117	-0.000984	-0.006163	-0.001993	-0.006213	-0.005109	0.0005141	-0.014125	0.0034762	-0.000571	-0.007546	-0.009587	0.0182453	0.0163118	-0.009876	0.0041486	-0.06453
25	0.0051571	-0.000749	0.0043274	-0.017596	-0.007926	0.0048936	0.0038376	-0.000992	-0.0011	-0.012738	0.0034623	0.0093794	-0.002694	0.003557	-0.003209	-0.003926	0.0054339	-0.0135	0.038206	0.0014064	0.0070868	0.0442547	0.0171251	0.0068121	0.0206435	0.0199837	0.122208
26	0.000237	-0.000306	-0.000417	-0.001036	-0.000534	-0.001548	-0.000557	-0.002239	-0.001755	-0.001294	0.0001673	0.0002476	-0.001428	-0.000403	-0.001734	-0.001476	2.71E-05	-0.002625	0.0016303	-0.001691	-0.006225	-0.002301	0.0009733	0.0010683	-0.001997	0.0088023	-0.01641
SUM	0.1562586	-0.060763	0.2826646	0.1303573	0.0392981	-0.008891	0.1435962	-0.074534	0.1304791	0.1764653	0.100354	-0.047308	0.0805278	-0.099123	-0.022174	-0.061735	0.2351249	-0.254524	-0.063954	-0.042541	-0.06938	0.1419842	0.1195479	0.036249	-0.001576	0.0335945	1

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.0118477	0.000316	0.00046	0.0014286	-0.00057	0.0104435	-3.19E-05	0.0102727	0.004475	0.0026415	0.0019244	-0.026432	0.0006748	-0.000184	0.0009388	0.0013518	-0.000969	-0.000171	0.0007652	-0.001316	0.0018854	-0.001364	0.000976	0.0008035	-0.009543	0.0005744	0.011198
2	0.0004603	0.0003775	0.0009877	0.0006454	0.0010057	0.0013331	0.0017075	0.0008502	0.0013095	0.0036194	0.0024493	0.0015274	-0.000128	-0.039181	-0.005034	-0.001266	0.003324	-0.001208	0.0012236	-0.006638	0.0001042	0.0027341	0.0003977	0.0003524	0.0011946	0.0006996	-0.027153
3	0.0026616	0.0009529	0.0260845	0.0020125	0.0090608	0.0011008	0.0012909	0.0013493	0.0012073	0.0059526	0.002261	0.0008645	0.001209	0.0009455	0.0008277	0.001594	0.0008735	0.0005462	0.0009294	0.0012157	0.0009637	3.21E-05	0.0008348	0.0007335	-0.004654	0.0010136	0.0618633
4	3.091E-05	1.784E-05	8.181E-05	0.0211687	1.824E-05	1.936E-05	1.014E-05	-1.39E-05	1.348E-06	-1.22E-06	8.351E-05	4.167E-05	4.227E-06	1.762E-05	2.407E-06	3.783E-05	3.49E-05	-1.46E-05	2.855E-05	4.678E-05	1.898E-05	-6.22E-07	8.465E-05	5.627E-05	-0.000674	4.009E-05	0.0211414
5	5.686E-05	9.875E-05	0.0001165	0.0045584	0.0180971	9.192E-05	7.802E-05	8.648E-05	9.181E-05	4.836E-05	0.0001764	0.0001013	6.974E-05	8.847E-05	7.857E-05	0.0001291	7.351E-05	0.0001109	7.635E-05	9.475E-05	0.0001178	5.411E-05	4.6E-05	4.772E-05	0.0001117	0.0001113	0.024812
6	0.0001399	0.0001979	-0.0001	-6.86E-05	0.0003437	-0.009634	0.000232	-0.000157	0.0024013	8.721E-05	0.0004341	0.000297	-0.000111	0.000198	4.235E-05	0.0002023	0.0007614	-0.00436	7.828E-05	0.0002765	0.0002762	-9.49E-05	-6.69E-05	0.000147	-7.97E-05	0.0001792	-0.008379
7	-9.18E-06	-3.34E-05	3.929E-05	-0.00035	0.0001745	1.138E-05	-0.000711	-0.003852	0.0010609	-0.000421	0.0002434	-6.38E-05	-0.000309	-8.56E-05	-8.22E-05	0.0001898	-7.33E-05	-0.001345	0.0001794	-0.004832	-4.48E-05	0.0001838	-0.000153	-5.3E-05	-0.000208	0.0001278	-0.010417
8	1.986E-05	3.048E-05	3.461E-05	3.285E-05	6.778E-05	2.974E-05	0.0001876	-0.001417	0.0005588	2.59E-05	4.797E-05	3.402E-05	3.215E-05	2.561E-05	1.549E-05	-7.13E-05	2.876E-05	8.513E-05	4.437E-05	0.0014884	5.504E-05	1.725E-05	2.529E-05	7.746E-05	-2.1E-05	0.0001123	0.0015677
9	0.0002424	8.242E-06	0.0006545	0.0013068	0.0053175	0.0002313	0.0005565	0.0007552	0.0219646	-0.001212	0.0009308	0.0009287	0.0004807	0.0003941	4.701E-05	8.729E-07	0.0007416	-0.000147	-0.000248	-4.56E-05	-0.003632	0.0004191	0.0002207	0.0003095	-8.9E-05	0.0013804	0.0315163
10	0.0022756	0.0010086	0.0020887	0.0020778	0.0014389	0.0039655	0.0005208	-0.002418	0.0018335	0.0077547	0.0048209	0.0017954	0.0066447	0.001437	0.0023542	0.0020708	0.0021559	0.0033081	0.0017252	0.0007569	0.0012018	0.0008259	0.0003719	0.000531	-0.000307	0.0016692	0.0519083
11	0.0015503	0.0029045	0.0041695	0.0030782	0.0025995	0.0042929	0.0072702	0.0077634	0.0025292	0.017027	0.0071741	0.0055737	0.0095724	0.0103625	0.0063195	0.0016296	0.0040704	0.0034221	0.0010829	0.005978	0.0001792	0.0108284	0.0020977	0.0020701	0.0061773	0.0027376	0.1324601
12	0.0002495	0.0001849	0.0003923	0.0003612	0.0003917	0.0019745	0.000218	-0.000263	0.0005494	0.0003983	0.0006414	0.0504868	0.0006965	0.0001488	0.0011932	0.0004785	-0.000133	0.0004179	0.000213	0.000211	0.0001722	-3.45E-05	0.0001441	0.0002767	-8.59E-05	0.0003953	0.0596784
13	0.0002878	0.0004322	0.0003905	-0.00177	0.0002285	0.0022697	0.0002687	-0.00093	0.0019726	-0.000828	0.0013007	0.000646	0.0135823	0.0005044	0.0019406	0.0003827	0.0006498	-0.000319	0.0006765	0.0059364	-0.000744	0.0006948	-2.63E-05	0.0006099	-9.87E-05	0.0011038	0.0291621
14	0.0001609	-0.000113	6.26E-05	0.0005684	0.0004466	0.0002757	6.859E-05	-0.000605	0.0012835	0.0003018	0.0003827	0.0002619	0.001154	0.0228051	0.0023327	-0.001132	0.0064942	-0.001096	0.0002829	-0.004149	0.000116	0.0003707	-3.7E-05	2.996E-05	-0.000145	0.0002697	0.0303901
15	0.0002889	0.0005141	-0.000607	0.0028895	0.0009005	0.0007922	0.000388	0.0009226	0.0011706	0.0003085	0.000495	0.0006328	0.0018688	0.0058196	0.0180498	0.0029334	0.0061952	0.0119005	0.0015891	0.0024109	0.0002599	0.0004697	4.952E-05	0.0003437	0.0001397	0.0008873	0.0616125
16	0.0036008	0.003347	0.0050052	0.0038509	0.0053579	0.0037672	0.003035	0.0035045	0.0041912	0.0033041	0.0069077	0.0050009	0.0038758	0.003034	0.0028295	0.0187108	0.0133514	0.0045357	0.0025706	0.004987	0.0040153	0.0018302	0.0002267	0.0016263	0.0012112	0.0034073	0.1170842
17	0.0009893	0.0005129	0.0009153	0.0006004	0.0007727	0.0007095	0.0005854	0.0005866	0.0007537	0.000517	0.0010898	0.0010998	0.0005337	0.0005049	0.0006699	0.0009634	0.016012	0.0013962	0.000483	0.0009277	0.0008249	-0.000845	0.0003237	0.0004301	-1.87E-05	0.0009681	0.0323065
18	0.0008818	9.432E-05	0.0004599	6.367E-05	0.0001115	0.0001652	0.0003889	1.959E-05	0.0001445	8.545E-05	0.0002077	0.0005769	9.625E-05	0.0001027	0.0002145	0.0001854	0.0004913	-0.023325	0.0001742	0.0001357	6.177E-05	0.0002566	1.912E-05	9.511E-06	5.511E-05	0.0005303	-0.017793
19	0.0014083	-0.001289	0.0017396	0.0009535	0.0012771	0.0031304	0.0036015	0.0032554	0.0019811	0.0016923	0.0012511	0.0030298	0.0013882	0.0090547	0.0080087	0.00073	0.0030635	0.0030269	0.0277434	0.0019172	0.0009358	0.001686	0.002903	0.0018183	0.0028398	0.0031514	0.0902978
20	-4.26E-05	0.0008037	2.154E-07	-0.000121	0.0002662	1.521E-05	2.193E-05	-0.000144	-0.000159	-2.01E-05	0.0004551	-6.02E-05	-8.02E-05	0.000589	5.291E-05	0.001489	0.0002632	-0.000367	0.0024337	-0.00019	-0.000908	0.0031661	0.0003889	0.0012287	-4.35E-05	0.0036687	0.0127069
21	0.0018087	0.0025278	0.0015459	9.985E-05	0.0034423	-0.003183	0.0012432	-0.003548	-0.00243	-0.003213	0.0084644	0.0018348	-0.001651	0.0020758	-0.002749	-0.002291	0.0037497	-0.012607	-0.003403	-0.003392	0.0039104	-0.000508	0.0012977	0.0030107	-0.002835	0.0038552	-0.002943
22	0.0020957	0.0012859	0.0023523	0.0018549	0.0009282	0.0038444	0.0036235	0.0047813	0.0034265	0.0030474	0.0035405	0.0032149	0.0043327	0.0023776	0.0031025	0.0023741	0.0026049	0.0024429	0.0015526	0.0043768	0.0027759	0.0315007	0.0025873	0.0067612	0.0030024	0.0053725	0.1091596
23	0.0004867	0.0005499	0.0011758	0.0007059	0.0015076	0.0009527	0.0010971	0.0009395	0.0003959	0.0006481	0.0010721	0.0009165	0.000814	0.0008197	0.0007854	0.0006586	0.0009838	0.000165	0.0007657	0.0023096	0.0012179	0.0106995	0.0081124	0.0020179	0.0028544	0.0017835	0.0444352
24	0.0013565	-0.000178	0.0010099	0.000269	0.0021839	0.0011791	0.0013504	0.0005319	0.0008391	0.0024784	0.000685	0.0015259	0.0004243	0.0078181	0.0016373	0.000214	0.0011208	0.0001066	0.0002946	0.0018515	-5.27E-05	0.0059961	0.0196733	0.0180891	0.0033222	0.0026047	0.0763312
25	0.0007162	8.153E-05	0.0002422	-0.001872	-0.000354	0.000407	-0.00014	-0.001427	-0.000588	-0.001783	0.0018426	0.0009251	-4.18E-05	-6.2E-05	-0.000304	7.423E-05	0.0016737	-0.002001	0.0019457	0.0041077	0.0029537	0.000254	0.007947	0.0048475	0.0261141	0.0052463	0.0508054
26	4.855E-05	8.779E-05	1.013E-07	-5.82E-06	0.0010023	-0.0001	1.537E-05	-0.000165	-4.61E-05	-4.85E-05	0.0001643	2.994E-05	-3.18E-05	1.745E-05	-0.000102	-3.62E-05	0.0001704	-0.000162	0.0004154	0.0003167	-0.000255	0.0004234	0.0052452	0.0007533	0.000773	0.0077359	0.0162468
SUM	0.0336132	0.0147211	0.0493015	0.0443402	0.0560166	0.028085	0.0268765	0.0206786	0.0509179	0.042411	0.0490459	0.05479	0.0451017	0.0296278	0.0431721	0.0316038	0.067712	-0.01566	0.0436219	0.0187825	0.0164103	0.0695952	0.0536892	0.0469284	0.0289919	0.0496259	1

Appendix Table 14
Multiplier Product Matrix, Thailand
1985

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.062402	0.002842	0.004134	0.01161	-0.00041	0.006718	-0.04879	-0.00124	0.006067	0.025764	-0.00138	0.150164	-0.00133	0.000296	0.000727	0.006178	0.005194	-0.00194	0.001008	-0.00023	0.03131	0.00334	-0.00085	0.000514	0.003726	0.03669	0.302514
2	0.000303	0.025505	0.000334	0.003604	3.88E-05	0.040411	0.002518	0.003316	0.000617	0.005336	2.78E-05	0.001119	0.000265	0.000187	0.000222	0.000372	0.001934	-1.9E-06	0.000286	0.000154	0.006713	0.000253	-1.9E-05	7.04E-05	0.000634	0.011339	0.105538
3	-0.00077	0.000417	-0.00614	0.001393	-0.00473	0.001378	-8.7E-05	-0.00073	-0.00287	-0.00897	-0.0032	0.001652	-0.00717	-0.0024	-0.00236	-0.00248	-0.09415	-0.00265	-0.01681	-0.00245	-0.00633	-0.00143	-0.00482	-0.00451	-0.00079	-0.00176	-0.17277
4	2.14E-05	-0.00722	0.00016	0.012856	-0.00047	-0.00812	-0.00092	7.83E-06	-0.0011	0.002223	-0.0006	5.1E-05	-0.00102	-0.00054	-0.00052	-0.00061	-0.0001	-0.00068	-0.00088	-0.00084	-0.00512	-0.00623	-0.0009	-0.00011	0.000619	-0.00304	-0.02309
5	0.007553	0.011352	0.009564	0.059238	0.074141	0.012938	0.009839	0.005672	0.013752	0.004695	0.077014	0.017287	0.039523	0.053109	0.022659	0.020977	0.018353	0.053107	0.022645	0.004621	0.015294	0.047735	0.005007	0.005439	0.005351	0.009956	0.62682
6	0.002373	-0.00987	0.002551	0.014739	-0.00132	0.034488	0.001691	0.005641	-0.00292	0.049906	-0.0023	0.008504	-0.00085	0.000548	0.000109	0.001018	0.006976	-0.00209	0.000434	-0.00235	0.043291	-0.00055	-0.00207	0.000279	0.003544	0.029205	0.18098
7	0.000138	-9.6E-05	0.000786	0.000312	-0.00044	-0.00063	-0.05311	-0.00096	-0.00132	-0.00142	-0.00081	-0.0008	-0.00088	-0.00098	-0.00047	-0.00073	0.000551	-0.00101	-0.0004	-0.00161	-0.02838	0.001859	-0.0014	0.000123	-0.00054	0.039449	-0.05275
8	0.000845	0.003887	0.005672	0.044197	-0.00258	0.004987	-0.00176	-0.06597	-0.00157	0.014327	-0.00437	-0.04526	-0.01045	-0.00228	-0.00103	-0.01743	0.006857	-0.00577	-0.002	0.000163	-0.00198	-0.00495	-0.00398	0.001995	-0.00231	-0.04912	-0.13989
9	0.001409	0.002251	0.00125	0.001531	0.000165	0.00348	0.011292	-0.00071	0.002602	0.012088	-0.00046	0.006318	-0.00201	-0.00246	-0.00096	0.002015	0.003225	-0.00288	-0.00161	-0.01044	-0.00049	-0.00042	-0.0045	0.000377	0.011272	-0.00087	0.031469
10	0.027644	0.019238	0.003639	0.010189	-0.00219	0.015318	0.000337	-0.00021	-0.0042	0.008816	-0.01351	0.008364	-0.02853	-0.01038	-0.00872	-0.00365	0.00953	-0.02165	-0.01018	-0.00039	0.002656	0.001697	-0.00514	0.000119	0.001853	0.046164	0.046813
11	0.010051	0.01538	0.014871	0.104777	0.015784	0.017334	0.008576	-0.00461	0.004821	-0.00685	0.002198	0.02429	0.019027	0.012978	0.008171	0.008639	0.008684	-0.14951	0.017947	0.0055	0.021948	0.056968	0.004195	0.009669	0.005551	-0.01059	0.225806
12	0.00104	0.002388	0.001539	0.004244	-0.00156	0.001546	-0.00037	-0.00333	-0.00655	0.002453	-0.004	0.007024	-0.00725	-0.00618	-0.00694	-0.06399	0.000934	-0.01174	-0.0069	-6.9E-05	-0.00064	0.002787	-0.00181	-0.00043	-0.00228	0.003011	-0.09707
13	0.000428	0.000646	0.00325	0.000791	-6.4E-05	0.000485	0.003563	-0.00117	-0.00052	-0.00973	-0.00059	-0.00135	0.03268	-0.00036	-0.00014	-0.0009	-0.00021	-0.00128	0.067422	-0.00044	0.00088	-0.00023	-0.0005	0.003123	-0.00148	-0.0026	0.091692
14	0.001186	0.00247	0.003763	0.009368	-0.00204	0.002945	0.002712	-0.0035	0.0014	-0.00063	-0.00722	-0.00256	0.006202	0.053512	-0.03695	0.034918	-0.00024	-0.01135	-0.01886	-0.00272	-0.0014	0.002777	-0.00484	-0.00494	-0.00118	-0.01594	0.006878
15	0.000694	0.002093	0.00192	0.003005	-0.00268	0.002662	0.00042	-0.00194	0.00293	0.000206	-0.00556	-0.00092	-0.00181	-0.0011	-0.01065	0.008171	0.000308	-0.00439	-0.01628	-0.00235	-0.00246	-0.00082	-0.00352	-0.00092	-0.00102	-0.00503	-0.03904
16	0.003577	0.007879	0.01467	0.028576	0.004101	0.005749	-0.00487	-0.00848	-0.01961	0.003418	-0.00924	0.000293	-0.03245	-0.02451	-0.01497	-0.07307	0.00547	-0.05777	-0.01698	-0.00187	0.002668	0.000917	-0.00397	0.001278	-0.00493	-0.06039	-0.2545
17	-0.00058	0.000931	0.00344	-0.0014	0.000177	-0.00044	-0.00083	0.005352	-0.0035	-0.0014	-0.00132	-0.00088	-0.00317	-0.00226	-0.00143	0.001514	0.06834	-0.00294	-0.01012	-0.00244	-0.00107	6.79E-05	-0.00872	-0.00367	0.00246	0.013086	0.049189
18	0.002893	0.012059	0.002959	0.012227	0.009527	0.009373	-0.00014	0.010909	0.004198	0.004775	0.024327	0.015504	0.026492	0.012443	0.004798	0.012871	0.010706	0.110441	0.009199	0.007444	0.013506	0.009283	0.007325	0.01182	0.009599	0.003275	0.357814
19	-0.00086	-0.00428	-0.00066	0.00103	-0.0048	-0.0032	-0.00356	-0.0079	-0.01096	-0.01203	-0.00609	-0.00446	-0.01163	-0.0067	-0.00549	-0.00656	-0.0041	-0.00712	-0.00326	-0.00254	-0.00158	-0.00549	-0.00548	-0.01902	-0.00338	-0.0137	-0.15384
20	0.004054	0.025691	0.004421	0.01096	-0.00562	0.00077	-0.01397	-0.00679	-0.03273	-0.00492	-0.01065	-6.6E-05	-0.03416	-0.0231	-0.0288	-0.04687	-0.00069	-0.04824	-0.02373	-0.00778	-0.00985	-0.01831	-0.00956	-0.00208	-0.00148	-0.02319	-0.3067
21	5.34E-05	-0.0002	0.003156	0.001266	-0.0052	-0.00219	-0.00576	-0.00638	-0.01277	-0.01309	-0.00682	-0.00623	-0.00975	-0.00681	-0.00563	-0.00653	0.00149	-0.00826	-0.00484	-0.00896	-0.0054	0.000553	-0.01187	-0.00045	-0.00382	-0.049	-0.17345
22	9.45E-05	0.009696	0.00396	0.010962	0.003457	0.007211	0.011482	0.004968	0.009029	0.008629	-0.00182	0.014519	-0.0058	-0.00584	0.003484	0.006845	0.012139	-0.00685	0.026893	0.004815	0.008983	0.002083	-0.00506	0.002464	0.001487	0.013361	0.141198
23	0.002186	0.008316	0.008383	0.008561	-0.00097	0.00974	0.002623	0.004957	0.013801	0.008053	-0.00239	0.013484	0.010079	0.01159	0.017453	0.020157	0.012225	-0.00599	0.015396	0.034632	0.007843	0.003626	-9.5E-05	0.003671	0.001948	0.017067	0.226354
24	-4.4E-06	6.51E-05	0.000102	0.000203	0.000662	-1.6E-06	0.000148	0.000161	0.000552	0.000507	0.000157	0.000508	-0.00106	0.000259	0.000623	0.00033	0.000295	-0.00154	0.000175	0.000198	0.000973	3.6E-05	-0.00058	0.00955	-0.00051	0.001734	0.013546
25	0.001544	0.002461	0.003283	0.004922	0.037843	0.002515	0.006344	-0.00504	0.002427	0.002599	0.018983	0.00449	0.004388	0.00835	0.005357	0.009529	0.005273	0.00668	0.007653	-0.00064	-0.0022	0.004128	0.000633	0.000973	0.005323	0.005813	0.143637
26	-0.00153	-0.00153	0.004356	-0.00066	-0.00717	-0.00256	-0.00475	-0.00427	-0.0084	-0.01075	-0.00762	-0.00408	-0.01398	-0.00448	-0.00706	-0.00811	-0.00333	-0.00864	-0.00596	-0.00913	-0.00389	-0.00663	-0.00791	-0.00073	-0.00321	-0.00512	-0.13716
SUM	0.126755	0.132368	0.095367	0.3585	0.103644	0.162892	-0.07737	-0.08225	-0.0468	0.083988	0.032756	0.206953	-0.03466	0.052914	-0.0685	-0.09738	0.075657	-0.19407	0.030261	0.000278	0.085262	0.093051	-0.07046	0.014594	0.026448	-0.0102	1

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1995

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.007176	-0.00471	0.000176	0.003429	-0.00063	-0.0219	-0.01912	-0.01128	-0.00142	-0.00063	-0.00136	0.009197	-0.00202	-0.00054	-0.00071	-0.00212	-0.00052	-0.00168	-0.00077	-0.00117	0.001439	-0.00024	-0.00102	-7.8E-05	0.000241	-0.02933	-0.0796
2	6.47E-05	0.008131	3.55E-05	0.001407	-1.8E-05	0.010997	0.000885	0.000538	0.000299	0.000983	-5.5E-05	0.000259	3.06E-06	3.4E-05	2.25E-05	5.09E-05	0.000522	-5.7E-05	2.98E-05	-1.8E-05	0.001543	3.41E-05	-2.6E-05	4.77E-06	0.000128	4.26E-05	0.02584
3	-0.00031	-0.00025	-0.0064	-0.0005	-0.00117	8.69E-06	-0.00013	0.000773	-0.00109	-0.00247	-0.0009	0.00032	-0.00205	-0.00074	-0.00102	-0.00111	-0.03464	-0.00065	-0.00491	-0.00063	-0.00213	-0.00034	-0.0014	-0.00138	-0.00013	-8.4E-05	-0.0633
4	2.67E-05	0.001247	4.42E-05	0.00208	-4.7E-05	0.004735	0.000367	0.000113	5.35E-05	0.000263	-0.00011	7.59E-05	-9E-05	-2.9E-05	-3.5E-05	-3.3E-05	0.000204	-0.00011	-2.6E-05	-9.7E-05	0.001229	3.04E-05	-9E-05	-6.9E-06	0.000104	-0.00136	0.00855
5	0.001221	0.001957	0.000292	0.007912	0.006536	0.002701	0.002008	0.000918	0.001785	0.0022	0.00769	-0.00428	0.021869	-0.01297	-0.00654	-0.00192	0.002018	0.017624	0.001927	0.000812	0.002836	-0.00129	-9.4E-06	-0.00039	0.001255	0.002563	0.05872
6	0.000176	0.014551	-8.4E-05	0.010449	-0.00085	0.021828	0.003531	0.00111	0.000426	0.001369	-0.00146	0.000765	-0.00145	-0.00039	-0.00081	-0.00064	0.000997	-0.00146	-0.0007	-0.00114	0.012772	-0.00055	-0.00086	-5E-05	0.000583	-0.03449	0.02363
7	-1.7E-06	-5.3E-05	0.000234	-1.1E-05	-0.00024	-0.00021	-0.00992	-0.0003	-0.00061	-0.00072	-0.00049	-0.00027	-0.00056	-0.00035	-0.00026	-0.00038	1.15E-05	-0.00049	-0.0003	-0.00077	-0.00799	-4.6E-06	-0.00061	-0.00012	-0.00018	-0.00093	-0.0255
8	0.000263	-0.00012	0.000725	-0.00126	-0.00027	-0.00116	-4E-05	-0.0153	-0.00088	0.010204	-0.001	-0.01042	-0.00384	-1.7E-05	0.00045	-0.00368	0.002756	-0.00147	-0.00061	-0.0012	-0.00031	-0.00179	-0.00096	8.17E-05	-0.00018	-0.01554	-0.0456
9	0.00058	0.00144	0.000454	0.000605	0.000558	0.002567	0.003209	0.002593	0.042157	0.000664	3.58E-05	0.001902	0.001036	0.001069	0.001929	0.001701	0.003239	0.000236	0.000446	-0.00115	0.000732	0.001322	0.000173	0.000701	0.006157	0.001791	0.07614
10	0.010789	0.006544	0.001898	0.003284	0.001723	0.007007	0.006458	0.017355	0.003292	0.027545	-0.00053	0.034696	-0.00111	0.004256	0.005909	0.007943	0.012423	-0.00413	0.001216	0.00124	0.003066	0.00275	0.000518	0.000127	0.004851	0.023718	0.18284
11	0.001285	0.002133	-0.00067	0.014973	0.004124	0.002976	0.000296	-0.00316	-0.00669	-0.00089	-0.0048	-0.01313	0.001028	0.002061	0.000189	-0.0046	-0.00073	-0.04332	-0.00261	0.000629	0.003307	-0.00896	-0.00163	-0.00029	0.001048	-0.00812	-0.0656
12	0.000631	0.001801	0.000952	0.005236	0.00106	0.002488	0.001989	0.001453	-9.7E-05	0.001295	-0.00016	0.006857	6.74E-05	-0.00015	0.000525	-0.01061	0.004394	-0.00191	0.000911	0.001265	0.000988	0.002882	0.000325	-8.2E-05	0.000218	0.026188	0.04852
13	0.000189	0.0003	0.001062	2.88E-05	0.000206	0.000507	0.000362	9.9E-05	-8.7E-05	-0.00192	-6.8E-05	0.000222	0.009686	0.001797	0.000854	0.00114	0.000748	-0.00033	0.014697	-7.9E-05	-0.00018	0.000171	-8.2E-05	-1E-04	-0.0003	0.001263	0.03018
14	0.001324	0.002229	0.004089	0.001164	0.002263	0.003781	0.004764	0.001076	0.001481	0.001422	-0.00033	0.000562	0.016316	0.087046	0.03422	0.014183	0.016313	-0.00182	0.007232	0.000328	0.001419	0.002919	1.35E-05	-0.00232	0.000961	0.014534	0.21517
15	0.00087	0.00158	0.002957	0.000171	0.000164	0.003111	0.004426	0.000159	0.000715	0.000227	-0.00112	-0.00015	0.000194	0.000987	-1.9E-06	0.002312	0.001164	-0.0009	-0.00275	-0.00043	0.000468	1.24E-05	-0.00072	-0.00078	7.93E-05	0.001396	0.01414
16	0.002146	0.004358	0.007625	0.005515	0.013367	0.00515	0.002665	0.003333	0.001935	0.004752	0.00383	0.00239	0.002942	0.005259	0.004534	0.067462	0.00538	-0.00808	0.009723	0.00171	0.003407	0.016743	0.002487	6.69E-05	0.002366	0.01598	0.18705
17	0.000102	0.000671	0.001074	-0.00055	0.000529	0.000441	0.000175	0.005506	-0.00018	0.000371	-9.8E-05	0.000735	-0.00039	0.000154	0.000571	6.78E-05	0.036833	-0.00032	-0.00188	0.000294	0.000146	0.000959	-0.00172	-0.00089	0.001529	0.007641	0.05177
18	0.000887	0.003175	0.000748	0.001286	0.003487	0.003286	0.000373	0.006007	0.000425	0.006888	-0.00407	0.006004	0.008195	0.011523	0.00651	0.003583	0.003058	0.015046	0.002763	0.002668	0.007999	0.000344	0.000444	0.002147	0.003618	-0.00194	0.09445
19	-0.00022	-0.00117	-0.00039	7.04E-05	-0.00091	-0.00074	-0.00097	-0.00185	-0.00324	-0.00335	-0.00166	-0.00122	-0.00259	-0.00147	-0.00112	-0.00147	-0.00083	-0.00154	-0.00067	-0.00053	-0.00031	-0.00151	-0.00148	-0.0103	-0.0008	-0.00251	-0.0428
20	0.002575	0.012645	0.001883	0.0026	0.00094	0.00716	-0.0008	0.004353	0.002863	0.005597	-0.00145	0.006377	-0.0053	-0.00209	-0.00235	-0.00322	0.009153	-0.01194	-0.00177	-0.0007	0.001995	-0.00301	-0.00093	-0.00082	0.003198	0.006137	0.03308
21	3.07E-05	7.95E-05	0.001589	6.65E-06	-0.00134	-0.00042	-0.00149	-0.00151	-0.00332	-0.00402	-0.00273	-0.00136	-0.00312	-0.00179	-0.00132	-0.00195	0.000439	-0.00279	-0.00148	-0.00369	-0.00164	-0.00091	-0.00339	-0.00054	-0.00083	-0.02167	-0.0592
22	-0.00013	0.000696	0.001191	0.000901	0.005052	0.000821	0.002007	0.000741	-0.00032	0.000249	0.000829	0.001508	-0.00379	-0.0008	0.00054	-0.00017	0.001975	-0.00218	-0.00131	0.002489	0.000848	0.008713	-0.00015	-0.00017	0.001177	0.001297	0.02201
23	0.004283	0.00702	0.002892	0.00705	0.003922	0.009153	0.005253	0.01079	0.012309	0.013681	0.001916	0.012159	0.01157	0.01001	0.014562	0.012026	0.010324	0.00768	0.009698	0.020063	0.00801	0.006957	0.014731	0.025592	0.002461	0.035068	0.27918
24	8.05E-05	0.000229	7.38E-05	0.000155	0.000465	0.00025	0.000333	0.00069	0.000521	0.000657	0.000227	0.000534	0.000258	0.000412	0.000633	0.000707	0.000592	-0.00022	0.000512	0.001618	0.000898	0.00068	0.000955	0.000496	4.43E-05	0.002499	0.0143
25	0.000455	0.000853	0.000733	0.001798	0.012342	0.001147	0.001946	0.000743	0.000251	-0.00231	0.005472	0.001334	0.002287	0.002835	0.002358	0.001419	0.001913	0.00137	0.001343	-0.00108	-0.0003	0.001881	0.000442	-9.3E-05	0.001705	0.00343	0.04427
26	-0.0003	-9.8E-05	-0.00088	-0.00024	-0.00177	-0.00025	-7.1E-05	-0.00016	-0.00303	-0.002	-0.00207	-0.00066	-0.0032	-0.00081	-0.00194	-0.00149	-0.00131	-0.00198	-0.00132	-0.00131	-0.00066	-0.00062	-0.00115	-7E-06	-0.00059	-0.00046	-0.0284
SUM	0.034195	0.065247	0.0223	0.067564	0.049494	0.065439	0.008498	0.024803	0.047552	0.060064	-0.00445	0.054413	0.045933	0.105301	0.057703	0.079198	0.076417	-0.04542	0.029392	0.019109	0.039591	0.027176	0.003852	0.010795	0.028713	0.027121	1

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.009	0.001204	0.000551	0.005782	-0.00027	-0.00524	-0.01008	-0.00489	0.000206	0.000616	-0.00059	0.005623	-0.00026	-0.00015	-1.7E-06	-0.00016	0.000569	-0.00078	0.000285	0.000161	0.010658	0.000701	0.000122	0.000236	0.001178	-0.01164	0.0028
2	0.000112	0.008637	3.06E-05	0.001542	8.61E-06	0.009433	0.000803	0.000715	0.000307	0.001162	2.66E-06	0.00034	0.00013	5.5E-05	5.53E-05	0.000115	0.000626	4.88E-06	9.22E-05	6.33E-05	0.001751	8.69E-05	4.91E-05	1.2E-05	0.000163	0.000956	0.0273
3	-7.2E-07	-0.00014	-0.00418	-0.00027	-0.00085	4.57E-05	3.14E-05	0.000848	-8.1E-05	-0.00112	-0.00052	0.000246	-0.00122	-0.00057	-0.00063	-0.00061	-0.2365	-0.00043	-0.00357	-0.00047	-0.0012	-0.00016	-0.00081	-0.00101	0.000158	-0.00045	-0.041
4	9.19E-05	0.001814	3.23E-05	0.002471	2.93E-05	0.004699	0.000435	0.000209	0.000205	0.000736	1.07E-05	0.000223	0.00016	7.29E-05	6.04E-05	0.000122	0.000258	2.27E-05	0.000172	5.29E-05	0.002507	0.00133	6.57E-05	1.62E-05	0.000159	-0.00019	0.0158
5	0.003186	0.0027	0.001077	0.008858	0.007221	0.003815	0.003521	0.003537	0.002177	0.006503	0.020315	0.001141	0.014644	-0.00782	-0.0016	0.001635	0.004298	0.014078	0.009959	0.001506	0.00408	0.008474	0.001248	0.000637	0.002333	0.004408	0.1219
6	0.000552	0.013853	-6.9E-05	0.013425	-0.00053	0.02356	0.00357	0.001026	0.000248	0.000389	-0.00086	0.000958	-0.00029	-0.00027	-0.00051	-0.00017	0.000413	-0.00088	-0.00024	-0.00022	0.013823	5.41E-05	-0.00017	1.08E-05	0.000904	-0.02038	0.0482
7	4.88E-05	-9.9E-05	9.45E-05	1.91E-05	-0.00018	-0.00016	-0.00384	-0.00023	-0.00044	-0.00056	-0.00032	-0.00019	-0.00039	-0.00031	-0.00028	-0.00028	-6.3E-05	-0.00034	-0.00022	-0.00048	-0.00442	9.74E-05	-0.00026	-0.00011	-6.3E-05	-0.00043	-0.013
8	0.000602	-6.3E-05	0.000885	0.00023	-0.00027	-0.00053	0.000162	0.008588	-0.0012	0.005275	-0.00064	-0.00415	-0.00156	-0.00024	-0.0002	-0.00141	0.003276	-0.00107	9.69E-05	-0.00032	0.00105	-0.00066	0.000403	2.68E-05	8.88E-05	-0.00886	-5E-04
9	0.000946	0.001107	0.000325	0.000527	0.000339	0.001983	0.004037	0.002737	0.044775	0.001035	0.00013	0.002191	0.001791	0.00026	0.001029	0.001349	0.002344	8.53E-05	0.000745	-0.00034	0.000983	0.000959	0.002956	0.000199	0.006821	0.002845	0.0822
10	0.019673	0.011434	0.002258	0.005891	0.00156	0.01155	0.013675	0.019088	0.01791	0.04443	-0.00017	0.046637	0.016812	0.005786	0.009743	0.012945	0.015074	-0.0016	0.007813	0.002194	0.006884	0.004098	0.002099	0.000643	0.012723	0.025263	0.3144
11	0.00435	0.00287	0.000634	0.013782	0.007106	0.004386	0.001964	0.001973	-0.00271	0.005922	0.001186	-0.00326	0.004072	0.001744	0.002159	0.000254	0.001798	-0.02816	0.004296	0.001888	0.005337	0.006455	0.000684	0.000855	0.002757	-0.00178	0.0406
12	0.001572	0.001966	0.00082	0.003148	0.000721	0.002816	0.001899	0.002338	0.001435	0.000865	0.000186	0.010602	0.001251	0.000188	0.001841	-0.00154	0.005553	-0.00066	0.00253	0.002125	0.001552	0.00382	0.000749	0.000178	0.000959	0.024107	0.071
13	0.000407	0.000353	0.001004	0.000146	0.000178	0.00045	0.000697	0.000308	0.000362	-0.00126	6.48E-05	0.000583	0.007778	0.00069	0.000188	0.001311	0.001422	-0.00014	0.018879	5.61E-05	0.000242	0.000388	0.00013	0.000473	7.02E-05	0.002748	0.0375
14	0.001894	0.001799	0.003299	0.001492	0.000547	0.003613	0.009936	0.001162	0.00042	0.000716	-0.00049	0.001135	0.001541	0.012569	0.010969	0.006679	0.017811	-0.00146	-0.00028	0.000329	0.002277	0.003039	0.000275	-0.00201	0.001032	0.008493	0.0868
15	0.001649	0.001795	0.003294	0.000446	0.000298	0.003672	0.012021	0.000805	0.001002	0.000827	-0.00039	0.001159	0.000791	0.000771	0.00122	0.002566	0.002152	-0.00025	-0.00099	-0.00013	0.001988	0.00073	-0.00027	-0.00048	0.000367	0.002899	0.0379
16	0.003397	0.003511	0.00508	0.007511	0.006596	0.004505	0.003012	0.003686	0.001534	0.004289	0.003195	0.003561	0.00408	0.002745	0.002925	0.080312	0.005007	-0.00123	0.015071	0.002597	0.00493	0.021881	0.003696	0.001108	0.005528	0.02148	0.22
17	0.000279	0.000249	0.001495	-0.00029	0.000355	0.000245	0.000248	0.004611	-0.00041	0.000126	1.14E-05	0.000967	1.2E-05	-7.6E-05	0.000589	0.000552	0.031189	-0.00019	-0.00177	9.08E-06	0.000141	0.00066	-0.00063	-0.00082	0.001673	0.004321	0.0435
18	0.001466	0.002264	0.00065	0.001674	0.001793	0.002794	0.001406	0.009111	0.001092	0.007918	-0.00123	0.007631	0.010621	0.007705	0.005184	0.00492	0.003387	0.018718	0.003639	0.002892	0.007998	0.002167	0.001163	0.003153	0.003716	0.000677	0.1125
19	3.56E-05	-0.00104	-0.00048	0.000218	-0.0011	-0.00053	-0.00054	-0.00115	-0.00264	-0.00227	-0.00126	-0.00061	-0.00205	-0.00135	-0.00105	-0.00096	-0.00066	-0.00137	-0.00046	-0.00059	-0.00046	-0.00096	-0.00109	-0.00752	-0.00087	-0.00234	-0.033
20	-0.0004	-0.00839	-0.00035	-0.00278	-0.00203	-0.00748	-0.00457	-0.01076	-0.01276	-0.01124	-0.00366	-0.0086	-0.01019	-0.00873	-0.01269	-0.01259	-0.00637	-0.0112	-0.01198	-0.00278	-0.01137	-0.00587	-0.0031	-0.00183	-0.0021	-0.01784	-0.192
21	0.000284	-0.00053	0.000606	3.75E-05	-0.00117	-0.00065	-0.00103	-0.00141	-0.00274	-0.00333	-0.00193	-0.00111	-0.00244	-0.00186	-0.00177	-0.00174	-0.00034	-0.00213	-0.00139	-0.00292	-0.00159	-0.00081	-0.00255	-0.00068	-0.00036	-0.01582	-0.049
22	0.000289	-0.00159	0.000525	1.87E-05	0.000602	-0.00106	-0.00034	-0.00026	-0.00305	-0.00186	-0.00035	-0.00024	-0.00652	-0.00279	-0.00158	-0.00115	0.000893	-0.00252	-0.00066	0.002389	5.36E-05	0.010784	0.000925	-0.0005	0.002141	0.000764	-0.005
23	0.000722	0.000638	0.000866	0.000911	-0.00017	0.001154	0.000353	0.001675	0.001024	0.001122	-0.00125	0.001388	0.000759	0.000912	0.001752	0.001279	0.001676	0.001314	0.001075	0.002118	0.00058	0.000721	0.003305	0.004518	0.000422	0.004779	0.0336
24	0.00021	0.000216	4.44E-05	0.000105	0.000251	0.00038	0.000204	0.000565	0.000244	0.000517	0.000122	0.000371	7.27E-05	0.000393	0.000379	0.000358	0.000345	-0.00016	0.000286	0.000687	0.000469	0.000247	0.000759	0.000262	3.53E-05	0.00132	0.0087
25	0.000714	0.000466	0.000471	0.000958	0.009197	0.000757	0.001216	0.000755	0.000392	-0.00168	0.004437	0.001412	0.001919	0.002266	0.001375	0.000912	0.00114	0.001105	0.001125	-0.0011	-0.00018	0.002054	0.0012	0.000313	0.001975	0.001505	0.0347
26	0.000264	0.000337	-0.00055	0.001109	-0.00116	0.00049	0.000491	0.000504	-0.00147	-0.00114	-0.00115	-7.5E-05	-0.00174	-0.00048	-0.00119	-0.00061	-0.0007	-0.00112	-0.00055	-0.00019	-0.00019	-0.00019	-5.8E-05	0.000199	0.000111	0.003314	-0.006
SUM	0.051342	0.045352	0.018418	0.066962	0.029061	0.064691	0.039284	0.045544	0.045836	0.057992	0.014848	0.06793	0.039773	0.011521	0.017972	0.094103	0.067444	-0.02037	0.043942	0.009511	0.047895	0.060103	0.010894	-0.00212	0.041925	0.030153	1

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0.0014023	-0.006119	0.0009729	0.0037767	-0.000493	-0.013063	-0.010811	-0.007562	-0.001673	-0.001588	-0.000764	0.0014482	-0.000902	-0.000284	-0.000384	-0.00157	-0.000591	-0.000866	-0.000228	-0.00062	0.0015308	-0.000445	-0.000515	-3.3E-05	0.0005576	-0.019062	-0.057884
2	5.599E-05	0.0067078	2.28E-05	0.0009645	-2.77E-05	0.0040552	0.0004039	0.0002375	1.7E-06	0.0002684	-4.49E-05	0.0001212	6.166E-07	5.109E-06	-1.24E-05	5.17E-06	8.922E-05	-3.76E-05	-4.83E-06	-5.12E-05	0.0005237	-9.79E-07	-3.94E-05	-5.85E-06	7.64E-05	-0.000653	0.012662
3	-2.78E-05	-0.00026	-0.003255	-0.000227	-0.000734	-6.34E-05	-2.91E-05	0.0007818	0.0012839	-0.001082	-0.000392	8.868E-05	-0.001048	-0.000358	-0.000528	-0.000564	-0.020615	-0.000268	-0.003399	-0.000413	-0.001215	-0.000169	-0.000719	-0.000852	0.0001638	-0.000258	-0.034159
4	7.403E-05	0.0006252	4.393E-05	0.003695	-2.25E-06	0.0013091	0.0001962	0.0001447	6.573E-05	0.0007751	-1.77E-05	0.0001928	7.355E-05	5.22E-05	3.215E-05	6.393E-05	7.381E-05	4.253E-06	9.153E-05	-4.02E-05	0.0010801	0.0006412	-6.34E-06	2.617E-06	8.786E-05	-0.000907	0.008352
5	0.0028897	0.0029005	0.0014894	0.007404	0.0081714	0.0040064	0.0034614	0.003818	0.0028488	0.005127	0.0251835	0.0016473	0.0143776	-0.001494	0.0025139	0.0035416	0.0053245	0.0201948	0.0068395	0.0016855	0.004312	0.0088887	0.001879	0.0009189	0.0028121	0.0065906	0.1473318
6	0.0003704	0.0049565	5.076E-05	0.0102572	-0.000469	0.0190652	0.003004	0.0003423	-0.000926	-0.000737	-0.000695	0.0005063	-0.000389	-0.000162	-0.00043	-0.000275	-9.91E-06	-0.000608	-0.000242	-0.000645	0.0067114	-0.00023	-0.000478	-4.64E-05	0.0007207	-0.016107	0.0235344
7	6.337E-05	-5.32E-05	0.0001938	2.342E-05	-0.000158	-0.000109	-0.007817	-0.000193	-0.000324	-0.000525	-0.000272	-0.000133	-0.000322	-0.0002	-0.000183	-0.000233	1.33E-05	-0.000263	-0.000117	-0.000552	-0.006678	8.345E-05	-0.000378	-0.00011	-6.22E-05	0.0005982	-0.017708
8	0.0002703	-0.00025	0.000411	0.0002019	-0.000394	-0.000667	-0.000226	-0.0008953	-0.002339	0.0002432	-0.000727	-0.007877	-0.002152	-0.000169	-0.000408	-0.002757	0.0005106	-0.001144	-0.000385	-0.000947	-0.000462	-0.001875	-0.00012	-3.34E-05	-0.000471	-0.008803	-0.039524
9	0.0006743	0.0005609	0.000313	0.0003825	0.0001486	0.0009634	-2.23E-05	0.0003374	0.00717	-0.002733	-9.23E-05	0.000573	-0.001126	0.0001722	0.0002769	0.0002409	0.0006781	-0.000255	2.795E-05	-0.00121	2.801E-05	-4.03E-05	0.0020601	0.0001201	0.0037805	0.0012766	0.0143047
10	0.0126195	0.0064227	0.001429	0.0041395	0.000779	0.0070682	0.0071608	0.0054418	0.0076257	0.0184637	-0.000434	0.029229	0.0089785	0.0035893	0.0054523	0.0062379	0.0073443	-0.002375	0.0042161	0.0009549	0.0038645	0.0016011	0.000344	0.0003952	0.0062815	0.0102338	0.1570631
11	0.0038528	0.0034569	0.0011017	0.0099787	0.0077386	0.0050237	0.0025725	0.0026542	-0.001386	0.0041007	0.0027113	-0.001842	0.0059571	0.0063133	0.0047636	0.0014113	0.0026383	-0.0226	0.0055269	0.0021389	0.0057483	0.0055273	0.0018023	0.0016602	0.0038787	0.0015274	0.0662572
12	0.0012323	0.0013671	0.0009624	0.0021041	0.0001228	0.0021333	0.0018203	0.0019363	0.0009644	-0.000178	-0.000228	0.0036813	0.0002072	1.83E-05	0.0008247	-0.005493	0.0031214	-0.001082	0.0014187	0.0012763	0.001037	0.0004437	0.0003202	0.0001058	0.0004583	0.003278	0.021853
13	0.0002525	0.0001748	9.07E-05	0.0001128	8.957E-05	0.0002414	0.0010571	4.424E-05	0.0001155	-0.001421	1.826E-05	0.0003215	0.0056821	0.00029	-9.56E-06	0.0006886	0.0008145	-0.000156	0.0127433	-1.29E-05	4.936E-05	0.0001609	5.893E-05	0.0002173	-3.94E-05	0.0027808	0.0243652
14	0.0021587	0.001933	0.005095	0.0015395	0.0010785	0.0035159	0.0077225	0.0016074	0.0019188	0.001595	0.0004355	0.0019915	0.0030132	0.0392084	0.0312498	0.0170415	0.0218815	0.000482	0.0085561	0.0006493	0.0023061	0.0027464	0.000833	-0.000893	0.001446	0.0134401	0.1725513
15	0.0017398	0.0013502	0.0045111	0.0003603	0.0001727	0.002679	0.0088321	0.0005886	0.0008611	0.0007941	-0.000332	0.0010919	0.0007211	0.0008822	0.0013379	0.0024651	0.0022617	-5.94E-05	0.0005836	-9.8E-05	0.001453	0.0004525	-0.00016	-0.00028	0.0003139	0.0040582	0.0365804
16	0.0024093	0.0029956	0.006605	0.0058279	0.003864	0.0040312	0.00201	0.0030918	0.002327	0.0032514	0.0016973	0.0032706	0.0019653	0.0023193	0.002471	0.043382	0.0049648	-0.001856	0.0111885	0.0018686	0.0042917	0.0087556	0.0030402	0.0010909	0.0044867	0.0098276	0.1391777
17	0.0002234	0.0001727	0.0002952	-0.000242	0.0002593	0.0002077	0.0001351	0.0043126	-0.000469	3.9E-05	-1.84E-05	0.0006849	-1.2E-05	0.0001845	0.0003621	0.0002132	0.0185115	-0.000124	-0.003197	-0.000152	0.0001635	0.0003415	-0.000897	-0.000769	0.0015308	0.0041478	0.0259062
18	0.0012861	0.0026626	0.0008369	0.0014908	0.0016555	0.0041	0.0013647	0.0099132	0.0013009	0.0066116	-0.002074	0.0074319	0.008834	0.0087676	0.006045	0.0047638	0.0037245	0.0123707	0.0044085	0.0028076	0.0089753	0.0019836	0.001734	0.004356	0.0034877	0.0022481	0.1110867
19	1.996E-05	-0.000877	-0.000326	0.0002142	-0.000899	-0.000422	-0.000494	-0.00106	-0.002536	-0.002105	-0.000957	-0.000552	-0.001595	-0.000895	-0.000694	-0.000783	-0.000499	-0.001002	-0.000276	-0.00049	-0.00024	-0.000781	-0.000828	-0.000675	-0.000648	-0.001968	-0.026769
20	0.0056924	0.00368	0.0028052	0.004006	0.0009272	0.0047525	0.0026214	0.0029675	0.0054135	0.0015129	-0.000405	0.0050135	-0.001484	0.0002448	-0.00185	0.0001573	0.0069318	-0.005455	0.0024667	-0.000186	0.001078	2.251E-05	0.0012914	-3.62E-05	0.0024376	0.0021549	0.0467607
21	0.0004227	-5.41E-05	0.0012678	0.0001782	-0.000868	-0.000104	-0.000733	-0.000861	-0.00164	-0.002627	-0.001433	-0.000494	-0.001749	-0.000919	-0.000948	-0.001122	0.000322	-0.001448	-0.000487	-0.002451	-0.000901	-0.000515	-0.001892	-0.000446	-0.000136	-0.013249	-0.032888
22	0.0022738	0.0017041	0.0018974	0.0020373	0.0012211	0.0033381	0.0027589	0.002886	0.0030695	0.0020774	0.0007219	0.0037246	0.000334	0.0018264	0.0022242	0.0020386	0.0038873	-3.96E-06	0.0070475	0.0035276	0.0040019	0.0152971	0.0043729	0.0005982	0.0040559	0.0113909	0.0883088
23	0.0018476	0.0019793	0.0009736	0.0016506	0.0001211	0.0026393	0.0012529	0.0029448	0.0022236	0.0019868	-0.000613	0.0025395	0.0023567	0.0033378	0.0033053	0.0022803	0.0024942	0.0026304	0.002456	0.0029399	0.0017253	0.0021794	0.0064202	0.0056088	0.001003	0.0038488	0.0621319
24	0.0002322	0.0002344	6.365E-05	0.0001203	0.0003307	0.0003877	0.0002377	0.0006753	0.000468	0.0005611	0.00019	0.0004197	0.000227	0.0003836	0.0005456	0.0003947	0.0004635	-2.3E-05	0.0006749	0.0007257	0.0009306	0.0006792	0.0009594	0.0004272	0.0004543	0.0021238	0.0128873
25	0.0007325	0.0007664	0.0006655	0.0009512	0.0078843	0.0012915	0.002135	0.0008284	0.0029181	-0.000659	0.0037191	0.0016195	0.0031118	0.0025067	0.0015951	0.0011837	0.0014681	0.0013001	0.0019042	-0.000722	0.0009158	0.0023601	0.0017521	0.0011439	0.0046184	0.0025391	0.0485298
26	0.0001003	0.0002129	-0.000454	0.000172	-0.000983	0.0001958	-5.27E-05	0.0004061	-0.001695	-0.001245	-0.000895	-0.000114	-0.001443	-0.000282	-0.000945	-0.00048	-0.000574	-0.000413	-0.000444	-0.000614	-0.000121	-0.000563	-0.00066	1.639E-05	-0.000114	0.0002752	-0.010713
SUM	0.0428686	0.0372498	0.0280631	0.0611198	0.0295366	0.0565757	0.0285612	0.0273305	0.0275889	0.032506	0.0242827	0.0545853	0.0436163	0.065337	0.0566085	0.072833	0.0652299	-0.003057	0.0613702	0.0093702	0.0411092	0.0475444	0.0201736	0.0070807	0.0411814	0.0213345	1

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 15
N Matrix, Philippines
1969

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.07849	-0.00761	-0.48584	-0.11314	-0.12657	-0.07517	-0.04571	-0.4513	-0.22587	-0.02311	-0.01477	-0.12063	-0.13908	-0.05459	-0.00644	-0.01073	-0.00587	-0.00647	-0.00867	-0.01464	-0.01089	-0.0633	-0.04371	-0.00383	-0.02195	-0.0048	-0.00907	-0.00794	-0.06048
2	-0.01939	-1.06568	-0.03523	-0.04844	-0.02742	-0.04899	-0.03131	-0.04935	-0.0426	-0.09933	-0.05462	-0.04082	-0.06064	-0.07027	-0.5782	-0.21464	-0.23804	-0.12637	-0.09681	-0.07559	-0.04552	-0.05116	-0.08533	-0.02098	-0.11632	-0.01756	-0.27025	-0.00922	-0.01914
3	-0.06701	-0.00622	-1.18236	-0.26863	-0.0183	-0.02931	-0.08918	-0.03726	-0.02496	-0.0141	-0.01636	-0.28336	-0.0395	-0.11084	-0.00654	-0.01119	-0.00757	-0.00847	-0.00872	-0.01325	-0.00819	-0.0432	-0.0123	-0.00395	-0.02225	-0.00603	-0.00615	-0.00602	-0.09024
4	-0.00011	-0.00014	-0.00012	-1.06622	-0.00017	-0.00016	-0.00014	-0.00016	-0.00014	-0.00023	-0.00025	-0.00012	-0.00023	-0.00036	-0.00018	-0.00027	-0.00017	-0.00018	-0.00018	-0.0003	-0.00018	-0.00024	-0.00023	-0.00015	-0.00085	-0.0002	-0.00015	-0.00022	-0.00361
5	-3.7E-06	-9.6E-08	-1.9E-06	-3E-07	-1.45185	-2E-07	-2.2E-07	-1.2E-06	-2.6E-07	-7.2E-08	-6.5E-08	-4.9E-07	-3.5E-07	-8.3E-07	-6.4E-08	-8.3E-08	-4.1E-08	-5.8E-08	-5.9E-08	-7.9E-08	-4.2E-08	-1.8E-07	-1.6E-07	-3.6E-08	-8.9E-08	-3.3E-08	-4.3E-08	-4E-08	-2.5E-07
6	-0.00166	-0.00116	-0.00752	-0.00266	-0.0039	-1.38071	-0.09938	-0.00567	-0.06555	-0.02472	-0.0129	-0.03413	-0.09834	-0.00345	-0.00105	-0.00379	-0.00092	-0.00178	-0.00242	-0.0036	-0.00476	-0.0432	-0.00261	-0.00126	-0.00531	-0.00174	-0.00093	-0.0015	-0.00789
7	-2.9E-06	-2.4E-06	-2.4E-06	-4.2E-06	-3.5E-06	-2.4E-06	-1.05529	-7.5E-06	-4.3E-06	-3.4E-06	-3.8E-06	-2.1E-06	-1.4E-05	-4.3E-06	-3.2E-06	-4.8E-06	-2.7E-06	-2.9E-06	-2.6E-06	-5.5E-06	-3E-06	-3.7E-06	-4E-06	-2.4E-06	-3.5E-06	-3.6E-06	-2.4E-06	-4.1E-06	-7.2E-05
8	-0.00173	-0.00202	-0.00145	-0.00226	-0.00231	-0.00143	-0.00236	-1.05642	-0.41279	-0.00549	-0.00252	-0.00161	-0.00141	-0.00222	-0.00135	-0.00454	-0.00152	-0.00189	-0.00394	-0.01254	-0.00235	-0.00603	-0.07058	-0.00142	-0.00157	-0.00089	-0.00104	-0.00898	-0.00236
9	-0.00023	-7.5E-05	-0.00017	-0.00026	-0.00011	-0.00035	-0.00062	-0.00099	-1.00115	-0.00016	-0.00011	-0.00035	-0.00015	-0.00015	-7E-05	-0.00378	-0.00011	-0.00019	-0.00027	-0.00091	-0.00019	-0.00015	-0.00178	-0.00032	-0.0003	-0.00025	-0.00017	-7.7E-05	-0.00018
10	-0.00641	-0.00409	-0.01355	-0.01836	-0.10896	-0.01934	-0.02579	-0.01056	-0.01301	-1.47874	-0.51918	-0.01379	-0.01881	-0.03327	-0.00547	-0.04907	-0.0071	-0.01013	-0.01253	-0.02441	-0.00674	-0.03882	-0.01499	-0.01901	-0.01097	-0.03241	-0.00757	-0.01244	-0.01778
11	-0.00099	-0.00114	-0.00204	-0.00509	-0.00393	-0.00334	-0.00526	-0.00236	-0.0027	-0.00735	-1.01697	-0.00228	-0.00551	-0.0081	-0.00123	-0.00307	-0.00173	-0.00228	-0.00245	-0.00458	-0.00218	-0.00473	-0.00308	-0.00429	-0.00512	-0.01302	-0.00318	-0.00729	-0.00596
12	-1.2E-05	-7.5E-05	-3.8E-05	-2.7E-05	-2.8E-05	-0.00528	-0.30577	-0.00042	-0.00114	-0.00012	-0.00106	-1.13295	-0.00132	-5.3E-05	-4.6E-05	-5.1E-05	-2.6E-05	-4.8E-05	-4.1E-05	-5.2E-05	-0.00023	-0.0008	-5.7E-05	-1.6E-05	-6.8E-05	-2.7E-05	-2.7E-05	-2.2E-05	-9.7E-05
13	-0.00106	-0.00395	-0.00173	-0.00184	-0.00149	-0.00181	-0.00982	-0.00219	-0.01836	-0.00285	-0.0026	-0.00536	-1.0916	-0.00243	-0.00327	-0.00311	-0.00253	-0.00229	-0.01526	-0.00482	-0.04419	-0.00344	-0.00524	-0.00307	-0.03251	-0.00234	-0.00236	-0.00087	-0.00244
14	-0.08327	-0.0392	-0.05385	-0.03177	-0.03621	-0.17717	-0.09093	-0.08647	-0.10482	-0.08969	-0.13374	-0.13284	-0.35273	-1.38416	-0.02866	-0.05807	-0.04784	-0.05706	-0.05789	-0.07718	-0.04753	-0.41999	-0.06523	-0.00955	-0.02711	-0.01896	-0.03483	-0.00996	-0.03757
15	-0.03314	-0.11015	-0.06079	-0.07972	-0.04896	-0.08561	-0.05413	-0.08639	-0.0628	-0.17643	-0.09519	-0.07067	-0.09734	-0.0965	-1.07049	-0.26162	-0.14838	-0.11638	-0.09813	-0.09863	-0.05372	-0.07626	-0.08284	-0.03785	-0.21189	-0.02988	-0.49648	-0.01405	-0.03272
16	-0.00138	-0.00134	-0.00155	-0.04964	-0.00091	-0.00226	-0.00148	-0.00189	-0.00492	-0.00279	-0.00231	-0.00192	-0.00381	-0.01217	-0.00105	-1.05886	-0.00419	-0.00327	-0.00261	-0.01002	-0.0023	-0.00898	-0.0823	-0.00109	-0.00148	-0.00127	-0.00544	-0.00529	-0.00287
17	-0.0048	-0.06549	-0.0185	-0.02029	-0.00547	-0.00789	-0.0103	-0.01902	-0.08299	-0.02682	-0.01582	-0.01075	-0.01521	-0.01954	-0.03672	-0.03863	-1.8097	-0.6949	-0.48602	-0.18776	-0.17551	-0.05053	-0.19673	-0.00345	-0.01914	-0.01115	-0.02478	-0.00567	-0.0063
18	-0.0036	-0.01606	-0.01243	-0.02089	-0.00359	-0.00524	-0.01038	-0.00545	-0.02356	-0.02012	-0.01259	-0.00871	-0.01549	-0.0183	-0.00985	-0.00999	-0.01677	-1.18137	-0.05679	-0.17542	-0.01774	-0.05045	-0.07652	-0.00199	-0.00791	-0.01252	-0.0109	-0.00469	-0.00457
19	-0.00143	-0.0069	-0.0017	-0.00313	-0.00103	-0.00156	-0.00086	-0.00259	-0.00207	-0.00626	-0.00514	-0.00126	-0.00219	-0.00183	-0.00389	-0.00342	-0.00201	-0.00191	-1.05664	-0.00339	-0.00272	-0.00126	-0.00292	-0.00069	-0.00109	-0.00041	-0.00212	-0.0007	-0.00083
20	-0.00086	-0.00262	-0.00118	-0.00143	-0.0013	-0.00139	-0.00125	-0.00135	-0.00126	-0.0051	-0.00329	-0.00127	-0.00204	-0.0023	-0.00177	-0.002	-0.00254	-0.00837	-0.02456	-1.23338	-0.00435	-0.00302	-0.01925	-0.00109	-0.00691	-0.0269	-0.01259	-0.00138	-0.00208
21	-0.00161	-0.00172	-0.00255	-0.0087	-0.00452	-0.00233	-0.00184	-0.00265	-0.00228	-0.00981	-0.00486	-0.00228	-0.00343	-0.00274	-0.00184	-0.00303	-0.00241	-0.00246	-0.00355	-0.00556	-1.33138	-0.00297	-0.00321	-0.00118	-0.04393	-0.0019	-0.00158	-0.00067	-0.00213
22	-0.00132	-0.00724	-0.00247	-0.00287	-0.003	-0.02871	-0.04026	-0.00314	-0.00545	-0.00748	-0.00781	-0.01803	-0.01353	-0.01031	-0.0045	-0.0174	-0.00408	-0.00732	-0.00698	-0.01026	-0.00524	-1.03171	-0.00473	-0.00091	-0.00217	-0.00154	-0.00266	-0.00192	-0.005
23	-0.00076	-0.00772	-0.00175	-0.00215	-0.00186	-0.00153	-0.00156	-0.00175	-0.0017	-0.00574	-0.00381	-0.00167	-0.00222	-0.00262	-0.00508	-0.00505	-0.00653	-0.00457	-0.00381	-0.00415	-0.00283	-0.00293	-1.00723	-0.00359	-0.00258	-0.00229	-0.00367	-0.00868	-0.00652
24	-0.06	-0.05412	-0.14368	-0.1296	-0.18621	-0.14276	-0.17376	-0.17132	-0.17301	-0.14838	-0.13662	-0.23011	-0.17684	-0.17864	-0.08732	-0.13636	-0.15991	-0.15845	-0.15067	-0.15245	-0.12563	-0.16207	-0.10458	-1.016	-0.11095	-0.03882	-0.11398	-0.01683	-0.04133
25	-0.01658	-0.01584	-0.02959	-0.02658	-0.02237	-0.03325	-0.02726	-0.03764	-0.03098	-0.05298	-0.03009	-0.02411	-0.04681	-0.03853	-0.0254	-0.04299	-0.03861	-0.03824	-0.05533	-0.04971	-0.0437	-0.04729	-0.03384	-0.01743	-1.04558	-0.01276	-0.02428	-0.00804	-0.01443
26	-0.00169	-0.00221	-0.00327	-0.00351	-0.00301	-0.00492	-0.00445	-0.00419	-0.00551	-0.00443	-0.0085	-0.0048	-0.00532	-0.00606	-0.00268	-0.0045	-0.00461	-0.00554	-0.00696	-0.00768	-0.00399	-0.00804	-0.00532	-0.0078	-0.00713	-1.04675	-0.00248	-0.00794	-0.01041
27	-0.00625	-0.01125	-0.01392	-0.01858	-0.01668	-0.02495	-0.01849	-0.01777	-0.01765	-0.07216	-0.04927	-0.024	-0.03108	-0.0323	-0.01212	-0.04014	-0.03717	-0.03088	-0.02805	-0.03637	-0.01579	-0.03169	-0.01656	-0.02417	-0.00986	-0.01519	-1.02201	-0.01409	-0.02542
28	-0.01222	-0.01771	-0.02506	-0.03128	-0.03143	-0.03484	-0.03171	-0.03381	-0.03748	-0.05107	-0.04871	-0.03425	-0.04621	-0.0599	-0.02322	-0.03678	-0.04337	-0.04918	-0.04993	-0.0727	-0.02989	-0.05771	-0.03373	-0.06429	-0.03639	-0.03735	-0.0216	-1.03823	-0.1772
29	-0.01483	-0.03437	-0.02243	-0.05921	-0.0479	-0.03248	-0.02961	-0.03249	-0.03098	-0.04991	-0.0557	-0.02512	-0.048	-0.06124	-0.04715	-0.07088	-0.03879	-0.04124	-0.03837	-0.07507	-0.04192	-0.05273	-0.05504	-0.03491	-0.04385	-0.05273	-0.03424	-0.05991	-1.0685

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1979

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.07543	-0.0106	-0.49468	-0.10879	-0.12489	-0.07188	-0.0476	-0.43456	-0.20601	-0.02196	-0.01468	-0.12279	-0.13223	-0.07926	-0.00813	-0.01246	-0.00541	-0.00713	-0.00902	-0.01545	-0.01091	-0.05646	-0.04378	-0.00479	-0.02228	-0.00541	-0.0092	-0.00846	-0.06196
2	-0.01793	-1.06004	-0.03254	-0.04518	-0.02548	-0.04479	-0.0281	-0.04555	-0.03876	-0.09161	-0.05058	-0.03717	-0.05573	-0.06603	-0.56821	-0.20765	-0.21294	-0.11546	-0.08877	-0.07079	-0.04256	-0.0483	-0.08042	-0.01889	-0.10517	-0.01577	-0.24086	-0.00869	-0.01769
3	-0.06106	-0.00577	-1.1722	-0.24912	-0.01764	-0.02643	-0.0887	-0.03485	-0.02319	-0.01491	-0.01603	-0.27585	-0.03644	-0.09775	-0.00611	-0.01052	-0.00725	-0.00812	-0.00839	-0.01236	-0.00785	-0.04091	-0.01184	-0.00442	-0.02246	-0.00606	-0.00613	-0.006	-0.08737
4	-0.0002	-0.0003	-0.00027	-1.06263	-0.00019	-0.00031	-0.00034	-0.00031	-0.00021	-0.00052	-0.00067	-0.00022	-0.00036	-0.0006	-0.00032	-0.00045	-0.00029	-0.00032	-0.00032	-0.00048	-0.00034	-0.00034	-0.00052	-0.00041	-0.00116	-0.00045	-0.00041	-0.00047	-0.00579
5	-1.7E-05	-7.6E-07	-1E-05	-9.9E-07	-1.42056	-6.6E-07	-1.3E-06	-3.9E-06	9.93E-07	-3E-07	-3.7E-07	-2.7E-06	-1.1E-06	-6.7E-06	-4.8E-07	-5.9E-07	-2.8E-07	-4.3E-07	-4E-07	-5E-07	-2.1E-07	-6.7E-07	-7.8E-07	-2.7E-07	-4.8E-07	-2.3E-07	-2.5E-07	-2.4E-07	-1.4E-06
6	-0.00258	-0.00201	-0.00846	-0.00264	-0.00373	-1.4027	-0.09254	-0.00542	-0.06157	-0.02178	-0.01532	-0.03759	-0.10263	-0.00363	-0.00148	-0.00378	-0.00097	-0.00377	-0.00266	-0.00387	-0.00485	-0.03951	-0.00287	-0.00167	-0.00595	-0.00189	-0.00111	-0.00139	-0.00739
7	-2.7E-06	-2.8E-06	-2.6E-06	-4.4E-06	-3.4E-06	-2.8E-06	-1.04988	-7.6E-06	-4.1E-06	-3.8E-06	-3.9E-06	-3.6E-06	-9.9E-05	-4.6E-06	-3.6E-06	-4.9E-06	-3E-06	-3.3E-06	-2.5E-06	-8.3E-06	-3.8E-06	-4E-06	-3.9E-06	-2.7E-06	-7.5E-06	-3.9E-06	-3.4E-06	-3.9E-06	-6.7E-05
8	-0.00186	-0.00266	-0.00165	-0.0033	-0.003	-0.00181	-0.00306	-1.05674	-0.3679	-0.00621	-0.0026	-0.00302	-0.00151	-0.00227	-0.00173	-0.00562	-0.0025	-0.00331	-0.00841	-0.01148	-0.00246	-0.00656	-0.0679	-0.00159	-0.00163	-0.00087	-0.00109	-0.00875	-0.00234
9	-0.0002	-8.7E-05	-0.00015	-0.00024	-0.00011	-0.00032	-0.00054	-0.00086	-1.00135	-0.00015	-0.00012	-0.00031	-0.00014	-0.00014	-7.9E-05	-0.00335	-0.00011	-0.00018	-0.00024	-0.01103	-0.00019	-0.00017	-0.00158	-0.00031	-0.00032	-0.00035	-0.00018	-0.0002	-0.00021
10	-0.00568	-0.00451	-0.01305	-0.02009	-0.10033	-0.01866	-0.02627	-0.01144	-0.01254	-1.46969	-0.4887	-0.01408	-0.01933	-0.03451	-0.00587	-0.05352	-0.00771	-0.01089	-0.01238	-0.0253	-0.00672	-0.03995	-0.01615	-0.01858	-0.01079	-0.03058	-0.00808	-0.01197	-0.01701
11	-0.00094	-0.00141	-0.00233	-0.00567	-0.00433	-0.0037	-0.00636	-0.0027	-0.00301	-0.00782	-1.01714	-0.0026	-0.00654	-0.00916	-0.00151	-0.0036	-0.00226	-0.00293	-0.00291	-0.00469	-0.00249	-0.00651	-0.00328	-0.00427	-0.00527	-0.01328	-0.00406	-0.00698	-0.00688
12	-8.2E-06	-9.3E-05	-3.1E-05	-2.5E-05	-2.5E-05	-0.00449	-0.31438	-0.00036	-0.00102	-0.00012	-0.00095	-1.11793	-0.00117	-5E-05	-5.3E-05	-5.2E-05	-3.3E-05	-4.6E-05	-5.2E-05	-4.5E-05	-0.00021	-0.00083	-5.5E-05	-1.4E-05	-5.8E-05	-2.4E-05	-2.1E-05	-2.1E-05	-9.8E-05
13	-0.0011	-0.0042	-0.00197	-0.00213	-0.00156	-0.0022	-0.01506	-0.00296	-0.01697	-0.00316	-0.0028	-0.00642	-1.08698	-0.00286	-0.00363	-0.00321	-0.00279	-0.00267	-0.01426	-0.00718	-0.04174	-0.00359	-0.00499	-0.00331	-0.0339	-0.0027	-0.00321	-0.0009	-0.0025
14	-0.07531	-0.04201	-0.05284	-0.03589	-0.03558	-0.1722	-0.0877	-0.08212	-0.10223	-0.08254	-0.12465	-0.13066	-0.3334	-1.36362	-0.02998	-0.05835	-0.04223	-0.05378	-0.05272	-0.0757	-0.04536	-0.38593	-0.06252	-0.00993	-0.02599	-0.01851	-0.03257	-0.01028	-0.03714
15	-0.03056	-0.09997	-0.0547	-0.07258	-0.04514	-0.07754	-0.04766	-0.0794	-0.05756	-0.16085	-0.08747	-0.06303	-0.08778	-0.08743	-1.07033	-0.24177	-0.13795	-0.10627	-0.08984	-0.08936	-0.0488	-0.06976	-0.07712	-0.03363	-0.19007	-0.02634	-0.43897	-0.01327	-0.02976
16	-0.00129	-0.00173	-0.00212	-0.0519	-0.00089	-0.00222	-0.00167	-0.00202	-0.00487	-0.00303	-0.00238	-0.0023	-0.00378	-0.01198	-0.00147	-1.0599	-0.00476	-0.00378	-0.00316	-0.01156	-0.00269	-0.01262	-0.08495	-0.00145	-0.00161	-0.00148	-0.00646	-0.00554	-0.00342
17	-0.00461	-0.0674	-0.01732	-0.01918	-0.00511	-0.00729	-0.00979	-0.01745	-0.08397	-0.02483	-0.01488	-0.01044	-0.01415	-0.01841	-0.03732	-0.03719	-1.76883	-0.66085	-0.45969	-0.17572	-0.15619	-0.05166	-0.18913	-0.0033	-0.01753	-0.01047	-0.02574	-0.00593	-0.00591
18	-0.0035	-0.0208	-0.01321	-0.02091	-0.0034	-0.00501	-0.01076	-0.00561	-0.02636	-0.01813	-0.01234	-0.01	-0.01435	-0.01787	-0.01319	-0.01116	-0.02283	-1.18293	-0.06882	-0.16645	-0.01733	-0.05241	-0.07967	-0.00207	-0.00787	-0.0122	-0.01098	-0.00474	-0.00474
19	-0.00131	-0.00811	-0.00166	-0.00283	-0.00098	-0.00151	-0.00097	-0.00244	-0.00223	-0.00566	-0.0048	-0.00121	-0.00215	-0.00181	-0.00454	-0.00347	-0.00176	-0.00187	-1.05465	-0.00336	-0.00241	-0.0013	-0.00263	-0.00061	-0.00097	-0.0004	-0.00195	-0.00066	-0.00083
20	-0.00086	-0.00305	-0.00124	-0.00149	-0.00128	-0.00143	-0.00137	-0.00147	-0.00135	-0.00488	-0.00333	-0.0014	-0.00201	-0.00243	-0.00204	-0.00214	-0.00265	-0.0078	-0.0222	-1.22809	-0.00516	-0.00436	-0.01979	-0.00128	-0.00727	-0.03019	-0.01199	-0.00148	-0.00229
21	-0.00167	-0.00328	-0.00271	-0.00763	-0.00415	-0.00246	-0.0022	-0.00292	-0.00244	-0.0088	-0.00496	-0.00235	-0.00366	-0.00302	-0.00293	-0.0033	-0.0026	-0.00275	-0.00395	-0.00534	-1.36133	-0.00295	-0.00323	-0.00169	-0.04452	-0.00237	-0.00194	-0.00091	-0.00217
22	-0.00122	-0.00767	-0.00307	-0.00367	-0.0029	-0.02525	-0.0393	-0.00305	-0.00697	-0.01155	-0.00746	-0.02212	-0.01272	-0.01059	-0.00499	-0.01837	-0.01555	-0.013	-0.00977	-0.01018	-0.00391	-1.03068	-0.00626	-0.00096	-0.00215	-0.00165	-0.0032	-0.00189	-0.005
23	-0.00074	-0.00703	-0.00179	-0.0022	-0.00182	-0.00169	-0.00166	-0.00182	-0.00184	-0.00532	-0.00378	-0.00166	-0.00244	-0.00265	-0.00633	-0.00557	-0.0068	-0.00482	-0.00436	-0.00411	-0.00328	-0.00324	-1.00966	-0.0044	-0.00255	-0.00243	-0.00384	-0.0124	-0.00562
24	-0.05478	-0.0559	-0.13853	-0.1221	-0.17116	-0.13887	-0.16265	-0.16412	-0.16317	-0.14757	-0.1326	-0.21193	-0.1665	-0.16742	-0.08189	-0.13319	-0.15784	-0.15712	-0.14626	-0.14625	-0.12845	-0.15387	-0.10585	-1.01589	-0.10253	-0.03732	-0.10831	-0.01662	-0.04071
25	-0.01566	-0.01762	-0.0303	-0.02564	-0.02126	-0.03201	-0.02679	-0.04013	-0.02978	-0.05045	-0.03112	-0.02362	-0.04387	-0.03827	-0.02577	-0.04179	-0.03859	-0.03902	-0.05268	-0.04782	-0.04021	-0.04468	-0.03377	-0.02087	-1.04455	-0.01614	-0.02522	-0.00867	-0.01506
26	-0.0017	-0.00238	-0.00336	-0.00349	-0.00296	-0.00497	-0.00486	-0.0043	-0.00549	-0.00503	-0.00936	-0.00454	-0.0054	-0.0061	-0.00282	-0.00456	-0.0047	-0.00558	-0.00674	-0.0072	-0.00436	-0.00761	-0.00516	-0.008	-0.00742	-1.04051	-0.00295	-0.00788	-0.00969
27	-0.00583	-0.01224	-0.01303	-0.01755	-0.01559	-0.02505	-0.01867	-0.01737	-0.01817	-0.06461	-0.0455	-0.0225	-0.03082	-0.03032	-0.01191	-0.04093	-0.03608	-0.02981	-0.0275	-0.03412	-0.01526	-0.03003	-0.016	-0.02228	-0.01004	-0.01526	-1.03963	-0.01281	-0.02348
28	-0.01203	-0.01937	-0.02622	-0.03121	-0.03023	-0.03581	-0.03237	-0.03441	-0.03653	-0.05089	-0.04725	-0.03281	-0.04444	-0.05767	-0.02517	-0.03807	-0.04342	-0.04959	-0.04921	-0.06868	-0.03344	-0.05516	-0.03455	-0.0742	-0.03581	-0.03561	-0.02376	-1.04001	-0.15498
29	-0.01625	-0.03723	-0.02491	-0.0608	-0.04522	-0.03539	-0.03405	-0.03466	-0.03088	-0.05607	-0.06573	-0.02628	-0.04898	-0.06505	-0.04841	-0.07207	-0.04017	-0.04328	-0.04056	-0.07608	-0.04486	-0.05227	-0.061	-0.04146	-0.04712	-0.05739	-0.04059	-0.06453	-1.0714

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1988

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.029432	-0.001274	-0.146355	-0.00799	-0.012398	0.0003541	-0.007198	-0.111457	-0.114243	-0.009081	-0.001568	0.0097535	-0.034628	0.0040832	0.0005978	0.0005944	0.0004625	0.0014623	0.0018395	0.0002189	0.001221	-0.00436	-0.005936	-0.004421	-0.003545	-0.001181	-0.034112	-0.000242	-0.009749
2	-0.00089	-1.039402	-0.000492	-0.002166	-0.000315	0.0008181	-0.005622	-0.000724	-0.002371	0.0004962	-0.001153	0.0003637	-0.000728	-0.009174	-0.093556	-0.031775	-0.06881	-0.005457	0.0001302	-0.004503	-0.000483	-0.029828	-0.00478	-0.000856	-0.010632	-0.003201	-0.01602	-0.000955	-0.003516
3	-0.011624	-0.001244	-1.031409	-0.054068	-0.000778	0.0002122	0.0039154	-0.001414	-0.004275	-0.003208	-0.001006	0.00993	-0.000875	-0.017526	-0.000391	0.0001886	0.0002239	0.0004104	0.0004696	-0.000317	0.0004327	-0.000682	6.16E-05	-0.000928	-0.00293	-0.000343	-0.000314	-0.000126	-0.017218
4	4.141E-05	5.459E-05	-4.97E-05	-1.038501	-0.000412	0.0001063	-2.8E-05	8.617E-05	4.774E-05	0.0001583	0.0001545	7.524E-05	9.678E-05	0.0001266	9.15E-05	0.0001208	9.27E-05	0.0001115	0.0001071	0.0001098	0.0001126	8.427E-05	0.0001505	9.777E-05	6.316E-05	5.873E-05	9.845E-05	3.295E-05	-0.00047
5	5.194E-06	-2.56E-06	3.851E-06	-1.5E-06	-1.044804	2.248E-07	-6.1E-06	2.018E-06	-1.26E-06	-1.26E-06	-3.74E-06	1.192E-06	6.469E-09	8.495E-07	-8.03E-07	-1.37E-06	-8.04E-07	-4.48E-07	-2.33E-07	-2.08E-06	-5.04E-07	-7.43E-07	-8.22E-07	-1.94E-06	-7.93E-06	-5.3E-06	-2.04E-06	-8.05E-06	-0.000156
6	-0.000628	-0.000468	-0.001229	-0.000213	-9.57E-05	-1.021943	-1.217133	-0.000103	-0.038963	9.18E-05	-0.00102	-0.016324	-0.09527	-0.001054	7.582E-05	-0.00062	-0.000416	0.0005626	0.0001076	-0.008593	-0.00075	-0.047015	8.888E-05	-0.007466	-0.002189	-0.000842	-0.000186	-0.001907	-0.008955
7	-5.3E-05	-0.000133	-0.000189	-0.000174	-0.000151	-0.000147	-1.029134	-0.000164	-0.000357	-0.000183	-0.000344	-0.000127	-0.00067	-0.000163	-8.98E-05	-0.000146	-0.000203	-0.000137	-7.28E-05	-0.00037	-0.000804	-0.000216	-8.42E-05	-0.006955	-0.000238	-0.000139	-0.000163	-5.88E-05	-0.001734
8	-0.000648	-0.005931	-0.000104	0.0003218	0.0002988	0.0001419	-0.000449	-1.022466	-0.107103	3.484E-05	-0.000135	0.0004015	-0.000217	-0.000881	-0.000484	0.0001753	-0.000281	0.0004207	0.0014657	-0.000652	0.0001259	-0.000522	-0.011454	-0.003001	-8.39E-05	-0.000113	-0.00022	-0.001013	-0.000508
9	1.626E-06	6.974E-07	5.466E-06	5.855E-06	3.047E-06	-5.05E-06	-6.64E-05	6.326E-07	-1.008616	1.046E-05	-1.42E-06	-0.000123	-0.000365	9.412E-06	7.734E-06	4.398E-05	8.471E-06	1.169E-05	1.368E-05	0.0006681	-1.44E-05	-0.000205	3.579E-05	9.316E-06	-6.57E-06	1.918E-05	8.831E-06	2.211E-05	-0.000369
10	-0.000191	-9.43E-05	-4.09E-05	-0.001649	-0.045434	0.0009102	-0.003035	0.0004327	-0.001969	-1.070047	-0.170643	0.0009637	0.0007305	0.00015636	-0.000434	-0.007109	0.0009137	0.0008178	0.0010421	-0.001456	0.0006876	0.00057	0.0010456	-0.000286	-0.000117	-0.000869	0.0003137	-0.001185	-0.00462
11	-0.000121	-0.000196	-1.32E-05	-0.001117	-0.009381	-0.000134	-0.005482	-0.000187	-0.000247	0.0005484	-1.016744	0.0002797	0.0004525	0.000471	-0.002085	-0.00157	0.000113	8.915E-05	0.0003437	-0.002489	0.0002225	0.0004269	0.0001929	-6.34E-05	-0.000629	-0.002157	-0.00069	-0.001125	-0.0073
12	-7.82E-06	-3.22E-05	-2.18E-05	-1.91E-05	-1.52E-05	-0.000307	-0.026257	-6.12E-05	-0.002364	-2.88E-05	-2.96E-05	-1.046697	-0.002681	-0.000235	-9.85E-06	-2.47E-05	-5.41E-05	-2.78E-05	-8.06E-05	-4.4E-05	-8.16E-05	-0.00083	-1.89E-05	-0.000377	-7.61E-05	-2.11E-05	-2.07E-05	-2.96E-05	-0.000237
13	-4.79E-05	-0.002015	7.38E-06	-4.02E-05	3.721E-05	0.0002812	-0.00063	-7.66E-05	-0.000336	0.0001951	-0.000329	0.0005673	-1.056979	-9.45E-05	-0.00021	-0.00015	-8.12E-05	0.000117	0.0002978	-2.94E-05	0.0012532	-0.009595	-0.000825	-0.000597	-0.018735	-0.00099	0.0002685	-0.00042	-0.001425
14	-0.008906	-0.024887	-0.001785	-0.001142	-0.003781	-0.008314	-0.091959	-0.001645	-0.012159	-0.003694	-0.040019	-0.017964	-0.028453	-1.061151	-0.019799	-0.00565	-0.003098	-0.001057	0.0003303	-0.028241	0.0007028	-0.015981	-0.001351	-0.001547	-0.003526	-0.002176	-0.005017	-0.002048	-0.017475
15	-0.009687	-0.028199	-0.008255	-0.022503	-0.004893	-0.003792	-0.037761	-0.015955	-0.016384	-0.009779	-0.011443	-0.000985	-0.012626	-0.006917	-1.047452	-0.094876	-0.024284	-0.003649	0.0004203	-0.009408	-0.001351	-0.009847	-0.010815	-0.007585	-0.104876	-0.02625	-0.170165	-0.00733	-0.020978
16	-3.29E-05	-0.00149	-0.00085	-0.016055	-0.00031	0.0001089	-0.001259	-0.000221	-0.004363	-0.000608	-0.000288	0.0001563	-0.000364	-0.004711	-8.95E-05	-1.027752	-0.001318	-0.000121	4.133E-05	-0.006135	-8.28E-05	-0.004617	-0.017754	6.989E-05	-0.000124	-0.000353	-0.000154	-0.001449	-0.000736
17	1.163E-05	-0.009566	-0.000263	-0.002644	-0.000478	0.0003994	-0.00187	-0.00035	-0.005445	-0.003922	-0.002507	0.0006118	-9.77E-05	-2.52E-05	0.0021467	-0.001361	-1.147282	-0.079256	0.0050469	-0.055549	-0.014438	-0.020258	-0.008508	-0.004486	-0.001006	-0.002868	0.0012534	-0.000634	-0.009589
18	-0.000648	-0.006287	-0.000974	-0.021733	-0.00024	0.0003746	-0.001213	-0.003622	-0.019809	-0.000124	3.672E-05	0.0011305	0.0001188	-0.000201	-0.000193	0.0002152	0.0027317	-0.99076	0.0044634	-0.016057	-0.00228	6.492E-05	-0.007186	-0.0003	-0.002006	-0.00334	-0.002086	-0.000483	-0.002196
19	-0.000965	-0.001905	-0.000235	-0.000242	-0.000114	6.561E-05	-0.000522	-0.003148	-0.000756	-0.001763	-0.000656	4.674E-05	-0.000192	-0.000191	0.0002345	-0.000868	-0.000596	-6.86E-05	-1.014288	-0.002713	-4.74E-05	-0.000432	-0.000395	-0.000176	-0.002647	-0.000444	-4.35E-05	-0.000126	-0.002261
20	-0.000244	-0.006083	-0.000262	-0.000352	-0.000682	-0.000179	-0.002716	-0.002412	-0.000965	-0.00031	-0.002703	-0.000263	-0.002288	-0.000877	-0.001311	-0.003211	-0.001512	-0.000347	-8.007915	-1.3315	-0.004058	-0.001473	-0.004269	-0.000388	-0.006104	-0.053215	-0.008406	-0.000869	-0.004108
21	-0.000446	0.0001647	-6.32E-05	-0.000183	-2.26E-05	0.0002126	-0.002606	-0.000141	-0.000371	0.0001916	-0.000265	0.0001398	2.261E-05	0.0001144	-0.000237	-4.54E-05	-9.94E-05	0.0002591	0.0004577	-0.000304	-1.021621	-0.001062	3.788E-05	-0.000932	-0.022345	-0.001743	-0.006969	-0.000506	-0.006534
22	3.197E-06	0.0001309	0.0003777	0.00038	6.31E-05	0.0005201	-0.003847	-0.000442	-0.001611	0.0011514	-2.18E-05	0.0010208	0.0002063	0.0005119	0.000396	0.0010069	0.0044997	0.0029578	0.0023752	-0.000886	0.0002575	-1.020304	0.0013043	-0.000107	-0.000897	-0.003586	-0.00012	-0.000829	-0.004189
23	-0.000637	-0.006367	-0.000934	-0.001451	-0.000464	-0.001152	-0.005822	-0.000715	-0.002716	-0.001301	-0.003372	-0.00025	-0.000604	-0.000691	-0.00055	-0.000981	-0.002423	-0.000314	0.000239	-0.001815	0.0001701	-0.003424	-0.999103	-0.000617	-0.001832	-0.003936	-0.0088	-0.020369	-0.004762
24	-0.005193	-0.009452	-0.017418	-0.015591	-0.015815	-0.001357	-0.115341	-0.013096	-0.044734	-0.012498	-0.037629	-0.008108	-0.025044	-0.012803	-0.006159	-0.009072	-0.014846	-0.003991	0.0025055	-0.043887	-0.000511	-0.020896	0.0006538	-1.002786	-0.015448	-0.010187	-0.014785	-0.001554	-0.017051
25	-0.003846	-0.005342	-0.006178	-0.007187	-0.003229	-0.001166	-0.079511	-0.011291	-0.015728	-0.001643	-0.010635	-0.00153	-0.005734	-0.003998	-0.014683	-0.00559	-0.006244	-0.001025	0.0012176	-0.015885	-0.002264	-0.010756	-0.005582	-0.013357	-1.027464	-0.015845	-0.002638	-0.006502	-0.012189
26	-0.000323	-0.000329	-0.000299	-0.001178	-0.000498	5.121E-05	-0.01093	-0.000609	-0.002709	0.0001292	-0.00205	-0.000629	-0.000744	-0.000295	-3.4E-05	-0.000351	-0.000257	-7.24E-06	-0.000651	-0.002314	0.0001344	-0.004221	-0.000417	-0.00444	-0.004298	-1.028506	1.72E-05	-0.00251	-0.004328
27	-0.001723	-0.001409	-0.007166	-0.01282	-0.0036	-0.000321	-0.078495	-0.003961	-0.012919	-0.001216	-0.019667	-0.003604	-0.01621	-0.007268	-0.000791	-0.024339	-0.008277	-0.002054	0.0001408	-0.013641	-0.001524	-0.013739	-0.001264	-0.008339	-0.006051	-0.03847	-1.0047	-0.007215	-0.022127
28	-0.000875	-0.002371	-0.001124	-0.001949	-0.001366	0.0012615	-0.061942	-0.001201	-0.008151	0.0016573	-0.004243	-0.001979	-0.002082	-0.000141	0.0004164	-0.000885	0.0005423	0.0022604	0.0020866	-0.004715	0.0022822	-0.00689	0.0011568	-0.00573	-0.011346	-0.014827	-0.004643	-1.007701	-0.016848
29	-0.00185	-0.014695	-0.002517	-0.01031	-0.003445	0.0023893	-0.042685	-0.001241	-0.00572	0.0005002	-0.015681	-0.000356	-0.00137	-0.002584	-0.000953	-0.003393	-0.001177	0.001759	0.002852	-0.008224	0.002392	-0.004883	0.0006199	-0.006301	-0.052261	-0.030483	-0.006887	-0.01307	-1.033099

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1994

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.137259	-0.019029	-0.583922	-0.12827	-0.098597	-0.120114	-0.060623	-0.350477	-0.151095	-0.090586	-0.055646	-0.055204	-0.199918	-0.096786	-0.019364	-0.02227	-0.014708	-0.016269	-0.021341	-0.023649	-0.040577	-0.035503	-0.024944	-0.021717	-0.033903	-0.008571	-0.012984	-0.006908	-0.07714
2	-0.045641	-1.120121	-0.058379	-0.093067	-0.059993	-0.081124	-0.059441	-0.083592	-0.063979	-0.123095	-0.100902	-0.06119	-0.085734	-0.12074	-0.615467	-0.34232	-0.445312	-0.252728	-0.10994	-0.125824	-0.141655	-0.127529	-0.138818	-0.070402	-0.235987	-0.03982	-0.298062	-0.025964	-0.05991
3	-0.056596	-0.009219	-1.112397	-0.154574	-0.011826	-0.024449	-0.022551	-0.022477	-0.014481	-0.013459	-0.01226	-0.022877	-0.021762	-0.071645	-0.011965	-0.009289	-0.007912	-0.010354	-0.007612	-0.010975	-0.008629	-0.01055	-0.008728	-0.007509	-0.025044	-0.005943	-0.007302	-0.004652	-0.07552
4	-0.000162	-0.000388	-0.000295	-1.032024	-0.000163	-0.000282	-0.00028	-0.000242	-0.000205	-0.000319	-0.000419	-0.000219	-0.000276	-0.000489	-0.000347	-0.000382	-0.000369	-0.000328	-0.000329	-0.000403	-0.000275	-0.000297	-0.000497	-0.000409	-0.000644	-0.000471	-0.000314	-0.000426	-0.007582
5	-1.2E-05	-1.45E-05	-9.39E-06	-1.32E-05	-1.321514	-8.21E-06	-7.93E-06	-8.83E-06	-6.17E-06	-5.51E-06	-7.03E-06	-8.1E-06	-6.89E-06	-1.29E-05	-1.17E-05	-1.06E-05	-1.31E-05	-1.02E-05	-1.09E-05	-1.12E-05	-7.61E-06	-9.32E-06	-1.51E-05	-1.24E-05	-1.99E-05	-1.46E-05	-7.05E-06	-1.17E-05	-0.000272
6	-0.008526	-0.011132	-0.009876	-0.0046	-0.004114	-1.621328	-0.642699	-0.019436	-0.120099	-0.010451	-0.013218	-0.256918	-0.248534	-0.008863	-0.008336	-0.008197	-0.006938	-0.008181	-0.015585	-0.009856	-0.047927	-0.159058	-0.005114	-0.006456	-0.020359	-0.003817	-0.005344	-0.00187	-0.011281
7	-0.000188	-0.000365	-0.00026	-0.000323	-0.000236	-0.015015	-1.175871	-0.000463	-0.001451	-0.000428	-0.000413	-0.004137	-0.00964	-0.00038	-0.000439	-0.000375	-0.000443	-0.000415	-0.000525	-0.000447	-0.00191	-0.002038	-0.000307	-0.00164	-0.00096	-0.000256	-0.000315	-0.000168	-0.00273
8	-0.003733	-0.011342	-0.003639	-0.002906	-0.002543	-0.002925	-0.002234	-1.157652	-0.193056	-0.003014	-0.002182	-0.002457	-0.002988	-0.005859	-0.007149	-0.008057	-0.006262	-0.006756	-0.027284	-0.021495	-0.004946	-0.007127	-0.041394	-0.00236	-0.004283	-0.001874	-0.004239	-0.003367	-0.002437
9	-3.38E-05	-9.52E-05	-4.3E-05	-6.26E-05	-3.78E-05	-0.000188	-0.000109	-0.000293	-1.014996	-6.64E-05	-6.73E-05	-0.001037	-0.000109	-0.000159	-8.65E-05	-0.000143	-9.39E-05	-8.56E-05	-0.001793	-0.001327	-6.4E-05	-0.00048	-0.000172	-0.000143	-0.000124	-0.000102	-7.65E-05	-0.000104	-0.000574
10	-0.010469	-0.029827	-0.021953	-0.041083	-0.41626	-0.039717	-0.025529	-0.021924	-0.031273	-1.924256	-0.970485	-0.033105	-0.029865	-0.056479	-0.031511	-0.161265	-0.025678	-0.032412	-0.041456	-0.067989	-0.023855	-0.056735	-0.030921	-0.023481	-0.025806	-0.020238	-0.020403	-0.015184	-0.046134
11	-0.001718	-0.003611	-0.003173	-0.005602	-0.014996	-0.004455	-0.004116	-0.004295	-0.004074	-0.004169	-1.043099	-0.003585	-0.004116	-0.004647	-0.010959	-0.008091	-0.004799	-0.005606	-0.003941	-0.006937	-0.003315	-0.004765	-0.004066	-0.003347	-0.007422	-0.00345	-0.007576	-0.004143	-0.01824
12	-0.000209	-0.000611	-0.000271	-0.000295	-0.00024	-0.007527	-0.052255	-0.004981	-0.032336	-0.000501	-0.000465	-1.578894	-0.04324	-0.000575	-0.000581	-0.000465	-0.000475	-0.000452	-0.005139	-0.001016	-0.007233	-0.00979	-0.000503	-0.000552	-0.002741	-0.000385	-0.000421	-0.000202	-0.001075
13	-0.002748	-0.00753	-0.004184	-0.004778	-0.004097	-0.005795	-0.008054	-0.007608	-0.006235	-0.008844	-0.007542	-0.015848	-1.094051	-0.006303	-0.008798	-0.0071	-0.007251	-0.006523	-0.006674	-0.00728	-0.163708	-0.024167	-0.005957	-0.010717	-0.061619	-0.005794	-0.007322	-0.003254	-0.008839
14	-0.063008	-0.082994	-0.056423	-0.066445	-0.053175	-0.202064	-0.104258	-0.06757	-0.094343	-0.093457	-0.114846	-0.119394	-0.19347	-1.363534	-0.128034	-0.0866	-0.060294	-0.070171	-0.057057	-0.115632	-0.067169	-0.114113	-0.052802	-0.026661	-0.071109	-0.019619	-0.072119	-0.012869	-0.064911
15	-0.089204	-0.223295	-0.112198	-0.162956	-0.119453	-0.153061	-0.115245	-0.16367	-0.122049	-0.243571	-0.195091	-0.117591	-0.162022	-0.149294	-1.301852	-0.47222	-0.275786	-0.219346	-0.140498	-0.140122	-0.1501	-0.13796	-0.167664	-0.143325	-0.486619	-0.073098	-0.622371	-0.04626	-0.112214
16	-0.00166	-0.005548	-0.00355	-0.040414	-0.001686	-0.004225	-0.002909	-0.002415	-0.003088	-0.003201	-0.003254	-0.003213	-0.004049	-0.018615	-0.004961	-1.113274	-0.00478	-0.007307	-0.007023	-0.01221	-0.006082	-0.013232	-0.125273	-0.002712	-0.003607	-0.002493	-0.004547	-0.011513	-0.005891
17	-0.00842	-0.044713	-0.014901	-0.048143	-0.011579	-0.013038	-0.009804	-0.022676	-0.028412	-0.029199	-0.027541	-0.010605	-0.016252	-0.026718	-0.039089	-0.0282	-1.52408	-0.664207	-0.195007	-0.222451	-0.296988	-0.09395	-0.104162	-0.012033	-0.035979	-0.019398	-0.029895	-0.008457	-0.01915
18	-0.007462	-0.02683	-0.016621	-0.064926	-0.008483	-0.009071	-0.007695	-0.022611	-0.026751	-0.025152	-0.018724	-0.008879	-0.011967	-0.019494	-0.032189	-0.020173	-0.040766	-1.064222	-0.068553	-0.063606	-0.022813	-0.024844	-0.071111	-0.00706	-0.018448	-0.012706	-0.021703	-0.005855	-0.013177
19	-0.006561	-0.040915	-0.007436	-0.007803	-0.00528	-0.010444	-0.007509	-0.029733	-0.027734	-0.012394	-0.009487	-0.006792	-0.010007	-0.010584	-0.026436	-0.018124	-0.024116	-0.018272	-1.483333	-0.032002	-0.015599	-0.013069	-0.011669	-0.006379	-0.028828	-0.007822	-0.020255	-0.003398	-0.010094
20	-0.007524	-0.057123	-0.009247	-0.011448	-0.008337	-0.016535	-0.011379	-0.01445	-0.012338	-0.018987	-0.01612	-0.010068	-0.015973	-0.013572	-0.035582	-0.025524	-0.032593	-0.025516	-0.110641	-1.701284	-0.096159	-0.028675	-0.026395	-0.014672	-0.04424	-0.073193	-0.03628	-0.006576	-0.020596
21	-0.008595	-0.02804	-0.011472	-0.014452	-0.009249	-0.014353	-0.012953	-0.016289	-0.013123	-0.01716	-0.017773	-0.013488	-0.014643	-0.014781	-0.028316	-0.020679	-0.035599	-0.026216	-0.017596	-0.019028	-2.127833	-0.028013	-0.014965	-0.030118	-0.107099	-0.013042	-0.03829	-0.006923	-0.029847
22	-0.000698	-0.002962	-0.001903	-0.002774	-0.001052	-0.002579	-0.006957	-0.00126	-0.002655	-0.004278	-0.003503	-0.009321	-0.005564	-0.003893	-0.002811	-0.004046	-0.008428	-0.008641	-0.004715	-0.002576	-0.002692	-1.094433	-0.003286	-0.00181	-0.00317	-0.00702	-0.002111	-0.001811	-0.008602
23	-0.003566	-0.024991	-0.004634	-0.005969	-0.004557	-0.007567	-0.006026	-0.005951	-0.007242	-0.007566	-0.007588	-0.006139	-0.006359	-0.006885	-0.017182	-0.012403	-0.014531	-0.010212	-0.008796	-0.008308	-0.006944	-0.00727	-1.017414	-0.007494	-0.010771	-0.008583	-0.011749	-0.041104	-0.009505
24	-0.035572	-0.059648	-0.078506	-0.094788	-0.08703	-0.110178	-0.107683	-0.119079	-0.104507	-0.158018	-0.141301	-0.16213	-0.132894	-0.117733	-0.13236	-0.114288	-0.151539	-0.158899	-0.163307	-0.153859	-0.162311	-0.11523	-0.070633	-1.038399	-0.110032	-0.035985	-0.112056	-0.015775	-0.056251
25	-0.03365	-0.052964	-0.053443	-0.053846	-0.042542	-0.065038	-0.061292	-0.087943	-0.066381	-0.06912	-0.071629	-0.063509	-0.063941	-0.057326	-0.090508	-0.068286	-0.058151	-0.060778	-0.058004	-0.065677	-0.067976	-0.062693	-0.070631	-0.106489	-1.077644	-0.048088	-0.055614	-0.031127	-0.041958
26	-0.004883	-0.007372	-0.006513	-0.008139	-0.007003	-0.010124	-0.01047	-0.010949	-0.011196	-0.010314	-0.013612	-0.013428	-0.011303	-0.009844	-0.010445	-0.009678	-0.01076	-0.011819	-0.046113	-0.018188	-0.011805	-0.013648	-0.011944	-0.04514	-0.016692	-1.044852	-0.008189	-0.016043	-0.014243
27	-0.021241	-0.07074	-0.047594	-0.06515	-0.047168	-0.093108	-0.071348	-0.0538	-0.060801	-0.10406	-0.083119	-0.062733	-0.071568	-0.064039	-0.052265	-0.093256	-0.109906	-0.09177	-0.06592	-0.077783	-0.059922	-0.072475	-0.037647	-0.054096	-0.043586	-0.032894	-1.082893	-0.025872	-0.053057
28	-0.020665	-0.039297	-0.029109	-0.036216	-0.028986	-0.050236	-0.05487	-0.041834	-0.045628	-0.042546	-0.046934	-0.065016	-0.049339	-0.042854	-0.051175	-0.045358	-0.046933	-0.046878	-0.072095	-0.060759	-0.042815	-0.052922	-0.055952	-0.094929	-0.06248	-0.067251	-0.042232	-1.050048	-0.045602
29	-0.018709	-0.055484	-0.024103	-0.053788	-0.021557	-0.034923	-0.032313	-0.02793	-0.026449	-0.03159	-0.040188	-0.027176	-0.030827	-0.046156	-0.046974	-0.046095	-0.051177	-0.04196	-0.043798	-0.04866	-0.033631	-0.036269	-0.062951	-0.053011	-0.076204	-0.06121	-0.03405	-0.051878	-1.076163

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.036987	-0.005343	-0.273345	-0.030611	-0.027825	-0.024122	-0.069245	-0.084271	-0.040197	-0.020858	-0.009761	-0.050116	-0.053851	-0.06081	-0.004329	-0.0062	-0.003179	-0.004556	-0.002904	0.0559075	0.0019621	-0.073594	-0.009406	-0.017266	-0.006898	-1.71E-06	-0.0033	-0.004159	-0.035798
2	-0.004833	-1.012086	-0.01224	-0.020655	-0.004449	-0.009558	-0.193158	-0.008467	-0.026627	-0.018416	-0.022654	-0.038683	-0.050415	-0.03124	-0.423277	-0.143728	-0.188264	-0.04272	-0.033048	0.3841325	0.0134446	-0.102237	-0.023134	-0.02037	-0.079599	-0.007437	-0.232448	-0.013473	-0.017148
3	-0.016794	-0.000854	-1.065344	-0.062704	-0.003387	-0.002715	-0.052752	-0.003993	-0.014491	-0.004622	-0.007486	-0.089204	-0.004339	-0.041257	-0.001373	-0.003019	-0.002251	-0.001903	-0.002992	0.0629256	0.0042915	-0.015365	-0.001606	-0.021649	-0.008511	0.0035894	-0.002386	-0.003514	-0.047833
4	-0.000132	-0.000184	-0.00024	-1.071249	-0.000179	-0.00027	-0.003428	-0.000296	-0.000464	-0.000347	-0.000541	-0.00133	-0.000341	-0.00043	-0.000222	-0.000379	-0.000376	-0.000322	-0.000365	0.0074252	0.000411	-0.000792	-0.00035	-0.003319	-0.000736	0.0006191	-0.000352	-0.000437	-0.006168
5	-2.2E-05	1.549E-05	-4.89E-05	-1.36E-05	-1.061287	-3.43E-05	-0.002229	-7.19E-05	-0.000234	-9.55E-06	-6.86E-05	-0.000792	-6.91E-05	-4.36E-05	1.47E-06	-6.09E-05	-0.000134	-7.54E-05	-0.000232	0.0040537	0.000282	-0.000399	5.647E-06	-0.002121	6.921E-05	0.000529	-4.95E-05	-3.04E-06	-0.000143
6	-0.003495	-0.001398	-0.004096	-0.001533	-0.000873	-1.140571	-3.940048	-0.015418	-0.146856	-0.001878	-0.012274	-0.340201	-0.041439	-0.003235	-0.002619	-0.00645	-0.001328	-0.003179	-0.002815	0.0336878	-0.000661	-0.092372	-0.002041	-0.011762	-0.006494	-0.011567	-0.001677	-0.001911	-0.009771
7	-9.18E-06	1.422E-05	-0.000165	-8.3E-05	-2.97E-05	-2.05E-05	-1.742064	-0.004147	-0.006077	3.6E-07	-8.07E-05	-0.018336	-0.001069	-7.47E-05	-1.57E-06	-0.001289	-0.000165	-6.68E-05	-0.000261	0.0057068	0.0004121	-0.001009	-0.000281	-0.002493	-0.000762	0.0003131	-9.67E-05	-0.000163	-0.002451
8	-0.000598	-0.001777	-0.001016	-0.00183	-0.001896	-0.001335	-0.0095	-1.064291	-0.370524	-0.006737	-0.002275	-0.00423	-0.00095	-0.00268	-0.002807	-0.01337	-0.001737	-0.002495	-0.003782	0.0310278	0.0018741	-0.034963	-0.016389	-0.003984	-0.008937	-0.016891	-0.001374	-0.003606	-0.001235
9	-3.49E-05	-0.000896	-8.13E-05	-0.000183	-9.35E-05	-5.88E-05	-0.005813	-8.91E-05	-1.030717	-5.9E-05	-0.00028	-0.001825	-0.000231	-0.000189	-0.000468	-0.000439	-0.000478	-0.000157	-0.000793	0.0109899	0.0010958	-0.00156	-0.000897	-0.002782	-0.007765	-0.035124	-0.00094	-0.002344	-0.000795
10	-0.001171	-0.001077	-0.004923	-0.012026	-0.043069	-0.004984	-0.077915	-0.004183	-0.018904	-1.319431	-0.293259	-0.037652	-0.007229	-0.022429	-0.00321	-0.021545	-0.003209	-0.003498	0.0092349	0.0912235	0.0073948	-0.076539	-0.005963	-0.005235	-0.007249	0.0005142	-0.002614	-0.007206	-0.013309
11	-0.000416	-0.000596	-0.001003	-0.00182	-0.002534	-0.001415	-0.004954	-0.000882	-0.00189	-0.016096	-1.012287	-0.002129	-0.002435	-0.003519	-0.001051	-0.001634	-0.00117	-0.00135	0.0002626	0.011391	0.0005134	-0.004599	-0.00104	-0.001725	-0.001775	-0.002111	-0.002246	-0.000895	-0.011186
12	-3.27E-05	-0.000603	-0.0001	-0.000161	-7.5E-05	-0.00034	-0.259656	-0.010401	-0.363664	-7.46E-05	-0.000328	-1.712077	-0.002088	-0.000428	-0.000358	-0.000596	-0.000254	-0.000118	-0.000797	0.0086569	0.0004448	-0.024607	-0.000476	-0.002765	-0.003589	-0.015826	-0.000511	-0.001143	-0.001121
13	-0.000331	-0.001378	-0.000812	-0.00082	-0.000502	-0.004606	-0.027102	-0.00153	-0.002455	-0.001119	-0.00944	-0.004571	-1.02296	-0.002375	-0.00099	-0.003459	-0.001051	-0.00114	-0.002791	0.0171016	-0.024851	-0.015543	-0.00134	-0.003404	-0.022728	-0.016877	-0.002048	-0.001353	-0.003189
14	-0.016264	-0.011927	-0.015231	-0.020547	-0.017307	-0.049574	-0.280965	-0.021831	-0.167988	-0.03183	-0.115179	-0.542386	-0.075391	-1.11302	-0.017263	-0.03728	-0.007938	-0.013303	-0.016397	0.301155	0.0198664	-0.185734	-0.010705	-0.009443	-0.012288	0.006983	-0.012668	-0.013886	-0.027061
15	-0.01049	-0.024941	-0.015151	-0.035655	-0.009415	-0.019974	-0.437106	-0.016821	-0.049199	-0.035485	-0.03683	-0.082151	-0.127448	-0.062956	-1.068919	-0.141969	-0.044661	-0.028892	-0.017496	0.4636584	0.0303404	-0.074459	-0.021139	-0.038014	-0.211318	-0.04272	-0.26148	-0.02856	-0.034533
16	-0.000195	-0.001578	-0.002132	-0.024842	-0.000275	-0.000651	-0.002076	-0.000519	-0.002893	-0.000793	-0.000911	-0.003186	-0.000947	-0.005516	-0.001066	-1.053029	-0.002564	-0.001617	0.008096	0.0781408	0.0036012	-0.035359	-0.037255	-0.002605	0.0013201	0.0081732	-0.001949	-0.005321	-0.002468
17	-0.000628	-0.012017	-0.002785	-0.002664	-0.000356	-0.000847	0.0068743	-0.003568	-0.02663	-0.001075	-0.003713	0.0001068	-0.000382	-0.001845	-0.008378	-0.006927	-1.187655	-0.231558	-0.212872	0.6352698	-0.02805	-0.101996	-0.034574	-0.001004	-0.003575	0.00744	-0.004478	-0.002563	-0.000277
18	-0.001532	-0.006362	-0.00999	-0.021635	-0.00095	-0.001493	-0.026683	-0.013691	-0.017655	-0.004146	-0.019255	-0.012634	-0.002925	-0.010579	-0.009318	-0.00641	-0.045232	-1.049903	-0.132179	0.3319484	0.020746	-0.099173	-0.023722	-0.005278	-0.004512	-0.060522	-0.005526	-0.003945	-0.005076
19	-0.001563	-0.001187	-0.001899	-0.002387	-0.00044	-0.001482	-0.033762	-0.001411	-0.009863	-0.000909	-0.002585	-0.005949	-0.001064	-0.001176	-0.001587	-0.004658	-0.001507	-0.007182	-1.072922	0.2137943	0.025928	-0.012982	-0.001003	-0.009238	-0.015545	-1.59171	-0.006866	-0.003223	-0.003147
20	0.0029433	0.0141704	0.0061832	0.0187165	0.0018981	0.003916	0.1521442	0.0057446	0.0246512	0.0056688	0.0085884	0.0328321	0.0057229	0.0107942	0.0106313	0.0198988	0.0142144	0.0173122	0.4873304	2.419223	0.3991393	0.0639585	0.0163024	0.0272836	0.0857027	0.4682778	0.0176953	0.0119094	0.0215248
21	-0.000569	-0.002803	-0.001767	-0.001475	-0.000439	-0.000944	-0.031909	-0.001189	-0.002066	-0.00099	-0.001214	-0.002747	-0.001119	-0.001049	-0.002153	-0.001647	-0.005427	-0.001626	-0.000192	0.0510814	-1.226475	-0.008156	-0.001415	-0.005375	-0.043818	0.0044011	-0.001955	-0.001576	-0.007583
22	-0.000337	-0.002256	-0.00157	-0.004125	-0.000881	-0.001881	-0.041665	-0.00159	-0.006109	-0.004958	-0.003801	-0.013609	-0.002919	-0.0042	-0.003034	-0.00846	-0.015592	-0.011318	-0.001198	0.0475749	0.0025409	-1.12504	-0.004869	-0.006548	-0.002641	-0.037502	-0.002405	-0.007376	-0.005973
23	-0.000584	-0.002376	-0.000748	-0.000959	-0.000488	-0.000882	-0.001897	-0.00067	-0.001892	-0.001027	-0.001117	-0.00077	-0.000904	-0.000954	-0.00262	-0.002041	-0.001953	-0.001509	-0.000517	0.0080179	-0.000258	-0.001509	-1.004708	-0.001609	-0.001116	-0.002402	-0.002889	-0.009209	-0.00404
24	-0.004727	-0.000713	-0.029599	-0.014018	-0.023389	-0.029456	-0.910646	-0.041544	-0.11009	-0.021683	-0.04011	-0.344415	-0.041011	-0.028181	-0.006127	-0.038192	-0.071678	-0.050646	-0.059261	2.0200416	0.1432369	-0.165909	-0.01078	-0.992272	0.0320808	0.2606931	-0.025024	0.0002779	-0.009918
25	-0.002455	-0.003654	-0.006316	-0.003915	-0.00327	-0.005701	-0.065966	-0.009034	-0.009467	-0.004952	-0.006298	-0.021908	-0.006277	-0.007136	-0.004241	-0.006501	-0.009401	-0.008713	-0.030301	0.2222073	0.0216046	-0.016545	-0.027557	-0.053603	-1.014077	0.0023844	-0.006276	-0.018767	-0.014496
26	-0.001036	-0.001894	-0.002551	-0.004682	-0.002291	-0.002373	-0.073109	-0.002464	-0.01337	-0.003926	-0.007945	-0.015712	-0.004411	-0.004043	-0.00409	-0.00547	-0.005247	-0.003547	-0.014345	0.1074394	0.004899	-0.018718	-0.00158	-0.018513	-0.004957	-1.039817	-0.015526	-0.014846	-0.007476
27	-0.003819	-0.009602	-0.008804	-0.03018	-0.004831	-0.011791	-0.155333	-0.007515	-0.042219	-0.030357	-0.0513	-0.027514	-0.014927	-0.013226	-0.005337	-0.053561	-0.045966	-0.048425	-0.011327	0.3166769	0.0191916	-0.046269	-0.002855	-0.004981	-0.000402	0.0153078	-1.115892	-0.011245	-0.024661
28	-0.004762	-0.007646	-0.009122	-0.010203	-0.006419	-0.011485	-0.058041	-0.00944	-0.031861	-0.011693	-0.018414	-0.022093	-0.012711	-0.015554	-0.012245	-0.01216	-0.011069	-0.013085	-0.009555	0.1255064	-0.012934	-0.082045	-0.0136	-0.037693	-0.030412	-0.048277	-0.011353	-1.031814	-0.024078
29	-0.006538	-0.014027	-0.009134	-0.017691	-0.00661	-0.012602	-0.018749	-0.009369	-0.00866	-0.015635	-0.020104	-0.008389	-0.012118	-0.019425	-0.012381	-0.015275	-0.010862	-0.011303	0.0086315	0.1357059	0.0073476	-0.020261	-0.018036	-0.016695	-0.023738	-0.037117	-0.026542	-0.060138	-1.048085

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2006

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	-1.185461	-0.012291	-0.578431	-0.108729	-0.270374	-0.035077	-0.109498	-0.172565	-0.096034	-0.054697	-0.037292	-0.035489	-0.3035	-0.083183	-0.010818	-0.023438	-0.017616	-0.016071	-0.02078	-0.015818	-0.033855	-0.100894	-0.027405	-0.042452	-0.019222	-0.007853	-0.004733	-0.006866	-0.055922
2	-0.037081	-1.112696	-0.047013	-0.084357	-0.054236	-0.112523	-0.070089	-0.097134	-0.078981	-0.10323	-0.089947	-0.101416	-0.146433	-0.195293	-0.742164	-0.341663	-0.369803	-0.514973	-0.272565	-0.075887	-0.119585	-0.146612	-0.159483	-0.046225	-0.215535	-0.037411	-0.104716	-0.028888	-0.031381
3	-0.083758	-0.003652	-1.200723	-0.149838	-0.026848	-0.005423	-0.023158	-0.017872	-0.01068	-0.013796	-0.009687	-0.021114	-0.026514	-0.0096	-0.003608	-0.006484	-0.006957	-0.005742	-0.007063	-0.006383	-0.011104	-0.012977	-0.005405	-0.018364	-0.012073	-0.004854	-0.002039	-0.0051	-0.0715
4	-0.001756	-0.000084	-0.015941	-1.163004	-0.002614	-0.00201	-0.001751	-0.003781	-0.002199	-0.004565	-0.003102	-0.001641	-0.002203	-0.002035	-0.001003	-0.001973	-0.002512	-0.00176	-0.002477	-0.002404	-0.004345	-0.002701	-0.001421	-0.008521	-0.00157	-0.001131	-0.000464	-0.000828	-0.010225
5	-0.000161	-0.000169	-0.000339	-0.000466	-1.11193	-0.00053	-0.000448	-0.001017	-0.000575	-0.001233	-0.000779	-0.000494	-0.000493	-0.000506	-0.000224	-0.000489	-0.000666	-0.00044	-0.000652	-0.000632	-0.001192	-0.000704	-0.000331	-0.002527	-0.000279	-0.000192	-7.12E-05	-6.04E-05	-0.000184
6	-0.008883	-0.004049	-0.011902	-0.010069	-0.01526	-1.423287	-0.37087	-0.027994	-0.067929	-0.040805	-0.040451	-0.621287	-0.064972	-0.012936	-0.003324	-0.015033	-0.004581	-0.007643	-0.011552	-0.006578	-0.007924	-0.10592	-0.008157	-0.006062	-0.011966	-0.006978	-0.002346	-0.003187	-0.014749
7	-6.15E-05	-0.000102	-0.000122	-0.00011	-0.000114	-0.00017	-1.007513	-0.004038	-0.001963	-0.000241	-0.000185	-0.000138	-0.000119	-0.000287	-8.24E-05	-0.000167	-0.000113	-0.000148	-0.000244	-0.000122	-0.000147	-0.000219	-0.001323	-0.000185	-0.000472	-0.000151	-0.000135	-5.22E-05	-0.000415
8	-0.003122	-0.010214	-0.003721	-0.009063	-0.008905	-0.006948	-0.006332	-1.052786	-0.450194	-0.027399	-0.017698	-0.011064	-0.00353	-0.013018	-0.007394	-0.018877	-0.00718	-0.012194	-0.0143	-0.005304	-0.005029	-0.029979	-0.086893	-0.002494	-0.009191	-0.003451	-0.002323	-0.004064	-0.004014
9	-0.001063	-0.007312	-0.001947	-0.010477	-0.003389	-0.005167	-0.005685	-0.006182	-1.0368	-0.010667	-0.013146	-0.01365	-0.002161	-0.0056	-0.005315	-0.008296	-0.007171	-0.009389	-0.007336	-0.004511	-0.003488	-0.00469	-0.003265	-0.00276	-0.008994	-0.003032	-0.002178	-0.002263	-0.002916
10	-0.009635	-0.025566	-0.02168	-0.044607	-0.214288	-0.035004	-0.027022	-0.038009	-0.031255	-1.325067	-0.429168	-0.031629	-0.023027	-0.080309	-0.023078	-0.047925	-0.022682	-0.030236	-0.042973	-0.030916	-0.018051	-0.062509	-0.018916	-0.009674	-0.018671	-0.013012	-0.013896	-0.019227	-0.021299
11	-0.001794	-0.002413	-0.004044	-0.010808	-0.020051	-0.004134	-0.003647	-0.003472	-0.003754	-0.054475	-1.046015	-0.003262	-0.003076	-0.008814	-0.002622	-0.004155	-0.002851	-0.003296	-0.004026	-0.002856	-0.002141	-0.005364	-0.002382	-0.001222	-0.004124	-0.004029	-0.001828	-0.023926	-0.01209
12	-0.000546	-0.000691	-0.000739	-0.00126	-0.001557	-0.066853	-0.06472	-0.001941	-0.049662	-0.005481	-0.00383	-1.066334	-0.002851	-0.001555	-0.000533	-0.002071	-0.000689	-0.000911	-0.001157	-0.000556	-0.000689	-0.013086	-0.00104	-0.000484	-0.001275	-0.000602	-0.000278	-0.000382	-0.001696
13	-0.001072	-0.007085	-0.002177	-0.001953	-0.001586	-0.016756	-0.013755	-0.003372	-0.003663	-0.003158	-0.007354	-0.021714	-1.146713	-0.002818	-0.004982	-0.006151	-0.005337	-0.005312	-0.00967	-0.003116	-0.038046	-0.004597	-0.007082	-0.002539	-0.023959	-0.002095	-0.00249	-0.001717	-0.002532
14	-0.083029	-0.064581	-0.078513	-0.094691	-0.118826	-0.099103	-0.070051	-0.135545	-0.119401	-0.130193	-0.239171	-0.083108	-0.06889	-1.46165	-0.055595	-0.196262	-0.061109	-0.087308	-0.062172	-0.042085	-0.053075	-0.144134	-0.049875	-0.016902	-0.03425	-0.020977	-0.019556	-0.022722	-0.035318
15	-0.055507	-0.170005	-0.061237	-0.113607	-0.074895	-0.170991	-0.096019	-0.141585	-0.112877	-0.13775	-0.125009	-0.135073	-0.23432	-0.315957	-1.287982	-0.356363	-0.384879	-0.307819	-0.316366	-0.084395	-0.132574	-0.185069	-0.166026	-0.042406	-0.348847	-0.045563	-0.112295	-0.044876	-0.044669
16	-0.001934	-0.008566	-0.006025	-0.067691	-0.00293	-0.037101	-0.039405	-0.00446	-0.009745	-0.006299	-0.013234	-0.106752	-0.005236	-0.009431	-0.006224	-1.090501	-0.006893	-0.007046	-0.015895	-0.008072	-0.006128	-0.022386	-0.076539	-0.003715	-0.003683	-0.003656	-0.00258	-0.006149	-0.006382
17	-0.002687	-0.034228	-0.004061	-0.006498	-0.005544	-0.006011	-0.005995	-0.00666	-0.026937	-0.015908	-0.011339	-0.007195	-0.021957	-0.011428	-0.022438	-0.018354	-1.417494	-0.116722	-0.188419	-0.037034	-0.144478	-0.026676	-0.167938	-0.005662	-0.024764	-0.008582	-0.007541	-0.00237	-0.003672
18	-0.008998	-0.033691	-0.010365	-0.018407	-0.013862	-0.013315	-0.013445	-0.019911	-0.023995	-0.03447	-0.024471	-0.020639	-0.012775	-0.017841	-0.028654	-0.029667	-0.125272	-1.147361	-0.226264	-0.050057	-0.061044	-0.044515	-0.087688	-0.008251	-0.0295	-0.022814	-0.014215	-0.003993	-0.006552
19	-0.001312	-0.002759	-0.002018	-0.002604	-0.001457	-0.003413	-0.001732	-0.001833	-0.002816	-0.002248	-0.003926	-0.002538	-0.003603	-0.001451	-0.002039	-0.001872	-0.002248	-0.002084	-1.051761	-0.002093	-0.049814	-0.003246	-0.001156	-0.0018	-0.010011	-0.001238	-0.001041	-0.001015	-0.001605
20	-0.028885	-0.064603	-0.023891	-0.050923	-0.026099	-0.039686	-0.158387	-0.043643	-0.050962	-0.036879	-0.032152	-0.0351	-0.028093	-0.043321	-0.049613	-0.059147	-0.053283	-0.074296	-0.093349	-2.847769	-0.352007	-0.098636	-0.054278	-0.025755	-0.147744	-0.325762	-0.098953	-0.017335	-0.041406
21	-0.000269	-0.00136	-0.000527	-0.000378	-0.00027	-0.000455	-0.000568	-0.000713	-0.000483	-0.000631	-0.000645	-0.000428	-0.000642	-0.000624	-0.000981	-0.000642	-0.000566	-0.000448	-0.000778	-0.000659	-1.076934	-0.000454	-0.000653	-0.000811	-0.009467	-0.000678	-0.000712	-0.000274	-0.000496
22	-0.001054	-0.004939	-0.001919	-0.003535	-0.006084	-0.003113	-0.007245	-0.005079	-0.00498	-0.009384	-0.019681	-0.005917	-0.00654	-0.004902	-0.003767	-0.006749	-0.009768	-0.009521	-0.0077	-0.003196	-0.001991	-1.124491	-0.0041	-0.001064	-0.003974	-0.002675	-0.002582	-0.002305	-0.006817
23	1.48E-05	-0.000187	-0.000132	-9.42E-05	-1.04E-05	-7.07E-05	-9E-05	1.708E-05	-9.15E-05	-4.89E-05	-0.000172	-4.69E-05	-0.000157	-9.46E-05	-0.00081	-0.000523	-0.000327	-0.000314	-0.000316	-0.000232	-0.00014	-0.000227	-1.001685	-0.000669	5.891E-05	-9.88E-05	-0.000591	-0.002117	-0.000211
24	-0.074867	-0.084563	-0.167609	-0.22894	-0.31587	-0.261333	-0.221867	-0.494486	-0.289024	-0.599477	-0.384228	-0.244869	-0.242652	-0.248898	-0.110768	-0.241507	-0.327442	-0.217697	-0.320148	-0.314855	-0.573382	-0.345591	-0.165591	-1.275457	-0.136358	-0.093999	-0.037531	-0.028603	-0.063138
25	-0.019482	-0.03201	-0.019646	-0.021006	-0.02123	-0.019576	-0.021825	-0.033174	-0.023847	-0.027603	-0.024156	-0.017271	-0.019507	-0.025259	-0.026995	-0.029184	-0.029242	-0.034133	-0.05438	-0.049932	-0.031366	-0.025726	-0.026521	-0.033416	-1.047179	-0.025732	-0.012146	-0.020649	-0.015916
26	-0.010364	-0.022726	-0.016453	-0.035592	-0.025302	-0.023843	-0.025183	-0.032687	-0.023021	-0.041218	-0.029339	-0.020809	-0.018353	-0.02084	-0.019334	-0.0272	-0.025001	-0.028048	-0.032095	-0.066779	-0.04684	-0.03346	-0.015254	-0.029979	-0.021969	-1.065313	-0.01884	-0.022314	-0.029381
27	-0.012645	-0.044324	-0.020657	-0.043342	-0.031746	-0.034411	-0.067313	-0.029525	-0.03868	-0.055969	-0.064028	-0.043782	-0.026867	-0.039923	-0.031613	-0.083439	-0.07936	-0.075644	-0.062782	-0.062431	-0.036381	-0.042851	-0.030338	-0.008763	-0.025688	-0.027319	-1.180147	-0.019849	-0.036664
28	-0.030086	-0.021636	-0.027467	-0.038521	-0.028938	-0.030997	-0.03227	-0.026175	-0.057173	-0.044699	-0.030795	-0.026401	-0.024043	-0.025681	-0.020995	-0.028137	-0.026322	-0.028019	-0.038171	-0.03008	-0.025477	-0.036631	-0.021695	-0.029172	-0.083331	-0.087809	-0.023035	-1.20439	-0.074693
29	-0.013125	-0.027217	-0.014456	-0.032552	-0.01546	-0.017808	-0.01897	-0.016516	-0.014681	-0.027626	-0.035674	-0.013778	-0.022901	-0.022381	-0.022666	-0.02815	-0.026093	-0.029203	-0.025117	-0.021316	-0.025154	-0.019768	-0.024425	-0.011284	-0.044229	-0.047792	-0.019771	-0.06622	-1.063851

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 16
N Matrix, Malaysia
1978

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-0.93297	0.090196	-0.28896	0.066897	1.09E-05	0.122462	-0.25083	0.01296	0.106596	0.090911	0.107488	-0.45224	0.101327	0.124677	0.11519	0.10587	0.075046	0.126798	0.121019	0.098574	0.098319	0.09373	0.087832	0.091023	0.000213	0.087867
2	0.06157	-0.94686	0.099455	0.076709	0.073794	0.083163	0.090385	0.093378	0.073484	0.068559	-0.16393	0.099138	0.029397	-0.38194	0.008591	0.060009	0.05772	0.079107	0.02292	0.018266	0.068203	0.063427	0.059421	0.061548	0.080054	0.064427
3	0.004571	0.048442	-1.1519	-0.0509	0.04955	0.061627	0.054299	0.069607	0.055298	0.035285	0.0564	0.053318	0.056141	0.069247	0.060832	0.055541	0.047815	0.066809	0.063374	0.067161	0.050621	0.053247	0.046577	0.048114	-0.01324	0.041573
4	0.03119	0.031122	0.049893	-0.9612	0.035524	0.041831	0.045901	0.049544	0.036553	0.037939	0.035486	0.049659	0.038669	0.044091	0.039463	0.035898	0.030745	0.046607	0.040716	0.044874	0.034951	0.036297	0.02949	0.030598	0.030788	0.033377
5	0.031166	0.031409	0.050343	0.041017	-0.98483	0.042064	0.046152	0.049984	0.036914	0.038024	0.035663	0.049795	0.038791	0.04435	0.039752	0.036063	0.03091	0.047011	0.040999	0.045258	0.03565	0.037024	0.029693	0.030845	0.041686	0.034262
6	0.042414	0.043187	0.065541	0.053148	0.048472	-1.26459	0.063115	0.065442	0.044073	0.051527	0.049352	0.062652	0.049469	0.061137	0.052852	0.048084	0.041987	0.029001	0.055419	0.061945	0.048673	0.04858	0.03931	0.042627	0.055446	0.041137
7	0.04695	0.046188	0.076289	0.057748	0.05442	0.063243	-1.02529	-0.24969	0.054452	0.053983	0.054408	0.074256	0.055096	0.066224	0.058591	0.054161	0.044079	0.057446	0.061541	-0.00867	0.052955	0.05539	0.043074	0.044011	0.061223	0.047927
8	0.031383	0.031424	0.050498	0.041015	0.035972	0.042175	0.046251	-0.96824	0.034553	0.038481	0.03573	0.049984	0.039058	0.044417	0.039671	0.035104	0.030905	0.047085	0.041106	0.044841	0.035559	0.037089	0.029693	0.03084	0.041241	0.034161
9	0.041905	0.039228	0.062209	0.036203	-2E-05	0.049051	0.060155	0.058374	-1.06021	0.030008	0.048001	0.063799	0.038043	0.058311	0.04186	0.040092	0.040628	0.041572	0.050895	0.055121	0.002758	0.045362	0.03676	0.03709	0.04538	0.035866
10	0.018462	0.040963	0.056203	0.046882	0.04345	0.047595	0.040859	0.022365	0.032714	-1.02422	0.046357	0.04084	0.013448	0.05593	0.042225	0.038072	0.033046	0.053139	0.054215	0.03925	0.046164	0.048323	0.039034	0.04099	0.042418	0.041275
11	0.041126	0.021713	0.071067	0.053863	0.055778	0.05348	0.058293	0.068423	0.051619	0.03943	-0.97487	0.067774	-0.00061	0.05663	0.057773	0.055745	0.050592	0.071244	-0.19318	0.052295	0.041732	0.00735	0.044837	0.052512	0.05019	0.045193
12	0.033158	0.032807	0.054728	0.044912	0.039238	0.043979	0.049126	0.045598	0.04008	0.041361	0.03945	-0.98277	0.041131	0.047761	0.043051	0.038531	0.005186	0.051037	0.044324	0.046377	0.035752	0.021765	0.031909	0.034349	0.040467	0.036692
13	0.040171	0.041366	0.059347	-0.03048	0.040462	0.049688	0.059829	0.035142	0.040816	0.026989	0.048552	0.063119	-0.9885	0.058917	0.0774	0.011774	0.040118	0.043501	0.054014	-0.03205	0.034566	0.049648	0.036715	0.03899	0.053468	0.041757
14	0.042159	0.038783	0.065783	0.052687	0.049703	0.057916	0.061862	0.056521	0.049883	0.049826	0.047646	0.067982	0.051013	-0.97993	-0.10428	0.019654	0.029021	0.029035	0.052844	-0.01147	0.047665	0.049802	0.039474	0.039905	0.0539	0.04262
15	0.031994	0.034535	0.035592	0.028491	0.039919	0.047281	0.049584	0.053742	0.040457	0.031927	0.034927	0.053659	0.041582	0.048485	-0.98406	0.03862	0.032086	0.051287	0.043337	0.023034	0.036849	0.04098	0.031326	0.033723	0.044303	0.036444
16	0.035577	0.031873	0.060318	0.045307	0.04443	0.05058	0.050335	0.059264	0.042215	0.04441	0.041686	0.057355	0.042485	0.049047	0.039996	-1.04092	0.029948	0.020341	0.041589	0.0243	0.042935	0.043138	0.028098	0.036495	0.043226	0.035968
17	0.031028	0.031458	0.050856	0.041387	0.036093	0.043124	0.04537	0.050193	0.037596	0.038931	0.036723	0.050457	0.038958	0.045327	0.040599	0.036899	-0.97184	0.048015	0.041845	0.045847	0.035846	0.016574	0.030574	0.03196	0.033041	0.033135
18	0.039136	0.039042	0.062776	0.050093	0.043561	0.044348	0.057606	0.061094	0.042594	0.047064	0.044624	0.062067	0.048087	0.055327	0.049294	0.044405	0.038555	-1.19114	0.051001	0.056286	0.043764	0.045802	0.036242	0.037933	0.050442	0.040003
19	0.042886	0.020503	0.062877	0.037727	0.046513	0.021449	0.051177	0.046172	0.033611	0.025883	0.042305	0.057599	0.004618	0.045514	0.043294	0.03992	0.041216	0.045342	-0.94901	0.050811	0.033719	0.04563	0.028422	0.038261	0.010955	0.032495
20	0.035769	0.029903	0.057886	0.045481	0.041901	0.047187	0.051565	0.055066	0.039545	0.042458	0.041076	0.056179	0.041559	0.04901	0.044193	0.040819	0.03671	0.051426	0.032491	-0.95713	0.026272	0.038882	0.025108	-0.00556	0.041307	-0.0091
21	0.05113	0.051465	0.066608	0.036109	0.042688	0.022681	0.078058	0.042201	-0.00211	0.013087	0.068341	0.061203	0.02232	0.073541	0.011998	-0.01881	0.051907	-0.04326	0.00594	0.022056	-0.93269	0.046882	0.060854	0.069165	0.040176	0.058456
22	0.042499	0.03574	0.046357	0.042208	0.022173	0.049653	0.010368	0.031777	0.040658	0.042535	0.047304	0.058594	0.041634	0.055152	0.045882	0.040464	0.03589	0.054086	0.045285	0.040066	0.024277	-1.01435	0.036713	0.04527	0.045689	0.034073
23	0.034824	0.034297	0.055042	0.042311	0.038271	0.042991	0.049106	0.05069	0.032886	0.038834	0.040279	0.054131	0.039852	0.04897	0.041031	0.035791	0.033938	0.043407	0.040238	0.047212	0.021981	0.032584	-0.98172	0.025864	0.027844	0.029346
24	0.041019	0.034976	0.06242	0.044534	0.042995	0.043005	0.051029	0.044762	0.033229	0.040104	0.046531	0.061739	0.039096	0.05376	0.041471	0.039923	0.038291	0.043604	0.04716	0.039285	0.002642	0.018039	0.039321	-1.00629	0.020642	0.036716
25	0.048534	0.03427	0.068397	0.018727	0.022126	0.052499	0.058939	0.046929	0.027062	0.019008	0.05368	0.07141	0.036929	0.061106	0.041588	0.044604	0.043705	0.039788	0.048114	0.043813	0.003308	0.004975	0.040422	0.039399	-0.97924	0.010144
26	0.032269	0.031739	0.05073	0.040672	0.03612	0.041316	0.046551	0.048475	0.035186	0.037676	0.036793	0.050233	0.038047	0.044719	0.038695	0.035591	0.031289	0.045887	0.041491	0.043433	0.026417	0.033602	0.030587	0.030307	0.038128	-0.96596

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1983

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.0235959	-0.0071858	-0.4412696	-0.0579232	-0.1161482	-0.0022606	-0.4006455	-0.1428949	-0.0076126	-0.0287902	-0.0016841	-0.6129478	-0.0191374	-0.0117768	-0.0077311	-0.0059347	-0.021259	-0.0195335	-0.0056757	-0.0417561	-0.0126321	-0.0235281	-0.0036224	-0.0034383	-0.1342038	-0.0171783
2	-0.0058126	-1.0110297	-0.0086579	-0.008378	-0.0025469	-0.0076493	-0.0081697	-0.0114931	-0.0034608	-0.0114383	-0.1918043	-0.0135671	-0.0382659	-0.4971917	-0.0781409	-0.0197816	-0.0088072	-0.024991	-0.0512548	-0.082011	-0.0076536	-0.0136936	-0.0039753	-0.0043422	-0.007542	-0.0082898
3	-0.0450284	-0.0020705	-1.2236339	-0.1140243	-0.0070668	-0.0062738	-0.0185591	-0.010944	-0.0041223	-0.0262645	-0.0008166	-0.0276357	-0.0044216	-0.0021779	-0.0033546	-0.0027979	-0.0019169	-0.0098466	-0.0026032	-0.0052006	-0.0068527	-0.0066993	-0.0009605	-0.0012343	-0.0792198	-0.0132464
4	-6.821E-05	-0.0002436	-0.0004473	-1.0013154	-0.0003517	-0.0002204	-0.0002392	-0.0004505	-0.0004207	-0.0005813	-8.643E-05	-0.0001829	-0.0003614	-0.0001819	-0.0003324	-0.0002463	-0.0001233	-0.0004002	-0.0002692	-0.0003518	-0.0006925	-0.0008471	-9.605E-05	-0.0001278	-0.0112079	-0.0007822
5	-0.0002088	-3.301E-05	-0.0001542	-0.0001318	-1.0212672	-9.534E-05	-0.0001044	-0.0001533	-0.0001448	-0.0005295	-3.107E-05	-0.0001972	-0.0003491	-4.539E-05	-0.000119	-0.0001278	-4.117E-05	-0.0001578	-5.966E-05	-0.0001179	-4.167E-05	-8.838E-05	-1.953E-05	-1.009E-05	-9.959E-05	-4.89E-05
6	-0.0012137	-0.0004394	-0.0048329	-0.0042807	-0.0013715	-1.3427839	-0.0011866	0.00219195	-0.0081108	-0.0019985	-0.0001717	-0.0079547	-0.005487	-0.0003667	-0.0028873	0.00136494	-0.0005071	-0.0479201	-0.0017327	-0.0010211	-0.000951	-0.0034564	-0.0023312	-0.0001467	-0.0026371	-0.0070014
7	-0.0014583	-0.0025576	-0.001657	-0.0056575	-0.0011403	-0.0017906	-1.0952259	-0.3261329	-0.0025019	-0.0053615	-0.0004591	-0.0024056	-0.0051728	-0.002518	-0.0024228	-0.0014276	-0.0037947	-0.0172482	-0.0019133	-0.0784586	-0.0021394	-0.0019725	-0.0032084	-0.0036042	-0.0034123	-0.0052022
8	-4.089E-05	-8.675E-05	-9.743E-05	-0.0001408	-0.0002132	-8.018E-05	-0.0001037	-1.0215953	-0.0032618	-0.0001947	-3.034E-05	-8.379E-05	-0.0001349	-7.441E-05	-0.0003432	-0.0009443	-0.0001103	-0.0001709	-8.69E-05	-0.0005958	-0.0002689	-0.000147	-1.887E-05	-5.777E-05	-0.0006802	-0.0002353
9	-0.0026047	-0.006229	-0.0098292	-0.0185249	-0.0535536	-0.0105015	-0.0054521	-0.0137196	-1.1169963	-0.0265096	-0.0023733	-0.0075628	-0.0175782	-0.0050475	-0.0156569	-0.0124163	-0.003692	-0.0268261	-0.0075227	-0.0108338	-0.0502706	-0.0075597	-0.0040685	-0.0056584	-0.0131584	-0.0135746
10	-0.0240563	-0.0019588	-0.0133473	-0.0093487	-0.0059007	-0.0086128	-0.0215045	-0.0499035	-0.0166719	-1.0660068	-0.0029467	-0.0265638	-0.0395034	-0.0047757	-0.012324	-0.0118472	-0.0093786	-0.0088554	-0.0020381	-0.0237321	-0.0026161	-0.0023822	-0.0018849	-0.0015386	-0.0149278	-0.0057364
11	-0.0147923	-0.0372324	-0.0201902	-0.0210406	-0.006877	-0.0185111	-0.0236314	-0.0225558	-0.0154596	-0.0302451	-1.0388845	-0.0050513	-0.043265	-0.0250158	-0.0142172	-0.0095365	-0.006324	-0.0129963	-0.2693864	-0.0275997	-0.0216205	-0.0597506	-0.0086222	-0.0033312	-0.0259332	-0.0171348
12	-0.0021544	-0.0025799	-0.0022917	-0.0016719	-0.0016322	-0.0038067	-0.0036139	-0.0091236	-0.0020362	-0.0018454	-0.0006311	-1.0383592	-0.003169	-0.0024482	-0.0021728	-0.0022868	-0.0303943	-0.0021769	-0.0022829	-0.0047391	-0.004655	-0.0222302	-0.0019445	-0.0005059	-0.0073676	-0.0020878
13	-0.0038776	-0.003073	-0.0119093	-0.0940066	-0.0112091	-0.0096311	-0.0047834	-0.0379722	-0.0119648	-0.027997	-0.0013379	-0.0067832	-1.03748	-0.0035467	0.00423983	-0.0184006	-0.0031114	-0.0240985	-0.0036165	-0.0964649	-0.0168315	-0.0027382	-0.005652	-0.0043199	-0.0056107	-0.0066706
14	-0.0022861	-0.0058869	-0.0056081	-0.0046186	-0.0011956	-0.0015729	-0.0036009	-0.0134309	-0.0014842	-0.0045628	-0.0020597	-0.0025563	-0.0037014	-1.0348987	-0.1585725	-0.0336913	-0.0148319	-0.0428589	-0.0051844	-0.0769259	-0.0026852	-0.0028685	-0.002853	-0.0038131	-0.0052504	-0.0062129
15	-0.0040444	-0.0015438	-0.0224624	-0.01788	-0.001583	-0.0010622	-0.0037098	-0.0033849	-0.0021527	-0.0130507	-0.0065857	-0.0032593	-0.0030912	-0.0009516	-1.0245068	-0.0024716	-0.0031993	-0.0005533	-0.0039146	-0.0289954	-0.0046114	-0.0016212	-0.00317	-0.00176	-0.004024	-0.0030882
16	-0.0065693	-0.0107163	-0.0064434	-0.0093281	-0.0033693	-0.0045661	-0.0124653	-0.0065615	-0.0070541	-0.0065136	-0.0046706	-0.0093972	-0.0082201	-0.0102766	-0.0125305	-1.0992742	-0.0117026	-0.0583903	-0.0139111	-0.0364047	-0.0039991	-0.0064188	-0.0114996	-0.0046009	-0.0104124	-0.0102227
17	-0.0017479	-0.0010706	-0.0018949	-0.0014371	-0.0015462	-0.0006591	-0.0030299	-0.0021351	-0.0009962	-0.0011712	-0.0006074	-0.0016835	-0.0016063	-0.0007668	-0.0007231	-0.0007222	-0.9920913	0.00046256	-0.0010502	-0.0011896	-0.0011403	-0.0224003	-0.0004227	-0.0002242	-0.0104137	-0.002707
18	-0.0002238	-0.0005822	-0.0006581	-0.0018248	-0.0020796	-0.0054713	-0.0004543	-0.0022325	-0.0046612	-0.0017389	-0.000154	-0.0007601	-0.0010616	-0.0005312	-0.0008612	-0.0012452	-0.0003427	-1.3634679	-0.0006645	-0.0008446	-0.0011903	-0.0010305	-0.0012087	-0.0001431	-0.0023068	-0.0034114
19	-0.0038135	-0.0290455	-0.0125776	-0.0222858	-0.0062446	-0.0360357	-0.0163702	-0.0294221	-0.0207143	-0.0322957	-0.0082248	-0.0155585	-0.0502841	-0.0213537	-0.0155765	-0.0131824	-0.0054305	-0.0209657	-1.0069437	-0.0173471	-0.0191488	-0.0099275	-0.0118963	-0.0073728	-0.052131	-0.0179028
20	-0.0023582	-0.0092612	-0.0039302	-0.004968	-0.0021326	-0.0042091	-0.0039364	-0.0060678	-0.0057089	-0.0048438	-0.0018538	-0.004944	-0.0059791	-0.0058914	-0.0046967	-0.0037553	-0.0012121	-0.006897	-0.0183655	-1.0142829	-0.0174109	-0.0070123	-0.0120604	-0.0431824	-0.0098241	-0.0525602
21	-0.0260297	-0.0289504	-0.0591069	-0.0679169	-0.046159	-0.0828331	-0.0345121	-0.0855005	-0.0989169	-0.084063	-0.0175865	-0.065025	-0.0760499	-0.0350249	-0.0880369	-0.1128361	-0.0257341	-0.1965961	-0.0939417	-0.0931662	-1.0220293	-0.0481267	-0.01361	-0.0070448	-0.0664533	-0.0286698
22	-0.0061781	-0.0057571	-0.0324878	-0.0229639	-0.0358939	-0.0167118	-0.0673744	-0.050612	-0.0169943	-0.0155003	-0.0136575	-0.0196713	-0.0180254	-0.0074818	-0.0151279	-0.0152765	-0.0126571	-0.0186921	-0.0197144	-0.0264681	-0.024378	-1.0711408	-0.0110052	-0.00298	-0.0182968	-0.0193037
23	-0.0013596	-0.0022165	-0.0034167	-0.0053415	-0.0034897	-0.0059381	-0.0043597	-0.0076168	-0.0102417	-0.0061013	-0.0009262	-0.003743	-0.0055296	-0.0022811	-0.0051989	-0.0065207	-0.0019436	-0.0130318	-0.0079981	-0.0046358	-0.01961	-0.0110382	-1.0157044	-0.0089853	-0.0212699	-0.0106732
24	-0.003148	-0.0099678	-0.009037	-0.0143608	-0.0073364	-0.0158898	-0.0138317	-0.0264953	-0.0184032	-0.0139823	-0.0033503	-0.0087566	-0.0156248	-0.0088956	-0.0145857	-0.011989	-0.0051577	-0.0242343	-0.0112177	-0.0259165	-0.0488214	-0.0361256	-0.0021694	-1.0508753	-0.0377932	-0.0111309
25	-0.0060809	-0.0214169	-0.0207937	-0.0507318	-0.036485	-0.0204216	-0.0214715	-0.0418417	-0.0382123	-0.0507183	-0.007865	-0.0162324	-0.0320572	-0.0170098	-0.0293908	-0.0210336	-0.010471	-0.0484495	-0.023783	-0.0335545	-0.0612452	-0.0633319	-0.0102824	-0.0129	-1.0472042	-0.0482787
26	-0.0004899	-0.0011755	-0.0020677	-0.0024382	-0.0016036	-0.0025833	-0.0017946	-0.0041738	-0.0037443	-0.0027489	-0.0003983	-0.0020299	-0.0028991	-0.0013844	-0.0030014	-0.0025244	-0.0010841	-0.00422	-0.0014065	-0.0029481	-0.0120634	-0.0059203	-0.0004306	-0.0018633	-0.0056316	-1.0013584

28th IOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

1991

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.04488	-0.0048	-0.43771	-0.05587	-0.09368	-0.00614	-0.46773	-0.14882	-0.00697	-0.02513	-0.00168	-0.53386	-0.01537	-0.00844	-0.00675	-0.00454	-0.01675	-0.01384	-0.00421	-0.02994	-0.00954	-0.01759	-0.00276	-0.00308	-0.10302	-0.01437
2	-0.0065	-1.00981	-0.0105	-0.00844	-0.00394	-0.00391	-0.00998	-0.01162	-0.00631	-0.04392	-0.4467	-0.01593	-0.03456	-0.2692	-0.07492	-0.01494	-0.007	-0.02353	-0.03911	-0.06246	-0.00657	-0.01828	-0.00374	-0.00393	-0.00614	-0.00816
3	-0.0681	-0.00199	-1.3443	-0.12909	-0.00834	-0.00503	-0.03831	-0.01707	-0.00438	-0.03159	-0.00182	-0.03169	-0.00634	-0.00248	-0.00363	-0.00253	-0.00247	-0.00729	-0.00291	-0.00512	-0.00587	-0.00708	-0.00181	-0.00182	-0.06889	-0.01392
4	-0.00016	-0.00019	-0.00041	-1.00313	-0.0004	-0.00021	-0.00032	-0.00041	-0.00036	-0.00055	-0.00013	-0.00019	-0.00032	-0.00017	-0.00029	-0.00021	-0.00012	-0.00044	-0.00023	-0.00035	-0.00056	-0.00133	-0.00015	-0.00013	-0.00868	-0.00072
5	-0.00018	-7.7E-05	-0.00034	-0.00054	-1.05309	-0.00022	-0.00022	-0.00046	-0.00231	-0.00047	-0.00011	-0.00041	-0.00061	-0.00014	-0.00027	-0.00024	-0.00012	-0.00038	-0.00011	-0.00019	-0.00025	-0.00047	-4.9E-05	-7.7E-05	-0.00015	-0.00014
6	-0.00086	-0.00041	-0.00354	-0.00302	-0.00178	-1.26458	-0.00121	-0.00572	-0.00578	-0.00168	-0.00027	-0.00929	-0.00377	-0.00066	-0.00205	-0.00186	-0.00168	-0.03049	-0.00122	-0.00092	-0.00092	-0.00259	-0.00194	-0.00026	-0.00223	-0.00556
7	-0.00169	-0.00175	-0.00158	-0.00413	-0.00103	-0.00144	-1.09535	-0.2669	-0.00255	-0.00437	-0.00027	-0.00315	-0.00391	-0.00226	-0.00285	-0.00139	-0.00252	-0.01174	-0.00137	-0.06088	-0.00189	-0.00162	-0.00183	-0.003	-0.0025	-0.00408
8	-8.8E-05	-9.5E-05	-0.00013	-0.00018	-0.00019	-0.00049	-0.00052	-1.02018	-0.00166	-0.00017	-8.2E-05	-0.00019	-0.00018	-0.00012	-0.00025	-0.00076	-0.00014	-0.00022	-0.00013	-0.00061	-0.00025	-0.0002	-0.00014	-0.0001	-0.00104	-0.00036
9	-0.00449	-0.0057	-0.01189	-0.02219	-0.07297	-0.0113	-0.00912	-0.01645	-1.10964	-0.02007	-0.00466	-0.01058	-0.01917	-0.00607	-0.0136	-0.01061	-0.00486	-0.0233	-0.00797	-0.01071	-0.04175	-0.00832	-0.0068	-0.01056	-0.01443	-0.01433
10	-0.02571	-0.00242	-0.01846	-0.01322	-0.00734	-0.01052	-0.02516	-0.04228	-0.01995	-1.07915	-0.00486	-0.02549	-0.05456	-0.00601	-0.01825	-0.0101	-0.01087	-0.01516	-0.00405	-0.02053	-0.00268	-0.00346	-0.00162	-0.00159	-0.01374	-0.00621
11	-0.01369	-0.02544	-0.01776	-0.01532	-0.00674	-0.0189	-0.0221	-0.01768	-0.01351	-0.0211	-1.0665	-0.04475	-0.02522	-0.02466	-0.01248	-0.00775	-0.00519	-0.01139	-0.20716	-0.02449	-0.0173	-0.05414	-0.00707	-0.003	-0.0215	-0.01413
12	-0.00172	-0.00195	-0.00182	-0.00135	-0.00125	-0.003	-0.00238	-0.01384	-0.00144	-0.00154	-0.00049	-1.06044	-0.00275	-0.00188	-0.0018	-0.00189	-0.02736	-0.00233	-0.00136	-0.00341	-0.00311	-0.01704	-0.00112	-0.00038	-0.00491	-0.00229
13	-0.0038	-0.00217	-0.01433	-0.09655	-0.0221	-0.01049	-0.01191	-0.034	-0.01282	-0.02128	-0.00287	-0.01028	-1.06829	-0.01369	-0.01367	-0.01318	-0.01466	-0.02614	-0.00385	-0.10042	-0.00984	-0.0039	-0.00361	-0.00402	-0.00486	-0.00856
14	-0.00157	-0.00352	-0.00461	-0.00626	-0.00169	-0.00148	-0.00277	-0.01004	-0.00208	-0.00324	-0.00153	-0.00261	-0.00643	-1.0968	-0.13942	-0.02147	-0.0139	-0.02632	-0.00386	-0.07049	-0.00214	-0.0022	-0.00178	-0.00306	-0.00372	-0.00482
15	-0.00441	-0.00162	-0.02313	-0.04536	-0.00403	-0.00157	-0.00552	-0.01295	-0.00363	-0.01088	-0.01213	-0.00627	-0.00523	-0.02476	-1.07151	-0.01035	-0.00621	-0.00436	-0.00546	-0.03591	-0.00361	-0.00269	-0.00223	-0.00171	-0.00362	-0.00568
16	-0.00792	-0.01008	-0.01126	-0.01193	-0.01236	-0.00707	-0.01549	-0.01631	-0.00952	-0.00811	-0.0084	-0.01186	-0.01494	-0.01525	-0.01981	-1.09727	-0.0194	-0.03578	-0.00986	-0.03824	-0.00466	-0.00969	-0.01128	-0.004	-0.01152	-0.0435
17	-0.00423	-0.00349	-0.00612	-0.00443	-0.00341	-0.00239	-0.00754	-0.00522	-0.00313	-0.00303	-0.00456	-0.00528	-0.00604	-0.00391	-0.00494	-0.0042	-1.07773	-0.00276	-0.00205	-0.00653	-0.0035	-0.04512	-0.00207	-0.00137	-0.00962	-0.01637
18	-0.00101	-0.00104	-0.0014	-0.00176	-0.0016	-0.00803	-0.0018	-0.00226	-0.00368	-0.00151	-0.00156	-0.00133	-0.00199	-0.00051	-0.00129	-0.00117	-0.00067	-1.18539	-0.00097	-0.00114	-0.00124	-0.00159	-0.00183	-0.0011	-0.0037	-0.00425
19	-0.00629	-0.01776	-0.01912	-0.02763	-0.01214	-0.03846	-0.02293	-0.03084	-0.02279	-0.03434	-0.00923	-0.02442	-0.0576	-0.04763	-0.02185	-0.01591	-0.01003	-0.02589	-1.02583	-0.0182	-0.03355	-0.01156	-0.02331	-0.00958	-0.04234	-0.02511
20	-0.00286	-0.00604	-0.00478	-0.00512	-0.0029	-0.00443	-0.0064	-0.00682	-0.00592	-0.00461	-0.00157	-0.00543	-0.00691	-0.00713	-0.00505	-0.00357	-0.00189	-0.00616	-0.02181	-1.01063	-0.01527	-0.0077	-0.01105	-0.03733	-0.00946	-0.05397
21	-0.03126	-0.02304	-0.06544	-0.07447	-0.05933	-0.07793	-0.04825	-0.08293	-0.09037	-0.07155	-0.03775	-0.06606	-0.07715	-0.09206	-0.09594	-0.11215	-0.0517	-0.15713	-0.08133	-0.08962	-1.02489	-0.0474	-0.01474	-0.00964	-0.05868	-0.03648
22	-0.01016	-0.01671	-0.04343	-0.0232	-0.03489	-0.0168	-0.05873	-0.04109	-0.01868	-0.01791	-0.01887	-0.0261	-0.0259	-0.02175	-0.02249	-0.01593	-0.01426	-0.02186	-0.01857	-0.03212	-0.04015	-1.09115	-0.01298	-0.00535	-0.02077	-0.0327
23	-0.00207	-0.00231	-0.00445	-0.00524	-0.00462	-0.00611	-0.00564	-0.00812	-0.01013	-0.00543	-0.00231	-0.00511	-0.00629	-0.00399	-0.00577	-0.00579	-0.00263	-0.00996	-0.00681	-0.00673	-0.01867	-0.01096	-1.05591	-0.01674	-0.02118	-0.01291
24	-0.00509	-0.00972	-0.0127	-0.01552	-0.01826	-0.01743	-0.01775	-0.02557	-0.02184	-0.01421	-0.00877	-0.01377	-0.01865	-0.01492	-0.01719	-0.01188	-0.00827	-0.02241	-0.01234	-0.02184	-0.05244	-0.04174	-0.01163	-1.05076	-0.03584	-0.01765
25	-0.01694	-0.02481	-0.02833	-0.04225	-0.03923	-0.02362	-0.03428	-0.04493	-0.04089	-0.04187	-0.02136	-0.02435	-0.0367	-0.02125	-0.02935	-0.01851	-0.01626	-0.0394	-0.03489	-0.03598	-0.05797	-0.0635	-0.02603	-0.02772	-1.05483	-0.06432
26	-0.00076	-0.00111	-0.00224	-0.00208	-0.00178	-0.00248	-0.00203	-0.00349	-0.00318	-0.00243	-0.00088	-0.00269	-0.00272	-0.00165	-0.00252	-0.00179	-0.00101	-0.00298	-0.00474	-0.00362	-0.00856	-0.0042	-0.0011	-0.00199	-0.00441	-1.00236

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.050248	-0.005629	-0.410834	-0.057206	-0.122683	-0.011489	-0.434468	-0.127768	-0.023886	-0.050598	-0.003336	-0.423567	-0.017443	-0.011244	-0.008032	-0.006834	-0.020362	-0.017103	-0.005222	-0.030293	-0.010054	-0.018174	-0.003157	-0.003831	-0.112059	-0.015367
2	-0.013008	-1.014338	-0.016854	-0.008434	-0.004659	-0.007131	-0.013043	-0.012597	-0.008454	-0.02512	-0.267878	-0.014166	-0.04346	-0.302032	-0.072283	-0.019517	-0.006687	-0.010187	-0.04832	-0.060098	-0.006381	-0.022051	-0.003246	-0.004592	-0.010131	-0.009906
3	-0.067479	-0.002241	-1.393724	-0.135384	-0.012649	-0.01049	-0.035066	-0.013087	-0.008766	-0.0742	-0.00331	-0.019665	-0.007367	-0.005505	-0.004523	-0.003261	-0.00384	-0.009313	-0.006529	-0.006336	-0.007146	-0.010922	-0.002936	-0.002255	-0.094769	-0.019815
4	-0.000177	-0.000199	-0.000859	-1.032303	-0.000422	-0.000325	-0.000307	-0.000404	-0.00045	-0.001474	-0.000144	-0.000213	-0.000387	-0.000268	-0.000314	-0.000224	-0.000152	-0.000495	-0.000262	-0.000379	-0.000565	-0.000572	-0.000133	-0.000187	-0.00956	-0.000729
5	-0.000128	-3.24E-05	-0.000101	-8.75E-05	-1.030153	-8.5E-05	-6.94E-05	-0.000125	-0.000109	-0.000354	-1.77E-05	-0.000177	-0.000222	-4.26E-05	-9.99E-05	-0.00013	-2.28E-05	-0.000183	-8.74E-05	-0.000111	-4.48E-05	-8.6E-05	-7.17E-06	-2.15E-05	-9.8E-05	-4.44E-05
6	-0.001205	-0.000447	-0.003328	-0.003118	-0.001516	-1.293163	-0.001147	-0.009144	-0.006186	-0.001732	-0.000229	-0.00627	-0.004047	-0.000616	-0.002265	-0.002152	-0.009254	-0.033816	-0.00146	-0.001337	-0.001002	-0.002997	-0.001703	-0.000208	-0.002356	-0.006205
7	-0.001885	-0.002052	-0.001534	-0.004466	-0.000793	-0.001352	-1.086479	-0.254805	-0.006779	-0.003943	-0.000486	-0.001484	-0.003632	-0.002654	-0.002924	-0.002616	-0.004096	-0.013774	-0.001977	-0.063304	-0.001857	-0.001594	-0.002591	-0.004156	-0.002797	-0.005802
8	-9.33E-05	-8.75E-05	-0.000118	-0.000208	-0.000193	-0.000184	-0.000157	-1.037082	-0.002042	-0.000183	-5.34E-05	-0.00049	-0.000291	-0.000149	-0.000298	-0.001202	-0.000508	-0.000353	-0.00013	-0.000644	-0.000199	-0.000191	-0.000127	-9.24E-05	-0.000585	-0.000219
9	-0.00277	-0.004821	-0.016564	-0.029785	-0.034731	-0.011259	-0.007854	-0.014152	-1.14648	-0.021374	-0.001741	-0.009381	-0.018147	-0.005288	-0.015002	-0.009734	-0.00389	-0.025206	-0.008716	-0.009053	-0.034574	-0.006302	-0.004368	-0.008218	-0.015376	-0.014667
10	-0.029783	-0.002255	-0.020258	-0.017605	-0.006029	-0.024927	-0.027421	-0.038211	-0.024638	-1.113471	-0.010574	-0.03019	-0.047481	-0.013371	-0.013846	-0.012288	-0.013804	-0.014311	-0.001632	-0.021517	-0.002053	-0.004561	-0.001934	-0.001715	-0.013836	-0.006157
11	-0.036856	-0.030256	-0.040594	-0.021706	-0.010737	-0.022267	-0.037878	-0.02194	-0.021704	-0.0519	-1.083381	-0.043152	-0.039974	-0.028573	-0.013844	-0.009013	-0.006001	-0.013958	-0.2083	-0.024683	-0.016824	-0.073276	-0.007487	-0.00237	-0.025824	-0.015938
12	-0.003287	-0.001862	-0.00203	-0.001783	-0.001428	-0.004314	-0.003358	-0.008844	-0.00151	-0.002018	-0.000478	-1.103501	-0.003023	-0.003096	-0.004656	-0.002031	-0.018721	-0.002742	-0.00172	-0.004602	-0.003021	-0.015544	-0.000948	-0.000372	-0.004937	-0.001615
13	-0.004991	-0.002139	-0.011421	-0.078141	-0.007738	-0.017963	-0.005456	-0.043176	-0.00882	-0.020058	-0.001046	-0.007336	-1.067012	-0.008974	-0.007492	-0.006607	-0.012564	-0.022159	-0.004023	-0.107499	-0.011084	-0.002955	-0.00314	-0.002573	-0.005235	-0.004441
14	-0.001915	-0.003959	-0.004346	-0.00356	-0.001046	-0.001557	-0.002671	-0.011469	-0.002236	-0.003942	-0.00191	-0.003316	-0.003735	-1.093341	-0.132732	-0.021523	-0.014546	-0.041358	-0.003987	-0.079973	-0.00234	-0.001944	-0.000618	-0.002509	-0.00413	-0.004077
15	-0.003163	-0.001683	-0.017134	-0.044316	-0.001241	-0.002316	-0.00519	-0.011754	-0.003679	-0.011578	-0.004917	-0.006346	-0.005895	-0.011177	-1.05133	-0.008183	-0.006514	-0.00864	-0.005834	-0.032477	-0.003183	-0.00219	-0.003733	-0.001368	-0.004022	-0.002714
16	-0.007687	-0.009941	-0.009569	-0.019995	-0.005672	-0.008326	-0.012129	-0.011379	-0.008911	-0.009654	-0.009604	-0.01038	-0.011382	-0.016036	-0.020271	-1.083776	-0.021948	-0.045858	-0.016413	-0.037991	-0.004742	-0.012581	-0.035163	-0.006851	-0.014855	-0.012319
17	-0.004305	-0.002551	-0.002917	-0.00194	-0.002195	-0.001311	-0.004581	-0.007907	-0.001736	-0.00232	-0.001279	-0.001343	-0.001925	-0.001028	-0.001407	-0.001434	-1.110612	-0.002289	-0.002524	-0.002501	-0.002128	-0.031151	-0.001487	-0.00066	-0.008723	-0.009846
18	-0.000416	-0.000676	-0.000967	-0.001566	-0.001643	-0.008952	-0.0007	-0.002495	-0.003626	-0.001554	-0.000476	-0.001038	-0.001363	-0.000235	-0.001012	-0.001105	-0.000796	-1.217112	-0.001569	-0.000948	-0.001047	-0.00131	-0.001683	-0.001563	-0.002813	-0.004209
19	-0.009436	-0.018953	-0.045142	-0.031047	-0.012685	-0.048457	-0.028505	-0.02924	-0.03531	-0.044722	-0.01488	-0.033942	-0.063149	-0.053293	-0.027352	-0.01509	-0.015956	-0.028005	-1.033744	-0.022356	-0.022231	-0.015874	-0.020065	-0.015315	-0.051396	-0.026113
20	-0.002848	-0.007118	-0.004805	-0.006149	-0.002735	-0.005462	-0.005371	-0.006461	-0.008229	-0.006411	-0.002406	-0.007667	-0.010178	-0.006793	-0.005181	-0.003449	-0.003264	-0.007136	-0.014032	-1.011648	-0.015402	-0.006524	-0.007752	-0.031155	-0.010259	-0.037588
21	-0.036425	-0.022544	-0.063865	-0.070151	-0.051705	-0.08047	-0.046437	-0.080159	-0.093882	-0.08365	-0.03212	-0.059724	-0.071555	-0.061765	-0.081425	-0.103828	-0.052868	-0.151054	-0.072587	-0.088344	-1.01816	-0.046075	-0.015762	-0.008166	-0.059093	-0.025627
22	-0.009613	-0.015564	-0.032975	-0.019779	-0.034087	-0.016915	-0.062333	-0.047764	-0.020468	-0.021141	-0.009731	-0.018883	-0.020022	-0.013977	-0.016178	-0.014506	-0.012522	-0.020591	-0.017331	-0.031722	-0.025673	-1.100419	-0.014735	-0.004987	-0.022767	-0.021139
23	-0.002363	-0.00197	-0.004816	-0.005719	-0.005631	-0.007452	-0.005299	-0.010108	-0.010898	-0.006815	-0.001795	-0.004714	-0.007424	-0.003862	-0.006265	-0.005679	-0.00344	-0.010137	-0.008416	-0.007603	-0.019601	-0.013909	-1.020248	-0.019766	-0.023302	-0.01225
24	-0.003482	-0.007883	-0.008269	-0.010945	-0.007753	-0.014894	-0.012586	-0.021573	-0.016133	-0.013146	-0.003681	-0.008135	-0.013346	-0.010031	-0.012563	-0.009654	-0.005102	-0.020846	-0.012994	-0.025482	-0.045229	-0.028599	-0.010543	-1.058237	-0.03387	-0.013701
25	-0.011025	-0.020014	-0.02636	-0.042949	-0.03921	-0.023831	-0.027077	-0.037206	-0.039797	-0.043956	-0.011989	-0.022344	-0.030996	-0.024429	-0.028442	-0.017875	-0.015763	-0.040877	-0.044737	-0.038016	-0.062726	-0.08656	-0.021421	-0.020693	-1.062828	-0.061592
26	-0.000456	-0.001047	-0.001826	-0.001693	-0.001425	-0.002246	-0.001484	-0.002936	-0.002773	-0.002208	-0.000307	-0.002021	-0.00219	-0.001159	-0.002333	-0.001823	-0.000489	-0.003273	-0.00275	-0.00337	-0.008333	-0.003852	-0.000719	-0.002564	-0.004642	-1.005834

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.136127	-0.009981	-0.438113	-0.078186	-0.10242	-0.087528	-0.394827	-0.238435	-0.058915	-0.054317	-0.021034	-0.106495	-0.025457	-0.010865	-0.012763	-0.017473	-0.016045	-0.016342	-0.009694	-0.028025	-0.024533	-0.011881	-0.004679	-0.006697	-0.015134	-0.017822
2	-0.012501	-1.020337	-0.022435	-0.019329	-0.015435	-0.022131	-0.027453	-0.027433	-0.01764	-0.053959	-0.28596	-0.040202	-0.048349	-0.081629	-0.035794	-0.015561	-0.018981	-0.019948	-0.082849	-0.045471	-0.01102	-0.053101	-0.013539	-0.012879	-0.026394	-0.019369
3	-0.077773	-0.014551	-1.500622	-0.148361	-0.124145	-0.022962	-0.037361	-0.029381	-0.02535	-0.099191	-0.033514	-0.030245	-0.024405	-0.015189	-0.017671	-0.024701	-0.01908	-0.01888	-0.014397	-0.017631	-0.016109	-0.014053	-0.006799	-0.008755	-0.012097	-0.024787
4	-0.000457	-0.000484	-0.001567	-1.217719	-0.001002	-0.00053	-0.000513	-0.000557	-0.000719	-0.001013	-0.001053	-0.000787	-0.00059	-0.000465	-0.000531	-0.000778	-0.000557	-0.000578	-0.000442	-0.000495	-0.000538	-0.00048	-0.00022	-0.000318	-0.001062	-0.000796
5	-0.001039	-0.001192	-0.001806	-0.056276	-1.19771	-0.001297	-0.001195	-0.00129	-0.001513	-0.001583	-0.002457	-0.001893	-0.001375	-0.001104	-0.00124	-0.001796	-0.00141	-0.001293	-0.001078	-0.001288	-0.001333	-0.001281	-0.000904	-0.001111	-0.000904	-0.001552
6	-0.002377	-0.002191	-0.003962	-0.00415	-0.006098	-1.25165	-0.003275	-0.003608	-0.030172	-0.003268	-0.004502	-0.010881	-0.004343	-0.002209	-0.003114	-0.004127	-0.008288	-0.009309	-0.002247	-0.003107	-0.002353	-0.002562	-0.001816	-0.001673	-0.001901	-0.008406
7	-0.001451	-0.001861	-0.002293	-0.002828	-0.003585	-0.002057	-1.091317	-0.297393	-0.013421	-0.002466	-0.002848	-0.00262	-0.002641	-0.001926	-0.002495	-0.002963	-0.003153	-0.006671	-0.002701	-0.039936	-0.001828	-0.002786	-0.001644	-0.002972	-0.001528	-0.004927
8	-0.000245	-0.000418	-0.000466	-0.000626	-0.001148	-0.000427	-0.001685	-1.007352	-0.008157	-0.000455	-0.000577	-0.000553	-0.000494	-0.000443	-0.00053	-0.00077	-0.000437	-0.000841	-0.000848	-0.012369	-0.00035	-0.000926	-0.000436	-0.000928	-0.000399	-0.001687
9	-0.005406	-0.005222	-0.017985	-0.041821	-0.113918	-0.015863	-0.012103	-0.023857	-1.3363	-0.015755	-0.010482	-0.023766	-0.024788	-0.011373	-0.018543	-0.014078	-0.012181	-0.029845	-0.007575	-0.011267	-0.011176	-0.015329	-0.008736	-0.009887	-0.014756	-0.027111
10	-0.049964	-0.014384	-0.038074	-0.034689	-0.026874	-0.04991	-0.033324	-0.033442	-0.044408	-1.1553	-0.057194	-0.044731	-0.111491	-0.026193	-0.04222	-0.036524	-0.041111	-0.040458	-0.021597	-0.036699	-0.014469	-0.020807	-0.008892	-0.010352	-0.011134	-0.026267
11	-0.043564	-0.071461	-0.078031	-0.06419	-0.048234	-0.08145	-0.104869	-0.09931	-0.061718	-0.213542	-1.212252	-0.153385	-0.158731	-0.148831	-0.096425	-0.038918	-0.075101	-0.055834	-0.307668	-0.095598	-0.033766	-0.216095	-0.04894	-0.043706	-0.10379	-0.064831
12	-0.00642	-0.005937	-0.00933	-0.009327	-0.010088	-0.032394	-0.00695	-0.007741	-0.012883	-0.010359	-0.012275	-1.799755	-0.01559	-0.006886	-0.023815	-0.011269	-0.026254	-0.009568	-0.005801	-0.008577	-0.006427	-0.0164	-0.003852	-0.004157	-0.003404	-0.007862
13	-0.00804	-0.007996	-0.017648	-0.067172	-0.015572	-0.0318	-0.010003	-0.030485	-0.036647	-0.023083	-0.017056	-0.018762	-1.170966	-0.011426	-0.015054	-0.032292	-0.014978	-0.023143	-0.014203	-0.15286	-0.008401	-0.015927	-0.007025	-0.012664	-0.005972	-0.02074
14	-0.004028	-0.003899	-0.006073	-0.012073	-0.006731	-0.00475	-0.004439	-0.008498	-0.018877	-0.008117	-0.006921	-0.006411	-0.017575	-1.277386	-0.182762	-0.015924	-0.089114	-0.028612	-0.006718	-0.033343	-0.003684	-0.00425	-0.002409	-0.003606	-0.002674	-0.006887
15	-0.01033	-0.008127	-0.017491	-0.055723	-0.015227	-0.0123	-0.010456	-0.015269	-0.020674	-0.018167	-0.016696	-0.01688	-0.026962	-0.07604	-1.208847	-0.03734	-0.084986	-0.102151	-0.026269	-0.053447	-0.00837	-0.009483	-0.005628	-0.007604	-0.005946	-0.016357
16	-0.051355	-0.047824	-0.070337	-0.063006	-0.077446	-0.051054	-0.049765	-0.050454	-0.065246	-0.058411	-0.095348	-0.07484	-0.060688	-0.044191	-0.051182	-1.275239	-0.174176	-0.085082	-0.043419	-0.089608	-0.045747	-0.04047	-0.023118	-0.029746	-0.022053	-0.055036
17	-0.013172	-0.007242	-0.012911	-0.010191	-0.012769	-0.009076	-0.009738	-0.009215	-0.011231	-0.009286	-0.014572	-0.013216	-0.008658	-0.006928	-0.009329	-0.012207	-1.159852	-0.013227	-0.006729	-0.010595	-0.009457	-0.012354	-0.004854	-0.00494	-0.00817	-0.013457
18	-0.007243	-0.001303	-0.004153	-0.002528	-0.003007	-0.010602	-0.003519	-0.003116	-0.006073	-0.002747	-0.002441	-0.002037	-0.002265	-0.001601	-0.002986	-0.002952	-0.004902	-1.093972	-0.002379	-0.001911	-0.001704	-0.003617	-0.00169	-0.001304	-0.001755	-0.007418
19	-0.024437	-0.014533	-0.036085	-0.040637	-0.029373	-0.080765	-0.061421	-0.068177	-0.054165	-0.056707	-0.032806	-0.065025	-0.076227	-0.170966	-0.126206	-0.025917	-0.062799	-0.063266	-1.318743	-0.039535	-0.032265	-0.042552	-0.059098	-0.036194	-0.087794	-0.061836
20	-0.004427	-0.015799	-0.006574	-0.005946	-0.007305	-0.008334	-0.00873	-0.009305	-0.007882	-0.008633	-0.009806	-0.008344	-0.008874	-0.014348	-0.009962	-0.019655	-0.008766	-0.007603	-0.046511	-1.014741	-0.011825	-0.046384	-0.02144	-0.059227	-0.013026	-0.086896
21	-0.042997	-0.050199	-0.075256	-0.07057	-0.082115	-0.059156	-0.050582	-0.058884	-0.068689	-0.069138	-0.101371	-0.081441	-0.06006	-0.046719	-0.056701	-0.084499	-0.056651	-0.070339	-0.050436	-0.06049	-1.053806	-0.049843	-0.03039	-0.036817	-0.035261	-0.058495
22	-0.038298	-0.032128	-0.066835	-0.048853	-0.054139	-0.067255	-0.110292	-0.106812	-0.071152	-0.065887	-0.064938	-0.068877	-0.081861	-0.060236	-0.063707	-0.051184	-0.060119	-0.04958	-0.04213	-0.089564	-0.065316	-1.447326	-0.066705	-0.100931	-0.064796	-0.095532
23	-0.010665	-0.009716	-0.019745	-0.015507	-0.022568	-0.020828	-0.020544	-0.022279	-0.020094	-0.019082	-0.019904	-0.020269	-0.020741	-0.018136	-0.018912	-0.016896	-0.019579	-0.016493	-0.018567	-0.033663	-0.034703	-0.14631	-1.100124	-0.043266	-0.05734	-0.038255
24	-0.022494	-0.010733	-0.025218	-0.021349	-0.038599	-0.037001	-0.034369	-0.039348	-0.036247	-0.047453	-0.020056	-0.029117	-0.030525	-0.114667	-0.040503	-0.017503	-0.031132	-0.029671	-0.019527	-0.051024	-0.053297	-0.144966	-0.218373	-1.238961	-0.087035	-0.050733
25	-0.016018	-0.023251	-0.024	-0.024829	-0.036762	-0.027874	-0.024587	-0.030793	-0.027644	-0.033171	-0.033348	-0.028418	-0.029595	-0.027285	-0.026454	-0.02009	-0.031422	-0.026014	-0.049509	-0.083068	-0.09294	-0.078432	-0.118205	-0.079418	-1.336776	-0.114127
26	-0.001705	-0.002244	-0.00308	-0.00321	-0.013091	-0.003429	-0.003259	-0.004007	-0.003834	-0.003552	-0.003183	-0.003331	-0.003643	-0.003806	-0.003481	-0.002768	-0.004006	-0.003226	-0.007413	-0.00915	-0.00974	-0.018443	-0.053052	-0.012213	-0.016842	-1.071486

Appendix Table 17
N Matrix, Thailand
1975

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-0.93297	0.090196	-0.28896	0.066897	1.09E-05	0.122462	-0.25083	0.01296	0.106596	0.090911	0.107488	-0.45224	0.101327	0.124677	0.11519	0.10587	0.075046	0.126798	0.121019	0.098574	0.098319	0.09373	0.087832	0.091023	0.000213	0.087867
2	0.06157	-0.94686	0.099455	0.076709	0.073794	0.083163	0.090385	0.093378	0.073484	0.068559	-0.16393	0.099138	0.029397	-0.38194	0.008591	0.060009	0.05772	0.079107	0.02292	0.018266	0.068203	0.063427	0.059421	0.061548	0.080054	0.064427
3	0.004571	0.048442	-1.1519	-0.0509	0.04955	0.061627	0.054299	0.069607	0.055298	0.035285	0.0564	0.053318	0.056141	0.069247	0.060832	0.055541	0.047815	0.066809	0.063374	0.067161	0.050621	0.053247	0.046577	0.048114	-0.01324	0.041573
4	0.03119	0.031122	0.049893	-0.9612	0.035524	0.041831	0.045901	0.049544	0.036553	0.037939	0.035486	0.049659	0.038669	0.044091	0.039463	0.035898	0.030745	0.046607	0.040716	0.044874	0.034951	0.036297	0.02949	0.030598	0.030788	0.033377
5	0.031166	0.031409	0.050343	0.041017	-0.98483	0.042064	0.046152	0.049984	0.036914	0.038024	0.035663	0.049795	0.038791	0.04435	0.039752	0.036063	0.03091	0.047011	0.040999	0.045258	0.03565	0.037024	0.029693	0.030845	0.041686	0.034262
6	0.042414	0.043187	0.065541	0.053148	0.048472	-1.26459	0.063115	0.065442	0.044073	0.051527	0.049352	0.062652	0.049469	0.061137	0.052852	0.048084	0.041987	0.029001	0.055419	0.061945	0.048673	0.04858	0.03931	0.042627	0.055446	0.041137
7	0.04695	0.046188	0.076289	0.057748	0.05442	0.063243	-1.02529	-0.24969	0.054452	0.053983	0.054408	0.074256	0.055096	0.066224	0.058591	0.054161	0.044079	0.057446	0.061541	-0.00867	0.052955	0.05539	0.043074	0.044011	0.061223	0.047927
8	0.031383	0.031424	0.050498	0.041015	0.035972	0.042175	0.046251	-0.96824	0.034553	0.038481	0.03573	0.049984	0.039058	0.044417	0.039671	0.035104	0.030905	0.047085	0.041106	0.044841	0.035559	0.037089	0.029693	0.03084	0.041241	0.034161
9	0.041905	0.039228	0.062209	0.036203	-2E-05	0.049051	0.060155	0.058374	-1.06021	0.030008	0.048001	0.063799	0.038043	0.058311	0.04186	0.040092	0.040628	0.041572	0.050895	0.055121	0.002758	0.045362	0.03676	0.03709	0.04538	0.035866
10	0.018462	0.040963	0.056203	0.046882	0.04345	0.047595	0.040859	0.022365	0.032714	-1.02422	0.046357	0.04084	0.013448	0.05593	0.042225	0.038072	0.033046	0.053139	0.054215	0.03925	0.046164	0.048323	0.039034	0.04099	0.042418	0.041275
11	0.041126	0.021713	0.071067	0.053863	0.055778	0.05348	0.058293	0.068423	0.051619	0.03943	-0.97487	0.067774	-0.00061	0.05663	0.057773	0.055745	0.050592	0.071244	-0.19318	0.052295	0.041732	0.00735	0.044837	0.052512	0.05019	0.045193
12	0.033158	0.032807	0.054728	0.044912	0.039238	0.043979	0.049126	0.045598	0.04008	0.041361	0.03945	-0.98277	0.041131	0.047761	0.043051	0.038531	0.005186	0.051037	0.044324	0.046377	0.035752	0.021765	0.031909	0.034349	0.040467	0.036692
13	0.040171	0.041366	0.059347	-0.03048	0.040462	0.049688	0.059829	0.035142	0.040816	0.026989	0.048552	0.063119	-0.9885	0.058917	0.0774	0.011774	0.040118	0.043501	0.054014	-0.03205	0.034566	0.049648	0.036715	0.03899	0.053468	0.041757
14	0.042159	0.038783	0.065783	0.052687	0.049703	0.057916	0.061862	0.056521	0.049883	0.049826	0.047646	0.067982	0.051013	-0.97993	-0.10428	0.019654	0.029021	0.029035	0.052844	-0.01147	0.047665	0.049802	0.039474	0.039905	0.0539	0.04262
15	0.031994	0.034535	0.035592	0.028491	0.039919	0.047281	0.049584	0.053742	0.040457	0.031927	0.034927	0.053659	0.041582	0.048485	-0.98406	0.03862	0.032086	0.051287	0.043337	0.023034	0.036849	0.04098	0.031326	0.033723	0.044303	0.036444
16	0.035577	0.031873	0.060318	0.045307	0.04443	0.05058	0.050335	0.059264	0.042215	0.04441	0.041686	0.057355	0.042485	0.049047	0.039996	-1.04092	0.029948	0.020341	0.041589	0.0243	0.042935	0.043138	0.028098	0.036495	0.043226	0.035968
17	0.031028	0.031458	0.050856	0.041387	0.036093	0.043124	0.04537	0.050193	0.037596	0.038931	0.036723	0.050457	0.038958	0.045327	0.040599	0.036899	-0.97184	0.048015	0.041845	0.045847	0.035846	0.016574	0.030574	0.03196	0.033041	0.033135
18	0.039136	0.039042	0.062776	0.050093	0.043561	0.044348	0.057606	0.061094	0.042594	0.047064	0.044624	0.062067	0.048087	0.055327	0.049294	0.044405	0.038555	-1.19114	0.051001	0.056286	0.043764	0.045802	0.036242	0.037933	0.050442	0.040003
19	0.042886	0.020503	0.062877	0.037727	0.046513	0.021449	0.051177	0.046172	0.033611	0.025883	0.042305	0.057599	0.004618	0.045514	0.043294	0.03992	0.041216	0.045342	-0.94901	0.050811	0.033719	0.04563	0.028422	0.038261	0.010955	0.032495
20	0.035769	0.029903	0.057886	0.045481	0.041901	0.047187	0.051565	0.055066	0.039545	0.042458	0.041076	0.056179	0.041559	0.04901	0.044193	0.040819	0.03671	0.051426	0.032491	-0.95713	0.026272	0.038882	0.025108	-0.00556	0.041307	-0.0091
21	0.05113	0.051465	0.066608	0.036109	0.042688	0.022681	0.078058	0.042201	-0.00211	0.013087	0.068341	0.061203	0.02232	0.073541	0.011998	-0.01881	0.051907	-0.04326	0.00594	0.022056	-0.93269	0.046882	0.060854	0.069165	0.040176	0.058456
22	0.042499	0.03574	0.046357	0.042208	0.022173	0.049653	0.010368	0.031777	0.040658	0.042535	0.047304	0.058594	0.041634	0.055152	0.045882	0.040464	0.03589	0.054086	0.045285	0.040066	0.024277	-1.01435	0.036713	0.04527	0.045689	0.034073
23	0.034824	0.034297	0.055042	0.042311	0.038271	0.042991	0.049106	0.05069	0.032886	0.038834	0.040279	0.054131	0.039852	0.04897	0.041031	0.035791	0.033938	0.043407	0.040238	0.047212	0.021981	0.032584	-0.98172	0.025864	0.027844	0.029346
24	0.041019	0.034976	0.06242	0.044534	0.042995	0.043005	0.051029	0.044762	0.033229	0.040104	0.046531	0.061739	0.039096	0.05376	0.041471	0.039923	0.038291	0.043604	0.04716	0.039285	0.002642	0.018039	0.039321	-1.00629	0.020642	0.036716
25	0.048534	0.03427	0.068397	0.018727	0.022126	0.052499	0.058939	0.046929	0.027062	0.019008	0.05368	0.07141	0.036929	0.061106	0.041588	0.044604	0.043705	0.039788	0.048114	0.043813	0.003308	0.004975	0.040422	0.039399	-0.97924	0.010144
26	0.032269	0.031739	0.05073	0.040672	0.03612	0.041316	0.046551	0.048475	0.035186	0.037676	0.036793	0.050233	0.038047	0.044719	0.038695	0.035591	0.031289	0.045887	0.041491	0.043433	0.026417	0.033602	0.030587	0.030307	0.038128	-0.96596

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1985

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.09967	-0.22919	-0.02133	-0.03983	-0.00449	-0.48831	-0.12829	-0.12577	-0.03403	-0.05461	-0.00535	-0.31183	-0.01125	-0.00596	-0.00861	-0.02252	-0.03488	-0.00639	-0.01039	-0.01136	-0.13553	-0.01531	-0.00725	-0.0022	-0.01013	-0.26244
2	-0.00096	-1.04722	-0.00064	-0.00869	-0.00046	-0.10959	-0.00717	-0.00426	-0.00272	-0.01136	-0.00056	-0.00247	-0.00113	-0.00076	-0.001	-0.0014	-0.00797	-0.00061	-0.00122	-0.00147	-0.02912	-0.00108	-0.00087	-0.00032	-0.00194	-0.03649
3	-0.00219	-0.00406	-1.06417	-0.00335	-0.00584	-0.00373	-0.00236	-0.00301	-0.00683	-0.01369	-0.00394	-0.00602	-0.01374	-0.00407	-0.0066	-0.006	-0.2131	-0.00318	-0.02655	-0.00365	-0.01229	-0.00262	-0.00559	-0.00505	-0.00268	-0.01265
4	-0.00047	-0.041	-0.00024	-1.01357	-0.00079	-0.05305	-0.00395	-0.00108	-0.00236	-0.00407	-0.00096	-0.0013	-0.00168	-0.00099	-0.00107	-0.0014	-0.00266	-0.001	-0.00154	-0.00178	-0.03108	-0.00692	-0.00137	-0.00034	-0.00177	-0.02016
5	-0.02045	-0.0274	-0.02014	-0.1077	-1.08903	-0.03152	-0.0261	-0.04094	-0.05836	-0.07708	-0.59584	-0.03331	-0.19231	-0.28779	-0.14878	-0.08313	-0.04707	-0.22158	-0.1328	-0.01463	-0.03315	-0.17371	-0.01889	-0.01512	-0.01744	-0.06932
6	-0.0064	-0.43393	-0.00419	-0.07849	-0.00441	-1.13038	-0.07278	-0.01204	-0.02647	-0.06906	-0.00614	-0.0159	-0.0102	-0.00585	-0.00811	-0.01057	-0.04132	-0.00609	-0.00877	-0.01296	-0.19558	-0.00934	-0.00758	-0.0022	-0.01053	-0.33246
7	-0.00035	-0.00115	-0.00083	-0.00042	-0.0011	-0.00181	-1.14067	-0.0022	-0.00355	-0.00431	-0.00174	-0.0021	-0.00257	-0.00199	-0.00199	-0.00259	-0.00176	-0.00182	-0.00241	-0.0053	-0.13564	-0.00411	-0.00421	-0.00122	-0.00136	-0.046
8	-0.00899	-0.01269	-0.0064	-0.03327	-0.00631	-0.02139	-0.01043	-1.73633	-0.03631	-0.04417	-0.00787	-0.10538	-0.03044	-0.00908	-0.01306	-0.04002	-0.07889	-0.01254	-0.01867	-0.02166	-0.02606	-0.02844	-0.01691	-0.00373	-0.01647	-0.17166
9	-0.00487	-0.00643	-0.00195	-0.00356	-0.00537	-0.00894	-0.02952	-0.0195	-1.47055	-0.06327	-0.00593	-0.02173	-0.03518	-0.01257	-0.01326	-0.0174	-0.01964	-0.0072	-0.01632	-0.01998	-0.01192	-0.01398	-0.03615	-0.00358	-0.03155	-0.04762
10	-0.06983	-0.03912	-0.00885	-0.01273	-0.01599	-0.04538	-0.04737	-0.1571	-0.16154	-1.4406	-0.02824	-0.25715	-0.08308	-0.06062	-0.05987	-0.08508	-0.06485	-0.04686	-0.05021	-0.01058	-0.02982	-0.02449	-0.02123	-0.0058	-0.03577	-0.11131
11	-0.02931	-0.03551	-0.0262	-0.16636	-0.08166	-0.04248	-0.03575	-0.05993	-0.08459	-0.07839	-1.1299	-0.03662	-0.19632	-0.10393	-0.07601	-0.07359	-0.04278	-0.28877	-0.10609	-0.01944	-0.04294	-0.30221	-0.02632	-0.0122	-0.02051	-0.09965
12	-0.0042	-0.0056	-0.00145	-0.01003	-0.0059	-0.00692	-0.00692	-0.01288	-0.02294	-0.03595	-0.00712	-1.0782	-0.01416	-0.01111	-0.01527	-0.1136	-0.01833	-0.01556	-0.01807	-0.00744	-0.00694	-0.02486	-0.00441	-0.00202	-0.00775	-0.0306
13	-0.00172	-0.00233	-0.00549	-0.0028	-0.00203	-0.00241	-0.02173	-0.00344	-0.00574	-0.02048	-0.00216	-0.00495	-1.07565	-0.003	-0.00289	-0.02204	-0.0064	-0.00425	-0.14191	-0.00233	-0.00852	-0.00364	-0.00229	-0.00628	-0.00383	-0.0141
14	-0.01007	-0.01401	-0.02008	-0.0128	-0.02068	-0.01638	-0.01342	-0.01436	-0.03045	-0.0261	-0.02002	-0.01777	-0.06948	-1.7443	-0.8154	-0.27054	-0.07633	-0.02533	-0.28628	-0.00781	-0.01271	-0.03512	-0.01077	-0.01964	-0.01351	-0.06688
15	-0.00685	-0.00905	-0.01598	-0.00426	-0.00625	-0.01172	-0.00433	-0.00619	-0.01299	-0.01134	-0.00838	-0.00834	-0.00581	-0.00423	-1.03594	-0.02615	-0.01136	-0.00718	-0.0499	-0.00374	-0.00791	-0.00607	-0.00495	-0.00567	-0.00492	-0.03104
16	-0.02041	-0.0211	-0.01784	-0.03039	-0.06696	-0.02574	-0.03479	-0.03778	-0.07003	-0.05422	-0.05623	-0.03584	-0.08708	-0.07409	-0.06146	-1.50745	-0.03994	-0.11087	-0.10871	-0.01595	-0.02107	-0.16283	-0.02075	-0.01201	-0.03006	-0.13981
17	-0.00447	-0.00538	-0.00524	-0.00742	-0.00407	-0.00554	-0.00411	-0.01186	-0.01486	-0.01346	-0.00428	-0.00693	-0.01165	-0.00692	-0.01318	-0.0251	-1.15738	-0.00542	-0.07123	-0.01194	-0.00519	-0.0062	-0.01451	-0.0069	-0.01198	-0.05161
18	-0.0076	-0.02302	-0.00633	-0.02356	-0.01831	-0.02529	-0.02286	-0.05382	-0.06758	-0.06081	-0.06909	-0.03693	-0.07649	-0.09351	-0.06207	-0.05034	-0.03638	-1.16109	-0.04459	-0.01622	-0.03668	-0.03643	-0.02418	-0.01619	-0.02178	-0.07433
19	-0.00232	-0.00995	-0.00429	-0.00079	-0.00842	-0.00638	-0.00615	-0.01072	-0.02425	-0.01899	-0.00898	-0.00911	-0.01596	-0.00983	-0.00889	-0.01005	-0.00731	-0.00926	-1.00615	-0.00508	-0.00576	-0.00823	-0.01001	-0.05476	-0.00916	-0.01858
20	-0.02259	-0.09996	-0.01206	-0.04426	-0.01901	-0.09085	-0.05105	-0.1071	-0.11642	-0.115	-0.02288	-0.10288	-0.07955	-0.06686	-0.10059	-0.13992	-0.08423	-0.06458	-0.10411	-1.02167	-0.10611	-0.06171	-0.02489	-0.01052	-0.0331	-0.16074
21	-0.00281	-0.00645	-0.00251	-0.00328	-0.00933	-0.00882	-0.01102	-0.01492	-0.02178	-0.02861	-0.01388	-0.01381	-0.02086	-0.01348	-0.01427	-0.01887	-0.01355	-0.01403	-0.01644	-0.03862	-1.01321	-0.01566	-0.02387	-0.0073	-0.00872	-0.12049
22	-0.01711	-0.04014	-0.00798	-0.02292	-0.03447	-0.04143	-0.02958	-0.03564	-0.06292	-0.06369	-0.02982	-0.04198	-0.09256	-0.04668	-0.0476	-0.06427	-0.04201	-0.03845	-0.12255	-0.02756	-0.03967	-1.06772	-0.04578	-0.01024	-0.01762	-0.09799
23	-0.01837	-0.02378	-0.00784	-0.01513	-0.01136	-0.02045	-0.01443	-0.02232	-0.02363	-0.03152	-0.01834	-0.02245	-0.02963	-0.02254	-0.01956	-0.02008	-0.01857	-0.01517	-0.02572	-0.03652	-0.02084	-0.02527	-1.02597	-0.00753	-0.00679	-0.03918
24	-0.00034	-0.00045	-0.00015	-0.00034	-0.00062	-0.00072	-0.0004	-0.00056	-0.00091	-0.00209	-0.00101	-0.00084	-0.00226	-0.00073	-0.0012	-0.00224	-0.00066	-0.00247	-0.00095	-0.00019	-0.00079	-0.0033	-0.00218	-1.00523	-0.0013	-0.00182
25	-0.00479	-0.00668	-0.0048	-0.01098	-0.0319	-0.00851	-0.01469	-0.01801	-0.01665	-0.04482	-0.02752	-0.01573	-0.02219	-0.01878	-0.01594	-0.02042	-0.01212	-0.0192	-0.02185	-0.01777	-0.0149	-0.02256	-0.02077	-0.01154	-1.03674	-0.02392
26	-0.00196	-0.00215	-0.00778	-0.0013	-0.00777	-0.00326	-0.00603	-0.00484	-0.01948	-0.0124	-0.00814	-0.00502	-0.01529	-0.00542	-0.01119	-0.01038	-0.00867	-0.00938	-0.00777	-0.00953	-0.00455	-0.00987	-0.00974	-0.00101	-0.00423	-1.00661

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1995

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.09388	-0.19387	-0.01982	-0.04373	-0.00425	-0.36777	-0.06559	-0.07629	-0.02652	-0.03603	-0.00409	-0.26373	-0.00868	-0.00517	-0.00817	-0.01948	-0.03063	-0.00488	-0.00955	-0.00857	-0.11695	-0.01254	-0.00539	-0.00153	-0.00965	-0.13869
2	-0.0009	-1.07758	-0.00057	-0.01562	-0.00059	-0.14462	-0.01108	-0.00538	-0.00489	-0.01028	-0.00058	-0.00343	-0.0014	-0.00095	-0.00119	-0.00144	-0.00971	-0.00054	-0.00135	-0.00132	-0.03362	-0.00115	-0.00086	-0.0002	-0.00233	-0.01727
3	-0.00084	-0.00239	-1.03894	-0.0012	-0.00282	-0.00249	-0.00136	-0.00125	-0.00279	-0.0053	-0.00186	-0.00476	-0.00737	-0.00194	-0.00245	-0.00253	-0.08236	-0.0013	-0.01337	-0.00133	-0.00564	-0.00121	-0.00181	-0.00154	-0.00116	-0.00747
4	-0.00044	-0.05191	-0.00049	-1.01809	-0.00047	-0.08216	-0.00631	-0.00144	-0.00282	-0.00474	-0.00046	-0.00165	-0.00095	-0.00059	-0.00077	-0.00091	-0.00374	-0.00044	-0.00087	-0.00127	-0.04149	-0.00079	-0.00074	-0.00018	-0.00194	-0.00932
5	-0.02051	-0.03003	-0.0121	-0.09806	-1.07173	-0.03682	-0.02593	-0.04395	-0.05675	-0.08681	-0.5912	-0.05505	-0.21848	-0.1638	-0.09544	-0.05872	-0.04088	-0.28519	-0.12095	-0.01534	-0.03819	-0.12956	-0.01547	-0.00869	-0.02055	-0.06664
6	-0.00455	-0.5165	-0.00379	-0.12547	-0.00411	-1.22879	-0.09025	-0.01532	-0.03629	-0.05204	-0.00445	-0.01706	-0.01002	-0.00562	-0.00734	-0.00861	-0.04511	-0.00418	-0.0083	-0.00984	-0.23863	-0.00776	-0.0061	-0.00133	-0.01289	-0.13415
7	-0.00037	-0.00092	-0.00092	-0.00047	-0.00095	-0.00118	-1.11943	-0.00139	-0.00181	-0.0026	-0.00099	-0.00142	-0.00167	-0.00113	-0.0014	-0.0017	-0.00159	-0.0011	-0.00176	-0.00368	-0.11301	-0.00431	-0.00286	-0.00066	-0.00099	-0.02877
8	-0.01144	-0.01107	-0.00803	-0.00836	-0.0061	-0.01427	-0.01131	-1.70132	-0.03327	-0.08706	-0.00603	-0.08677	-0.01757	-0.01058	-0.01628	-0.02825	-0.09238	-0.00837	-0.01606	-0.01608	-0.02531	-0.02251	-0.014	-0.00294	-0.01719	-0.12305
9	-0.00632	-0.01384	-0.00422	-0.00708	-0.01015	-0.022	-0.04234	-0.03296	-1.70065	-0.05885	-0.00747	-0.02735	-0.04256	-0.02087	-0.02435	-0.02734	-0.03824	-0.01115	-0.01969	-0.01807	-0.01639	-0.02221	-0.03863	-0.00624	-0.06005	-0.0522
10	-0.11023	-0.06411	-0.01772	-0.03217	-0.02799	-0.06958	-0.07899	-0.24065	-0.17683	-1.57577	-0.03483	-0.42976	-0.0883	-0.09056	-0.09411	-0.11672	-0.13893	-0.03371	-0.06227	-0.01712	-0.04194	-0.04309	-0.02537	-0.00584	-0.05971	-0.2189
11	-0.03019	-0.04031	-0.01477	-0.18021	-0.09687	-0.05035	-0.03092	-0.04627	-0.05291	-0.07345	-1.15064	-0.06461	-0.10247	-0.10179	-0.07024	-0.05735	-0.03941	-0.20047	-0.06982	-0.019	-0.04353	-0.23878	-0.02078	-0.00776	-0.02178	-0.06901
12	-0.00591	-0.01307	-0.00329	-0.03377	-0.00679	-0.01792	-0.01489	-0.01944	-0.02013	-0.03828	-0.00533	-1.10576	-0.01121	-0.00817	-0.0163	-0.06575	-0.04036	-0.00904	-0.01915	-0.01171	-0.01077	-0.03213	-0.00457	-0.00137	-0.00853	-0.13782
13	-0.00221	-0.00359	-0.00881	-0.00267	-0.00309	-0.00471	-0.02147	-0.0034	-0.00471	-0.01507	-0.00216	-0.00473	-1.10381	-0.01486	-0.01121	-0.02332	-0.01012	-0.00307	-0.17472	-0.00193	-0.00719	-0.00434	-0.00184	-0.00221	-0.00291	-0.02139
14	-0.01753	-0.02866	-0.04439	-0.01609	-0.03638	-0.04044	-0.04114	-0.02467	-0.039	-0.03232	-0.02366	-0.02417	-0.17581	-2.28786	-1.059	-0.34934	-0.19836	-0.02316	-0.34843	-0.00978	-0.02123	-0.05535	-0.01133	-0.00824	-0.02066	-0.17085
15	-0.01049	-0.01638	-0.02842	-0.00517	-0.00909	-0.02561	-0.02307	-0.00746	-0.01569	-0.01143	-0.00693	-0.00894	-0.00776	-0.01147	-1.04155	-0.0377	-0.01431	-0.00573	-0.04586	-0.00251	-0.01107	-0.00832	-0.00297	-0.00231	-0.00588	-0.03671
16	-0.03211	-0.04762	-0.05877	-0.05819	-0.149	-0.05836	-0.05373	-0.05951	-0.08673	-0.07857	-0.09228	-0.05591	-0.11244	-0.09995	-0.08547	-1.95134	-0.06511	-0.09295	-0.17318	-0.02653	-0.03961	-0.2699	-0.03709	-0.01107	-0.04588	-0.25807
17	-0.00512	-0.00818	-0.00855	-0.00443	-0.00635	-0.00739	-0.0052	-0.03765	-0.01361	-0.01596	-0.00443	-0.01063	-0.00946	-0.00741	-0.0153	-0.02125	-1.32215	-0.0051	-0.06551	-0.01375	-0.00585	-0.01085	-0.00863	-0.003	-0.01878	-0.08192
18	-0.01129	-0.03282	-0.00918	-0.01533	-0.02813	-0.03744	-0.02627	-0.07911	-0.06743	-0.0963	-0.03058	-0.06589	-0.10091	-0.16056	-0.09916	-0.06359	-0.05263	-1.17195	-0.05318	-0.02307	-0.06669	-0.03118	-0.02075	-0.01679	-0.03383	-0.06845
19	-0.00126	-0.00595	-0.00295	-0.00119	-0.00617	-0.00361	-0.00246	-0.00396	-0.01173	-0.00723	-0.00481	-0.00387	-0.00816	-0.00424	-0.00434	-0.00412	-0.00372	-0.00598	-1.00429	-0.00272	-0.00448	-0.00378	-0.00485	-0.01726	-0.00634	-0.01054
20	-0.03334	-0.14876	-0.01902	-0.05712	-0.02514	-0.1266	-0.05405	-0.12926	-0.14608	-0.14335	-0.02439	-0.13662	-0.06617	-0.05996	-0.09787	-0.13549	-0.13593	-0.03456	-0.10525	-1.02006	-0.12009	-0.05656	-0.0231	-0.0074	-0.0488	-0.19109
21	-0.00205	-0.00514	-0.00858	-0.0026	-0.00566	-0.00605	-0.00545	-0.00809	-0.01086	-0.01358	-0.00585	-0.00797	-0.01007	-0.00641	-0.00904	-0.01082	-0.01135	-0.00669	-0.011	-0.02513	-1.0072	-0.0113	-0.01299	-0.00316	-0.00588	-0.04177
22	-0.01618	-0.03979	-0.01107	-0.02263	-0.05765	-0.04228	-0.03455	-0.03778	-0.05852	-0.06094	-0.03828	-0.04564	-0.07712	-0.03808	-0.04505	-0.05976	-0.04482	-0.03663	-0.10258	-0.03781	-0.03963	-1.1083	-0.04831	-0.0098	-0.02284	-0.09772
23	-0.04334	-0.06675	-0.02129	-0.05211	-0.03584	-0.0723	-0.0425	-0.08088	-0.08758	-0.10522	-0.02996	-0.09276	-0.08241	-0.08176	-0.09083	-0.08103	-0.08489	-0.05544	-0.07046	-0.11889	-0.06278	-0.06341	-1.09758	-0.12973	-0.02315	-0.21496
24	-0.00105	-0.00242	-0.00069	-0.00142	-0.00259	-0.00266	-0.00207	-0.00416	-0.00349	-0.00555	-0.00207	-0.00404	-0.00381	-0.00247	-0.00392	-0.0058	-0.00458	-0.00198	-0.00342	-0.00782	-0.00463	-0.00665	-0.00701	-1.00323	-0.00204	-0.01356
25	-0.00492	-0.00886	-0.00546	-0.01414	-0.06515	-0.01238	-0.02013	-0.02219	-0.016	-0.03147	-0.04016	-0.01748	-0.032	-0.01631	-0.01888	-0.02088	-0.01729	-0.02669	-0.0234	-0.01324	-0.01433	-0.02467	-0.02212	-0.01028	-1.04154	-0.03454
26	-0.00134	-0.00241	-0.00205	-0.00164	-0.00337	-0.00292	-0.00699	-0.0046	-0.00673	-0.00739	-0.0032	-0.00372	-0.00576	-0.004	-0.00506	-0.00508	-0.00481	-0.00392	-0.00487	-0.00784	-0.00305	-0.01083	-0.0078	-0.00111	-0.00242	-1.00502

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.12935	-0.22786	-0.02362	-0.06953	-0.00493	-0.43193	-0.07532	-0.08606	-0.03485	-0.04358	-0.00437	-0.26368	-0.01319	-0.00599	-0.01095	-0.02832	-0.03859	-0.00425	-0.01391	-0.0126	-0.19088	-0.01781	-0.00854	-0.00316	-0.0173	-0.16303
2	-0.00264	-1.10952	-0.00083	-0.0263	-0.00078	-0.17337	-0.0146	-0.00951	-0.00678	-0.01601	-0.00068	-0.00717	-0.00346	-0.00137	-0.00189	-0.00267	-0.01329	-0.00056	-0.00245	-0.00197	-0.04516	-0.00193	-0.00141	-0.00027	-0.00392	-0.02168
3	-0.00148	-0.00274	-1.03667	-0.00122	-0.00205	-0.00274	-0.00157	-0.00196	-0.00866	-0.00783	-0.0014	-0.00395	-0.007	-0.00162	-0.00214	-0.0025	-0.05698	-0.00094	-0.01023	-0.00115	-0.00647	-0.00116	-0.00163	-0.00116	-0.00159	-0.00555
4	-0.00151	-0.06199	-0.00061	-1.02928	-0.00053	-0.09936	-0.00836	-0.00262	-0.00386	-0.00912	-0.00047	-0.004	-0.00197	-0.0008	-0.00109	-0.00152	-0.00493	-0.00037	-0.00135	-0.00163	-0.05662	-4.8E-06	-0.00093	-0.00018	-0.00294	-0.01008
5	-0.05271	-0.04827	-0.02159	-0.15116	-1.10701	-0.06311	-0.04605	-0.07404	-0.06297	-0.14379	-0.73626	-0.09755	-0.23731	-0.19093	-0.12488	-0.08979	-0.07352	-0.28079	-0.20016	-0.0264	-0.06589	-0.22193	-0.02689	-0.01288	-0.03944	-0.09825
6	-0.0075	-0.56472	-0.0037	-0.18802	-0.00376	-1.32473	-0.10175	-0.01701	-0.03517	-0.04675	-0.00362	-0.02001	-0.01414	-0.00494	-0.00672	-0.00912	-0.04244	-0.0032	-0.00957	-0.01172	-0.29554	-0.00938	-0.00711	-0.00129	-0.01671	-0.12066
7	-0.0004	-0.00061	-0.0007	-0.00056	-0.00068	-0.00096	-1.13476	-0.00101	-0.00104	-0.00148	-0.00074	-0.00084	-0.00108	-0.0008	-0.00084	-0.00111	-0.00116	-0.00082	-0.00136	-0.00383	-0.11654	-0.00491	-0.00368	-0.00065	-0.00108	-0.02971
8	-0.01882	-0.01343	-0.01217	-0.01597	-0.00577	-0.01653	-0.01476	-1.83156	-0.03154	-0.09155	-0.00528	-0.10656	-0.028	-0.00975	-0.01489	-0.03184	-0.10949	-0.00593	-0.0206	-0.01853	-0.03584	-0.02439	-0.02097	-0.00294	-0.02103	-0.12278
9	-0.01302	-0.01965	-0.00569	-0.01196	-0.01301	-0.03074	-0.06444	-0.04883	-1.90526	-0.06453	-0.011	-0.03967	-0.05453	-0.01728	-0.02492	-0.03576	-0.04691	-0.01141	-0.02786	-0.02233	-0.02507	-0.02749	-0.06862	-0.00613	-0.09375	-0.07522
10	-0.26121	-0.15405	-0.03727	-0.09056	-0.04227	-0.1598	-0.17996	-0.34804	-0.36917	-1.85277	-0.03995	-0.72894	-0.26205	-0.12119	-0.16175	-0.22464	-0.26172	-0.0339	-0.15788	-0.03631	-0.11312	-0.08712	-0.0493	-0.00925	-0.16972	-0.39052
11	-0.06596	-0.05778	-0.0246	-0.2315	-0.13424	-0.07629	-0.04635	-0.06955	-0.06277	-0.12974	-1.21492	-0.09934	-0.1338	-0.09751	-0.0837	-0.07766	-0.06123	-0.17251	-0.11394	-0.03035	-0.07082	-0.34294	-0.03282	-0.01031	-0.04059	-0.09632
12	-0.01528	-0.0201	-0.00638	-0.03591	-0.00887	-0.02943	-0.02005	-0.03053	-0.02978	-0.03468	-0.00729	-1.15252	-0.01677	-0.00977	-0.02643	-0.09865	-0.06771	-0.00806	-0.03079	-0.02253	-0.01837	-0.04765	-0.00919	-0.00244	-0.0146	-0.20163
13	-0.00237	-0.00282	-0.01061	-0.00319	-0.00191	-0.00398	-0.02301	-0.00305	-0.00246	-0.00852	-0.00152	-0.0034	-1.1112	-0.00653	-0.00746	-0.02325	-0.01625	-0.00178	-0.24526	-0.0021	-0.00856	-0.00504	-0.00208	-0.0014	-0.00248	-0.03262
14	-0.02628	-0.03142	-0.04691	-0.02519	-0.02808	-0.04908	-0.08953	-0.03064	-0.03113	-0.02988	-0.02249	-0.03107	-0.07453	-1.8101	-0.91821	-0.33166	-0.24872	-0.02011	-0.29268	-0.01193	-0.03306	-0.06749	-0.0149	-0.0071	-0.02611	-0.15009
15	-0.02045	-0.02534	-0.03918	-0.0117	-0.0109	-0.04238	-0.08864	-0.01399	-0.02137	-0.01764	-0.00955	-0.02071	-0.01268	-0.01105	-1.05038	-0.05485	-0.02611	-0.00728	-0.05321	-0.00425	-0.02538	-0.01694	-0.00507	-0.0026	-0.01003	-0.05469
16	-0.06256	-0.06062	-0.07502	-0.12288	-0.15028	-0.08045	-0.06681	-0.07453	-0.06696	-0.08924	-0.11275	-0.07736	-0.1199	-0.09936	-0.08759	-2.55708	-0.08622	-0.10463	-0.2954	-0.04859	-0.07781	-0.45876	-0.06777	-0.01722	-0.10011	-0.426
17	-0.00782	-0.00801	-0.01698	-0.00627	-0.00821	-0.00837	-0.0071	-0.05455	-0.01088	-0.01651	-0.00666	-0.01722	-0.01332	-0.00763	-0.01949	-0.02803	-1.40666	-0.00563	-0.06083	-0.01426	-0.00782	-0.01309	-0.01406	-0.00309	-0.02632	-0.08403
18	-0.02757	-0.03876	-0.013	-0.02766	-0.0267	-0.0485	-0.04147	-0.13329	-0.07449	-0.13798	-0.04231	-0.11537	-0.15128	-0.1507	-0.10657	-0.09729	-0.07664	-1.24901	-0.07995	-0.03487	-0.09745	-0.0521	-0.02906	-0.03212	-0.05201	-0.09112
19	-0.00038	-0.00278	-0.00104	-0.00099	-0.00205	-0.00157	-0.001	-0.00201	-0.00035	-0.0034	-0.00198	-0.00159	-0.00326	-0.00316	-0.00227	-0.00201	-0.00151	-0.00236	-1.00165	-0.00124	-0.00155	-0.00189	-0.00308	-0.01058	-0.00168	-0.0041
20	-0.0004	-0.00839	-0.00035	-0.00278	-0.00203	-0.00748	-0.00457	-0.01076	-0.01276	-0.01124	-0.00366	-0.0086	-0.01019	-0.00873	-0.01269	-0.01259	-0.00637	-0.0112	-0.01198	-1.00278	-0.01137	-0.00588	-0.0031	-0.00183	-0.0021	-0.01784
21	-0.00164	-0.00191	-0.0057	-0.00115	-0.00373	-0.00287	-0.00281	-0.00444	-0.00505	-0.00657	-0.00407	-0.00373	-0.00577	-0.00407	-0.00436	-0.00607	-0.00722	-0.00446	-0.00721	-0.02162	-1.00406	-0.00829	-0.00993	-0.0022	-0.00529	-0.02612
22	-0.0144	-0.01549	-0.00763	-0.01248	-0.03746	-0.01948	-0.01594	-0.02435	-0.02156	-0.03495	-0.03116	-0.02461	-0.03523	-0.02369	-0.02795	-0.03968	-0.0332	-0.02169	-0.09134	-0.04371	-0.02876	-1.14662	-0.0549	-0.00676	-0.02877	-0.08797
23	-0.02325	-0.02321	-0.01012	-0.01757	-0.01162	-0.02473	-0.01778	-0.03446	-0.02736	-0.03616	-0.01205	-0.02975	-0.03327	-0.02656	-0.02704	-0.02738	-0.02836	-0.03707	-0.02813	-0.03708	-0.02294	-0.03152	-1.05185	-0.0396	-0.01036	-0.06952
24	-0.00244	-0.00213	-0.00057	-0.00149	-0.00203	-0.00376	-0.00199	-0.0046	-0.00221	-0.00585	-0.00192	-0.00406	-0.00302	-0.00298	-0.00329	-0.0049	-0.00382	-0.0017	-0.00274	-0.00507	-0.00363	-0.00527	-0.00799	-1.00239	-0.0021	-0.01041
25	-0.00903	-0.0099	-0.00635	-0.01751	-0.07848	-0.0147	-0.02087	-0.02661	-0.01715	-0.031	-0.05966	-0.02239	-0.03463	-0.02136	-0.02036	-0.02366	-0.01981	-0.02825	-0.03208	-0.01138	-0.01749	-0.03903	-0.03005	-0.01341	-1.04875	-0.03316
26	-0.00359	-0.0059	-0.00188	-0.0109	-0.00287	-0.00813	-0.00929	-0.00837	-0.00795	-0.00629	-0.00274	-0.00432	-0.00603	-0.00439	-0.00486	-0.00543	-0.00507	-0.00379	-0.00449	-0.01248	-0.00467	-0.0105	-0.01233	-0.00308	-0.00493	-1.02981

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	-1.071298	-0.164831	-0.027226	-0.053526	-0.003505	-0.343797	-0.059711	-0.062337	-0.021238	-0.02809	-0.003556	-0.231213	-0.009467	-0.005529	-0.008374	-0.017634	-0.025493	-0.004145	-0.010298	-0.008409	-0.125205	-0.009542	-0.00539	-0.00159	-0.012461	-0.094199
2	-0.001026	-1.098675	-0.000575	-0.018658	-0.000474	-0.130956	-0.010562	-0.004418	-0.002859	-0.007227	-0.000509	-0.002892	-0.001773	-0.000858	-0.000979	-0.001168	-0.007135	-0.000494	-0.001313	-0.001092	-0.029605	-0.00096	-0.000741	-0.000178	-0.002396	-0.015989
3	-0.001261	-0.001393	-1.039643	-0.000945	-0.001686	-0.001673	-0.001152	-0.002177	-0.019684	-0.006774	-0.001156	-0.003088	-0.006335	-0.001775	-0.00211	-0.002325	-0.061046	-0.001088	-0.009303	-0.0011	-0.004126	-0.001003	-0.001932	-0.001072	-0.001973	-0.005752
4	-0.001465	-0.050536	-0.00077	-1.041813	-0.000501	-0.071589	-0.006324	-0.001932	-0.002873	-0.010642	-0.000524	-0.004132	-0.001914	-0.001058	-0.001205	-0.001374	-0.003302	-0.000476	-0.001389	-0.001218	-0.044481	-0.000367	-0.000773	-0.000188	-0.00242	-0.009637
5	-0.056512	-0.058193	-0.031162	-0.159626	-1.137949	-0.078356	-0.057685	-0.087885	-0.077489	-0.138824	-0.808668	-0.109446	-0.259533	-0.245488	-0.1661	-0.112903	-0.096806	-0.355405	-0.194594	-0.034051	-0.083806	-0.245146	-0.040657	-0.023415	-0.055769	-0.125766
6	-0.005206	-0.48919	-0.004266	-0.18156	-0.003442	-1.312628	-0.10192	-0.010441	-0.022182	-0.035469	-0.003877	-0.01426	-0.012224	-0.005269	-0.005971	-0.007161	-0.035854	-0.003791	-0.008624	-0.008896	-0.242695	-0.007506	-0.005595	-0.001279	-0.016102	-0.138624
7	-0.000553	-0.000851	-0.001083	-0.000606	-0.000678	-0.001139	-1.098116	-0.001376	-0.001808	-0.001796	-0.000731	-0.001309	-0.001415	-0.001177	-0.001142	-0.001494	-0.001469	-0.001081	-0.001899	-0.003021	-0.092952	-0.005093	-0.002608	-0.000475	-0.001123	-0.040324
8	-0.009266	-0.007641	-0.007021	-0.013843	-0.003507	-0.010247	-0.007358	-1.686337	-0.016309	-0.041082	-0.003577	-0.057936	-0.016894	-0.008435	-0.009732	-0.018918	-0.078519	-0.00521	-0.013026	-0.012622	-0.021111	-0.012439	-0.016187	-0.002391	-0.011627	-0.113951
9	-0.006769	-0.009834	-0.004296	-0.00684	-0.008402	-0.01549	-0.023863	-0.022096	-1.533585	-0.027255	-0.00726	-0.017158	-0.024865	-0.016536	-0.016605	-0.019269	-0.023135	-0.00911	-0.016172	-0.014346	-0.013126	-0.014594	-0.058883	-0.005924	-0.061064	-0.054417
10	-0.182919	-0.09115	-0.026958	-0.062041	-0.029214	-0.097538	-0.114781	-0.205566	-0.242583	-1.608348	-0.034911	-0.544713	-0.188387	-0.107012	-0.123622	-0.13565	-0.153171	-0.030073	-0.111405	-0.020955	-0.065242	-0.043761	-0.027791	-0.006966	-0.102476	-0.178179
11	-0.066139	-0.064299	-0.033254	-0.220378	-0.153633	-0.084037	-0.056877	-0.073262	-0.076213	-0.115161	-1.211885	-0.105459	-0.15034	-0.152057	-0.118909	-0.095157	-0.077617	-0.188949	-0.136167	-0.035634	-0.077396	-0.344277	-0.045553	-0.016142	-0.057239	-0.120754
12	-0.013952	-0.01596	-0.00752	-0.028904	-0.006183	-0.024979	-0.021084	-0.028737	-0.031776	-0.029814	-0.005791	-1.104522	-0.014811	-0.011248	-0.023036	-0.06554	-0.047858	-0.007438	-0.026103	-0.017385	-0.014531	-0.023616	-0.006345	-0.001844	-0.011048	-0.043688
13	-0.002022	-0.002166	-0.004028	-0.002845	-0.001524	-0.002896	-0.027599	-0.002916	-0.00296	-0.008442	-0.001312	-0.00352	-1.105976	-0.004506	-0.006346	-0.019425	-0.01442	-0.002098	-0.219812	-0.001652	-0.006982	-0.003383	-0.001822	-0.001787	-0.00232	-0.039037
14	-0.039342	-0.04023	-0.088414	-0.036097	-0.037406	-0.065198	-0.107161	-0.044502	-0.05316	-0.043505	-0.030417	-0.048885	-0.096842	-2.163124	-1.192564	-0.497895	-0.363782	-0.035556	-0.394167	-0.015928	-0.041327	-0.076957	-0.021582	-0.009753	-0.039685	-0.246535
15	-0.022507	-0.020481	-0.055022	-0.010083	-0.009148	-0.035742	-0.076287	-0.011518	-0.019483	-0.016434	-0.008186	-0.020224	-0.01204	-0.014505	-1.053856	-0.05204	-0.025426	-0.008398	-0.063888	-0.003596	-0.019027	-0.012382	-0.004656	-0.002569	-0.00932	-0.066478
16	-0.05119	-0.056364	-0.093289	-0.100869	-0.114543	-0.076782	-0.061085	-0.072669	-0.106444	-0.085621	-0.090911	-0.081218	-0.113335	-0.103993	-0.090092	-2.06227	-0.088365	-0.112965	-0.250353	-0.037813	-0.070988	-0.278819	-0.060959	-0.018521	-0.090001	-0.273117
17	-0.007024	-0.006955	-0.006169	-0.005782	-0.007771	-0.007701	-0.006077	-0.052084	-0.011652	-0.01488	-0.006439	-0.013623	-0.013515	-0.01054	-0.017742	-0.024866	-1.30958	-0.006581	-0.043923	-0.012078	-0.007563	-0.009952	-0.009831	-0.00306	-0.026999	-0.085578
18	-0.026581	-0.045908	-0.019292	-0.031323	-0.027256	-0.069523	-0.045738	-0.146378	-0.083276	-0.127525	-0.030998	-0.116408	-0.148268	-0.19194	-0.137302	-0.103941	-0.089859	-1.218305	-0.095461	-0.03762	-0.119956	-0.051675	-0.037478	-0.048983	-0.055655	-0.095479
19	-0.000511	-0.00264	-0.00128	-0.001353	-0.001782	-0.001584	-0.001254	-0.002478	-0.004427	-0.003893	-0.001706	-0.002239	-0.004099	-0.002696	-0.00214	-0.002737	-0.001929	-0.002526	-1.002028	-0.001177	-0.002381	-0.001848	-0.003084	-0.010654	-0.00231	-0.004164
20	-0.070885	-0.118261	-0.034961	-0.082842	-0.0317	-0.126553	-0.073312	-0.129552	-0.179656	-0.125509	-0.029736	-0.147565	-0.07778	-0.075875	-0.094021	-0.153464	-0.151157	-0.039963	-0.132873	-1.021889	-0.117568	-0.070778	-0.039762	-0.009079	-0.057354	-0.174758
21	-0.002976	-0.003904	-0.011689	-0.002774	-0.003992	-0.005274	-0.004294	-0.006773	-0.011771	-0.009054	-0.004156	-0.007309	-0.007243	-0.006324	-0.006384	-0.008203	-0.010208	-0.005108	-0.010763	-0.021196	-1.005971	-0.009943	-0.011123	-0.002489	-0.007105	-0.024934
22	-0.043476	-0.054117	-0.026897	-0.044221	-0.047595	-0.074782	-0.053026	-0.063541	-0.092457	-0.077743	-0.040989	-0.078903	-0.095818	-0.071575	-0.070279	-0.08312	-0.08063	-0.04231	-0.181102	-0.061261	-0.077426	-1.224161	-0.095346	-0.014986	-0.061665	-0.200972
23	-0.038395	-0.039857	-0.016235	-0.031076	-0.015485	-0.045486	-0.029445	-0.051902	-0.044662	-0.048795	-0.015455	-0.048295	-0.052415	-0.061475	-0.053948	-0.044931	-0.048619	-0.052479	-0.050687	-0.049694	-0.039333	-0.050334	-1.089112	-0.058985	-0.020032	-0.072015
24	-0.003516	-0.003205	-0.001364	-0.00254	-0.003628	-0.005281	-0.003136	-0.006834	-0.005388	-0.006993	-0.003242	-0.005747	-0.004911	-0.004752	-0.00638	-0.006405	-0.006573	-0.003307	-0.007873	-0.006633	-0.009073	-0.010504	-0.011595	-1.004383	-0.006476	-0.019699
25	-0.012058	-0.01451	-0.010323	-0.020827	-0.086319	-0.023433	-0.032826	-0.031203	-0.043511	-0.038997	-0.067199	-0.030255	-0.052493	-0.034278	-0.030092	-0.030052	-0.028133	-0.039206	-0.043036	-0.013442	-0.028182	-0.048753	-0.039583	-0.022487	-1.07973	-0.047792
26	-0.00232	-0.004796	-0.001681	-0.003903	-0.002531	-0.005457	-0.005765	-0.008548	-0.00624	-0.005291	-0.002437	-0.004148	-0.006904	-0.005016	-0.005202	-0.007516	-0.005602	-0.008326	-0.005287	-0.008459	-0.004742	-0.006948	-0.006412	-0.001398	-0.003237	-1.008242

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

Appendix Table 18
Residual Matrix, Philippines
1969

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0	0.00761	0.48584	0.11314	0.12657	0.07517	0.04571	0.4513	0.22587	0.02311	0.01477	0.12063	0.13908	0.05459	0.00644	0.01073	0.00587	0.00647	0.00867	0.01464	0.01089	0.0633	0.04371	0.00383	0.02195	0.0048	0.00907	0.00794	0.06048	2.16218
2	0.01939	0	0.03523	0.04844	0.02742	0.04899	0.03131	0.04935	0.0426	0.09933	0.05462	0.04082	0.06064	0.07027	0.5782	0.21464	0.23804	0.12637	0.09681	0.07559	0.04552	0.05116	0.08533	0.02098	0.11632	0.01756	0.27025	0.00922	0.01914	2.59355
3	0.06701	0.00622	0	0.26863	0.0183	0.02931	0.08918	0.03726	0.02496	0.0141	0.01636	0.28336	0.0395	0.11084	0.00654	0.01119	0.00757	0.00847	0.00872	0.01325	0.00819	0.0432	0.0123	0.00395	0.02225	0.00603	0.00615	0.00602	0.09024	1.25909
4	0.00011	0.00014	0.00012	0	0.00017	0.00016	0.00014	0.00016	0.00014	0.00023	0.00025	0.00012	0.00023	0.00036	0.00018	0.00027	0.00017	0.00018	0.00018	0.0003	0.00018	0.00024	0.00023	0.00015	0.00085	0.0002	0.00015	0.00022	0.00361	0.00946
5	3.7E-06	9.6E-08	1.9E-06	3E-07	0	2E-07	2.2E-07	1.2E-06	2.6E-07	7.2E-08	6.5E-08	4.9E-07	3.5E-07	8.3E-07	6.4E-08	8.3E-08	4.1E-08	5.8E-08	5.9E-08	7.9E-08	4.2E-08	1.8E-07	1.6E-07	3.6E-08	8.9E-08	3.3E-08	4.3E-08	4E-08	2.5E-07	1.1E-05
6	0.00166	0.00116	0.00752	0.00266	0.0039	0	0.09938	0.00567	0.06555	0.02472	0.0129	0.03413	0.09834	0.00345	0.00105	0.00379	0.00092	0.00178	0.00242	0.0036	0.00476	0.0432	0.00261	0.00126	0.00531	0.00174	0.00093	0.0015	0.00789	0.44381
7	2.9E-06	2.4E-06	2.4E-06	4.2E-06	3.5E-06	2.4E-06	0	7.5E-06	4.3E-06	3.4E-06	3.8E-06	2.1E-06	1.4E-05	4.3E-06	3.2E-06	4.8E-06	2.7E-06	2.9E-06	2.6E-06	5.5E-06	3E-06	3.7E-06	4E-06	2.4E-06	3.5E-06	3.6E-06	2.4E-06	4.1E-06	7.2E-05	0.00018
8	0.00173	0.00202	0.00145	0.00226	0.00231	0.00143	0.00236	0	0.41279	0.00549	0.00252	0.00161	0.00141	0.00222	0.00135	0.00454	0.00152	0.00189	0.00394	0.01254	0.00235	0.00603	0.07058	0.00142	0.00157	0.00089	0.00104	0.00898	0.00236	0.56057
9	0.00023	7.5E-05	0.00017	0.00026	0.00011	0.00035	0.00062	0.00099	0	0.00016	0.00011	0.00035	0.00015	0.00015	7E-05	0.00378	0.00011	0.00019	0.00027	0.00991	0.00019	0.00015	0.00178	0.00032	0.0003	0.00025	0.00017	7.7E-05	0.00018	0.02146
10	0.00641	0.00409	0.01355	0.01836	0.10896	0.01934	0.02579	0.01056	0.01301	0	0.51918	0.01379	0.01881	0.03327	0.00547	0.04907	0.0071	0.01013	0.01253	0.02441	0.00674	0.03882	0.01499	0.01901	0.01097	0.03241	0.00757	0.01244	0.01778	1.07454
11	0.00099	0.00114	0.00204	0.00509	0.00393	0.00334	0.00526	0.00236	0.0027	0.00735	0	0.00228	0.00551	0.0081	0.00123	0.00307	0.00173	0.00228	0.00245	0.00458	0.00218	0.00473	0.00308	0.00429	0.00512	0.01302	0.00318	0.00729	0.00596	0.11426
12	1.2E-05	7.5E-05	3.8E-05	2.7E-05	2.8E-05	0.00528	0.30577	0.00042	0.00114	0.00012	0.00106	0	0.00132	5.3E-05	4.6E-05	5.1E-05	2.6E-05	4.8E-05	4.1E-05	5.2E-05	0.00023	0.0008	5.7E-05	1.6E-05	6.8E-05	2.7E-05	2.7E-05	2.2E-05	9.7E-05	0.31695
13	0.00106	0.00395	0.00173	0.00184	0.00149	0.00181	0.00982	0.00219	0.01836	0.00285	0.0026	0.00536	0	0.00243	0.00327	0.00311	0.00253	0.00229	0.01526	0.00482	0.04419	0.00344	0.00524	0.00307	0.03251	0.00234	0.00236	0.00087	0.00244	0.18322
14	0.08327	0.0392	0.05385	0.03177	0.03621	0.17717	0.09093	0.08647	0.10482	0.08969	0.13374	0.13284	0.35273	0	0.02866	0.05807	0.04784	0.05706	0.05789	0.07718	0.04753	0.41999	0.06523	0.00955	0.02711	0.01896	0.03483	0.00996	0.03757	2.41013
15	0.03314	0.11015	0.06079	0.07972	0.04896	0.08561	0.05413	0.08639	0.0628	0.17643	0.09519	0.07067	0.09734	0.0965	0	0.26162	0.14838	0.11638	0.09813	0.09863	0.05372	0.07626	0.08284	0.03785	0.21189	0.02988	0.49648	0.01405	0.03272	2.91665
16	0.00138	0.00134	0.00155	0.04964	0.00091	0.00226	0.00148	0.00189	0.00492	0.00279	0.00231	0.00192	0.00381	0.01217	0.00105	0	0.00419	0.00327	0.00261	0.01002	0.0023	0.00898	0.0823	0.00109	0.00148	0.00127	0.00544	0.00529	0.00287	0.22054
17	0.0048	0.06549	0.0185	0.02029	0.00547	0.00789	0.0103	0.01902	0.08299	0.02682	0.01582	0.01075	0.01521	0.01954	0.03672	0.03863	0	0.6949	0.48602	0.18776	0.17551	0.05053	0.19673	0.00345	0.01914	0.01115	0.02478	0.00567	0.0063	2.26018
18	0.0036	0.01606	0.01243	0.02089	0.00359	0.00524	0.01038	0.00545	0.02356	0.02012	0.01259	0.00871	0.01549	0.0183	0.00985	0.00999	0.01677	0	0.05679	0.17542	0.01774	0.05045	0.07652	0.00199	0.00791	0.01252	0.0109	0.00469	0.00457	0.63252
19	0.00143	0.0069	0.0017	0.00313	0.00103	0.00156	0.00086	0.00259	0.00207	0.00626	0.00514	0.00126	0.00219	0.00183	0.00389	0.00342	0.00201	0.00191	0	0.00339	0.00272	0.00126	0.00292	0.00069	0.00109	0.00041	0.00212	0.0007	0.00083	0.06531
20	0.00086	0.00262	0.00118	0.00143	0.0013	0.00139	0.00125	0.00135	0.00126	0.0051	0.00329	0.00127	0.00204	0.0023	0.00177	0.002	0.00254	0.00837	0.02456	0	0.00435	0.00302	0.01925	0.00109	0.00691	0.0269	0.01259	0.00138	0.00208	0.14343
21	0.00161	0.00172	0.00255	0.0087	0.00452	0.00233	0.00184	0.00265	0.00228	0.00981	0.00486	0.00228	0.00343	0.00274	0.00184	0.00303	0.00241	0.00246	0.00355	0.00556	0	0.00297	0.00321	0.00118	0.04393	0.0019	0.00158	0.00067	0.00213	0.12775
22	0.00132	0.00724	0.00247	0.00287	0.003	0.02871	0.04026	0.00314	0.00545	0.00748	0.00781	0.01803	0.01353	0.01031	0.0045	0.0174	0.00408	0.00732	0.00698	0.01026	0.00524	0	0.00473	0.00091	0.00217	0.00154	0.00266	0.00192	0.005	0.22634
23	0.00076	0.00772	0.00175	0.00215	0.00186	0.00153	0.00156	0.00175	0.0017	0.00574	0.00381	0.00167	0.00222	0.00262	0.00508	0.00505	0.00653	0.00457	0.00381	0.00415	0.00283	0.00293	0	0.00359	0.00258	0.00229	0.00367	0.00868	0.00652	0.09912
24	0.06	0.05412	0.14368	0.1296	0.18621	0.14276	0.17376	0.17132	0.17301	0.14838	0.13662	0.23011	0.17684	0.17864	0.08732	0.13636	0.15991	0.15845	0.15067	0.15245	0.12563	0.16207	0.10458	0	0.11095	0.03882	0.11398	0.01683	0.04133	3.6644
25	0.01658	0.01584	0.02959	0.02658	0.02237	0.03325	0.02726	0.03764	0.03098	0.05298	0.03009	0.02411	0.04681	0.03853	0.0254	0.04299	0.03861	0.03824	0.05533	0.04971	0.0437	0.04729	0.03384	0.01743	0	0.01276	0.02428	0.00804	0.01443	0.88466
26	0.00169	0.00221	0.00327	0.00351	0.00301	0.00492	0.00445	0.00419	0.00551	0.00443	0.0085	0.0048	0.00532	0.00606	0.00268	0.0045	0.00461	0.00554	0.00696	0.00768	0.00399	0.00804	0.00532	0.0078	0.00713	0	0.00248	0.00794	0.01041	0.14694
27	0.00625	0.01125	0.01392	0.01858	0.01668	0.02495	0.01849	0.01777	0.01765	0.07216	0.04927	0.024	0.03108	0.0323	0.01212	0.04014	0.03717	0.03088	0.02805	0.03637	0.01579	0.03169	0.01656	0.02417	0.00986	0.01519	0	0.01409	0.02542	0.69185
28	0.01222	0.01771	0.02506	0.03128	0.03143	0.03484	0.03171	0.03381	0.03748	0.05107	0.04871	0.03425	0.04621	0.0599	0.02322	0.03678	0.04337	0.04918	0.04993	0.0727	0.02989	0.05771	0.03373	0.06429	0.03639	0.03735	0.0216	0	0.1772	1.22903
29	0.01483	0.03437	0.02243	0.05921	0.0479	0.03248	0.02961	0.03249	0.03098	0.04991	0.0557	0.02512	0.048	0.06124	0.04715	0.07088	0.03879	0.04124	0.03837	0.07507	0.04192	0.05273	0.05504	0.03491	0.04385	0.05273	0.03424	0.05991	0	1.2311
SUM	0.34235	0.42042	0.94241	0.95007	0.70762	0.77208	1.11362	1.06821	1.39459	0.90664	1.23781	1.09424	1.22724	0.82871	0.89512	1.03512	0.82277	1.37984	1.22094	1.13003	0.69827	1.23098	1.0227	0.26828	0.7496	0.34294	1.09256	0.21442	0.57964	25.6892

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1979

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM	
1	0	0.0106	0.49468	0.10879	0.12489	0.07188	0.0476	0.43456	0.20601	0.02196	0.01468	0.12279	0.13223	0.07926	0.00813	0.01246	0.00541	0.00713	0.00902	0.01545	0.01091	0.05646	0.04378	0.00479	0.02228	0.00541	0.0092	0.00846	0.06196	2.150785	
2	0.01793	0	0.03254	0.04518	0.02548	0.04479	0.0281	0.04555	0.03876	0.09161	0.05058	0.03717	0.05573	0.06603	0.56821	0.20765	0.21294	0.11546	0.08877	0.07079	0.04256	0.0483	0.08042	0.01889	0.10517	0.01577	0.24086	0.00869	0.01769	2.421607	
3	0.06106	0.00577	0	0.24912	0.01764	0.02643	0.0887	0.03485	0.02319	0.01491	0.01603	0.27585	0.03644	0.09775	0.00611	0.01052	0.00725	0.00812	0.00839	0.01236	0.00785	0.04091	0.01184	0.00442	0.02246	0.00606	0.00613	0.006	0.08737	1.193494	
4	0.0002	0.0003	0.00027	0	0.00019	0.00031	0.00034	0.00031	0.00021	0.00052	0.00067	0.00022	0.00036	0.0006	0.00032	0.00045	0.00029	0.00032	0.00032	0.00048	0.00034	0.00034	0.00052	0.00041	0.00116	0.00045	0.00041	0.00047	0.00579	0.016561	
5	1.7E-05	7.6E-07	1E-05	9.9E-07	0	6.6E-07	1.3E-06	3.9E-06	-1E-06	3E-07	3.7E-07	2.7E-06	1.1E-06	6.7E-06	4.8E-07	5.9E-07	2.8E-07	4.3E-07	4E-07	5E-07	2.1E-07	6.7E-07	7.8E-07	2.7E-07	4.8E-07	2.3E-07	2.5E-07	2.4E-07	1.4E-06	5.26E-05	
6	0.00258	0.00201	0.00846	0.00264	0.00373	0	0.09254	0.00542	0.06157	0.02178	0.01532	0.03759	0.10263	0.00363	0.00148	0.00378	0.00097	0.00377	0.00266	0.00387	0.00485	0.03951	0.00287	0.00167	0.00595	0.00189	0.00111	0.00139	0.00739	0.44308	
7	2.7E-06	2.8E-06	2.6E-06	4.4E-06	3.4E-06	2.8E-06	0	7.6E-06	4.1E-06	3.8E-06	3.9E-06	3.6E-06	9.9E-05	4.6E-06	3.6E-06	4.9E-06	3E-06	3.3E-06	2.5E-06	8.3E-06	3.8E-06	4E-06	3.9E-06	2.7E-06	7.5E-06	3.9E-06	3.4E-06	3.9E-06	6.7E-05	0.000271	
8	0.00186	0.00266	0.00165	0.0033	0.003	0.00181	0.00306	0	0.3679	0.00621	0.0026	0.00302	0.00151	0.00227	0.00173	0.00562	0.0025	0.00331	0.00841	0.01148	0.00246	0.00656	0.0679	0.00159	0.00163	0.00087	0.00109	0.00875	0.00234	0.527083	
9	0.0002	8.7E-05	0.00015	0.00024	0.00011	0.00032	0.00054	0.00086	0	0.00015	0.00012	0.00031	0.00014	0.00014	7.9E-05	0.00335	0.00011	0.00018	0.00024	0.01103	0.00019	0.00017	0.00158	0.00031	0.00032	0.00035	0.00018	0.0002	0.00021	0.021879	
10	0.00568	0.00451	0.01305	0.02009	0.10033	0.01866	0.02627	0.01144	0.01254	0	0.4887	0.01408	0.01933	0.03451	0.00587	0.05352	0.00771	0.01089	0.01238	0.0253	0.00672	0.03995	0.01615	0.01858	0.01079	0.03058	0.00808	0.01197	0.01701	1.044659	
11	0.00094	0.00141	0.00233	0.00567	0.00433	0.0037	0.00636	0.0027	0.00301	0.00782	0	0.0026	0.00654	0.00916	0.00151	0.0036	0.00226	0.00293	0.00291	0.00469	0.00249	0.00651	0.00328	0.00427	0.00527	0.01328	0.00406	0.00698	0.00688	0.127512	
12	8.2E-06	9.3E-05	3.1E-05	2.5E-05	2.5E-05	0.00449	0.31438	0.00036	0.00102	0.00012	0.00095	0	0.00117	5E-05	5.3E-05	5.2E-05	3.3E-05	4.6E-05	5.2E-05	4.5E-05	0.00021	0.00083	5.5E-05	1.4E-05	5.8E-05	2.4E-05	2.1E-05	2.1E-05	9.8E-05	0.324337	
13	0.0011	0.0042	0.00197	0.00213	0.00156	0.0022	0.01506	0.00296	0.01697	0.00316	0.0028	0.00642	0	0.00286	0.00363	0.00321	0.00279	0.00267	0.01426	0.00718	0.04174	0.00359	0.00499	0.00331	0.0339	0.0027	0.00321	0.0009	0.0025	0.193977	
14	0.07531	0.04201	0.05284	0.03589	0.03558	0.1722	0.0877	0.08212	0.10223	0.08254	0.12465	0.13066	0.3334	0	0.02998	0.05835	0.04223	0.05378	0.05272	0.0757	0.04536	0.38593	0.06252	0.00993	0.02599	0.01851	0.03257	0.01028	0.03714	2.298109	
15	0.03056	0.09997	0.0547	0.07258	0.04514	0.07754	0.04766	0.0794	0.05756	0.16085	0.08747	0.06303	0.08778	0.08743	0	0.24177	0.13795	0.10627	0.08984	0.08936	0.0488	0.06976	0.07712	0.03363	0.19007	0.02634	0.43897	0.01327	0.02976	2.644601	
16	0.00129	0.00173	0.00212	0.0519	0.00089	0.00222	0.00167	0.00202	0.00487	0.00303	0.00238	0.0023	0.0023	0.00378	0.01198	0.00147	0	0.00476	0.00378	0.00316	0.01156	0.00269	0.01262	0.08495	0.00145	0.00161	0.00148	0.00646	0.00554	0.00342	0.237127
17	0.00461	0.0674	0.01732	0.01918	0.00511	0.00729	0.00979	0.01745	0.08397	0.02483	0.01488	0.01044	0.01415	0.01841	0.03732	0.03719	0	0.66085	0.45969	0.17572	0.15619	0.05166	0.18913	0.0033	0.01753	0.01047	0.02574	0.00593	0.00591	2.151461	
18	0.0035	0.0208	0.01321	0.02091	0.0034	0.00501	0.01076	0.00561	0.02636	0.01813	0.01234	0.01	0.01435	0.01787	0.01319	0.01116	0.02283	0	0.06882	0.16645	0.01733	0.05241	0.07967	0.00207	0.00787	0.0122	0.01098	0.00474	0.00474	0.656682	
19	0.00131	0.00811	0.00166	0.00283	0.00098	0.00151	0.00097	0.00244	0.00223	0.00566	0.0048	0.00121	0.00215	0.00181	0.00454	0.00347	0.00176	0.00187	0	0.00336	0.00241	0.0013	0.00263	0.00061	0.00097	0.0004	0.00195	0.00066	0.00083	0.064426	
20	0.00086	0.00305	0.00124	0.00149	0.00128	0.00143	0.00137	0.00147	0.00135	0.00488	0.00333	0.0014	0.00201	0.00243	0.00204	0.00214	0.00265	0.0078	0.0222	0	0.00516	0.00436	0.01979	0.00128	0.00727	0.03019	0.01199	0.00148	0.00229	0.14823	
21	0.00167	0.00328	0.00271	0.00763	0.00415	0.00246	0.0022	0.00292	0.00244	0.0088	0.00496	0.00235	0.00366	0.00302	0.00293	0.0033	0.0026	0.00275	0.00395	0.00534	0	0.00295	0.00323	0.00169	0.04452	0.00237	0.00194	0.00091	0.00217	0.132899	
22	0.00122	0.00767	0.00307	0.00367	0.0029	0.02525	0.0393	0.00305	0.00697	0.01155	0.00746	0.02212	0.01272	0.01059	0.00499	0.01837	0.01555	0.013	0.00977	0.01018	0.00391	0	0.00626	0.00096	0.00215	0.00165	0.0032	0.00189	0.005	0.254429	
23	0.00074	0.00703	0.00179	0.0022	0.00182	0.00169	0.00166	0.00182	0.00184	0.00532	0.00378	0.00166	0.00244	0.00265	0.00633	0.00557	0.0068	0.00482	0.00436	0.00411	0.00328	0.00324	0	0.0044	0.00255	0.00243	0.00384	0.0124	0.00562	0.106219	
24	0.05478	0.0559	0.13853	0.1221	0.17116	0.13887	0.16265	0.16412	0.16317	0.14757	0.1326	0.21193	0.1665	0.16742	0.08189	0.13319	0.15784	0.15712	0.14626	0.14625	0.12845	0.15387	0.10585	0	0.10253	0.03732	0.10831	0.01662	0.04071	3.513533	
25	0.01566	0.01762	0.0303	0.02564	0.02126	0.03201	0.02679	0.04013	0.02978	0.05045	0.03112	0.02362	0.04387	0.03827	0.02577	0.04179	0.03859	0.03902	0.05268	0.04782	0.04021	0.04468	0.03377	0.02087	0	0.01614	0.02522	0.00867	0.01506	0.876818	
26	0.0017	0.00238	0.00336	0.00349	0.00296	0.00497	0.00486	0.0043	0.00549	0.00503	0.00936	0.00454	0.0054	0.0061	0.00282	0.00456	0.0047	0.00558	0.00674	0.0072	0.00436	0.00761	0.00516	0.008	0.00742	0	0.00295	0.00788	0.00969	0.148642	
27	0.00583	0.01224	0.01303	0.01755	0.01559	0.02505	0.01867	0.01737	0.01817	0.06461	0.0455	0.0225	0.03082	0.03032	0.01191	0.04093	0.03608	0.02981	0.0275	0.03412	0.01526	0.03003	0.016	0.02228	0.01004	0.01526	0	0.01281	0.02348	0.66275	
28	0.01203	0.01937	0.02622	0.03121	0.03023	0.03581	0.03237	0.03441	0.03653	0.05089	0.04725	0.03281	0.04444	0.05767	0.02517	0.03807	0.04342	0.04959	0.04921	0.06868	0.03344	0.05516	0.03455	0.0742	0.03581	0.03561	0.02376	0	0.15498	1.212867	
29	0.01625	0.03723	0.02491	0.0608	0.04522	0.03539	0.03405	0.03466	0.03088	0.05607	0.06573	0.02628	0.04898	0.06505	0.04841	0.07207	0.04017	0.04328	0.04056	0.07608	0.04486	0.05227	0.061	0.04146	0.04712	0.05739	0.04059	0.06453	0	1.311323	
SUM	0.31889	0.43743	0.94216	0.91627	0.66896	0.74329	1.10542	1.03228	1.30502	0.86846	1.19007	1.0669	1.17264	0.81734	0.89589	1.01616	0.8002	1.33413	1.18488	1.08461	0.67206	1.17097	1.01501	0.28438	0.71243	0.34516	1.01284	0.22145	0.5501	24.88541	

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1988

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0	0.0012739	0.1463549	0.0079901	0.0123983	-0.000354	0.0071978	0.1114567	0.1142432	0.0090814	0.0015682	-0.009753	0.0346277	-0.004083	-0.000598	-0.000594	-0.000463	-0.001462	-0.00184	-0.000219	-0.001221	0.0043603	0.0059361	0.0044208	0.0035455	0.0011809	0.0341116	0.0002416	0.0097493	0.4891509
2	0.0008897	0	0.0004918	0.0021656	0.0003149	-0.000818	0.0056222	0.0007241	0.002371	-0.000496	0.0011528	-0.000364	0.0007278	0.009174	0.0935557	0.0317747	0.0688102	0.0054567	-0.00013	0.0045029	0.000483	0.0298277	0.0047796	0.0008562	0.0106324	0.0032008	0.0160203	0.0009553	0.0035161	0.2961969
3	0.0116243	0.0012439	0	0.0540682	0.0007781	-0.000212	-0.003915	0.0014141	0.0042747	0.0032082	0.0010057	-0.00993	0.0008751	0.017526	0.0003911	-0.000189	-0.000224	-0.00041	-0.00047	0.0003166	-0.000433	0.0006824	-6.16E-05	0.0009284	0.0029302	0.0003427	0.0003139	0.0001255	0.017218	0.1034228
4	-4.14E-05	-5.46E-05	4.969E-05	0	0.000412	-0.000106	2.802E-05	-8.62E-05	-4.77E-05	-0.000158	-0.000154	-7.52E-05	-9.68E-05	-0.000127	-9.15E-05	-0.000121	-9.27E-05	-0.000111	-0.000107	-0.00011	-0.000113	-8.43E-05	-0.000151	-9.78E-05	-6.32E-05	-5.87E-05	-9.85E-05	-3.29E-05	0.0004696	-0.00132
5	-5.19E-06	2.557E-06	-3.85E-06	1.503E-06	0	-2.25E-07	6.102E-06	-2.02E-06	1.26E-06	1.26E-06	3.736E-06	-1.19E-06	-6.47E-09	-8.5E-07	8.03E-07	1.369E-06	8.036E-07	4.48E-07	2.326E-07	2.078E-06	5.038E-07	7.429E-07	8.221E-07	1.942E-06	7.927E-06	5.298E-06	2.045E-06	8.054E-06	0.0001564	0.0001925
6	0.000628	0.0004682	0.0012293	0.0002133	9.571E-05	0	1.2171326	0.0001028	0.0389631	-9.18E-05	0.0010197	0.0163244	0.0952701	0.0010538	-7.58E-05	0.00062	0.0004158	-0.000563	-0.000108	0.0085931	0.0007499	0.0470153	-8.89E-05	0.0074658	0.0021891	0.0008419	0.0001861	0.0019066	0.0089551	1.450513
7	5.303E-05	0.0001328	0.0001888	0.0001741	0.0001506	0.000147	0	0.0001636	0.000357	0.0001828	0.0003437	0.000127	0.0006699	0.0001634	8.976E-05	0.0001462	0.0002032	0.0001369	7.279E-05	0.0003701	0.0008035	0.0002159	8.422E-05	0.0069554	0.0002376	0.0001386	0.0001629	5.877E-05	0.0017345	0.0142643
8	0.0006483	0.0059305	0.0001044	-0.000322	-0.000299	-0.000142	0.0004488	0	0.1071034	-3.48E-05	0.0001353	-0.000402	0.0002175	0.000881	0.0004838	-0.000175	0.0002805	-0.000421	-0.001466	0.0006525	-0.000126	0.0005215	0.0114539	0.0030008	8.39E-05	0.0001131	0.00022	0.0010134	0.0005081	0.1304142
9	-1.63E-06	-6.97E-07	-5.47E-06	-5.86E-06	-3.05E-06	5.05E-06	6.64E-05	-6.33E-07	0	-1.05E-05	1.42E-06	0.0001233	0.0003649	-9.41E-06	-7.73E-06	-4.4E-05	-8.47E-06	-1.17E-05	-1.37E-05	-0.000668	1.441E-05	0.0002051	-3.58E-05	-9.32E-06	6.565E-06	-1.92E-05	-8.83E-06	-2.21E-05	0.0003689	0.00027
10	0.0001909	9.433E-05	4.087E-05	0.0016494	0.0454338	-0.00091	0.0030353	-0.000433	0.0016994	0	0.1706426	-0.000964	-0.000731	-0.001564	0.0004344	0.0071095	-0.000914	-0.000818	-0.001042	0.0014556	-0.000688	-0.00057	-0.001046	0.000286	0.0001173	0.0008688	-0.000314	0.0011852	0.0046204	0.2291426
11	0.0001214	0.0001962	1.319E-05	0.0011167	0.0093809	0.0001342	0.0054819	0.0001871	0.0002472	-0.000548	0	-0.00028	-0.000453	-0.000471	0.0020853	0.0015699	-0.000113	-8.91E-05	-0.000344	0.0024893	-0.000223	-0.000427	-0.000193	6.338E-05	0.0006289	0.002157	0.0006903	0.0011253	0.0073004	0.0318487
12	7.822E-06	3.216E-05	2.178E-05	1.913E-05	1.518E-05	0.0003074	0.0262575	6.116E-05	0.002364	2.88E-05	2.962E-05	0	0.0026807	0.0002347	9.848E-06	2.47E-05	5.413E-05	2.781E-05	8.056E-05	4.401E-05	8.158E-05	0.00083	1.888E-05	0.0003769	7.609E-05	2.113E-05	2.065E-05	2.957E-05	0.0002371	0.0339929
13	4.794E-05	0.0020152	-7.38E-06	4.024E-05	-3.72E-05	-0.000281	0.0006299	7.659E-05	0.0003358	-0.000195	0.0003291	-0.000567	0	9.449E-05	0.0002103	0.00015	8.125E-05	-0.000117	-0.000298	2.936E-05	-0.001253	0.0095947	0.0008251	0.0005971	0.0187354	0.0009903	-0.000269	0.0004205	0.0014252	0.0336035
14	0.0089064	0.0248873	0.0017847	0.0011422	0.0037813	0.008314	0.0919586	0.0016445	0.0121587	0.0036939	0.0400186	0.0179641	0.0284526	0	0.019799	0.0056502	0.0030979	0.0010574	-0.00033	0.0282414	-0.000703	0.015981	0.0013506	0.0015469	0.0035261	0.002176	0.0050167	0.0020476	0.0174754	0.3506401
15	0.0096872	0.028199	0.0082554	0.022503	0.004893	0.0037919	0.0377608	0.0159555	0.0163837	0.0097792	0.0114435	0.0009852	0.0126258	0.0069173	0	0.0948755	0.024284	0.0036488	-0.00042	0.0094078	0.0013511	0.0098468	0.0108148	0.0075846	0.1048764	0.0262496	0.1701646	0.00733	0.0209781	0.6801719
16	3.29E-05	0.0014904	0.0008496	0.0160545	0.00031	-0.000109	0.0012594	0.0002211	0.0043632	0.0006079	0.000288	-0.000156	0.0003639	0.004711	8.945E-05	0	0.001318	0.0001213	-4.13E-05	0.0061353	8.284E-05	0.0046168	0.0177544	-6.99E-05	0.0001237	0.0003534	0.0001543	0.001449	0.0007362	0.0631103
17	-1.16E-05	0.0095662	0.0002629	0.0026442	0.0004779	-0.000399	0.0018699	0.0003498	0.0054447	0.0039224	0.002507	-0.000612	9.767E-05	2.521E-05	-0.002147	0.0013609	0	0.0792558	-0.005047	0.0555491	0.0144383	0.0202585	0.0085076	0.0044863	0.0010063	0.0028675	-0.001253	0.0006339	0.0095889	0.2156514
18	0.0006482	0.0062871	0.0009742	0.0217334	0.0002404	-0.000375	0.0012134	0.0036221	0.0198088	0.0001241	-3.67E-05	-0.00113	-0.000119	0.0002014	0.0001928	-0.000215	-0.002732	0	-0.004463	0.0160567	0.0022801	-6.49E-05	0.0071864	0.0003004	0.0020062	0.0033397	0.002086	0.0004831	0.0021961	0.0818451
19	0.0009646	0.0019048	0.0002353	0.0002415	0.0001136	-6.56E-05	0.000522	0.0031483	0.0007564	0.0017632	0.0006556	-4.67E-05	0.0001918	0.0001907	-0.000235	0.0008682	0.0005957	6.86E-05	0	0.002713	4.738E-05	0.0004321	0.0003951	0.0001763	0.0026468	0.0004437	4.351E-05	0.0001259	0.0022614	0.0211587
20	0.0002435	0.006083	0.0002617	0.0003524	0.0006824	0.0001785	0.002716	0.0024122	0.0009648	0.0003102	0.0027033	0.0002628	0.0022882	0.0008767	0.0013111	0.0032111	0.0015123	0.0003466	0.0079149	0	0.0040581	0.0014728	0.0042687	0.0003878	0.0061041	0.053215	0.008406	0.0008689	0.0041082	0.1175214
21	0.0004456	-0.000165	6.316E-05	0.0001827	2.255E-05	-0.000213	0.0026057	0.0001408	0.0003709	-0.000192	0.0002648	-0.00014	-2.26E-05	-0.000114	0.0002375	4.539E-05	9.938E-05	-0.000259	-0.000458	0.0003037	0	0.0010623	-3.79E-05	0.0009316	0.0223454	0.0017428	0.0069686	0.0005058	0.0065338	0.0432719
22	-3.2E-06	-0.000131	-0.000378	-0.00038	-6.31E-05	-0.00052	0.0038471	0.0004421	0.0016105	-0.001151	2.181E-05	-0.001021	-0.000206	-0.000512	-0.000396	-0.001007	-0.0045	-0.002958	-0.002375	0.0008859	-0.000257	0	-0.001304	0.0001066	0.000897	0.003586	0.0001199	0.0008294	0.0041887	-0.000628
23	0.0006366	0.0063671	0.0009343	0.001451	0.0004637	0.0011522	0.0058218	0.0007154	0.0027157	0.0013015	0.0033715	0.0002504	0.000604	0.0006905	0.0005499	0.0009813	0.0024226	0.0003135	-0.000239	0.0018146	-0.00017	0.0034236	0	0.0006171	0.0018322	0.0039359	0.0087998	0.0203688	0.0047624	0.0758884
24	0.0051934	0.009452	0.0174178	0.0155912	0.0158151	0.0013566	0.1153406	0.0130957	0.0447339	0.0124984	0.0376289	0.0081079	0.0250441	0.0128032	0.0061593	0.0090715	0.0148457	0.0039909	-0.002505	0.0438871	0.0005114	0.0208963	-0.000654	0	0.0154481	0.0101869	0.0147852	0.00015544	0.0170514	0.4893079
25	0.0038463	0.0053416	0.0061784	0.007187	0.0032285	0.001166	0.0795109	0.0112914	0.015728	0.0016429	0.0106347	0.0015301	0.0057337	0.0039982	0.0146827	0.0055899	0.0062439	0.0010248	-0.001218	0.0158851	0.0022643	0.0107561	0.0055822	0.013357	0	0.015845	0.0026383	0.0065022	0.0121892	0.268361
26	0.0003231	0.0003293	0.0002989	0.0011777	0.0004981	-5.12E-05	0.01093	0.0006094	0.0027089	-0.000129	0.00205	0.0006285	0.0007441	0.0002949	3.401E-05	0.0003509	0.0002566	7.239E-06	0.0006512	0.0023139	-0.000134	0.0042213	0.0004173	0.0044397	0.0042984	0	-1.72E-05	0.0025104	0.0043281	0.0440899
27	0.0017229	0.0014091	0.0071659	0.0128202	0.0036	0.0003212	0.0784948	0.0039606	0.0129186	0.0012159	0.0196668	0.0036044	0.0162102	0.0072684	0.0007908	0.0243388	0.0082768	0.0020544	-0.000141	0.0136409	0.0015237	0.0137386	0.0012636	0.0083387	0.0060506	0.0384697	0	0.0072147	0.0221267	0.3180665
28	0.0008754	0.0023706	0.0012399	0.0019485	0.0013657	-0.001261	0.0619422	0.0012014	0.0081508	-0.001657	0.0042429	0.0019786	0.0020819	0.0001408	-0.000416	0.000885	-0.000542	-0.00226	-0.002087	0.004715	-0.002282	0.00689	-0.001157	0.0057301	0.0113458	0.0148268	0.0046425	0	0.0168477	0.1417585
29	0.0018502	0.0146946	0.002517	0.0103102	0.0034454	-0.002389	0.0426852	0.0012409	0.0057203	-0.0005	0.015681	0.0003562	0.0013705	0.0025844	0.000953	0.0033932	0.0011766	-0.001759	-0.002852	0.0082241	-0.002392	0.0048834	-0.00062	0.0063006	0.0522608	0.0304826	0.0068869	0.0130696	0	0.2195741</

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1994

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0	0.0190293	0.5839221	0.1282704	0.0985969	0.1201142	0.0606228	0.3504767	0.1510947	0.0905861	0.0556455	0.0552036	0.1999176	0.0967858	0.0193637	0.0222699	0.0147076	0.0162693	0.0213411	0.0236491	0.0405772	0.0355026	0.0249444	0.0217168	0.0339033	0.0085708	0.0129838	0.0069082	0.0771399	2.3901135
2	0.0456408	0	0.0583792	0.0930669	0.0599297	0.0811244	0.0594415	0.0835918	0.0639789	0.1230955	0.1009024	0.0611901	0.0857337	0.1207402	0.6154669	0.3423196	0.4453119	0.2527284	0.1099404	0.1258238	0.1416549	0.127529	0.1388179	0.0704021	0.2359865	0.0398198	0.2980619	0.0259644	0.05991	4.0665526
3	0.0565958	0.0092193	0	0.1545741	0.011826	0.0244492	0.0225513	0.0224769	0.0144811	0.0134589	0.0122601	0.0228769	0.0217616	0.0716449	0.0119652	0.0092888	0.0079116	0.0103537	0.0076118	0.0109745	0.0086288	0.0105504	0.0087281	0.0075092	0.0250439	0.0059427	0.0073015	0.0046516	0.0755196	0.6701579
4	0.0001619	0.0003882	0.0002949	0	0.0001633	0.0002821	0.0002803	0.0002423	0.0002047	0.000319	0.0004192	0.0002189	0.0002761	0.0004888	0.0003471	0.000382	0.0003685	0.0003284	0.0003288	0.0004033	0.0002754	0.0002974	0.0004974	0.0004086	0.0006437	0.0004711	0.0003139	0.0004264	0.0075818	0.0168138
5	1.205E-05	1.454E-05	9.392E-06	1.32E-05	0	8.208E-06	7.926E-06	8.832E-06	6.173E-06	5.514E-06	7.027E-06	8.102E-06	6.895E-06	1.294E-05	1.168E-05	1.062E-05	1.306E-05	1.016E-05	1.089E-05	1.117E-05	7.608E-06	9.322E-06	1.514E-05	1.243E-05	1.99E-05	1.461E-05	7.045E-06	1.166E-05	0.0002717	0.0005578
6	0.0085262	0.0111325	0.0098757	0.0045996	0.004114	0	0.6426989	0.019436	0.1200987	0.0104506	0.0132181	0.2569184	0.2485345	0.0088626	0.008336	0.0081973	0.0069383	0.0081814	0.0155852	0.0098558	0.0479274	0.1590576	0.0051141	0.0064556	0.0203589	0.0038173	0.0053437	0.0018697	0.0112814	1.6767855
7	0.0001881	0.0003649	0.0002598	0.0003226	0.0002358	0.0150151	0	0.0004632	0.001451	0.0004282	0.0004129	0.0041375	0.0096404	0.00038	0.000439	0.0003751	0.0004432	0.0004148	0.0005251	0.0004467	0.0019103	0.0020383	0.0003073	0.0016396	0.0009599	0.0002563	0.0003151	0.0001682	0.0027301	0.0462685
8	0.0037333	0.0113419	0.0036394	0.0029058	0.0025433	0.0029253	0.002234	0	0.1930563	0.0030143	0.0021817	0.0024567	0.0029878	0.0058594	0.0071493	0.0080569	0.0062615	0.0067562	0.0272837	0.0214947	0.0049459	0.0071271	0.041394	0.0023598	0.0042827	0.0018735	0.0042393	0.0033675	0.0024373	0.3879086
9	3.379E-05	9.517E-05	4.301E-05	6.258E-05	3.784E-05	0.0001879	0.0001094	0.0023925	0	6.643E-05	6.732E-05	0.001037	0.000109	0.0001595	8.654E-05	0.0001428	9.387E-05	8.559E-05	0.0017928	0.0013274	6.396E-05	0.0004797	0.0001717	0.000143	0.0001238	0.0001021	7.652E-05	0.0001038	0.0005742	0.0097693
10	0.0104689	0.0298271	0.0219528	0.0410834	0.4162601	0.0397174	0.0255291	0.0219242	0.0312731	0	0.9704854	0.0331049	0.0298645	0.0564789	0.0315106	0.1612649	0.0256785	0.0324125	0.0414564	0.0679891	0.0238551	0.0567352	0.0309205	0.0234812	0.025806	0.0202375	0.0204028	0.0151843	0.0461339	2.3510382
11	0.0017184	0.0036106	0.0031726	0.0056017	0.0149958	0.0045497	0.0041163	0.0042948	0.0040737	0.0041693	0	0.0035852	0.0041157	0.0046473	0.0109592	0.0080905	0.0047986	0.0056064	0.0039406	0.0069373	0.0033151	0.0047654	0.0040663	0.0033473	0.0074217	0.0034499	0.0075765	0.0041431	0.01824	0.1593092
12	0.0002093	0.0006108	0.0002715	0.0002947	0.00024	0.0075266	0.0522551	0.0049807	0.0323364	0.0005011	0.0004649	0	0.0432402	0.000575	0.0005807	0.0004653	0.0004753	0.0004524	0.0051391	0.0010163	0.0072327	0.0097901	0.0005032	0.0005516	0.0027411	0.0003854	0.0004212	0.0002023	0.0010754	0.1745385
13	0.0027477	0.0075298	0.0041845	0.0047784	0.0040968	0.0057949	0.0080541	0.007608	0.006235	0.0088436	0.0075416	0.0158477	0	0.0063026	0.0087983	0.0070995	0.0072505	0.0065228	0.0066738	0.0072796	0.1637085	0.0241672	0.005957	0.010717	0.0616194	0.0057941	0.0073223	0.0032544	0.0088391	0.4245682
14	0.0630082	0.0829937	0.0564231	0.0664451	0.053175	0.2020643	0.104258	0.0675695	0.0943434	0.0934574	0.1148464	0.1193935	0.1934699	0	0.1280337	0.0865998	0.0602944	0.0701171	0.0570574	0.1156321	0.0671689	0.1141133	0.0528023	0.0266613	0.0711089	0.0196194	0.0721192	0.0128692	0.0649113	2.33061
15	0.0892036	0.2232951	0.1121982	0.1629559	0.1194534	0.1530608	0.1152446	0.1636697	0.1220486	0.2435707	0.1950911	0.1175908	0.1620221	0.1492937	0	0.4722202	0.2757861	0.2193455	0.1404976	0.1401217	0.1500999	0.1379603	0.167664	0.1433247	0.4866194	0.0730985	0.622371	0.0462602	0.1122143	5.3162817
16	0.0016598	0.0055479	0.0035496	0.040414	0.0016863	0.0042252	0.002909	0.0024145	0.0030883	0.0032013	0.0032538	0.0032133	0.0040486	0.018615	0.0049605	0	0.0047799	0.0073075	0.0070231	0.0122097	0.0060821	0.0132323	0.1252729	0.0027115	0.0036071	0.0024931	0.0045474	0.0115131	0.005891	0.3094578
17	0.0084205	0.0447131	0.0149007	0.0481433	0.011579	0.0130378	0.0098041	0.0226758	0.0284119	0.0291992	0.0275413	0.0106046	0.0162521	0.0267185	0.0390891	0.0281999	0	0.6642066	0.1950066	0.2224511	0.2969878	0.0939498	0.1041621	0.0120335	0.035979	0.0193976	0.0298954	0.0084574	0.0191497	2.0809675
18	0.0074623	0.0268296	0.0166208	0.0649259	0.0084834	0.0090711	0.0076948	0.0226114	0.026751	0.0251523	0.0187236	0.0088794	0.0119665	0.0194935	0.0321891	0.0201727	0.0407665	0	0.0685528	0.0636057	0.0228132	0.0248438	0.0711114	0.00706	0.0184482	0.0127063	0.0217033	0.0058551	0.0131774	0.6976713
19	0.0065613	0.0409154	0.0074356	0.0078026	0.0052801	0.0104437	0.0075087	0.0297325	0.0277338	0.0123936	0.0094875	0.0067918	0.0100067	0.0105841	0.0264356	0.0181243	0.0241157	0.0182716	0	0.0320022	0.0155988	0.0130694	0.0116689	0.0063788	0.0288277	0.0078218	0.0202555	0.0033981	0.010094	0.4287396
20	0.0075239	0.0571225	0.0092468	0.0114483	0.0083374	0.0165347	0.0113788	0.0144503	0.0123378	0.0189873	0.0161204	0.0100675	0.0159733	0.0135723	0.0355821	0.0255237	0.0325926	0.0255158	0.1106407	0	0.0961595	0.0286747	0.0263949	0.0146722	0.0442401	0.0731929	0.0362801	0.0065763	0.0205957	0.7997426
21	0.0085952	0.0280404	0.0114719	0.0144517	0.0092495	0.0143534	0.0129534	0.0162888	0.0131229	0.0171599	0.0177728	0.0134885	0.0146431	0.0147806	0.028316	0.0206789	0.0355985	0.0262163	0.0175965	0.0190284	0	0.0280127	0.0149646	0.0301179	0.1070988	0.013042	0.0382901	0.0069232	0.0298475	0.6221036
22	0.000698	0.002962	0.0019026	0.0027741	0.0010517	0.0025791	0.006957	0.0012599	0.0026548	0.0042781	0.0035028	0.0093214	0.0055639	0.003893	0.0028109	0.0040461	0.0084278	0.0086408	0.004715	0.0025764	0.0026922	0	0.003286	0.0018096	0.0031695	0.0070197	0.002111	0.0018107	0.0086018	0.1111159
23	0.0035661	0.0249914	0.0046343	0.0059691	0.0045575	0.0075671	0.0060262	0.0059514	0.0072423	0.0075663	0.0075882	0.0061388	0.0063591	0.0068845	0.0171824	0.0124029	0.0145312	0.010212	0.0087964	0.0083076	0.0069441	0.0072704	0	0.0074941	0.0107706	0.0085829	0.0117487	0.0411042	0.009505	0.2798949
24	0.0355722	0.0596484	0.0785056	0.0947876	0.0870298	0.1101778	0.1076833	0.1190794	0.1045066	0.1580178	0.1413012	0.1621303	0.1328941	0.117733	0.1323602	0.1142877	0.1515388	0.1588995	0.1633072	0.1538589	0.1623111	0.1152301	0.0706333	0	0.1100321	0.0359853	0.1120562	0.0157751	0.0562507	3.0615932
25	0.0336496	0.0529641	0.0534427	0.0538465	0.0425417	0.0650385	0.0612921	0.0879433	0.0663806	0.0691198	0.0716293	0.063509	0.0639414	0.0573265	0.0905079	0.0682858	0.0581506	0.0607776	0.0580045	0.0656771	0.0679762	0.0626934	0.0706311	0.1064887	0	0.0480879	0.0556141	0.0311273	0.0419581	1.7286054
26	0.0048833	0.0073719	0.0065127	0.0081388	0.0070034	0.0101124	0.0104705	0.0109492	0.0111956	0.0103144	0.0136117	0.0134279	0.011303	0.0098445	0.010445	0.0096784	0.0107604	0.0118188	0.046113	0.0181881	0.0118046	0.0136479	0.0119436	0.0451402	0.0166924	0	0.0081889	0.0160434	0.0142432	0.3798589
27	0.0212406	0.0707402	0.0475945	0.06515	0.047168	0.093108	0.0713477	0.0538004	0.0608012	0.1040601	0.0831188	0.0627334	0.071568	0.0640389	0.0522649	0.093256	0.1099063	0.0917702	0.0659197	0.0777833	0.059922	0.0724749	0.0376471	0.0540961	0.0435859	0.0328943	0	0.0258719	0.0530566	1.7869189
28	0.0206655	0.0392973	0.0291089	0.0362163	0.0289857	0.0502362	0.0548699	0.0418343	0.0456277	0.0425463	0.0469337	0.0650158	0.0493394	0.0428544	0.0511749	0.0453575	0.0469333	0.0468783	0.0720945	0.0607586	0.0428153	0.0529224	0.0559517	0.0949286	0.0624801	0.0672506	0.0422315	0	0.0456023	1.380911
29	0.018709	0.055484	0.0241035	0.0537884	0.0215571	0.0349232	0.032313	0.0279295	0.0264487	0.0315905	0.0401875	0.0271761	0.030827																	

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0	0.0053433	0.2733448	0.0306115	0.0278253	0.0241219	0.0692451	0.0842709	0.040197	0.0208584	0.009761	0.0501159	0.053851	0.0608096	0.004329	0.0062004	0.0031785	0.0045557	0.0029042	-0.055907	-0.001962	0.0735944	0.0094062	0.0172656	0.0068981	1.707E-06	0.0033	0.004159	0.035798	0.864077
2	0.0048332	0	0.0122403	0.0206548	0.0044495	0.0095577	0.1931576	0.0084673	0.0266266	0.018416	0.022654	0.0386833	0.0504145	0.0312399	0.4232769	0.1437277	0.1882642	0.04272	0.0330482	-0.384133	-0.013445	0.1022369	0.0231344	0.0203697	0.0795987	0.0074374	0.232448	0.0134726	0.0171482	1.3707005
3	0.0167938	0.0008536	0	0.0627043	0.0033872	0.0027153	0.052752	0.0039927	0.0144912	0.0046217	0.0074858	0.0892045	0.0043393	0.0412568	0.0013734	0.0030191	0.0022509	0.0019031	0.0029925	-0.062926	-0.004292	0.0153646	0.0016057	0.0216494	0.0085114	-0.003589	0.0023859	0.0035136	0.0478335	0.3461947
4	0.0001321	0.0001844	0.0002401	0	0.0001786	0.0002699	0.0034278	0.0002962	0.000464	0.0003467	0.000541	0.00133	0.0003412	0.0004299	0.0002221	0.000379	0.0003757	0.0003217	0.0003651	-0.007425	-0.000411	0.0007918	0.0003504	0.0033186	0.0007363	-0.000619	0.0003524	0.0004373	0.0061679	0.0135447
5	2.205E-05	-1.55E-05	4.886E-05	1.361E-05	0	3.427E-05	0.0022294	7.187E-05	0.0002341	9.554E-06	6.864E-05	0.0007918	6.91E-05	4.356E-05	-1.47E-06	6.092E-05	0.0001342	7.541E-05	0.0002316	-0.004054	-0.000282	0.0003994	-5.65E-06	0.0021211	-6.92E-05	-0.000529	4.95E-05	3.041E-06	0.0001432	0.0018986
6	0.0034945	0.0013976	0.0040961	0.0015334	0.0008727	0	3.9400483	0.0154184	0.1468558	0.0018777	0.012274	0.3402012	0.0414387	0.0032348	0.0026191	0.0064502	0.0013275	0.0031792	0.0028148	-0.033688	0.0006606	0.0923723	0.0020409	0.011762	0.0064937	0.011567	0.0016772	0.0019105	0.0097711	4.6337017
7	9.177E-06	-1.42E-05	0.000165	8.301E-05	2.973E-05	2.046E-05	0	0.0041469	0.0060772	-3.6E-07	8.068E-05	0.0183357	0.0010692	7.474E-05	1.575E-06	0.001289	0.0001655	6.685E-05	0.0002614	-0.005707	-0.000412	0.0010094	0.0002814	0.0024928	0.0007618	-0.000313	9.665E-05	0.0001626	0.0024513	0.0326852
8	0.0005983	0.0017772	0.001016	0.00183	0.0018965	0.0013347	0.0095002	0	0.3705236	0.0067367	0.0022753	0.0042303	0.0009503	0.0026805	0.0028073	0.0133699	0.0017368	0.0024947	0.0037821	-0.031028	-0.001874	0.0349627	0.0163892	0.0039838	0.0089371	0.0168911	0.0013737	0.0036064	0.0012347	0.4840172
9	3.489E-05	0.0008959	8.135E-05	0.0001831	9.348E-05	5.885E-05	0.0058135	8.914E-05	0	5.904E-05	0.0002797	0.0018248	0.0002313	0.0001892	0.0004685	0.0004392	0.0004784	0.0001574	0.0007929	-0.010999	-0.001096	0.0015599	0.0008971	0.002782	0.0077649	0.0351244	0.0009402	0.0023436	0.0007945	0.0522825
10	0.0011706	0.0010772	0.0049229	0.0120264	0.043069	0.0049838	0.0779152	0.0041829	0.0189044	0	0.2932585	0.0376523	0.007229	0.0224289	0.0032104	0.021545	0.0032094	0.0034983	-0.009235	-0.091223	-0.007395	0.0765393	0.0059634	0.0052355	0.0072487	-0.000514	0.0026142	0.0072063	0.0133088	0.5700328
11	0.0004156	0.0005962	0.001003	0.0018204	0.0025337	0.0014153	0.0049542	0.0008819	0.0018902	0.0160957	0	0.0021292	0.0024351	0.0035194	0.0010506	0.0016337	0.0011697	0.0013496	-0.000263	-0.011391	-0.000513	0.0045985	0.0010398	0.0017253	0.0017753	0.002111	0.0022461	0.0089748	0.0111857	0.0663831
12	3.269E-05	0.0006033	0.0001003	0.000161	7.497E-05	0.0003405	0.2596557	0.010401	0.3636636	7.461E-05	0.0003281	0	0.0020883	0.0004276	0.0003575	0.0005956	0.0002541	0.0001181	0.0007973	-0.008657	-0.000445	0.0246067	0.000476	0.0027652	0.003589	0.015826	0.0005113	0.0011425	0.0011213	0.6810107
13	0.0003309	0.0013783	0.0008119	0.0008198	0.0005017	0.0046063	0.0271017	0.0015304	0.0024551	0.0011186	0.0094403	0.0045709	0	0.0023754	0.0009896	0.0034595	0.0010508	0.0011403	0.0027912	-0.017102	0.0248511	0.0155433	0.0013402	0.003404	0.0222782	0.0168771	0.0020476	0.0013526	0.0031886	0.1407038
14	0.016264	0.0119272	0.0152315	0.0205469	0.0173073	0.0495744	0.2809653	0.0218313	0.1679877	0.0318297	0.1151794	0.5423861	0.0753909	0	0.0172626	0.0372804	0.0079379	0.0133028	0.0163974	-0.301155	-0.019866	0.1857338	0.0107052	0.0094429	0.012288	-0.006983	0.0126676	0.0138864	0.0270609	1.4023832
15	0.0104899	0.0249414	0.0151508	0.0356554	0.0094145	0.0199742	0.4371064	0.0168215	0.0491988	0.0354847	0.0368304	0.0821511	0.1274485	0.0629561	0	0.141969	0.0446613	0.0288922	0.0174964	-0.463658	-0.03034	0.0744588	0.0211388	0.038014	0.2113183	0.04272	0.26148	0.0285596	0.0345328	1.4148661
16	0.0001953	0.0015784	0.0021316	0.0248424	0.0002746	0.0006514	0.0020755	0.0005191	0.0028928	0.0007928	0.0009114	0.0031858	0.0009469	0.0055163	0.0010656	0	0.0025641	0.0016171	-0.008096	-0.078141	-0.003601	0.035359	0.0372552	0.0026046	-0.00132	-0.008173	0.0019489	0.005321	0.0024676	0.0373862
17	0.0006284	0.0120174	0.0027852	0.0026642	0.0003561	0.0008469	-0.006874	0.0035677	0.0266295	0.0010746	0.0037129	-0.000107	0.0003824	0.0018446	0.008378	0.0069266	0	0.2315576	0.212872	-0.63527	0.0280504	0.1019958	0.0345744	0.0010045	0.0035754	-0.00744	0.0044476	0.002563	0.0002771	0.0430712
18	0.0015318	0.0063622	0.0099904	0.0216349	0.0009504	0.0014931	0.0266832	0.013691	0.0176553	0.0041458	0.0192546	0.0126342	0.0029255	0.0105791	0.0093184	0.0064102	0.0452323	0	0.1321789	-0.331948	-0.020746	0.0991728	0.0237215	0.0052784	0.0045117	0.0605218	0.0055257	0.003945	0.0050756	0.1977293
19	0.0015632	0.001187	0.001899	0.0023866	0.0004402	0.001482	0.0337623	0.0014111	0.0098631	0.0009089	0.0025848	0.0059487	0.0010636	0.0011763	0.0015874	0.0046578	0.0015065	0.007182	0	-0.213794	-0.025928	0.0129818	0.0010034	0.0092376	0.0155448	0.1591708	0.0068659	0.0032233	0.0031474	0.0520631
20	-0.002943	-0.01417	-0.006183	-0.018716	-0.001898	-0.003916	-0.152144	-0.005745	-0.024651	-0.005669	-0.008588	-0.032832	-0.005723	-0.010794	-0.010631	-0.019899	-0.014214	-0.017312	-0.48733	0	-0.399139	-0.063958	-0.016302	-0.027284	-0.085703	-0.468278	-0.017695	-0.011909	-0.021525	-1.955155
21	0.0005695	0.0028029	0.0017672	0.0014754	0.0004395	0.0009442	0.0319087	0.0011891	0.0020656	0.0009902	0.0012135	0.0027467	0.0011191	0.0010489	0.0021531	0.001647	0.005427	0.0016264	0.0001924	-0.051081	0	0.0081559	0.0014147	0.0053749	0.0438184	-0.004401	0.0019553	0.0015762	0.0075826	0.0757217
22	0.0003367	0.0022556	0.0015702	0.0041255	0.0008815	0.0018808	0.0416648	0.0015899	0.0061088	0.0049585	0.003801	0.0136086	0.002919	0.0041999	0.0030341	0.0084604	0.0155918	0.0113182	0.0011979	-0.047575	-0.002541	0	0.0048695	0.0065481	0.0026412	0.0375017	0.0024048	0.007376	0.0059731	0.1467018
23	0.0005845	0.0023759	0.0007482	0.0009591	0.0004876	0.0008816	0.0018972	0.0006697	0.0018923	0.0010267	0.0011172	0.0007699	0.0009044	0.0009542	0.0026203	0.0020411	0.0019531	0.0015092	0.0005171	-0.008018	0.0002584	0.0015089	0	0.001609	0.0011158	0.0024016	0.0028894	0.0092086	0.0040399	0.0389229
24	0.0047274	0.0007132	0.0295988	0.0140177	0.0233889	0.0294557	0.9106463	0.0415436	0.1100899	0.0216835	0.0401099	0.3444153	0.0410112	0.0281812	0.0061265	0.0381925	0.0716779	0.0506456	0.0592609	-2.020042	-0.143237	0.1659087	0.0107798	0	-0.032081	-0.260693	0.0250244	-0.000278	0.0099177	-0.379214
25	0.0024551	0.0036539	0.0063161	0.0039149	0.0032703	0.0057009	0.0659665	0.0090341	0.0094673	0.0049516	0.0062979	0.0219079	0.0062765	0.0071364	0.0042411	0.0065007	0.0094014	0.0087127	0.0303014	-0.222207	-0.021605	0.0165454	0.0275572	0.0536025	0	-0.002384	0.0062757	0.0187674	0.0144959	0.1065547
26	0.0010361	0.001894	0.0025506	0.0046823	0.0022909	0.0023733	0.0731092	0.0024644	0.0133702	0.0039256	0.0079453	0.0157123	0.0044113	0.0040427	0.0040904	0.0054698	0.0052473	0.0035472	0.0143449	-0.107439	-0.004899	0.0187176	0.0015796	0.0185129	0.004957	0	0.0155259	0.0148465	0.007476	0.1417848
27	0.0038186	0.0096024	0.0088045	0.0301805	0.0048309	0.0117907	0.1553332	0.0075146	0.0422192	0.030357	0.0513004	0.0275144	0.0149266	0.0132259	0.0053368	0.0535606	0.0459658	0.0484254												

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2006

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	SUM
1	0	0.0122906	0.5784309	0.1087294	0.2703741	0.0350765	0.1094984	0.1725647	0.0960337	0.0546974	0.0372917	0.0354888	0.3034997	0.083183	0.0108179	0.0234379	0.0176157	0.0160713	0.02078	0.0158184	0.0338549	0.1008935	0.0274047	0.0424518	0.0192223	0.0078529	0.0047328	0.0068664	0.055922	2.3009016
2	0.037081	0	0.0470127	0.0843568	0.0542358	0.1125228	0.0700886	0.0971339	0.0789807	0.1032304	0.0899471	0.1014163	0.1464334	0.1952933	0.7421643	0.3416628	0.3698034	0.5149731	0.272565	0.0758873	0.119585	0.146612	0.1594826	0.0462246	0.2155352	0.0374114	0.1047156	0.0288883	0.0313809	4.4246246
3	0.0837583	0.003652	0	0.1498377	0.0268484	0.0054232	0.023158	0.0178718	0.0106804	0.0137956	0.009687	0.0211145	0.0265142	0.0095997	0.0036075	0.0064837	0.006957	0.0057424	0.0070633	0.006383	0.0111043	0.0129769	0.005405	0.0183642	0.0120726	0.0048543	0.0020387	0.0050996	0.0714996	0.5815929
4	0.001756	0.0008398	0.0159406	0	0.0026138	0.0020101	0.0017514	0.0037815	0.0021989	0.0045645	0.0031016	0.0016411	0.0022031	0.0020346	0.0010032	0.0019726	0.0025123	0.0017604	0.002477	0.0024037	0.0043451	0.0027006	0.0014214	0.0085214	0.0015699	0.0011309	0.0004639	0.0008278	0.0102248	0.0877721
5	0.0001606	0.000169	0.0003393	0.0004659	0	0.00053	0.0004481	0.0010174	0.0005753	0.0012325	0.000779	0.0004941	0.0004925	0.0005055	0.0002242	0.0004894	0.0006657	0.0004403	0.0006523	0.0006319	0.0011919	0.000704	0.0003305	0.0025267	0.000279	0.0001924	7.115E-05	6.042E-05	0.0001836	0.015853
6	0.0088834	0.0040493	0.0119017	0.0100694	0.0152604	0	0.3708699	0.0279944	0.0679294	0.0408048	0.0404509	0.6212867	0.0649723	0.0129364	0.0033243	0.0150325	0.0045811	0.0076426	0.0115523	0.0065784	0.007924	0.1059202	0.008157	0.0060618	0.0119658	0.0069785	0.0023463	0.0031874	0.0147494	1.5134105
7	6.152E-05	0.0001017	0.0001219	0.0001098	0.0001141	0.0001696	0	0.0040376	0.001963	0.0002406	0.0001846	0.0001382	0.0001193	0.0002869	8.238E-05	0.0001668	0.0001129	0.0001483	0.0002437	0.000122	0.0001466	0.0002194	0.0013225	0.0001849	0.000472	0.0001511	0.000135	5.222E-05	0.0004154	0.0116241
8	0.0031224	0.0102142	0.0037214	0.0090633	0.0089049	0.0069478	0.0063317	0	0.4501937	0.0273992	0.0176978	0.0110641	0.0035297	0.0130182	0.0073939	0.0188774	0.0071798	0.0121942	0.0143005	0.0053038	0.0050286	0.0299789	0.0868929	0.0024935	0.0091905	0.003451	0.0023233	0.0040637	0.0040139	0.7838945
9	0.0010631	0.0073118	0.0019465	0.0104773	0.0033885	0.0051675	0.0056851	0.0061817	0	0.010667	0.0131458	0.0136504	0.0021612	0.0055999	0.005315	0.0082957	0.0071708	0.0093891	0.0073357	0.0045111	0.0034884	0.0046904	0.0032647	0.0027603	0.0089935	0.0030323	0.0021779	0.0022634	0.0029163	0.1620504
10	0.0096355	0.025566	0.0216804	0.0446073	0.2142882	0.0350038	0.0270222	0.0380095	0.0312551	0	0.4291684	0.0316295	0.0230269	0.0803087	0.0230783	0.0479249	0.0226818	0.030236	0.0429729	0.0309163	0.0180514	0.0625091	0.0189158	0.0096744	0.018671	0.0130117	0.0138958	0.0192272	0.0212989	1.4042673
11	0.0017937	0.0024133	0.0040441	0.0108081	0.0200512	0.0041338	0.0036468	0.0034722	0.0037539	0.0544748	0	0.0032623	0.0030759	0.0088139	0.0026225	0.0041549	0.0028508	0.0032957	0.004026	0.0028556	0.0021414	0.0053641	0.0023816	0.0012224	0.004124	0.0040288	0.001828	0.0239258	0.0120896	0.2006552
12	0.0005458	0.0006911	0.0007389	0.0012599	0.001557	0.0668534	0.0647199	0.0019408	0.0496616	0.005481	0.0038295	-0.080379	0.0028514	0.001555	0.0005334	0.0020708	0.0006889	0.0009112	0.0011571	0.0005564	0.0006894	0.0130865	0.0010401	0.0004839	0.0012752	0.0006024	0.0002777	0.0003823	0.001696	0.1467575
13	0.0010722	0.0070848	0.0021767	0.0019534	0.0015864	0.016756	0.0137547	0.003372	0.0036633	0.0031585	0.0073539	0.0217144	0	0.0028176	0.0049822	0.0061507	0.005337	0.0053124	0.0096701	0.0031165	0.0380463	0.0045973	0.0070817	0.0025393	0.0239585	0.0020954	0.00249	0.0017165	0.0025322	0.2060899
14	0.0830292	0.0645805	0.078513	0.0946911	0.1188258	0.0991032	0.070051	0.1355445	0.1194009	0.1301933	0.2391713	0.0831079	0.0688899	0	0.0555948	0.1962619	0.0611094	0.0873083	0.0621722	0.0420846	0.053075	0.1441344	0.0498754	0.0169017	0.0342497	0.0209768	0.0195564	0.0227224	0.0353183	2.2864429
15	0.0555066	0.1700048	0.0612367	0.1136066	0.0748947	0.1709914	0.0960194	0.1415846	0.1128767	0.13775	0.1250088	0.1350733	0.2343199	0.3159573	0	0.3563625	0.3848793	0.3078186	0.3163656	0.0843952	0.1325741	0.1850689	0.1660263	0.0424056	0.3488467	0.0455633	0.1122951	0.0448762	0.0446688	4.516977
16	0.0019343	0.0085661	0.0060255	0.067691	0.0029297	0.0371012	0.0394049	0.0044603	0.0097451	0.0062991	0.0132345	0.1067516	0.0052363	0.0094307	0.0062243	0	0.0068931	0.0070462	0.0158955	0.0080719	0.0061284	0.0223858	0.0765392	0.0037146	0.0036827	0.0036563	0.0025804	0.006149	0.0063818	0.4941595
17	0.0026872	0.0342278	0.0040612	0.0064977	0.0055444	0.0060111	0.0059954	0.0066601	0.0269365	0.0159077	0.0113389	0.0071947	0.0219568	0.0114277	0.0224381	0.0183535	0	0.1167223	0.1884194	0.0370344	0.1444777	0.0266758	0.167938	0.0056623	0.024764	0.0085819	0.0075412	0.0023698	0.0036723	0.9410978
18	0.008998	0.0336911	0.0103654	0.0184071	0.0138616	0.013315	0.0134451	0.0199107	0.023995	0.0344705	0.024471	0.0206392	0.0127747	0.0178414	0.028654	0.0296669	0.1252723	0	0.2262636	0.0500574	0.0610441	0.044515	0.0876878	0.0082508	0.0295	0.0228137	0.0142155	0.0039932	0.0065516	1.0046716
19	0.0013121	0.0027591	0.0020183	0.0026036	0.0014571	0.0034133	0.0017318	0.0018333	0.0028164	0.0022476	0.0039259	0.0025381	0.0036031	0.0014511	0.0020387	0.0018717	0.0022476	0.0020841	0	0.0020933	0.049814	0.0032463	0.0011565	0.0017995	0.0100113	0.001238	0.0010406	0.0010147	0.0016053	0.1149725
20	0.028885	0.064603	0.0238911	0.0509235	0.026099	0.039686	0.1583869	0.0436433	0.0509618	0.0368785	0.0321521	0.0350999	0.0280926	0.0433209	0.0496131	0.059147	0.0532828	0.0742962	0.0933491	0	0.3520069	0.0986363	0.0542777	0.0257553	0.1477438	0.3257624	0.0989529	0.0173349	0.0414056	2.1541876
21	0.000269	0.0013603	0.0005266	0.0003781	0.0002702	0.0004553	0.0005678	0.0007126	0.0004831	0.0006312	0.0006454	0.0004276	0.0006417	0.0006241	0.0009809	0.0006417	0.0005656	0.0004485	0.0007777	0.0006586	0	0.0004544	0.0006532	0.0008115	0.0094671	0.0006776	0.0007122	0.0002741	0.0004959	0.0256119
22	0.0010535	0.0049395	0.0019186	0.0035346	0.006084	0.0031129	0.0072449	0.005079	0.0049799	0.009384	0.0196811	0.0059167	0.0065396	0.0049022	0.003767	0.0067491	0.0097678	0.0095213	0.0076996	0.0031964	0.0019905	0	0.0041003	0.0010638	0.0039736	0.0026745	0.002582	0.0023052	0.006817	0.1505783
23	-1.48E-05	0.0001873	0.0001324	9.425E-05	1.038E-05	7.07E-05	9.004E-05	-1.71E-05	9.149E-05	4.895E-05	0.0001717	4.694E-05	0.000157	9.464E-05	0.0008103	0.0005235	0.0003274	0.0003139	0.0003159	0.0002325	0.0001401	0.000227	0	0.0006688	-5.89E-05	9.88E-05	0.0005914	0.0021174	0.0002114	0.0076834
24	0.074867	0.0845635	0.1676087	0.2289403	0.3158701	0.2613333	0.221867	0.4944864	0.2890245	0.599477	0.3842278	0.2448695	0.2426516	0.2488978	0.1107676	0.2415072	0.3274423	0.2176974	0.3201475	0.3148548	0.5733818	0.3455906	0.1655914	0	0.1363583	0.0939994	0.0375312	0.0286032	0.0631377	6.8352948
25	0.0194822	0.03201	0.0196463	0.0210062	0.0212298	0.0195756	0.0218246	0.033174	0.0238469	0.0276034	0.0241564	0.0172709	0.0195068	0.0252591	0.0269948	0.0291843	0.0292422	0.034133	0.0543798	0.0499323	0.0313662	0.0257257	0.0265206	0.0334165	0	0.0257319	0.0121456	0.0206492	0.0159159	0.7409299
26	0.0103637	0.0227259	0.0164527	0.0355924	0.0253019	0.0238429	0.025183	0.0326868	0.0230214	0.041218	0.0293389	0.0208088	0.0183531	0.0208399	0.0193343	0.0271999	0.0250008	0.0280477	0.0320947	0.0667794	0.0468404	0.0334596	0.0152543	0.0299791	0.0219686	0	0.0188404	0.0223141	0.0293811	0.7622238
27	0.0126452	0.0443244	0.0206569	0.0433421	0.031746	0.0344109	0.0673131	0.0295248	0.0386799	0.0559691	0.064028	0.0437817	0.0268674	0.0399226	0.0316127	0.0834385	0.0793599	0.0756443	0.0627819	0.0624305	0.0363806	0.0428508	0.030338	0.008763	0.0256882	0.0273187	0	0.0198486	0.0366638	1.1763315
28	0.030086	0.0216357	0.0274672	0.0385208	0.0289382	0.0309968	0.03227	0.0261746	0.0571727	0.044699	0.0307947	0.0264014	0.0240427	0.0256813	0.0209953	0.0281369	0.0263218	0.0280185	0.0381714	0.0300801	0.0254769	0.0366306	0.0216954	0.0291723	0.0833309	0.0878089	0.0230347	0	0.0746933	0.9984482
29	0.0131247	0.0272166	0.014456	0.0325521	0.0154599	0.0178081	0.0189702	0.0165163	0.0146808	0.027626	0.0356736	0.0137784	0.0229012	0.0223809	0.0226															

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 19
Residual Matrix, Malaysia
1978

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	-0.0902	0.288965	-0.0669	-1.1E-05	-0.12246	0.250834	-0.01296	-0.1066	-0.09091	-0.10749	0.452242	-0.10133	-0.12468	-0.11519	-0.10587	-0.07505	-0.1268	-0.12102	-0.09857	-0.09832	-0.09373	-0.08783	-0.09102	-0.00021	-0.08787	-0.93297
2	-0.06157	0	-0.09946	-0.07671	-0.07379	-0.08316	-0.09039	-0.09338	-0.07348	-0.06856	0.163935	-0.09914	-0.0294	0.381935	-0.00859	-0.06001	-0.05772	-0.07911	-0.02292	-0.01827	-0.0682	-0.06343	-0.05942	-0.06155	-0.08005	-0.06443	-0.94686
3	-0.00457	-0.04844	0	0.050895	-0.04955	-0.06163	-0.0543	-0.06961	-0.0553	-0.03529	-0.0564	-0.05332	-0.05614	-0.06925	-0.06083	-0.05554	-0.04781	-0.06681	-0.06337	-0.06716	-0.05062	-0.05325	-0.04658	-0.04811	0.013239	-0.04157	-1.15131
4	-0.03119	-0.03112	-0.04989	0	-0.03552	-0.04183	-0.0459	-0.04954	-0.03655	-0.03794	-0.03549	-0.04966	-0.03867	-0.04409	-0.03946	-0.0359	-0.03074	-0.04661	-0.04072	-0.04487	-0.03495	-0.0363	-0.02949	-0.0306	-0.03079	-0.03338	-0.96121
5	-0.03117	-0.03141	-0.05034	-0.04102	0	-0.04206	-0.04615	-0.04998	-0.03691	-0.03802	-0.03566	-0.04979	-0.03879	-0.04435	-0.03975	-0.03606	-0.03091	-0.04701	-0.041	-0.04526	-0.03565	-0.03702	-0.02969	-0.03084	-0.04169	-0.03426	-0.98483
6	-0.04241	-0.04319	-0.06554	-0.05315	-0.04847	0	-0.06312	-0.06544	-0.04407	-0.05153	-0.04935	-0.06265	-0.04947	-0.06114	-0.05285	-0.04808	-0.04199	-0.029	-0.05542	-0.06194	-0.04867	-0.04858	-0.03931	-0.04263	-0.05545	-0.04114	-1.26459
7	-0.04695	-0.04619	-0.07629	-0.05775	-0.05442	-0.06324	0	0.249693	-0.05445	-0.05398	-0.05441	-0.07426	-0.0551	-0.06622	-0.05859	-0.05416	-0.04408	-0.05745	-0.06154	0.008671	-0.05295	-0.05539	-0.04307	-0.04401	-0.06122	-0.04793	-1.02529
8	-0.03138	-0.03142	-0.0505	-0.04102	-0.03597	-0.04218	-0.04625	0	-0.03455	-0.03848	-0.03573	-0.04998	-0.03906	-0.04442	-0.03967	-0.0351	-0.0309	-0.04709	-0.04111	-0.04484	-0.03556	-0.03709	-0.02969	-0.03084	-0.04124	-0.03416	-0.96824
9	-0.0419	-0.03923	-0.06221	-0.0362	2E-05	-0.04905	-0.06015	-0.05837	0	-0.03001	-0.048	-0.0638	-0.03804	-0.05831	-0.04186	-0.04009	-0.04063	-0.04157	-0.05089	-0.05512	-0.00276	-0.04536	-0.03676	-0.03709	-0.04538	-0.03587	-1.05865
10	-0.01846	-0.04096	-0.0562	-0.04688	-0.04345	-0.0476	-0.04086	-0.02237	-0.03271	0	-0.04636	-0.04084	-0.01345	-0.05593	-0.04223	-0.03807	-0.03305	-0.05314	-0.05422	-0.03925	-0.04616	-0.04832	-0.03903	-0.04099	-0.04242	-0.04128	-1.02422
11	-0.04113	-0.02171	-0.07107	-0.05386	-0.05578	-0.05348	-0.05829	-0.06842	-0.05162	-0.03943	0	-0.06777	0.000611	-0.05663	-0.05777	-0.05574	-0.05059	-0.07124	0.193185	-0.0523	-0.04173	-0.00735	-0.04484	-0.05251	-0.05019	-0.04519	-0.97486
12	-0.03316	-0.03281	-0.05473	-0.04491	-0.03924	-0.04398	-0.04913	-0.0456	-0.04008	-0.04136	-0.03945	0	-0.04113	-0.04776	-0.04305	-0.03853	-0.00519	-0.05104	-0.04432	-0.04638	-0.03575	-0.02176	-0.03191	-0.03435	-0.04047	-0.03669	-0.98277
13	-0.04017	-0.04137	-0.05935	0.030477	-0.04046	-0.04969	-0.05983	-0.03514	-0.04082	-0.02699	-0.04855	-0.06312	0	-0.05892	-0.0774	-0.01177	-0.04012	-0.0435	-0.05401	0.032055	-0.03457	-0.04965	-0.03672	-0.03899	-0.05347	-0.04176	-0.98382
14	-0.04216	-0.03878	-0.06578	-0.05269	-0.0497	-0.05792	-0.06186	-0.05652	-0.04988	-0.04983	-0.04765	-0.06798	-0.05101	0	0.104281	-0.01965	-0.02902	-0.02903	-0.05284	0.011467	-0.04766	-0.0498	-0.03947	-0.03991	-0.0539	-0.04262	-0.97993
15	-0.03199	-0.03453	-0.03559	-0.02849	-0.03992	-0.04728	-0.04958	-0.05374	-0.04046	-0.03193	-0.03493	-0.05366	-0.04158	-0.04848	0	-0.03862	-0.03209	-0.05129	-0.04334	-0.02303	-0.03685	-0.04098	-0.03133	-0.03372	-0.0443	-0.03644	-0.98417
16	-0.03558	-0.03187	-0.06032	-0.04531	-0.04443	-0.05058	-0.05034	-0.05926	-0.04221	-0.04441	-0.04169	-0.05736	-0.04249	-0.04905	-0.04	0	-0.02995	-0.02034	-0.04159	-0.0243	-0.04293	-0.04314	-0.0281	-0.0365	-0.04323	-0.03597	-1.04092
17	-0.03103	-0.03146	-0.05086	-0.04139	-0.03609	-0.04312	-0.04537	-0.05019	-0.0376	-0.03893	-0.03672	-0.05046	-0.03896	-0.04533	-0.0406	-0.0369	0	-0.04802	-0.04184	-0.04585	-0.03585	-0.01657	-0.03057	-0.03196	-0.03304	-0.03313	-0.97184
18	-0.03914	-0.03904	-0.06278	-0.05009	-0.04356	-0.04435	-0.05761	-0.06109	-0.04259	-0.04706	-0.04462	-0.06207	-0.04809	-0.05533	-0.04929	-0.0444	-0.03855	0	-0.051	-0.05629	-0.04376	-0.0458	-0.03624	-0.03793	-0.05044	-0.04	-1.19115
19	-0.04289	-0.0205	-0.06288	-0.03773	-0.04651	-0.02145	-0.05118	-0.04617	-0.03361	-0.02588	-0.04231	-0.0576	-0.00462	-0.04551	-0.04329	-0.03992	-0.04122	-0.04534	0	-0.05081	-0.03372	-0.04563	-0.02842	-0.03826	-0.01095	-0.0325	-0.9489
20	-0.03577	-0.0299	-0.05789	-0.04548	-0.0419	-0.04719	-0.05157	-0.05507	-0.03954	-0.04246	-0.04108	-0.05618	-0.04156	-0.04901	-0.04419	-0.04082	-0.03671	-0.05143	-0.03249	0	-0.02627	-0.03888	-0.02511	0.005558	-0.04131	0.009102	-0.95713
21	-0.05113	-0.05147	-0.06661	-0.03611	-0.04269	-0.02268	-0.07806	-0.0422	0.002106	-0.01309	-0.06834	-0.0612	-0.02232	-0.07354	-0.012	0.018811	-0.05191	0.043258	-0.00594	-0.02206	0	-0.04688	-0.06085	-0.06917	-0.04018	-0.05846	-0.93269
22	-0.0425	-0.03574	-0.04636	-0.04221	-0.02217	-0.04965	-0.01037	-0.03178	-0.04066	-0.04254	-0.0473	-0.05859	-0.04163	-0.05515	-0.04588	-0.04046	-0.03589	-0.05409	-0.04529	-0.04007	-0.02428	0	-0.03671	-0.04527	-0.04569	-0.03407	-1.01435
23	-0.03482	-0.0343	-0.05504	-0.04231	-0.03827	-0.04299	-0.04911	-0.05069	-0.03289	-0.03883	-0.04028	-0.05413	-0.03985	-0.04897	-0.04103	-0.03579	-0.03394	-0.04341	-0.04024	-0.04721	-0.02198	-0.03258	0	-0.02586	-0.02784	-0.02935	-0.98172
24	-0.04102	-0.03498	-0.06242	-0.04453	-0.043	-0.043	-0.05103	-0.04476	-0.03323	-0.0401	-0.04653	-0.06174	-0.0391	-0.05376	-0.04147	-0.03992	-0.03829	-0.0436	-0.04716	-0.03928	-0.00264	-0.01804	-0.03932	0	-0.02064	-0.03672	-1.00629
25	-0.04853	-0.03427	-0.0684	-0.01873	-0.02213	-0.0525	-0.05894	-0.04693	-0.02706	-0.01901	-0.05368	-0.07141	-0.03693	-0.06111	-0.04159	-0.0446	-0.04371	-0.03979	-0.04811	-0.04381	-0.00331	-0.00498	-0.04042	-0.0394	0	-0.01014	-0.97948
26	-0.03227	-0.03174	-0.05073	-0.04067	-0.03612	-0.04132	-0.04655	-0.04848	-0.03519	-0.03768	-0.03679	-0.05023	-0.03805	-0.04472	-0.03869	-0.03559	-0.03129	-0.04589	-0.04149	-0.04343	-0.02642	-0.0336	-0.03059	-0.03031	-0.03813	0	-0.96596
SUM	-0.93289	-0.94663	-1.15225	-0.96276	-0.98314	-1.26439	-1.02508	-0.96801	-1.05997	-1.02424	-0.97487	-0.9847	-0.98614	-0.97972	-1.01101	-1.01282	-0.97133	-1.18932	-0.94869	-0.95791	-0.93158	-1.01412	-0.98149	-1.00626	-0.97899	-0.96581	-26.2141

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1983

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.00718577	0.44126962	0.05792317	0.1161482	0.00226064	0.40064549	0.14289488	0.00761258	0.02879024	0.00168407	0.61294783	0.01913743	0.01177677	0.00773106	0.00593468	0.02125903	0.01953351	0.00567572	0.04175609	0.01263205	0.02352809	0.00362239	0.00343834	0.1342038	0.01717829	2.14676973
2	0.00581262	0	0.00865792	0.00837798	0.00254689	0.00764935	0.00816972	0.01149314	0.00346084	0.01143834	0.19180429	0.01356707	0.03826595	0.49719165	0.0781409	0.0197816	0.00880718	0.02499105	0.05125476	0.08201104	0.00765363	0.01369361	0.00397529	0.00434216	0.00754204	0.0082898	1.11891881
3	0.04502837	0.0020705	0	0.11402425	0.00706681	0.00627377	0.01855912	0.01094401	0.00412229	0.02626447	0.00081658	0.02763569	0.0044216	0.00217789	0.00335457	0.00279794	0.00191692	0.00984656	0.00260318	0.00520056	0.00685268	0.00669928	0.00096051	0.00123429	0.07921981	0.01324643	0.40333809
4	6.821E-05	0.00024361	0.00044733	0	0.00035172	0.00022037	0.00023918	0.00045051	0.00042074	0.0005813	8.6433E-05	0.00018293	0.00036136	0.00018191	0.0003324	0.00024629	0.00012325	0.00040024	0.00026921	0.00035178	0.00069246	0.00084709	9.6055E-05	0.00012781	0.01120788	0.00078223	0.0193123
5	0.00020885	3.3011E-05	0.00015421	0.00013179	0	9.5338E-05	0.00010439	0.00015326	0.0001448	0.00052948	3.107E-05	0.00019718	0.0003491	4.5386E-05	0.00011896	0.0001278	4.1171E-05	0.00015783	5.9657E-05	0.00011794	4.1668E-05	8.8381E-05	1.953E-05	1.0095E-05	9.9589E-05	4.8902E-05	0.0031094
6	0.00121373	0.00043943	0.00483295	0.00428069	0.00137149	0	0.00118658	-0.0021919	0.00811085	0.00199852	0.00017174	0.00795466	0.00548705	0.00036673	0.00288727	-0.0013649	0.00050706	0.04792006	0.00173271	0.00102109	0.00095098	0.00345638	0.00233122	0.00014675	0.00263714	0.00700139	0.10444957
7	0.00145831	0.00255763	0.00165699	0.00565749	0.00114028	0.00179062	0	0.3261329	0.00250191	0.00536146	0.00045907	0.00240561	0.0051728	0.00251802	0.00242278	0.00142759	0.0037947	0.01724822	0.00191329	0.07845859	0.00213943	0.00197253	0.00320835	0.00360424	0.00341235	0.00520218	0.48361734
8	4.0886E-05	8.6746E-05	9.7431E-05	0.00014082	0.00021317	8.0181E-05	0.00010366	0	0.0032618	0.00019472	3.0339E-05	8.3786E-05	0.00013495	7.441E-05	0.00034322	0.0009443	0.00011033	0.00017086	8.6903E-05	0.0005958	0.00026895	0.00014702	1.8871E-05	5.7774E-05	0.00068015	0.00023528	0.00820236
9	0.00260474	0.00622897	0.0098292	0.01852489	0.05355356	0.01050154	0.00545209	0.01371961	0	0.02650957	0.00237331	0.00756281	0.01757819	0.00504747	0.01565694	0.01241633	0.00369203	0.02682613	0.00752273	0.0108338	0.05027064	0.00755967	0.00406846	0.00565835	0.01315842	0.01357457	0.35072403
10	0.02405629	0.0019588	0.01334725	0.00934873	0.00590068	0.00861282	0.02150447	0.04990353	0.01667187	0	0.00294669	0.02656379	0.03950335	0.00477573	0.01232403	0.01184717	0.00937861	0.00885544	0.0020381	0.02373214	0.00261612	0.00238223	0.00188491	0.00153859	0.01492783	0.00573639	0.32235558
11	0.01479231	0.03723236	0.02019024	0.0210406	0.00687695	0.01851111	0.02363136	0.02255581	0.01545964	0.03024514	0	0.05005134	0.043265	0.02501578	0.01421722	0.0095365	0.00632401	0.01299628	0.26938644	0.02759966	0.0216205	0.05975058	0.00862222	0.00333118	0.02593318	0.01713478	0.8053202
12	0.00215438	0.00257985	0.00229166	0.00167191	0.00163216	0.00380666	0.00361386	0.00912359	0.00203618	0.00184536	0.0006311	0	0.00316905	0.0024482	0.00217279	0.00228685	0.03039433	0.00217695	0.00228288	0.00473907	0.00465502	0.02223017	0.00194454	0.00050588	0.00736764	0.00208781	0.11984791
13	0.00387756	0.00307304	0.0119093	0.0940066	0.0112091	0.00963113	0.0047834	0.03797221	0.01196482	0.02799699	0.00133786	0.00678321	0	0.00354669	-0.0042398	0.01840061	0.00311145	0.02409847	0.00361649	0.09646495	0.01683147	0.00273816	0.005652	0.00431994	0.00561068	0.00667056	0.41136685
14	0.00228609	0.00588687	0.00560809	0.00461855	0.00119562	0.00157291	0.0036009	0.01343091	0.00148423	0.00456278	0.00205966	0.00255627	0.00370142	0	0.15857247	0.03369129	0.0148319	0.04285894	0.00518438	0.07692593	0.00268519	0.00286851	0.00285303	0.0038131	0.00525037	0.00621291	0.40831233
15	0.00404444	0.00154376	0.02246242	0.01787997	0.00158298	0.00106217	0.00370981	0.00338495	0.00215268	0.01305068	0.00658575	0.00325927	0.00309122	0.00095163	0	0.00247161	0.00319926	0.00055329	0.00391458	0.02899535	0.0046114	0.00162117	0.00317004	0.00176001	0.00402401	0.00308825	0.14217071
16	0.00656928	0.01071626	0.00644339	0.00932811	0.00336925	0.00456608	0.01246526	0.0065615	0.00705414	0.00651356	0.00467056	0.00939718	0.00822011	0.01027664	0.01253045	0	0.01170258	0.05839028	0.01391114	0.03640472	0.00399912	0.00641875	0.01149959	0.00460088	0.0104124	0.01022268	0.28624392
17	0.00174787	0.00107059	0.00189487	0.0014371	0.00154618	0.00065906	0.00302987	0.0021351	0.00099621	0.00117118	0.00060737	0.00168347	0.00160635	0.00076684	0.0007231	0.00072222	0	-0.0004626	0.00105017	0.00118961	0.00114031	0.02240031	0.0004227	0.00022423	0.01041368	0.00270703	0.06088285
18	0.00022381	0.00058221	0.00065808	0.00182482	0.00207965	0.0054713	0.00045433	0.0022325	0.0046612	0.00173886	0.000154	0.00076014	0.00106159	0.00053116	0.00086124	0.00124523	0.00034271	0	0.00066447	0.00084456	0.00119032	0.00103046	0.00120874	0.00014314	0.00230684	0.00341138	0.03568274
19	0.00381352	0.02904546	0.01257756	0.02228578	0.00624458	0.03603573	0.01637016	0.02942214	0.02071427	0.03229574	0.00822476	0.01555853	0.05028411	0.02135375	0.01557649	0.01318245	0.00543052	0.02096574	0	0.01734713	0.0191488	0.00992754	0.01189628	0.00737275	0.05213101	0.01790278	0.49510758
20	0.00235817	0.00926123	0.00393023	0.00496802	0.00213262	0.00420905	0.00393642	0.00606777	0.00570891	0.00484385	0.00185384	0.00494404	0.00597909	0.00589143	0.0046967	0.0037553	0.0012121	0.00689702	0.01836549	0	0.01741088	0.00701123	0.01206035	0.04318236	0.00982408	0.05256023	0.2430615
21	0.02602973	0.02895043	0.0591069	0.06791692	0.04615904	0.08283309	0.03451212	0.08550049	0.09891689	0.08406303	0.01758652	0.06502496	0.07604987	0.03502492	0.08803691	0.11283614	0.02573406	0.19659608	0.09394174	0.09316615	0	0.04812667	0.01360997	0.00704484	0.06645331	0.02866983	1.58189063
22	0.00617807	0.00575709	0.0324878	0.02296394	0.03589387	0.01671183	0.06737438	0.05061198	0.01699431	0.01550032	0.01365753	0.01967129	0.01802543	0.00748181	0.01512795	0.01527652	0.01265706	0.01869209	0.01971439	0.02646807	0.02437804	0	0.01100516	0.00297998	0.01829676	0.01930367	0.51320934
23	0.00135963	0.00221651	0.00341674	0.00534146	0.00348974	0.00593811	0.00435971	0.00761677	0.01024169	0.00610128	0.00092624	0.00374302	0.00552959	0.00228107	0.00519888	0.00652067	0.00194363	0.01303183	0.00799815	0.00463577	0.01960997	0.01103819	0	0.0089853	0.02126993	0.01067321	0.17346708
24	0.00314801	0.00996777	0.00903701	0.0143608	0.00733637	0.0158898	0.01383167	0.02649534	0.01840323	0.01398234	0.00335028	0.00875661	0.01562481	0.00889562	0.01458569	0.01198901	0.00515774	0.02423426	0.01121768	0.02591653	0.04882144	0.0361256	0.00216936	0	0.03779318	0.01113086	0.39822101
25	0.00608088	0.02141685	0.02079375	0.05073183	0.03648501	0.02042163	0.02147148	0.04184174	0.03821228	0.05071825	0.00786501	0.01623242	0.03205725	0.01700982	0.02939078	0.02103361	0.010471	0.0484495	0.02378303	0.0335545	0.06124524	0.06333189	0.01028236	0.01289995	0	0.04827868	0.74405875
26	0.00048986	0.0011755	0.0020677	0.00243819	0.0016036	0.00258331	0.00179456	0.00417376	0.00374428	0.00274886	0.00039832	0.00202994	0.00289909	0.00138442	0.0030014	0.00252445	0.00108408	0.00422004	0.00140649	0.00294812	0.01206337	0.0059203	0.00043063	0.00186334	0.00563161	0	0.07062522
SUM	0.16564564	0.19128025	0.69516864	0.56122441	0.35712951	0.26738759	0.674904	0.90262645	0.30505265	0.39904634	0.27031237	0.90955305	0.40097575	0.66701575	0.48376438	0.30963122	0.1832267	0.62964812	0.54959376	0.72127896	0.34352972	0.3609149	0.11701255	0.12318528	0.5498077	0.31135011	11.4502658

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1991

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.0048	0.437712	0.055871	0.093677	0.006143	0.467734	0.148823	0.006965	0.025133	0.001679	0.533863	0.015375	0.008436	0.006752	0.004538	0.016752	0.013835	0.004209	0.029944	0.009543	0.017585	0.002765	0.00308	0.103024	0.014373	2.032613
2	0.006503	0	0.010497	0.008435	0.00394	0.003915	0.009975	0.011624	0.006306	0.043924	0.446702	0.015934	0.034557	0.269205	0.074922	0.014943	0.006998	0.023534	0.039112	0.062464	0.006571	0.018282	0.003741	0.003925	0.006145	0.008158	1.140311
3	0.068105	0.001986	0	0.129092	0.008341	0.005026	0.038314	0.017071	0.004377	0.031595	0.001815	0.03169	0.00634	0.002482	0.003631	0.002533	0.002474	0.007295	0.002912	0.00512	0.005865	0.007081	0.001812	0.001822	0.06889	0.013925	0.469594
4	0.000161	0.000194	0.000412	0	0.0004	0.000214	0.000324	0.000413	0.000364	0.000545	0.000131	0.00019	0.00032	0.000172	0.000289	0.000209	0.000117	0.000445	0.000227	0.000351	0.000565	0.001327	0.000153	0.000134	0.008685	0.000721	0.017062
5	0.000181	7.68E-05	0.000344	0.000541	0	0.000219	0.000224	0.000464	0.002305	0.000474	0.000114	0.000407	0.000612	0.000145	0.000274	0.000243	0.00012	0.000379	0.000108	0.000189	0.000251	0.000465	4.94E-05	7.71E-05	0.000153	0.000138	0.008552
6	0.000861	0.000405	0.003545	0.003016	0.00178	0	0.00121	0.005722	0.005778	0.00168	0.000265	0.009294	0.003766	0.000657	0.002054	0.001858	0.001675	0.030491	0.001222	0.000921	0.000922	0.002587	0.001943	0.000259	0.002226	0.005563	0.089701
7	0.001689	0.001748	0.001579	0.004125	0.001031	0.001438	0	0.266897	0.002553	0.00437	0.00027	0.003151	0.00391	0.00226	0.00285	0.001387	0.002523	0.011736	0.001375	0.060881	0.001893	0.001616	0.001827	0.002997	0.002499	0.004084	0.390686
8	8.79E-05	9.51E-05	0.000131	0.000182	0.000187	0.000487	0.000519	0	0.00166	0.000172	8.23E-05	0.000191	0.000183	0.000115	0.000248	0.000757	0.000137	0.00022	0.000127	0.00061	0.000247	0.000197	0.00014	0.000104	0.001041	0.000363	0.008284
9	0.004486	0.005699	0.011893	0.022192	0.07297	0.0113	0.009118	0.01645	0	0.020068	0.00466	0.010584	0.019174	0.006071	0.013599	0.010606	0.004857	0.023302	0.007965	0.010709	0.04175	0.008318	0.006799	0.010559	0.01443	0.014335	0.381895
10	0.025714	0.00242	0.018461	0.013222	0.007336	0.01052	0.025163	0.042284	0.019952	0	0.004857	0.025485	0.054556	0.006012	0.018251	0.010096	0.010865	0.015164	0.004051	0.020531	0.002679	0.003456	0.00162	0.001587	0.01374	0.006207	0.364229
11	0.013692	0.025442	0.01776	0.015318	0.006736	0.018902	0.022099	0.017682	0.013505	0.021103	0	0.044747	0.025223	0.024663	0.012481	0.007747	0.005193	0.011394	0.207163	0.024487	0.017298	0.054136	0.007066	0.002997	0.021498	0.014132	0.652464
12	0.001719	0.001955	0.001824	0.001348	0.001246	0.003001	0.002376	0.013844	0.001441	0.001541	0.000493	0	0.002746	0.00188	0.001801	0.001887	0.027358	0.002331	0.001359	0.003413	0.003114	0.017038	0.001123	0.000379	0.004911	0.002286	0.102416
13	0.003798	0.002172	0.014328	0.096552	0.022097	0.010489	0.011914	0.034005	0.012821	0.021284	0.002867	0.010275	0	0.013689	0.013673	0.013181	0.014664	0.026141	0.003852	0.100423	0.009841	0.003899	0.003611	0.004018	0.004859	0.008559	0.463012
14	0.001568	0.003517	0.004608	0.006258	0.001685	0.00148	0.002766	0.010038	0.002078	0.003244	0.001528	0.002612	0.006432	0	0.139423	0.021474	0.013899	0.026323	0.003857	0.070489	0.002136	0.002204	0.001784	0.003058	0.003718	0.004823	0.341002
15	0.004409	0.001616	0.023133	0.045357	0.004034	0.001574	0.005516	0.012951	0.003626	0.010879	0.012134	0.006269	0.005233	0.02476	0	0.010354	0.006213	0.004358	0.005461	0.035906	0.003609	0.00269	0.002232	0.001712	0.003622	0.005676	0.243323
16	0.007917	0.010075	0.011259	0.011925	0.01236	0.00707	0.01549	0.016307	0.00952	0.008106	0.008401	0.011862	0.014936	0.015246	0.019807	0	0.019402	0.035785	0.009862	0.038241	0.004662	0.009686	0.011278	0.003997	0.01152	0.043495	0.368212
17	0.00423	0.003494	0.006123	0.004431	0.003412	0.002389	0.00754	0.005223	0.003133	0.003026	0.004563	0.005276	0.006041	0.003912	0.004941	0.004199	0	0.002764	0.002052	0.006534	0.003502	0.045115	0.002065	0.001374	0.009625	0.016365	0.161326
18	0.001007	0.00104	0.0014	0.001764	0.001596	0.008035	0.001797	0.002258	0.003681	0.001509	0.001559	0.001335	0.001992	0.000515	0.001285	0.001175	0.000669	0	0.000972	0.001136	0.001243	0.001585	0.001825	0.001101	0.0037	0.004251	0.048428
19	0.006288	0.017756	0.019122	0.027631	0.012141	0.038461	0.022925	0.030837	0.022786	0.034338	0.009229	0.02442	0.057597	0.04763	0.021852	0.015911	0.010032	0.025892	0	0.018205	0.033551	0.011558	0.023307	0.009581	0.04234	0.025112	0.608501
20	0.002855	0.00604	0.004779	0.005125	0.002896	0.00443	0.006403	0.006821	0.005921	0.004609	0.001569	0.005428	0.006915	0.007126	0.005053	0.003573	0.001888	0.006161	0.021808	0	0.015266	0.0077	0.011049	0.037327	0.009464	0.053967	0.244172
21	0.031256	0.02304	0.065445	0.074469	0.059325	0.077925	0.048252	0.082933	0.090372	0.071546	0.037745	0.066061	0.077153	0.092056	0.095942	0.112146	0.051698	0.157132	0.081325	0.089623	0	0.047404	0.014736	0.009644	0.058681	0.036482	1.652394
22	0.010161	0.016707	0.043432	0.023203	0.034891	0.016799	0.058731	0.041092	0.018683	0.017907	0.018871	0.026105	0.025896	0.021751	0.022491	0.015929	0.014256	0.021865	0.01857	0.032122	0.040155	0	0.01298	0.005347	0.020766	0.032696	0.611406
23	0.002068	0.002311	0.004455	0.005242	0.004616	0.006106	0.005642	0.00812	0.010134	0.005428	0.002313	0.005111	0.006292	0.003987	0.005765	0.005792	0.002635	0.009963	0.006813	0.006732	0.018669	0.010961	0	0.016744	0.021179	0.012906	0.189982
24	0.005089	0.009724	0.012702	0.015516	0.018255	0.017434	0.017751	0.025568	0.021839	0.014206	0.008774	0.013771	0.018646	0.014925	0.017186	0.011875	0.008271	0.02241	0.012337	0.021842	0.052437	0.041745	0.011627	0	0.035836	0.017651	0.467416
25	0.016942	0.024806	0.02833	0.042254	0.039229	0.023621	0.034285	0.044928	0.040887	0.041869	0.021361	0.024354	0.036705	0.021248	0.029346	0.018505	0.016263	0.039405	0.034893	0.035976	0.057968	0.063498	0.026028	0.027715	0	0.064317	0.854733
26	0.000756	0.001113	0.002241	0.002077	0.001776	0.002479	0.002026	0.003491	0.003178	0.002432	0.000884	0.002694	0.002722	0.001648	0.002519	0.001791	0.00101	0.002976	0.004738	0.003615	0.008562	0.004198	0.001103	0.001993	0.004413	0	0.066434
SUM	0.221542	0.168233	0.745514	0.615144	0.415957	0.279457	0.818096	0.865847	0.313865	0.390987	0.592868	0.881106	0.433321	0.590592	0.516435	0.292708	0.239969	0.521299	0.476371	0.680464	0.342299	0.384331	0.152663	0.151531	0.476964	0.410586	11.97815

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.0056288	0.4108338	0.0572063	0.1226826	0.0114895	0.4344678	0.127768	0.0238861	0.0505979	0.003336	0.4235673	0.0174433	0.0112436	0.008032	0.0068337	0.0203617	0.0171035	0.0052224	0.0302927	0.0100537	0.0181743	0.003157	0.0038314	0.1120592	0.0153666	1.950639
2	0.0130077	0	0.0168537	0.008434	0.0046589	0.0071315	0.0130432	0.0125972	0.008454	0.0251203	0.2678783	0.0141657	0.0434596	0.3020324	0.0722827	0.019517	0.0066871	0.0101868	0.0483202	0.0600983	0.0063808	0.0220515	0.0032459	0.0045921	0.0101306	0.0099057	1.010235
3	0.0674787	0.0022409	0	0.1353843	0.012649	0.0104902	0.0350661	0.0130875	0.0087662	0.0742002	0.0033105	0.0196655	0.0073669	0.0055054	0.004523	0.0032609	0.0038402	0.0093131	0.0065295	0.0063361	0.0071461	0.010922	0.0029361	0.0025497	0.0947687	0.0198152	0.567152
4	0.0001773	0.0001994	0.0008589	0	0.0004218	0.0003253	0.0003067	0.0004041	0.00045	0.0014739	0.0001441	0.0002129	0.0003873	0.0002685	0.0003145	0.0002245	0.0001515	0.0004953	0.0002622	0.0003792	0.0005651	0.0005719	0.0001332	0.0001868	0.0095605	0.0007293	0.019204
5	0.0001277	3.237E-05	0.0001007	8.754E-05	0	8.502E-05	6.944E-05	0.0001254	0.000109	0.0003536	1.769E-05	0.0001771	0.0002222	4.256E-05	9.993E-05	0.0001303	2.278E-05	0.0001829	8.741E-05	0.000111	4.485E-05	8.598E-05	7.169E-06	2.146E-05	9.8E-05	4.444E-05	0.002487
6	0.0012046	0.0004467	0.0033276	0.0031181	0.0015159	0	0.0011474	0.0091441	0.0061856	0.0017318	0.000229	0.0062701	0.004047	0.000616	0.0022653	0.0021517	0.009254	0.0338159	0.00146	0.0013372	0.0010022	0.0029975	0.0017032	0.0002084	0.0023556	0.0062046	0.103739
7	0.001885	0.0020519	0.0015336	0.0044664	0.0007932	0.0013516	0	0.2548053	0.0067786	0.0039427	0.0004864	0.0014845	0.0036319	0.0026542	0.0029239	0.0026163	0.0040955	0.0137743	0.001977	0.063304	0.0018574	0.0015939	0.0025906	0.0041564	0.0027972	0.0058021	0.393354
8	9.334E-05	8.745E-05	0.0001183	0.0002084	0.000193	0.0001844	0.0001574	0	0.0020421	0.0001833	5.336E-05	0.00049	0.0002912	0.0001492	0.000298	0.0012019	0.000508	0.0003533	0.0001305	0.0006445	0.000199	0.0001906	0.0001265	9.239E-05	0.0005848	0.0002187	0.008799
9	0.0027701	0.0048209	0.0165645	0.0297849	0.0347308	0.0112586	0.0078538	0.0141521	0	0.021374	0.0017406	0.0093807	0.0181473	0.0052885	0.0150019	0.0097341	0.0038897	0.0252064	0.0087162	0.0090526	0.0345744	0.0063018	0.0043684	0.0082184	0.0153762	0.0146668	0.332973
10	0.0297834	0.0022546	0.020258	0.0176051	0.0060286	0.0249271	0.0274207	0.0382105	0.0246382	0	0.0105742	0.0301897	0.0474813	0.0133706	0.013846	0.0122877	0.0138043	0.0143107	0.0016322	0.0215173	0.0020532	0.0045612	0.0019344	0.0017153	0.0138365	0.0061571	0.400398
11	0.0368559	0.0302557	0.0405937	0.0217058	0.0107369	0.0222667	0.037878	0.02194	0.0217035	0.0518997	0	0.0431523	0.0399739	0.0285729	0.0138439	0.0090128	0.0060006	0.0139582	0.2083003	0.0246833	0.0168236	0.0732759	0.0074875	0.0023705	0.0258239	0.0159384	0.825054
12	0.003287	0.0018617	0.0020305	0.001783	0.0014276	0.004314	0.0033582	0.0088439	0.0015101	0.0020176	0.0004776	0	0.0030231	0.0030963	0.0046562	0.0020307	0.0187207	0.0027419	0.00172	0.0046023	0.0030209	0.015544	0.000948	0.000372	0.0049375	0.0016149	0.09794
13	0.004991	0.0021394	0.0114207	0.0781414	0.0073799	0.017963	0.0054559	0.0431762	0.0088197	0.0200584	0.001046	0.0073359	0	0.0089745	0.0074923	0.0066073	0.0125636	0.022159	0.0040225	0.1074994	0.0110837	0.0029552	0.0031398	0.0025725	0.005235	0.0044415	0.406674
14	0.0019148	0.0039595	0.0043465	0.0035601	0.0010464	0.001557	0.0026714	0.0114689	0.0022362	0.0039419	0.0019103	0.0033158	0.0037347	0	0.1327317	0.0215228	0.014546	0.0413579	0.0039872	0.0799729	0.0023404	0.0019444	0.0006176	0.0025088	0.0041301	0.0040775	0.355401
15	0.0031633	0.0016832	0.0171339	0.0443157	0.0012412	0.0023164	0.0051898	0.0117538	0.0036789	0.0115782	0.0049167	0.0063461	0.0058954	0.0111769	0	0.0081828	0.0065135	0.0086401	0.0058336	0.0324768	0.0031834	0.0021902	0.0037327	0.0013684	0.0040216	0.0027136	0.209246
16	0.0076868	0.0099405	0.0095693	0.0199947	0.0056716	0.0083262	0.012129	0.0113791	0.008911	0.0096543	0.0096036	0.0103796	0.0113816	0.0160365	0.0202709	0	0.0219478	0.0458578	0.0164129	0.0379914	0.0047421	0.0125805	0.0351635	0.0068507	0.014855	0.0123187	0.379655
17	0.0043051	0.0025514	0.0029168	0.0019403	0.0021955	0.0013107	0.004581	0.0079071	0.0017356	0.00232	0.0012789	0.0013432	0.001925	0.0010282	0.0014066	0.0014338	0	0.0022888	0.0025242	0.0025013	0.0021283	0.0311508	0.0014866	0.0006598	0.0087232	0.009846	0.101488
18	0.0004159	0.0006756	0.000967	0.0015664	0.0016435	0.0089525	0.0007001	0.0024951	0.0036257	0.0015538	0.0004764	0.0010382	0.0013631	0.0002345	0.0010124	0.0011046	0.0007958	0	0.0015688	0.000948	0.0010469	0.00131	0.0016829	0.0015631	0.0028131	0.0042092	0.043763
19	0.0094362	0.0189525	0.0451423	0.0310474	0.0126855	0.0484571	0.0285046	0.0292402	0.0353098	0.0447223	0.0148797	0.0339416	0.0631495	0.053293	0.0273518	0.0150896	0.0159557	0.0280049	0	0.0223561	0.0222307	0.0158736	0.0200647	0.0153153	0.051396	0.0261129	0.728513
20	0.0028478	0.0071182	0.0048053	0.006149	0.0027352	0.0054621	0.0053709	0.0064613	0.0082285	0.0064107	0.0024063	0.0076673	0.0101782	0.0067935	0.0051807	0.0034495	0.0032638	0.0071359	0.0140321	0	0.0154016	0.0065242	0.0077521	0.0311555	0.0102591	0.0375884	0.224377
21	0.0364255	0.0225439	0.0638653	0.0701515	0.0517052	0.0804701	0.0464367	0.0801589	0.0938818	0.0836505	0.0321202	0.0597236	0.0715552	0.0617645	0.0814249	0.1038282	0.0528676	0.1510544	0.0725866	0.0883439	0	0.0460755	0.0157619	0.0081661	0.0590929	0.0256273	1.559282
22	0.0096127	0.0155638	0.0329748	0.0197789	0.0340868	0.0169149	0.0623333	0.0477644	0.0204677	0.0211407	0.0097305	0.0188834	0.0200219	0.0139772	0.0161784	0.0145065	0.0125221	0.0205907	0.0173307	0.0317219	0.0256726	0	0.0147345	0.0049871	0.0227671	0.0211392	0.545402
23	0.0023628	0.0019696	0.0048158	0.0057189	0.0056314	0.0074524	0.0052986	0.0101083	0.0108977	0.0068151	0.0017949	0.0047143	0.0074243	0.003862	0.0062652	0.005679	0.0034398	0.0101373	0.0084164	0.0076033	0.0196012	0.013909	0	0.0197664	0.0233023	0.0122504	0.209236
24	0.0034821	0.0078834	0.0082694	0.0109449	0.0077528	0.014894	0.012586	0.0215729	0.0161327	0.0131457	0.0036808	0.0081352	0.0133455	0.0100308	0.0125629	0.009654	0.0051018	0.0208457	0.0129939	0.0254823	0.0452288	0.028599	0.0105426	0	0.0338703	0.0137008	0.370438
25	0.0110254	0.0200141	0.0263597	0.0429487	0.0392099	0.0238306	0.0270768	0.0372062	0.0397966	0.0439557	0.0119893	0.0223437	0.0309959	0.0244292	0.0284416	0.0178746	0.0157634	0.0408775	0.0447369	0.0380164	0.0627262	0.0865603	0.0214214	0.0206926	0	0.061592	0.839885
26	0.0004561	0.0010467	0.0018262	0.0016929	0.001425	0.0022462	0.0014845	0.0029362	0.0027725	0.0022081	0.0003073	0.0020208	0.0021902	0.0011592	0.0023333	0.0018225	0.0004892	0.0032725	0.0027504	0.0033701	0.008333	0.0038523	0.0007189	0.0025641	0.0046425	0	0.057921
SUM	0.2547961	0.1659222	0.7474863	0.6177344	0.370248	0.3339771	0.7805875	0.8247066	0.3610178	0.5040503	0.3843886	0.7359445	0.4286354	0.5855998	0.4807399	0.2797566	0.2531062	0.5436647	0.4915543	0.7006424	0.3074401	0.4097956	0.165457	0.1464853	0.5374365	0.3320812	11.74325

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.0099807	0.4381132	0.0781858	0.1024196	0.087528	0.3948267	0.2384352	0.0589146	0.0543174	0.0210341	0.1064946	0.0254569	0.0108647	0.0127634	0.0174731	0.0160447	0.0163421	0.009694	0.0280247	0.0245333	0.0118807	0.0046785	0.0066973	0.0151344	0.0178225	1.8076602
2	0.0125014	0	0.0224347	0.0193285	0.0154351	0.0221315	0.0274526	0.0274334	0.0176404	0.0539594	0.2859597	0.0402022	0.0483487	0.0816288	0.0357937	0.0155615	0.0189809	0.0199483	0.0828487	0.0454714	0.0110204	0.0531013	0.0135388	0.0128789	0.0263939	0.0193691	1.0293636
3	0.0777726	0.0145513	0	0.1483615	0.1241447	0.0229622	0.037361	0.0293805	0.0253495	0.0991907	0.0335142	0.0302454	0.0244046	0.0151894	0.0176713	0.0247007	0.01908	0.0188803	0.0143972	0.0176312	0.0161087	0.0140533	0.0067993	0.0087554	0.0120973	0.0247869	0.8773894
4	0.0004569	0.0004835	0.0015667	0	0.0010021	0.0005296	0.0005131	0.0005566	0.0007188	0.0010132	0.001053	0.0007868	0.0005901	0.0004646	0.0005314	0.0007779	0.0005567	0.0005781	0.0004417	0.0004945	0.0005383	0.0004795	0.0002195	0.0003184	0.0010622	0.0007961	0.0165294
5	0.0010386	0.0011923	0.001806	0.0562762	0	0.001297	0.0011945	0.0012896	0.0015131	0.0015829	0.0024573	0.0018932	0.0013754	0.0011037	0.0012402	0.0017958	0.0014104	0.0012929	0.0010782	0.0012881	0.0013327	0.0012808	0.0009041	0.0011109	0.0009043	0.0015524	0.0892107
6	0.0023775	0.0021915	0.0039619	0.0041503	0.0060983	0	0.003275	0.0036077	0.0301716	0.0032678	0.004502	0.0108806	0.0043426	0.0022089	0.0031136	0.0041266	0.0082884	0.0093085	0.0022472	0.0031073	0.0023529	0.0025621	0.0018159	0.001673	0.001901	0.0084065	0.1299387
7	0.0014512	0.001861	0.0022928	0.0028283	0.0035845	0.0020575	0	0.2973929	0.0134206	0.0024659	0.0028479	0.0026195	0.002641	0.0019261	0.0024953	0.0029626	0.0031533	0.0066711	0.0027014	0.0399363	0.0018281	0.0027858	0.0016435	0.0029721	0.0015279	0.0049269	0.4109935
8	0.000245	0.0004178	0.0004661	0.0006256	0.0011481	0.0004272	0.0016845	0	0.0081572	0.0004555	0.0005766	0.0005525	0.0004944	0.0004432	0.0005305	0.0007697	0.0004366	0.0008414	0.0008479	0.012369	0.0003499	0.0009256	0.0004356	0.0009277	0.0003988	0.0016872	0.0362136
9	0.0054062	0.0052222	0.017985	0.0418214	0.1139182	0.0158625	0.0121025	0.0238567	0	0.0157552	0.0104817	0.023766	0.024788	0.0113733	0.0185425	0.0140781	0.0121812	0.0298452	0.0075747	0.011267	0.0111757	0.0153285	0.008736	0.0098868	0.0147561	0.0271109	0.5028216
10	0.0499645	0.0143842	0.0380742	0.0346893	0.0268736	0.04991	0.0333242	0.0334423	0.0444082	0	0.0571942	0.0447306	0.111491	0.0261926	0.0422203	0.0365241	0.0411113	0.0404579	0.0215975	0.0366693	0.0144687	0.0208071	0.0088917	0.0103518	0.0111341	0.026267	0.8752096
11	0.043564	0.0714615	0.0780309	0.0641896	0.0482344	0.0814502	0.1048685	0.0993097	0.0617182	0.213542	0	0.1533845	0.1587308	0.1488314	0.0964251	0.0389177	0.0751005	0.0558342	0.3076681	0.095598	0.0337657	0.2160947	0.0489401	0.0437059	0.1037895	0.064831	2.5079863
12	0.0064199	0.0059374	0.0093304	0.0093266	0.0100883	0.0323939	0.0069503	0.0077412	0.0128829	0.0103585	0.0122746	0	0.0155905	0.006886	0.0238152	0.0112694	0.0262541	0.0095684	0.0058014	0.0085773	0.0064274	0.0163996	0.003852	0.004157	0.0034039	0.0078616	0.2735678
13	0.0080398	0.0079955	0.0176477	0.0671719	0.0155725	0.0318002	0.010003	0.0304851	0.0366469	0.023083	0.0170564	0.0187618	0	0.0114259	0.0150538	0.0322918	0.0149776	0.0231431	0.0142028	0.1528604	0.0084006	0.0159265	0.0070251	0.0126636	0.0059721	0.02074	0.618947
14	0.0040277	0.0038988	0.0060728	0.0120729	0.0067307	0.0047502	0.0044385	0.008498	0.018877	0.0081172	0.0069212	0.0064113	0.0175746	0	0.182762	0.0159238	0.0891143	0.0286118	0.0067184	0.0333427	0.0036845	0.0042498	0.002409	0.0036058	0.0026739	0.0068868	0.4883736
15	0.0103295	0.008127	0.0174909	0.0557228	0.0152267	0.0122999	0.0104555	0.0152692	0.0206744	0.0181671	0.0166964	0.0168795	0.0269617	0.07604	0	0.0373401	0.0849857	0.1021508	0.0262688	0.0534467	0.00837	0.0094834	0.0056275	0.0076039	0.0059462	0.0163567	0.6779205
16	0.0513553	0.0478239	0.0703366	0.0630063	0.0774457	0.0510539	0.0497649	0.0504537	0.0652459	0.058411	0.0953479	0.0748396	0.0606883	0.0441912	0.0511815	0	0.1741756	0.085082	0.0434191	0.0896085	0.0457474	0.0404705	0.0231184	0.0297461	0.022053	0.0550358	1.5196021
17	0.0131715	0.0072415	0.0129107	0.0101907	0.0127693	0.0090758	0.0097384	0.0092145	0.0112307	0.009286	0.0145723	0.013216	0.0086577	0.0069276	0.0093289	0.0122071	0	0.0132269	0.0067287	0.0105955	0.0094566	0.0123538	0.0048543	0.0049403	0.00817	0.0134572	0.253522
18	0.0072428	0.0013034	0.0041526	0.0025283	0.0030066	0.0106022	0.0035191	0.0031159	0.0060725	0.0027475	0.0024407	0.0020371	0.0022648	0.0016012	0.0029861	0.0029522	0.0049024	0	0.0023785	0.0019114	0.0017041	0.0036175	0.0016896	0.0013044	0.0017554	0.0074176	0.0852539
19	0.0244365	0.0145327	0.0360847	0.0406371	0.0293732	0.0807654	0.0614206	0.0681768	0.0541649	0.0567068	0.0328057	0.0650248	0.0762269	0.1709661	0.1262055	0.0259168	0.0627989	0.0632655	0	0.0395354	0.0322653	0.0425518	0.0590977	0.0361935	0.0877945	0.0618357	1.4487829
20	0.004427	0.0157988	0.0065739	0.0059461	0.0073046	0.0083337	0.0087303	0.009305	0.0078821	0.0086326	0.0098061	0.0083439	0.0088742	0.0143478	0.0099622	0.0196553	0.0087658	0.0076029	0.0465111	0	0.0118248	0.0463843	0.0214405	0.0592274	0.0130256	0.0868964	0.4556024
21	0.0429973	0.0501994	0.0752562	0.0705696	0.082115	0.0591565	0.0505824	0.0588836	0.0686885	0.069138	0.1013715	0.0814412	0.0600603	0.0467192	0.0567007	0.0844987	0.0566515	0.0703388	0.0504362	0.0604903	0	0.0498428	0.03039	0.0368166	0.0352612	0.0584948	1.5071
22	0.0382983	0.0321278	0.0668352	0.0488533	0.054139	0.0672551	0.1102924	0.1068122	0.0711521	0.065887	0.0649383	0.0688773	0.0818607	0.0602359	0.0637075	0.0511838	0.0601193	0.0495799	0.0421298	0.0895643	0.0653164	0	0.0667055	0.1009308	0.0647956	0.095532	1.6871294
23	0.0106652	0.009716	0.0197449	0.0155075	0.0225678	0.0208281	0.0205435	0.0227901	0.0200937	0.0190824	0.0199042	0.0202691	0.0207405	0.0181363	0.0189123	0.016896	0.0195787	0.0164934	0.0185666	0.0336631	0.0347032	0.1463097	0	0.0432656	0.05734	0.0382554	0.7045733
24	0.0224941	0.0107331	0.0252179	0.0213491	0.0385992	0.0370014	0.0343685	0.0393478	0.0362471	0.0474529	0.0200557	0.0291172	0.0305249	0.1146665	0.0405026	0.0175028	0.031132	0.029671	0.0195266	0.0510238	0.0532972	0.1449664	0.2183731	0	0.0870354	0.0507327	1.2509389
25	0.0160177	0.0232507	0.024	0.0248287	0.0367623	0.027874	0.0245869	0.0307931	0.0276439	0.0331712	0.0333484	0.0284181	0.0295952	0.0272854	0.0264538	0.0200904	0.0314216	0.0260138	0.0495089	0.0830677	0.0929397	0.0784325	0.1182053	0.0794181	0	0.114127	1.1072544
26	0.0017048	0.0022441	0.00308	0.0032102	0.0130911	0.0034291	0.0032587	0.0040072	0.0038336	0.003552	0.0031832	0.0033311	0.0036427	0.0038058	0.0034805	0.0027677	0.0040057	0.0032263	0.0074132	0.0091496	0.0097395	0.0184431	0.0530525	0.0122132	0.0168417	0	0.1957067
SUM	0.4564052	0.3626761	0.999466	0.9013773	0.8676507	0.740775	1.0252556	1.2195982	0.7233486	0.8793433	0.8703433	0.8525238	0.8459266	0.9034616	0.8623799	0.5081838	0.8652274	0.7279745	0.7907066	1.0087237	0.5013511	0.9687311	0.7124435	0.5313644	0.6011681	0.8311862	20.557591

28th IIOA Conference, Langkawi Island, Malaysia
 28 August 2022 to 2 September 2022

Appendix Table 20
Residual Matrix Thailand
1975

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	-0.0902	0.288965	-0.0669	-1.1E-05	-0.12246	0.250834	-0.01296	-0.1066	-0.09091	-0.10749	0.452242	-0.10133	-0.12468	-0.11519	-0.10587	-0.07505	-0.1268	-0.12102	-0.09857	-0.09832	-0.09373	-0.08783	-0.09102	-0.00021	-0.08787	-0.93297
2	-0.06157	0	-0.09946	-0.07671	-0.07379	-0.08316	-0.09039	-0.09338	-0.07348	-0.06856	0.163935	-0.09914	-0.0294	0.381935	-0.00859	-0.06001	-0.05772	-0.07911	-0.02292	-0.01827	-0.0682	-0.06343	-0.05942	-0.06155	-0.08005	-0.06443	-0.94686
3	-0.00457	-0.04844	0	0.050895	-0.04955	-0.06163	-0.0543	-0.06961	-0.0553	-0.03529	-0.0564	-0.05332	-0.05614	-0.06925	-0.06083	-0.05554	-0.04781	-0.06681	-0.06337	-0.06716	-0.05062	-0.05325	-0.04658	-0.04811	0.013239	-0.04157	-1.15131
4	-0.03119	-0.03112	-0.04989	0	-0.03552	-0.04183	-0.0459	-0.04954	-0.03655	-0.03794	-0.03549	-0.04966	-0.03867	-0.04409	-0.03946	-0.0359	-0.03074	-0.04661	-0.04072	-0.04487	-0.03495	-0.0363	-0.02949	-0.0306	-0.03079	-0.03338	-0.96121
5	-0.03117	-0.03141	-0.05034	-0.04102	0	-0.04206	-0.04615	-0.04998	-0.03691	-0.03802	-0.03566	-0.04979	-0.03879	-0.04435	-0.03975	-0.03606	-0.03091	-0.04701	-0.041	-0.04526	-0.03565	-0.03702	-0.02969	-0.03084	-0.04169	-0.03426	-0.98483
6	-0.04241	-0.04319	-0.06554	-0.05315	-0.04847	0	-0.06312	-0.06544	-0.04407	-0.05153	-0.04935	-0.06265	-0.04947	-0.06114	-0.05285	-0.04808	-0.04199	-0.029	-0.05542	-0.06194	-0.04867	-0.04858	-0.03931	-0.04263	-0.05545	-0.04114	-1.26459
7	-0.04695	-0.04619	-0.07629	-0.05775	-0.05442	-0.06324	0	0.249693	-0.05445	-0.05398	-0.05441	-0.07426	-0.0551	-0.06622	-0.05859	-0.05416	-0.04408	-0.05745	-0.06154	0.008671	-0.05295	-0.05539	-0.04307	-0.04401	-0.06122	-0.04793	-1.02529
8	-0.03138	-0.03142	-0.0505	-0.04102	-0.03597	-0.04218	-0.04625	0	-0.03455	-0.03848	-0.03573	-0.04998	-0.03906	-0.04442	-0.03967	-0.0351	-0.0309	-0.04709	-0.04111	-0.04484	-0.03556	-0.03709	-0.02969	-0.03084	-0.04124	-0.03416	-0.96824
9	-0.0419	-0.03923	-0.06221	-0.0362	2E-05	-0.04905	-0.06015	-0.05837	0	-0.03001	-0.048	-0.0638	-0.03804	-0.05831	-0.04186	-0.04009	-0.04063	-0.04157	-0.05089	-0.05512	-0.00276	-0.04536	-0.03676	-0.03709	-0.04538	-0.03587	-1.05865
10	-0.01846	-0.04096	-0.0562	-0.04688	-0.04345	-0.0476	-0.04086	-0.02237	-0.03271	0	-0.04636	-0.04084	-0.01345	-0.05593	-0.04223	-0.03807	-0.03305	-0.05314	-0.05422	-0.03925	-0.04616	-0.04832	-0.03903	-0.04099	-0.04242	-0.04128	-1.02422
11	-0.04113	-0.02171	-0.07107	-0.05386	-0.05578	-0.05348	-0.05829	-0.06842	-0.05162	-0.03943	0	-0.06777	0.000611	-0.05663	-0.05777	-0.05574	-0.05059	-0.07124	0.193185	-0.0523	-0.04173	-0.00735	-0.04484	-0.05251	-0.05019	-0.04519	-0.97486
12	-0.03316	-0.03281	-0.05473	-0.04491	-0.03924	-0.04398	-0.04913	-0.0456	-0.04008	-0.04136	-0.03945	0	-0.04113	-0.04776	-0.04305	-0.03853	-0.00519	-0.05104	-0.04432	-0.04638	-0.03575	-0.02176	-0.03191	-0.03435	-0.04047	-0.03669	-0.98277
13	-0.04017	-0.04137	-0.05935	0.030477	-0.04046	-0.04969	-0.05983	-0.03514	-0.04082	-0.02699	-0.04855	-0.06312	0	-0.05892	-0.0774	-0.01177	-0.04012	-0.0435	-0.05401	0.032055	-0.03457	-0.04965	-0.03672	-0.03899	-0.05347	-0.04176	-0.98382
14	-0.04216	-0.03878	-0.06578	-0.05269	-0.0497	-0.05792	-0.06186	-0.05652	-0.04988	-0.04983	-0.04765	-0.06798	-0.05101	0	0.104281	-0.01965	-0.02902	-0.02903	-0.05284	0.011467	-0.04766	-0.0498	-0.03947	-0.03991	-0.0539	-0.04262	-0.97993
15	-0.03199	-0.03453	-0.03559	-0.02849	-0.03992	-0.04728	-0.04958	-0.05374	-0.04046	-0.03193	-0.03493	-0.05366	-0.04158	-0.04848	0	-0.03862	-0.03209	-0.05129	-0.04334	-0.02303	-0.03685	-0.04098	-0.03133	-0.03372	-0.0443	-0.03644	-0.98417
16	-0.03558	-0.03187	-0.06032	-0.04531	-0.04443	-0.05058	-0.05034	-0.05926	-0.04221	-0.04441	-0.04169	-0.05736	-0.04249	-0.04905	-0.04	0	-0.02995	-0.02034	-0.04159	-0.0243	-0.04293	-0.04314	-0.0281	-0.0365	-0.04323	-0.03597	-1.04092
17	-0.03103	-0.03146	-0.05086	-0.04139	-0.03609	-0.04312	-0.04537	-0.05019	-0.0376	-0.03893	-0.03672	-0.05046	-0.03896	-0.04533	-0.0406	-0.0369	0	-0.04802	-0.04184	-0.04585	-0.03585	-0.01657	-0.03057	-0.03196	-0.03304	-0.03313	-0.97184
18	-0.03914	-0.03904	-0.06278	-0.05009	-0.04356	-0.04435	-0.05761	-0.06109	-0.04259	-0.04706	-0.04462	-0.06207	-0.04809	-0.05533	-0.04929	-0.0444	-0.03855	0	-0.051	-0.05629	-0.04376	-0.0458	-0.03624	-0.03793	-0.05044	-0.04	-1.19115
19	-0.04289	-0.0205	-0.06288	-0.03773	-0.04651	-0.02145	-0.05118	-0.04617	-0.03361	-0.02588	-0.04231	-0.0576	-0.00462	-0.04551	-0.04329	-0.03992	-0.04122	-0.04534	0	-0.05081	-0.03372	-0.04563	-0.02842	-0.03826	-0.01095	-0.0325	-0.9489
20	-0.03577	-0.0299	-0.05789	-0.04548	-0.0419	-0.04719	-0.05157	-0.05507	-0.03954	-0.04246	-0.04108	-0.05618	-0.04156	-0.04901	-0.04419	-0.04082	-0.03671	-0.05143	-0.03249	0	-0.02627	-0.03888	-0.02511	0.005558	-0.04131	0.009102	-0.95713
21	-0.05113	-0.05147	-0.06661	-0.03611	-0.04269	-0.02268	-0.07806	-0.0422	0.002106	-0.01309	-0.06834	-0.0612	-0.02232	-0.07354	-0.012	0.018811	-0.05191	0.043258	-0.00594	-0.02206	0	-0.04688	-0.06085	-0.06917	-0.04018	-0.05846	-0.93269
22	-0.0425	-0.03574	-0.04636	-0.04221	-0.02217	-0.04965	-0.01037	-0.03178	-0.04066	-0.04254	-0.0473	-0.05859	-0.04163	-0.05515	-0.04588	-0.04046	-0.03589	-0.05409	-0.04529	-0.04007	-0.02428	0	-0.03671	-0.04527	-0.04569	-0.03407	-1.01435
23	-0.03482	-0.0343	-0.05504	-0.04231	-0.03827	-0.04299	-0.04911	-0.05069	-0.03289	-0.03883	-0.04028	-0.05413	-0.03985	-0.04897	-0.04103	-0.03579	-0.03394	-0.04341	-0.04024	-0.04721	-0.02198	-0.03258	0	-0.02586	-0.02784	-0.02935	-0.98172
24	-0.04102	-0.03498	-0.06242	-0.04453	-0.043	-0.043	-0.05103	-0.04476	-0.03323	-0.0401	-0.04653	-0.06174	-0.0391	-0.05376	-0.04147	-0.03992	-0.03829	-0.0436	-0.04716	-0.03928	-0.00264	-0.01804	-0.03932	0	-0.02064	-0.03672	-1.00629
25	-0.04853	-0.03427	-0.0684	-0.01873	-0.02213	-0.0525	-0.05894	-0.04693	-0.02706	-0.01901	-0.05368	-0.07141	-0.03693	-0.06111	-0.04159	-0.0446	-0.04371	-0.03979	-0.04811	-0.04381	-0.00331	-0.00498	-0.04042	-0.0394	0	-0.01014	-0.97948
26	-0.03227	-0.03174	-0.05073	-0.04067	-0.03612	-0.04132	-0.04655	-0.04848	-0.03519	-0.03768	-0.03679	-0.05023	-0.03805	-0.04472	-0.03869	-0.03559	-0.03129	-0.04589	-0.04149	-0.04343	-0.02642	-0.0336	-0.03059	-0.03031	-0.03813	0	-0.96596
SUM	-0.93289	-0.94663	-1.15225	-0.96276	-0.98314	-1.26439	-1.02508	-0.96801	-1.05997	-1.02424	-0.97487	-0.9847	-0.98614	-0.97972	-1.01101	-1.01282	-0.97133	-1.18932	-0.94869	-0.95791	-0.93158	-1.01412	-0.98149	-1.00626	-0.97899	-0.96581	-26.2141

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1985

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.229191	0.021331	0.039833	0.004489	0.488311	0.128291	0.12577	0.034034	0.054613	0.005348	0.311826	0.011246	0.005962	0.008609	0.022519	0.034876	0.006389	0.010394	0.011365	0.135528	0.015308	0.007246	0.002198	0.010135	0.26244	1.987252
2	0.000956	0	0.000638	0.008688	0.000455	0.109586	0.00717	0.004261	0.002723	0.011357	0.000559	0.002466	0.001134	0.000756	0.000998	0.001399	0.007969	0.000606	0.001218	0.001469	0.029125	0.001082	0.000866	0.000321	0.00194	0.03649	0.234234
3	0.002187	0.00406	0	0.003351	0.005839	0.00373	0.002363	0.003008	0.006829	0.01369	0.003944	0.006018	0.013739	0.004068	0.0066	0.006002	0.2131	0.003176	0.026549	0.003649	0.012286	0.002616	0.005592	0.005055	0.002679	0.012646	0.372776
4	0.000468	0.041	0.000243	0	0.000786	0.053046	0.003949	0.001075	0.002357	0.004065	0.000957	0.001304	0.00168	0.00099	0.001072	0.001401	0.002657	0.000998	0.001536	0.001783	0.031083	0.006916	0.001366	0.000344	0.001775	0.020159	0.18301
5	0.020448	0.027402	0.02014	0.1077	0	0.031517	0.026098	0.040942	0.058359	0.077077	0.59584	0.033311	0.192313	0.287792	0.148783	0.083129	0.047074	0.221576	0.132797	0.014633	0.033147	0.173709	0.018892	0.015118	0.017443	0.06932	2.494559
6	0.006397	0.433934	0.004187	0.078492	0.004412	0	0.072784	0.012036	0.026467	0.069064	0.006144	0.015897	0.0102	0.005849	0.008111	0.010572	0.041325	0.006087	0.008768	0.012961	0.195577	0.009335	0.007575	0.002204	0.010527	0.332461	1.391368
7	0.000348	0.001153	0.000827	0.000417	0.001095	0.001814	0	0.002204	0.003547	0.004313	0.00174	0.002104	0.002572	0.001991	0.00199	0.002595	0.001764	0.001823	0.002415	0.005303	0.135642	0.004107	0.004206	0.001216	0.00136	0.045998	0.232547
8	0.008994	0.012687	0.006397	0.033273	0.006314	0.021394	0.010435	0	0.036314	0.044167	0.007868	0.105382	0.030441	0.009077	0.013061	0.040018	0.078888	0.012537	0.018669	0.021665	0.026058	0.028441	0.016915	0.003726	0.01647	0.17166	0.780853
9	0.004874	0.006429	0.001953	0.003563	0.005367	0.008935	0.02952	0.019503	0	0.063267	0.005934	0.021725	0.035176	0.012574	0.013255	0.017399	0.019645	0.007198	0.016317	0.01998	0.011916	0.01398	0.036155	0.003578	0.031548	0.047622	0.457412
10	0.06983	0.039115	0.008846	0.012728	0.015988	0.045384	0.047365	0.157096	0.161536	0	0.02824	0.257147	0.083079	0.060624	0.059873	0.085083	0.064855	0.046856	0.050207	0.010578	0.029821	0.02449	0.021225	0.005796	0.035771	0.111306	1.53284
11	0.029308	0.035509	0.026196	0.166357	0.081656	0.042478	0.03575	0.059931	0.084593	0.07839	0	0.03662	0.196319	0.10393	0.076012	0.073588	0.042777	0.288767	0.106086	0.019436	0.042942	0.302213	0.026318	0.012196	0.020511	0.099647	2.087533
12	0.004202	0.005605	0.001446	0.01003	0.005904	0.00692	0.006917	0.012876	0.022937	0.035947	0.007119	0	0.014159	0.011115	0.015271	0.113598	0.018328	0.015555	0.018075	0.007441	0.006942	0.024861	0.004414	0.002019	0.007745	0.030601	0.410026
13	0.00172	0.002326	0.005491	0.002799	0.002031	0.002413	0.021725	0.003437	0.005736	0.020484	0.002162	0.004947	0	0.002997	0.002889	0.022039	0.0064	0.004246	0.141909	0.002331	0.008516	0.003644	0.002292	0.00628	0.003825	0.014105	0.296743
14	0.010074	0.014013	0.020082	0.012798	0.020679	0.016382	0.013421	0.014364	0.030455	0.026103	0.020017	0.017768	0.069483	0	0.815402	0.270536	0.076328	0.025325	0.286277	0.007811	0.01271	0.035124	0.010765	0.019639	0.01351	0.066881	1.925949
15	0.006847	0.009047	0.015983	0.004257	0.006254	0.011722	0.004329	0.006189	0.012986	0.011339	0.00838	0.008336	0.00581	0.004226	0	0.026148	0.011356	0.007182	0.049897	0.003743	0.007913	0.006069	0.004948	0.005667	0.004921	0.031036	0.274583
16	0.020406	0.021103	0.017841	0.030389	0.066965	0.025742	0.034795	0.037781	0.070026	0.054217	0.056232	0.035837	0.087076	0.074086	0.061461	0	0.03994	0.11087	0.108709	0.015945	0.021075	0.162834	0.020752	0.012013	0.030056	0.13981	1.355962
17	0.004472	0.005385	0.005241	0.007424	0.004069	0.005542	0.004114	0.011864	0.01486	0.01346	0.00428	0.00693	0.011647	0.006922	0.013183	0.025102	0	0.005421	0.07123	0.011944	0.005191	0.006203	0.014507	0.006901	0.011983	0.051609	0.329485
18	0.007599	0.023017	0.006333	0.023559	0.018308	0.025294	0.022862	0.053815	0.067584	0.060815	0.069092	0.036934	0.076492	0.093514	0.062069	0.050343	0.036381	0	0.044586	0.016222	0.03668	0.036426	0.02418	0.016191	0.02178	0.074328	1.004406
19	0.002316	0.009946	0.004292	0.000793	0.008422	0.006376	0.006147	0.010723	0.024254	0.01899	0.008976	0.009108	0.015957	0.009826	0.00889	0.010055	0.007307	0.009256	0	0.005083	0.005763	0.008234	0.010015	0.054764	0.009159	0.018578	0.283228
20	0.022594	0.09996	0.012056	0.044259	0.019011	0.090854	0.051055	0.107103	0.116419	0.114998	0.022875	0.10288	0.079554	0.066861	0.100591	0.139925	0.084227	0.064585	0.104114	0	0.106108	0.061708	0.024885	0.010522	0.033102	0.16074	1.840985
21	0.002809	0.006454	0.002513	0.003277	0.009334	0.008819	0.011022	0.014922	0.021782	0.028608	0.013881	0.013809	0.020862	0.013477	0.014266	0.01887	0.013549	0.014027	0.016445	0.038617	0	0.015664	0.023874	0.007304	0.008724	0.120489	0.463397
22	0.017109	0.040138	0.007983	0.022918	0.03447	0.041427	0.029578	0.035641	0.062924	0.063693	0.029822	0.041977	0.09256	0.046682	0.047601	0.064269	0.042007	0.038455	0.122549	0.027559	0.039673	0	0.045778	0.010236	0.017624	0.097991	1.120665
23	0.018374	0.023777	0.007835	0.015132	0.011364	0.020453	0.014429	0.022316	0.023629	0.031521	0.018344	0.022452	0.029635	0.022536	0.019563	0.020082	0.018572	0.015171	0.025723	0.036524	0.020844	0.025274	0	0.007526	0.00679	0.039184	0.517049
24	0.000345	0.000449	0.000152	0.000337	0.000617	0.000721	0.000402	0.000557	0.000909	0.002088	0.001012	0.000842	0.002255	0.000735	0.001196	0.002243	0.000658	0.002467	0.000954	0.000189	0.000789	0.003304	0.002178	0	0.001302	0.001822	0.028523
25	0.004788	0.006678	0.004798	0.01098	0.031896	0.008507	0.014691	0.018009	0.016649	0.044819	0.027519	0.015729	0.022187	0.018777	0.015941	0.020421	0.01212	0.019202	0.021852	0.017772	0.014902	0.022564	0.020774	0.011537	0	0.023922	0.447031
26	0.001959	0.002154	0.007781	0.001298	0.007769	0.003259	0.006026	0.004842	0.019479	0.012403	0.008141	0.00502	0.01529	0.00542	0.011189	0.010378	0.008673	0.009376	0.007768	0.009527	0.004554	0.00987	0.009745	0.001007	0.004232	0	0.187159
SUM	0.269425	1.100532	0.210587	0.644653	0.373494	1.080625	0.605236	0.780265	0.927389	0.959487	0.954426	1.116367	1.120864	0.870788	1.527878	1.137717	0.930776	0.937153	1.395043	0.323531	0.974785	1.003975	0.365463	0.223358	0.324914	2.080845	22.23957

28th IOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

1995

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.193873	0.01982	0.043725	0.004247	0.367774	0.065594	0.07629	0.026523	0.036026	0.004086	0.263735	0.00868	0.005166	0.008168	0.019476	0.030631	0.004878	0.009547	0.008574	0.116953	0.012539	0.005387	0.001527	0.009647	0.138685	1.48155
2	0.0009	0	0.000566	0.015617	0.000592	0.144621	0.011081	0.005379	0.004895	0.010282	0.000578	0.003426	0.001399	0.000952	0.001185	0.001438	0.009709	0.000537	0.001355	0.001324	0.033622	0.001145	0.000861	0.0002	0.002326	0.017267	0.27126
3	0.000838	0.00239	0	0.001201	0.002815	0.002489	0.001359	0.001252	0.002789	0.005303	0.001861	0.00476	0.007368	0.001937	0.002448	0.002526	0.082359	0.001299	0.013371	0.001325	0.005641	0.00121	0.001808	0.001541	0.001163	0.007468	0.15852
4	0.000437	0.05191	0.000489	0	0.000473	0.082159	0.006312	0.001436	0.002816	0.004739	0.000455	0.001646	0.000954	0.000589	0.000771	0.000915	0.003744	0.000442	0.000873	0.001267	0.041494	0.00079	0.000735	0.000175	0.001942	0.009319	0.21689
5	0.020508	0.030027	0.012099	0.098064	0	0.036817	0.025927	0.043949	0.056755	0.08681	0.591199	0.055055	0.218476	0.163798	0.095443	0.058716	0.040883	0.285188	0.120948	0.01534	0.038187	0.129563	0.015472	0.008689	0.02055	0.066638	2.3351
6	0.004551	0.516502	0.00379	0.125473	0.00411	0	0.090253	0.015318	0.036293	0.052044	0.004448	0.01706	0.010022	0.005622	0.007345	0.008606	0.045107	0.004184	0.008302	0.009838	0.238628	0.00776	0.006096	0.00133	0.012892	0.134152	1.36973
7	0.000371	0.000921	0.00092	0.000467	0.000948	0.001184	0	0.001389	0.001814	0.002599	0.000989	0.001419	0.001667	0.001129	0.001405	0.001701	0.001593	0.001103	0.001758	0.003675	0.113013	0.004313	0.002864	0.000663	0.000994	0.028767	0.17766
8	0.011441	0.011072	0.008026	0.008356	0.006103	0.014271	0.011311	0	0.033273	0.087057	0.006028	0.086767	0.017571	0.01058	0.016283	0.028253	0.09238	0.008367	0.016065	0.016083	0.025308	0.022512	0.014003	0.002941	0.017193	0.123053	0.6943
9	0.006319	0.013843	0.00422	0.007084	0.010153	0.022002	0.042343	0.032958	0	0.058847	0.007475	0.027348	0.04256	0.020869	0.024354	0.027345	0.038243	0.011147	0.019689	0.018072	0.01639	0.022207	0.03863	0.006242	0.060047	0.052203	0.63059
10	0.110225	0.064105	0.017716	0.032167	0.027987	0.069575	0.078987	0.240652	0.176826	0	0.034829	0.429759	0.088296	0.090556	0.094115	0.116717	0.138926	0.033708	0.062267	0.017118	0.041941	0.043086	0.025374	0.005835	0.059707	0.218905	2.31938
11	0.03019	0.040308	0.014767	0.180206	0.096872	0.050345	0.03092	0.046271	0.052909	0.073448	0	0.064614	0.102472	0.101792	0.07024	0.057348	0.039408	0.200474	0.069819	0.019004	0.043532	0.238776	0.020785	0.007761	0.021777	0.069014	1.74306
12	0.005907	0.013071	0.003294	0.033773	0.006786	0.017918	0.014893	0.019442	0.020128	0.038278	0.005332	0	0.011211	0.00817	0.016297	0.065575	0.040359	0.00904	0.019147	0.011711	0.010771	0.032126	0.004568	0.001366	0.008529	0.137819	0.55569
13	0.002208	0.003588	0.008814	0.002671	0.003091	0.004714	0.021465	0.003404	0.004709	0.015066	0.00216	0.004727	0	0.014858	0.011207	0.02332	0.010115	0.003072	0.174721	0.001933	0.007189	0.004341	0.001843	0.002213	0.002907	0.021388	0.35573
14	0.017529	0.028657	0.044388	0.016092	0.036382	0.040438	0.041145	0.024669	0.038996	0.03232	0.023659	0.024169	0.175814	0	1.058998	0.349344	0.198358	0.023157	0.348427	0.009776	0.021228	0.055353	0.011332	0.008238	0.02066	0.170851	2.81998
15	0.010489	0.016381	0.028424	0.005168	0.009093	0.025613	0.023071	0.007458	0.015685	0.011434	0.006926	0.00894	0.007763	0.011475	0	0.037702	0.014308	0.005733	0.04586	0.002513	0.01107	0.008321	0.002967	0.002311	0.005884	0.036706	0.36129
16	0.032115	0.047624	0.058769	0.058187	0.149005	0.058364	0.053728	0.059511	0.086729	0.078565	0.092278	0.055909	0.112438	0.099954	0.085474	0	0.06511	0.092949	0.173181	0.026533	0.039608	0.269898	0.037091	0.011067	0.045881	0.258069	2.14804
17	0.005121	0.008177	0.008549	0.004427	0.00635	0.00739	0.005197	0.037654	0.013612	0.01596	0.004432	0.010627	0.009459	0.007412	0.015301	0.021248	0	0.005105	0.06551	0.013752	0.005849	0.010846	0.008634	0.003004	0.018776	0.081923	0.39432
18	0.011287	0.032822	0.009181	0.015325	0.028126	0.037437	0.026273	0.079108	0.067428	0.096304	0.030577	0.06589	0.100913	0.160557	0.099163	0.063594	0.052625	0	0.053182	0.023071	0.066693	0.03118	0.02075	0.016788	0.033825	0.068446	1.29055
19	0.001258	0.005951	0.002949	0.001192	0.006171	0.003606	0.002462	0.003964	0.011729	0.007228	0.004808	0.003871	0.008159	0.004245	0.004343	0.004118	0.003722	0.00598	0	0.00272	0.004481	0.003782	0.004855	0.017259	0.006342	0.010541	0.13573
20	0.033337	0.148755	0.019025	0.05712	0.025143	0.126604	0.054049	0.129263	0.146084	0.143355	0.024392	0.136616	0.066168	0.059959	0.097871	0.135493	0.13593	0.034561	0.105252	0	0.120086	0.056562	0.023098	0.007396	0.048804	0.191095	2.12602
21	0.002048	0.005142	0.008583	0.002598	0.005655	0.006045	0.005451	0.008092	0.010862	0.013581	0.005848	0.007973	0.010071	0.006411	0.009044	0.01082	0.011351	0.006687	0.011	0.025132	0	0.011298	0.012993	0.003159	0.005879	0.041768	0.24749
22	0.016179	0.039788	0.011069	0.022629	0.057648	0.042284	0.034554	0.037777	0.058523	0.060937	0.038281	0.045637	0.07712	0.038075	0.04505	0.059762	0.044817	0.036625	0.10258	0.037807	0.039635	0	0.048306	0.009797	0.02284	0.097722	1.12544
23	0.043344	0.066752	0.021292	0.052107	0.035837	0.072304	0.042503	0.080876	0.087583	0.105225	0.029959	0.092757	0.082411	0.081763	0.090831	0.081029	0.08489	0.055443	0.070464	0.118894	0.062783	0.063413	0	0.129729	0.023147	0.21496	1.89029
24	0.001051	0.002416	0.000685	0.001417	0.002586	0.002662	0.002069	0.004158	0.003489	0.005551	0.002066	0.004044	0.003808	0.002472	0.003919	0.005797	0.004578	0.001985	0.003425	0.007821	0.004629	0.006646	0.007006	0	0.002042	0.013555	0.09988
25	0.004924	0.008857	0.005465	0.014141	0.06515	0.012382	0.020134	0.022194	0.015999	0.031468	0.040162	0.017478	0.032003	0.016308	0.018877	0.020877	0.017292	0.026685	0.0234	0.013241	0.014333	0.024666	0.022118	0.010283	0	0.034538	0.53298
26	0.001339	0.00241	0.002055	0.001645	0.00337	0.002922	0.00699	0.004603	0.006726	0.007388	0.003204	0.003722	0.005762	0.003998	0.005065	0.005079	0.004807	0.003916	0.004869	0.007837	0.003049	0.010832	0.007803	0.001114	0.002416	0	0.11292
SUM	0.373915	1.35534	0.314954	0.800853	0.594692	1.25192	0.718072	0.987066	0.983177	1.079813	0.966031	1.437948	1.202564	0.918647	1.883196	1.206974	1.211247	0.862266	1.525012	0.414362	1.126111	1.073166	0.345379	0.26063	0.456172	2.244853	25.5944

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.227858	0.02362	0.069532	0.004926	0.431926	0.075319	0.086063	0.034848	0.043583	0.004372	0.263682	0.013194	0.005986	0.01095	0.028323	0.038589	0.00425	0.013906	0.012597	0.190877	0.017811	0.008543	0.003158	0.017304	0.163028	1.7942
2	0.002641	0	0.000832	0.026295	0.000781	0.173373	0.014604	0.009507	0.006779	0.016006	0.000677	0.007167	0.003458	0.001375	0.001894	0.002666	0.013288	0.000562	0.002454	0.001971	0.045162	0.001926	0.001407	0.000269	0.003923	0.021677	0.3607
3	0.00148	0.00274	0	0.001221	0.002051	0.002735	0.00157	0.001961	0.008656	0.007835	0.001397	0.003947	0.007002	0.00162	0.002137	0.002499	0.056982	0.000937	0.010226	0.00115	0.006466	0.00116	0.001628	0.00116	0.001594	0.005552	0.1357
4	0.00151	0.061985	0.00061	0	0.000535	0.099358	0.008355	0.002616	0.003859	0.009121	0.000467	0.004004	0.001975	0.000798	0.001089	0.00152	0.004926	0.000372	0.001347	0.001628	0.056621	4.83E-06	0.000931	0.000184	0.00294	0.010085	0.2768
5	0.052707	0.048266	0.021586	0.151162	0	0.063114	0.046045	0.074042	0.062968	0.143789	0.736259	0.097545	0.237315	0.190929	0.124878	0.089787	0.073515	0.280793	0.200161	0.026403	0.065888	0.221926	0.026895	0.012883	0.039445	0.098252	3.1866
6	0.007504	0.564722	0.003697	0.188023	0.00376	0	0.101752	0.017011	0.035166	0.046749	0.003617	0.020015	0.014142	0.004937	0.006716	0.00912	0.04244	0.003201	0.009572	0.011722	0.295537	0.00938	0.007106	0.001294	0.016712	0.120656	1.5446
7	0.000401	0.000613	0.000699	0.000556	0.000685	0.000956	0	0.001011	0.001045	0.001482	0.000737	0.000837	0.001081	0.000802	0.000835	0.001112	0.001161	0.000817	0.001358	0.003828	0.116537	0.00491	0.003678	0.000648	0.001077	0.029712	0.1766
8	0.018824	0.013429	0.012168	0.015974	0.00577	0.016533	0.014758	0	0.03154	0.091545	0.005276	0.106555	0.028	0.009749	0.014891	0.031838	0.10949	0.005933	0.020597	0.018533	0.035844	0.024393	0.020973	0.002941	0.021032	0.122782	0.7994
9	0.013017	0.01965	0.005692	0.011957	0.013008	0.030735	0.064438	0.048829	0	0.064526	0.011001	0.039674	0.054529	0.017285	0.024923	0.035757	0.046907	0.011406	0.027861	0.022328	0.02507	0.027488	0.068621	0.006133	0.093746	0.075216	0.8598
10	0.261214	0.15405	0.037265	0.090558	0.04227	0.159799	0.179961	0.348043	0.36917	0	0.039949	0.728945	0.262045	0.12119	0.161753	0.224644	0.261723	0.033904	0.157881	0.03631	0.113123	0.087122	0.049304	0.009253	0.169717	0.390525	4.4897
11	0.065957	0.05778	0.024599	0.231502	0.134238	0.07629	0.046346	0.069555	0.062768	0.129739	0	0.099345	0.133802	0.097507	0.083704	0.077655	0.061229	0.172511	0.11394	0.030349	0.070818	0.34294	0.032824	0.010306	0.040587	0.096317	2.3626
12	0.015277	0.020102	0.006376	0.035905	0.008866	0.029434	0.020052	0.030534	0.02978	0.034675	0.00729	0	0.016766	0.009766	0.026433	0.098649	0.067706	0.00806	0.030788	0.022534	0.018374	0.04765	0.009193	0.00244	0.014601	0.201627	0.8129
13	0.002366	0.00282	0.01061	0.003186	0.001909	0.003985	0.023015	0.003048	0.002456	0.008521	0.001523	0.003403	0	0.006526	0.00746	0.023247	0.01625	0.001784	0.245257	0.002096	0.008558	0.005041	0.002081	0.001395	0.002481	0.032617	0.4216
14	0.02628	0.031424	0.046909	0.025193	0.028076	0.049082	0.089529	0.030636	0.03113	0.029878	0.022488	0.031067	0.07453	0	0.918209	0.33166	0.24872	0.020107	0.292682	0.011928	0.033058	0.067494	0.014902	0.007102	0.02611	0.150086	2.6383
15	0.020453	0.025342	0.039177	0.0117	0.010903	0.042381	0.088636	0.013991	0.021366	0.017638	0.009547	0.020708	0.012682	0.011052	0	0.054853	0.026114	0.007275	0.053207	0.004252	0.025379	0.016938	0.005072	0.002598	0.010028	0.054688	0.606
16	0.06256	0.060623	0.075025	0.122884	0.15028	0.08045	0.066808	0.074526	0.066956	0.089237	0.11275	0.077357	0.119895	0.099361	0.087592	0	0.086216	0.104634	0.295395	0.048593	0.077807	0.458763	0.06777	0.017218	0.100111	0.426001	3.0288
17	0.007815	0.008011	0.016983	0.006266	0.008215	0.00837	0.007097	0.054553	0.010879	0.016508	0.006657	0.017217	0.013321	0.007632	0.019488	0.028028	0	0.005629	0.060831	0.014259	0.00782	0.013095	0.014056	0.003093	0.026324	0.084033	0.4662
18	0.027569	0.038759	0.013003	0.027659	0.026699	0.048501	0.041467	0.133289	0.07449	0.137977	0.042308	0.115372	0.151277	0.1507	0.106568	0.097287	0.076642	0	0.079947	0.034875	0.097454	0.052104	0.029064	0.032116	0.052012	0.091118	1.7783
19	0.000375	0.002782	0.001044	0.000994	0.00205	0.00157	0.001	0.002007	0.003503	0.003398	0.001981	0.001588	0.003257	0.003159	0.002269	0.002012	0.001513	0.002359	0	0.001241	0.001549	0.001887	0.003079	0.010584	0.001684	0.004103	0.061
20	0.0004	0.00839	0.000355	0.002779	0.002029	0.007482	0.004571	0.010755	0.012757	0.011236	0.003661	0.008603	0.010191	0.00873	0.012691	0.012588	0.00637	0.011201	0.011984	0	0.011367	0.005882	0.003099	0.001826	0.002099	0.017841	0.1889
21	0.001636	0.001914	0.005698	0.001152	0.003725	0.002869	0.002808	0.004436	0.005053	0.00657	0.004069	0.003726	0.005774	0.004067	0.004363	0.006069	0.007217	0.004463	0.007212	0.021617	0	0.00829	0.009931	0.002203	0.005293	0.026122	0.1563
22	0.014398	0.015493	0.007631	0.012481	0.037455	0.019484	0.01594	0.024352	0.021561	0.034949	0.031155	0.024614	0.035227	0.023687	0.027946	0.039675	0.033204	0.021686	0.091342	0.043709	0.028759	0	0.054902	0.006757	0.028769	0.087967	0.7831
23	0.023246	0.023208	0.010124	0.017573	0.011615	0.02473	0.017778	0.034456	0.027361	0.036161	0.012046	0.02975	0.033267	0.026557	0.027038	0.027376	0.028356	0.037073	0.028128	0.037079	0.022939	0.031522	0	0.0396	0.010362	0.06952	0.6869
24	0.002441	0.002129	0.000569	0.001489	0.002032	0.003758	0.001994	0.004598	0.002209	0.005853	0.001924	0.004057	0.003021	0.002982	0.003288	0.004896	0.00382	0.001699	0.002736	0.005069	0.003635	0.005274	0.007989	0	0.002096	0.010411	0.09
25	0.009031	0.0099	0.006353	0.017511	0.078482	0.014702	0.02087	0.026611	0.017154	0.031005	0.059663	0.022395	0.034633	0.021364	0.020358	0.023659	0.019808	0.028249	0.032083	0.011381	0.017489	0.039034	0.030047	0.013407	0	0.03316	0.6383
26	0.003589	0.005895	0.001878	0.010904	0.002866	0.008126	0.009292	0.008374	0.007945	0.006288	0.002743	0.004323	0.006028	0.004386	0.004859	0.005426	0.005068	0.003789	0.004492	0.012479	0.004673	0.010501	0.012333	0.003077	0.00493	0	0.1543
SUM	0.642692	1.407883	0.372502	1.084457	0.583225	1.399743	0.964004	1.114805	0.951401	1.024268	1.123557	1.735894	1.276411	0.832146	1.702337	1.260345	1.337257	0.772694	1.795386	0.437932	1.380801	1.502534	0.48543	0.191643	0.694975	2.423095	28.497

28th IIOA Conference, Langkawi Island, Malaysia
28 August 2022 to 2 September 2022

2005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	SUM
1	0	0.1648314	0.027226	0.0535257	0.0035052	0.3437972	0.059711	0.0623371	0.0212382	0.0280901	0.003556	0.2312125	0.0094668	0.0055294	0.0083744	0.0176337	0.0254925	0.0041452	0.0102976	0.0084089	0.1252046	0.0095416	0.0053899	0.0015898	0.0124614	0.0941995	1.3367657
2	0.001026	0	0.0005746	0.0186579	0.0004742	0.1309558	0.0105619	0.0044184	0.002859	0.0072269	0.0005087	0.0028919	0.0017732	0.0008581	0.0009788	0.0011681	0.0071353	0.000494	0.0013125	0.001092	0.0296054	0.0009603	0.000741	0.000178	0.0023956	0.0159889	0.2448365
3	0.0012608	0.0013929	0	0.000945	0.0016857	0.0016733	0.0011518	0.0021771	0.0196845	0.0067739	0.0011564	0.0030884	0.0063353	0.0017749	0.0021105	0.002325	0.0610458	0.0010882	0.0093031	0.0011001	0.0041258	0.0010033	0.0019315	0.0010718	0.0019734	0.0057518	0.1419304
4	0.0014649	0.0505359	0.0007697	0	0.0005008	0.0715886	0.0063242	0.0019315	0.0028726	0.0106418	0.0005241	0.0041317	0.0019137	0.0010576	0.0012048	0.0013735	0.003302	0.0004759	0.0013887	0.0012184	0.0444814	0.0003666	0.0007732	0.0001883	0.0024197	0.0096365	0.2210859
5	0.056512	0.0581934	0.0311619	0.1596261	0	0.0783557	0.0576851	0.0878852	0.0774893	0.1388237	0.8086677	0.1094456	0.2595326	0.2454883	0.1660997	0.1129034	0.0968064	0.3554053	0.1945937	0.0340509	0.083806	0.2451457	0.0406566	0.0234151	0.0557693	0.1257657	3.7032845
6	0.0052062	0.4891899	0.0042659	0.1815598	0.0034424	0	0.1019202	0.0104413	0.0221818	0.0354694	0.0038766	0.0142604	0.0122241	0.0052693	0.0059705	0.0071608	0.0358542	0.0037911	0.0086244	0.0088962	0.2426949	0.0075059	0.0055953	0.001279	0.0161025	0.138624	1.3714059
7	0.0005528	0.0008506	0.001083	0.0006056	0.0006776	0.0011393	0	0.0013761	0.0018081	0.0017962	0.000731	0.0013089	0.0014148	0.001177	0.0011417	0.001494	0.0014691	0.0010811	0.0018991	0.0030206	0.0929524	0.0050931	0.0026076	0.0004754	0.0011226	0.0403243	0.167202
8	0.0092662	0.0076414	0.0070212	0.0138434	0.0035071	0.0102469	0.0073576	0	0.0163091	0.041082	0.0035769	0.0579365	0.0168939	0.0084354	0.0097318	0.0189183	0.0785188	0.0052103	0.0130264	0.0126217	0.021111	0.012439	0.0161875	0.0023908	0.0116266	0.113951	0.5188507
9	0.0067689	0.0098335	0.0042962	0.0068398	0.0084016	0.0154899	0.0238626	0.0220964	0	0.027255	0.0072602	0.0171585	0.0248651	0.016536	0.0166052	0.019269	0.0231354	0.0091102	0.0161717	0.0143464	0.0131262	0.0145944	0.0588835	0.0059242	0.0610644	0.0544168	0.4973109
10	0.1829189	0.0911502	0.0269583	0.0620405	0.0292141	0.0975383	0.1147813	0.2055662	0.2425834	0	0.0349106	0.5447135	0.1883869	0.1070118	0.1236224	0.1356503	0.1531705	0.0300728	0.1114046	0.0209547	0.0652416	0.0437612	0.0277913	0.0069662	0.1024765	0.1781793	2.9270656
11	0.0661386	0.064299	0.0332537	0.2203782	0.1536329	0.0840373	0.0568766	0.0732622	0.0762132	0.1151606	0	0.1054588	0.1503398	0.1520565	0.1189086	0.0951568	0.0776167	0.1889493	0.1361674	0.0356339	0.0773957	0.3442766	0.0455529	0.0161424	0.0572395	0.1207544	2.6649019
12	0.0139523	0.0159597	0.0075199	0.0289038	0.0061834	0.0249788	0.0210843	0.0287372	0.0317763	0.0298144	0.0057912	0	0.0148111	0.0112479	0.0230361	0.0655398	0.0478582	0.0074384	0.0261033	0.017385	0.0145314	0.023616	0.0063454	0.0018436	0.011048	0.0436884	0.5291937
13	0.0020222	0.0021659	0.0040281	0.0028447	0.0015239	0.0028964	0.0275994	0.0029164	0.00296	0.0084416	0.0013118	0.0035204	0	0.0045056	0.0063456	0.0194247	0.0144197	0.0020979	0.2198124	0.0016523	0.0069819	0.0033831	0.0018223	0.0017874	0.0023197	0.0390367	0.3858203
14	0.0393418	0.0402295	0.0884138	0.0360968	0.0374057	0.0651977	0.1071609	0.0445022	0.0531603	0.043505	0.0304169	0.0488848	0.0968419	0	1.1925645	0.4978949	0.3637816	0.0355565	0.3941667	0.0159282	0.0413267	0.0769569	0.0215822	0.009753	0.039685	0.2465345	3.6668881
15	0.0225067	0.0204806	0.0550224	0.0100825	0.0091478	0.0357418	0.076287	0.0115181	0.0194826	0.0164344	0.0081859	0.0202241	0.01204	0.0145049	0	0.0520403	0.0254257	0.0083977	0.0638878	0.0035957	0.0190266	0.0123824	0.0046561	0.0025692	0.0093197	0.066478	0.599438
16	0.0511905	0.0563636	0.0932888	0.100869	0.1145425	0.0767824	0.0610848	0.0726689	0.1064442	0.0856211	0.090911	0.0812178	0.1133348	0.1039933	0.0900922	0	0.0883652	0.1129647	0.2503532	0.0378133	0.0709876	0.2788189	0.0609592	0.0185208	0.090001	0.2731167	2.5803053
17	0.0070237	0.0069545	0.0061686	0.0057816	0.0077705	0.0077008	0.006077	0.0520839	0.0116525	0.0148799	0.0064394	0.0136229	0.0135154	0.0105396	0.0177422	0.0248665	0	0.0065809	0.0439232	0.0120783	0.0075635	0.0099521	0.0098312	0.0030598	0.0269989	0.0855775	0.4183845
18	0.0265806	0.0459083	0.019292	0.0313228	0.0272556	0.0695234	0.0457384	0.1463777	0.0832764	0.1275249	0.0309977	0.1164084	0.1482682	0.1919402	0.1373021	0.1039414	0.0898593	0	0.0954614	0.0376201	0.1199565	0.051675	0.037478	0.0489826	0.0556549	0.0954791	1.9838252
19	0.000511	0.0026402	0.0012801	0.0013534	0.0017821	0.0015836	0.001254	0.0024779	0.0044266	0.0038935	0.0017065	0.002239	0.004099	0.0026957	0.00214	0.0027371	0.0019289	0.0025264	0	0.0011769	0.0023805	0.0018475	0.0030844	0.0106541	0.0023105	0.0041642	0.0668932
20	0.070885	0.1182611	0.0349614	0.0828422	0.0317004	0.1265532	0.0733122	0.1295517	0.1796556	0.1255093	0.0297357	0.1475646	0.0777804	0.0758751	0.0940214	0.1534637	0.151157	0.0399632	0.1328728	0	0.1175676	0.0707782	0.039762	0.0090787	0.0573545	0.1747584	2.3449654
21	0.0029757	0.0039041	0.011689	0.0027738	0.0039923	0.0052738	0.0042945	0.0067728	0.0117707	0.0090541	0.0041556	0.0073088	0.0072434	0.0063241	0.0063839	0.0082033	0.0102083	0.0051077	0.0107631	0.0211957	0	0.0099431	0.0112297	0.0024887	0.0071051	0.0249341	0.2050952
22	0.0434763	0.0541165	0.0268966	0.044221	0.0475953	0.0747824	0.0530263	0.0635413	0.0924574	0.0777429	0.0409889	0.0789034	0.0958175	0.0715748	0.0702788	0.08312	0.0806304	0.0423103	0.1811023	0.0612609	0.0774263	0	0.0953458	0.0149857	0.0616648	0.200972	1.8342382
23	0.0383952	0.039857	0.0162346	0.0310759	0.0154851	0.0454857	0.0294447	0.0519022	0.0446621	0.0487952	0.0154549	0.0482949	0.0524147	0.0614749	0.0539475	0.0449307	0.0486188	0.0524794	0.0506873	0.0496942	0.0393329	0.0503339	0	0.0589846	0.0200322	0.0720151	1.0800335
24	0.0035156	0.0032053	0.001364	0.0025404	0.0036278	0.0052814	0.0031362	0.0068339	0.0053877	0.0069931	0.003242	0.0057474	0.0049109	0.0047518	0.0063798	0.0064049	0.0065728	0.0033075	0.0078733	0.006633	0.0090734	0.0105041	0.0115951	0	0.006476	0.0196988	0.1550563
25	0.0120579	0.0145102	0.0103227	0.0208268	0.086319	0.0234325	0.0328263	0.0312034	0.0435108	0.0389971	0.0671986	0.0302555	0.052493	0.0342783	0.0300916	0.0300517	0.0281326	0.0392058	0.0430356	0.0134418	0.0281819	0.0487527	0.0395829	0.0224874	0	0.0477923	0.8689882
26	0.0023196	0.0047957	0.0016812	0.0039032	0.0025307	0.0054566	0.0057646	0.0085481	0.0062405	0.0052908	0.0024365	0.0041476	0.0069044	0.0050161	0.0052019	0.0075157	0.0056016	0.0083262	0.0052874	0.0084592	0.0047417	0.0069478	0.0064123	0.0013982	0.0032373	0	0.128165
SUM	0.6678696	1.3672704	0.5147736	1.1234602	0.6019037	1.4054929	0.988323	1.1311273	1.1801027	1.0548169	1.2037408	1.6999461	1.373621	1.1439168	2.1902759	1.5131877	1.5261067	0.9660858	2.0295189	0.4292784	1.3588236	1.3405796	0.5557968	0.2662149	0.717859	2.291838	30.64193

REFERENCES

- Abramovitz, M. (1986). Catching-up, forging Ahead, and falling behind. *Thinking about growth and other essays on economic growth and welfare*. New York: Cambridge University Press, 1989, 220-242.
- Aghion, P., & Howitt, P. (1998). *Endogenous growth theory*. Cambridge, Massachusetts: MIT Press.
- Aghion, P., & Howitt, P. (1990). A model of growth through creative destruction. *NBER Working Paper 3223* (January).
- Aghion, P., & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica*, Volume 60, No. 2 (March), 323-351.
- Andersen, E.S. (2004). Evolutionary econometrics: From Joseph Schumpeter's failed econometrics to George Price's general econometrics and beyond. Paper presented for the *Third Workshop on the Economic Transformation of Europe*, Sophia-Antipolis, 29-30 January.
- Andersen, E.S. (2003a). The evolving fable of the trees: Population thinking and evolutionary economic analysis. Paper presented at the *DRUID Summer Conference 2003 on Creating, Sharing and Transferring Knowledge: The Role of Geography, Institutions and Organizations*. Copenhagen, June 12-14.
- Andersen, E.S. (2003b). *A note on Price's equation for evolutionary economics: Derivation, interpretations and simple applications*. Preliminary Note, Aalborg: DRUID.
- Andersen, E.S. (1996). *Evolutionary economics: Post-Schumpeterian contributions*. London: Pinter
- Arrow, K. (1962). The economic implications of learning by doing. *The Review of Economic Studies*, Volume 29, Issue 3 (June), 155-173.
- Baldwin, W.L., & Scott, J.T. (1987). Market structure and technological change. *Fundamentals of Pure and Applied Economics*, Volume 15. Routledge (March).
- Baldwin, W.L., & Scott, J.T. (1989). Market structure and technological innovation. In F.M. Scherer (ed.), *The Economics of Technical Change*. Harwood Academic Publishers.
- Barro, R. J., & Becker, G.S. (1989). Fertility choice in a model of economic growth. *Econometrica*, Volume 57, No. 2 (March), 481-501.
- Barro, R.J., & Sala-i-Martin, X. (1995). *Economic growth*. Singapore: McGraw-Hill, Inc.
- Baumol, W. J. (1986). Productivity growth, convergence and welfare: What the long run data show. *American Economic Review*, 76, 1072-1085.
- Benabou, R. (1996). Heterogeneity, stratification, and growth: Macroeconomic implications of community structure and school finance. *The American Economic Review*, Volume 86, No. 3 (June), 584-609.
- Benhabib, J., & Farmer, R.E.A. (1994). Indeterminacy and increasing returns. *Journal of Economic Theory*, Volume 63, 19-41.
- Benhabib, J., & Perli, R. (1994). Uniqueness and indeterminacy: On the dynamics of endogenous growth. *Journal of Economic Theory*, Volume 63, 113-142.
- Boldrin, M., Nishimura, K., Shigoka, T., & Kano, M. (2001). Chaotic equilibrium dynamics in endogenous growth models. *Journal of Economic Theory*, Volume 96, 97-132.
- Boldrin, M., & Perisco, N. (1993). A chaotic map arising in the theory of endogenous growth. *Northwestern University Center for Mathematical Studies in Economics and Management Science Discussion Paper 1071*, November.
- Boldrin, M., & Rustichini, A. (1994). Growth and indeterminacy in dynamic models with externalities. *Econometrica*, Volume 62, 323-342.
- Boulding, K. E. (1991). What is evolutionary economics? *Journal of Evolutionary Economics*, Volume 1, Issue 1, 9-17.
- Baldwin, W.L., & Scott, J.T. (1981). *Evolutionary economics*. London: SAGE.

- Bretschger, L. (1999), *Growth theory and sustainable development*. UK: Edward Elgar.
- Brian, A.W. (1989). Competing technologies, increasing returns, and lock-in by historical events. *The Economic Journal*, Volume 99, No. 394 (March), 116-131.
- Brian, A.W (1988a). Self-reinforcing mechanisms in economics, in Anderson, P. W., Arrow, K.J., & Pines, D. (eds.) (1988). The economy as an evolving complex system, Proceedings of the *Evolutionary Paths of the Global Economy Workshop* held on September 1987 in Santa Fe, New Mexico. Massachusetts: Perseus Books, 9-31.
- Brian, A.W (1988b). Competing technologies: an overview. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg & L. Soete (eds.) (1988). *Technical change and economic theory*. London: Pinter Publishers, 590-607.
- Coase, R. H. (1937). The nature of the firm. *Economica*, New Series, Volume 4, No. 16 (November), 386-405.
- Cohen, W. M., & Levin, R.C. (1989). Empirical studies of innovation and market structure. In R. Schmalensee & R.D. Willig (Eds.), *Handbook of Industrial Organization*, North Holland, Amsterdam.
- Cohen, W. M., Levin, R.C., & Mowery, D.C. (1985). R&D appropriability, opportunity, and market structure: New evidence on some Schumpeterian hypotheses. *The American Economic Review*, Volume 75, No. 2, Papers and Proceedings of the Ninety-seventh Annual Meeting of the American Economic Association, (May), 20-24.
- Cohen, W. M., Levin, R.C., & Mowery, D.C. (1987). Firm size and R&D intensity: A re-examination. *The Journal of Industrial Economics*, Volume 35, No. 4. The Empirical Renaissance in Industrial Economics (June), 543-565.
- Cyert R., & March, J. (1963). *A behavioural theory of the firm*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Dasgupta, P., & Stiglitz, J. (1980a). Uncertainty, industrial structure, and the speed of R&D. *The Bell Journal of Economics*, Vol. 11, No. 1 (Spring), 1-28.
- Dasgupta, P., & Stiglitz, J. (1980b). Industrial structure and the nature of innovative activity. *The Economic Journal*, Vol. 90, No. 358 (June), 266-293.
- David, P. (1985). Clio and the economics of QWERTY. *American Economic Review*, 75, 332-337.
- Day, R. H. (1986). Disequilibrium economic dynamics: A post-Schumpeterian contribution. In R.H. Day & G. Eliasson (1986) (Eds.). *The Dynamics of Market Economies*. Netherlands: Elsevier Science Publishers B.V., 51-70.
- De Long, J.B. (1988), Productivity growth, convergence, and welfare: Comment. *The American Economic Review*, Vol. 78, No. 5, December.
- Domar, E. D. (1946). Capital expansion, rate of growth, and employment. *Econometrica*, 14 (2), 137-147.
- Dopfer, K. (ed.) (2001). *Evolutionary economics: Program and scope*. Boston: Kluwer Academic Publishers.
- Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, Volume 11, Issue 3 (June), 147-162.
- Dosi, G., & Nelson, R. (1994). An introduction to evolutionary theories in economics. *Journal of Evolutionary Economics*, Volume 4, Issue 3, 153-172.
- Dosi, G., Pavitt, K., & Soete, L. (1990). *The Economics of Technological Change and International Trade*. Edward Elgar.
- Eicher, T., & van't Veld, K. (2000). *Search in research: An evolutionary approach to technical change and growth*, Working Paper, University of Washington (October).
- Fagerberg, J. (2003). Schumpeter and the revival of evolutionary economics: An appraisal of the literature. *Journal of Evolutionary Economics*, Volume 13, No. 2 (April), 125-159.
- Fisher, R.A. (1930). *The genetical theory of natural selection*. Oxford: Clarendon Press.

- Foray, D., & Cowan, R. (2002). Evolutionary economics and the counterfactual threat: On the nature and role of counterfactual history as an empirical tool in economics. *Journal of Evolutionary Economics*, Volume 12, Issue 5, 539-562.
- Freeman, C. (1987). *Technology policy and economic performance*. London: Pinter.
- Grossman, G., & Helpman, E. (1991). Quality ladders in the theory of growth. *The Review of Economic Studies*, Volume 58, No. 1 (January), 43-61.
- Grossman, G., & Helpman, E. (1990a). Trade, knowledge spillovers, and growth. *NBER Working Paper No. 3485*, (October).
- Grossman, G., & Helpman, E. (1990b). Comparative advantage and long-run growth. *The American Economic Review*, Volume 80, No. 4 (September), 796-815.
- Grossman, G., & Helpman, E. (1990c). Trade, innovation, and growth. *The American Economic Review*, Volume 80, No. 2, Papers and Proceedings of the Hundred and Second Annual Meeting of the American Economic Association (May), 86-91.
- Grossman, G., & Helpman, E. (1989). Growth and welfare in a small open economy. *NBER Working Paper No. 2970* (July).
- Harrod, R. (1939). An essay in dynamic theory. *Economic Journal*, 49 (193), 14-33.
- Hirschman, A. (1958). *The strategy of economic development*. New Haven, Connecticut: Yale University Press.
- Hodgson, G. (2002). Evolutionary theories of the firm. *The IEBM Handbook of Economics*, Thomson, 515-521.
- Hodgson, G. (1998). Evolutionary and competence-based theories of the firm. *Journal of Economic Studies*, Volume 25, No. 1, 25-56.
- Hodgson, G. (1997). The evolutionary and non-Darwinian economics of Joseph Schumpeter. *Journal of Evolutionary Economics*, Volume 7, Issue 2, 131-145.
- Hodgson, G. (1993). *Economics and evolution: Bringing back life into economics*. Ann Arbor, Michigan: University of Michigan Press.
- Hofbauer, J., & Sigmund, K. (1988). *The theory of evolution and dynamical systems*. Cambridge: Cambridge University Press.
- Inada, K. (1963). On a two-sector model of economic growth: Comments and a generalization. *Review of Economic Studies*, 30 (2), 119-127.
- Jones, C. (1998). *Introduction to economic growth*. New York: W.W. Norton and Company.
- Kamien, M., & Schwartz, N. (1972a). Timing of innovation under rivalry. *Econometrica*, Volume 40, No. 1 (January), 43-60.
- Kamien, M., & Schwartz, N. (1972b). Market structure, rivals' response, and the firm's rate of product improvement. *The Journal of Industrial Economics*, Volume 20, No. 2 (April), 159-172.
- Kamien, M., & Schwartz, N. (1974). Patent life and R&D rivalry. *The American Economic Review*, Volume 64, No. 1 (March), 183-187.
- Kamien, M., & Schwartz, N. (1975). Market structure and innovation: A survey. *Journal of Economic Literature*, Volume 13, No. 1 (March), 1-37.
- Kamien, M., & Schwartz, N. (1976). On the degree of rivalry for maximum innovative activity. *The Quarterly Journal of Economics*, Volume 90, No. 2 (May), 245-260.
- Kamien, M., & Schwartz, N. (1978). Potential rivalry, monopoly profits and the pace of inventive activity. *The Review of Economic Studies*, Volume 45, No. 3 (October), 547-557.
- Kamien, M., & Schwartz, N. (1982). *Market structure and innovation*. Cambridge: Cambridge University Press.
- Kauffman, S., Lobo, J., & Macready, W. (1998). Optimal search on a technology landscape. *Research in Economics*, Working Paper No. 10-091, Santa Fe Institute.

- Kelm, M. (1997). Schumpeter's theory of economic evolution: A Darwinian interpretation. *Journal of Evolutionary Economics*, Volume 7, Issue 2, 97-130.
- Kennedy, C. (1964). Induced bias in innovation and the theory of distribution. *The Economic Journal*, Volume 74, Issue 295 (September), 541-547.
- Kennedy, P., & Welling, L. (1997). Production externalities and the efficiency of parental child care choices. *The Canadian Journal of Economics*, Volume 30, No. 42 (November), 822-834.
- Keynes, J. M. (1936). *The general theory of employment, interest and money*. London: Macmillan Company.
- Kim, S., & Mohtadi, H. (1992). Labour specialization and endogenous growth. *The American Economic Review*, Volume 82, No. 2 (May), 404-408.
- Kleinknecht, A. (1987). Measuring R&D in small firms: How much are we missing? *The Journal of Industrial Economics*, Volume 36, No. 2 (December), 253-256.
- Krugman, P. (1996). What economists can learn from evolutionary theorists and vice-versa? In J. Groenewegen & J. Vromen (Eds.) (2000). *Institutions and the evolution of capitalism*. Cheltenham, U.K. and Lyme, U.S.: Edward Elgar.
- Kwaśnicki, W. (1996). *Roots of evolutionary economics*. Maastricht Economic Research Institute on Innovation and Technology, Working Paper (September).
- Kwaśnicki, W., & Kwaśnicka, H. (1992). Market, innovation, competition: An evolutionary model of industrial dynamics. *Journal of Economic Behaviour and Organization*, Volume 19, Issue 3 (December), 343-368.
- Levin, R. (1978). Technical change, barriers to entry, and market structure. *Economica*, New Series, Volume 45, Issue 180 (November), 347-361.
- Lloyd-Ellis, H. (1999). Endogenous technological change and wage inequality. *The American Economic Review*, Volume 89, No. 1 (March), 47-77.
- Lotka, A.J. (1925). *Elements of physical biology*. Baltimore: Williams & Wilkins, Reprinted in 1956: *Elements of mathematical biology*. New York: Dover Publications, Inc.
- Loury, G. (1979). Market structure and innovation. *The Quarterly Journal of Economics*, Vol. 93, No. 3 (August), 395-410.
- Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, Volume 22, 3-42.
- Lundvall, B.-A. (ed.) (1992). *National systems of innovation: Towards a theory of innovation and interactive learning*. London: Pinter.
- Maddison, A. (1982). *Phases of capitalist development*. New York: Oxford University Press.
- Marshall, A. (1890). *Principles of economics*. First Edition (September). Library of Economics and Liberty. Retrieved from <http://www.econlib.org/library/Marshall/marP.html> on 12 December 2015.
- Matallia, C. (2000). *Neoclassical growth model and new endogenous growth model: A survey*. Turin, Italy: University of Turin, April.
- Matthews, R. (1984). Darwinism and economic change. *Oxford Economic Papers*, New Series, Volume 36 (November), 91-117.
- McCallum, B. (1996). Neoclassical vs. endogenous growth analysis: An overview. *NBER Working Paper No. 5844* (November).
- McKelvey, B. (1982). *Organizational systematics: Taxonomy, evolution, classification*. University of California Press.
- Metcalf, J.S. (1998). *Evolutionary economics and creative destruction*. The Graz Schumpeter Lectures 1, Routledge.
- Nakicenovic, N. (1988). Dynamics and replacement of U.S. transport infrastructures. In J. Ausubel & R. Herman (Eds.) (1988). *Cities and their vital systems: Infrastructure, past, present, and future*. Washington, D.C.: National Academy Press, 175-220.

- Nelson, R. (1993). *National innovation systems: A comparative analysis*. New York: Oxford University Press.
- Nelson, R., & Phelps, E. (1966). Investments in humans, technological diffusion, and economic growth. *The American Economic Review*, Vol. 56, No. 1/2 (March), 69-75.
- Nelson, R., & Winter, S. (1982a). *An evolutionary theory of economic change*. Cambridge: Massachusetts: Belknap Press of Harvard University Press.
- Nelson, R., & Winter, S. (1982b). The Schumpeterian tradeoff revisited. *The American Economic Review*, Volume 72, No. 1 (March), 114-132.
- Nelson, R., & Winter, S. (1977). Simulation of Schumpeterian competition. *The American Economic Review*, Volume 67, No. 1 (February), 271-276
- Nelson, R. (1995). Recent evolutionary theorizing about economic change. *Journal of Economic Literature*, Volume 33, No. 1 (March), 48-90.
- Nordhaus, W. (1969). An economic theory of technological change. *The American Economic Review*, Volume 59, Issue 2, Papers and Proceedings of the Eighty-first Annual Meeting of the American Economic Association (May), 18-28.
- Nurkse, R. (1953). *Problems of capital development in underdeveloped countries*. New York: Oxford University Press.
- Pack, H. (1994). Endogenous growth theory: Intellectual appeal and empirical shortcomings. *The Journal of Economic Perspectives*, Volume 8, No. 1 (Winter), 55-72.
- Paczkowski, W. (2002). *Endogenous growth models*. Lecture Notes. New Jersey: Rutgers University.
- Peet, R., & Hartwick, E. (1999). *Theories of development*. New York: Guilford Press.
- Penrose, E. (1959). *The theory of the growth of the firm*. New York: John Wiley.
- Penrose, E (1952). Biological analogies in the theory of the firm. *The American Economic Review*, Volume 42, No. 5 (December), 804-819.
- Perez, C. (1983). Structural change and assimilation of new technologies in the economic and social systems. *Futures*, Volume 15, No. 5 (October), 357-375.
- Perkins, D., Radelet, S., Lindauer, D. & Block, S. (2013). *Economics of Development*, 7th edition. W.W. Norton & Company: London.
- Price, G. (1972). Fisher's "fundamental theorem" made clear. *Annals of Human Genetics*, Volume 36, 129-140.
- Price, G. (1970). Selection and covariance. *Nature*, Volume 227, 520-521.
- Prichett, L. (2000). Understanding Patterns of Economic Growth: Searching for Hills among Plateaus, Mountains and Plains. *The World Bank Economic Review No. 14*, 1: 221-250.
- Quah, D. (1995). Empirics for Economic Growth and Convergence. *Centre for Economic Performance Discussion Paper No. 253*. London School of Economics.
- Rebelo, S. (1991). Long-run policy analysis and long-run growth. *The Journal of Political Economy*, Volume 99, No. 3 (June), 500-521.
- Ricardo, D. (1817). *On the principles of political economy and taxation*. Reprint: Cambridge 1951: Cambridge University Press.
- Romer, D. (2001). *Advanced macroeconomics*, 2nd ed., New York: McGraw-Hill, 5-46.
- Romer, P. (1986). Increasing returns and long run growth. *The Journal of Political Economy*, Volume 94, No. 5 (October), 1002-1037.

- Romer, P. (1990). Endogenous technological change. *The Journal of Political Economy*, Volume 98, No.5, Part 2: The Problem of Development: A Conference of the Institute for the Study of Free Enterprise Systems (October), S71-S102.
- Rosenberg, N. (1983). *Inside the black box: Technology and economics*. Cambridge University Press.
- Rosenstein-Rodan, P. (1943). Problems of industrialization of Eastern and Southeastern Europe. *Economic Journal* (June-September). Reprinted in A.N. Agarwala & S.P. Singh (Eds.) *The Economics of Underdevelopment*, New York: Oxford University Press, 1963.
- Sahal, D. (1985). Technological guideposts and innovation avenues. *Research Policy*, Volume 14, Issue 2 (April), 61-82.
- Sala-i-martin, X. (1990a) Lecture notes on economic growth (I): Introduction to the literature and neoclassical models. *NBER Working Paper* 3563 (December).
- Sala-i-martin, X. (1990b). Lecture notes on economic growth (II): Five prototype models of endogenous growth. *NBER Working Paper* 3564 (December).
- Salvadori, N. (ed.) (2003a). *Old and new growth theories: An assessment*. Cheltenham, UK: Edward Elgar.
- Salvadori, N. (2003b). *The theory of economic growth: A 'classical' perspective*. Cheltenham, UK: Edward Elgar.
- Saviotti P., & Metcalfe, J.S. (1991a). *Evolutionary theories of economic and technological change*. Switzerland: Harwood Academic Publishers.
- Saviotti P., & Metcalfe, J.S. (1991b). Present developments and trends in evolutionary economics. In P. Saviotti & J. S. Metcalfe (1991a). *Evolutionary theories of economic and technological change*. Switzerland: Harwood Academic Publishers, 1-30.
- Scherer, F.M. (1965). Firm size, market structure, opportunity, and the output of patented inventions. *The American Economic Review*, Volume 55, Issue 5 (December), 1097-1125.
- Scherer, F.M. (1967a). Research and development resource allocation under rivalry. *The Quarterly Journal of Economics*, Volume 81, Issue 3 (August), 359-394.
- Scherer, F.M. (1967b). Market structure and the employment of scientists and engineers. *The American Economic Review*, Volume 57, 524-531.
- Schmookler, J. (1959). Bigness, fewness, and research. *The Journal of Political Economy*, Volume 67, Issue 6 (December), 628-632.
- Schmookler, J. (1966). *Invention and economic growth*. Cambridge, Massachusetts: Harvard University Press.
- Schmookler, J. (1972). *Patents, invention and economic growth: Data and selected essays*. Cambridge, Massachusetts: Harvard University Press.
- Schumpeter, J. A. (1939). *Business cycles: a theoretical historical and statistical analysis of the capitalist process* (2 vol.). New York: McGraw-Hill.
- Schumpeter, J. A. (1934). The theory of economic development. *Harvard University Studies* 46. Translated by Redvers Opie.
- Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. New York: Harper and Brothers.
- Schumpeter, J. A. (1912). *The theory of economic development*. Oxford: Oxford University Press.
- Shell, K. (1973). Inventive activity, industrial organization, and economic activity. In J. Mirlees & N. Stern (Eds). *Models of economic growth*. London: Macmillan.
- Shell, K. (1967). A model of inventive economic activity and capital accumulation. In K. Shell (Ed.). *Essays on the theory of optimal economic growth*. Cambridge Massachusetts: MIT Press.
- Shell, K. (1966). Toward a theory of inventive activity and capital accumulation. *The American Economic Review*, Volume 56, Issue 1/2 (March), 62-68.

- Sheshinski, E. (1967). Optimal accumulation with learning by doing. In K. Shell (Ed.). *Essays on the theory of optimal economic growth*. Cambridge, Massachusetts: MIT Press.
- Silverberg, G. (1997). Evolutionary modelling in economics: Recent history and immediate prospects. MERIT: University of Maastricht. Paper for the *Workshop on Evolutionary Economics as a Scientific Research Programme*, Stockholm, May 26-27.
- Silverberg, G. (1988). Modelling economic dynamics and technical change: mathematical approaches to self-organisation and evolution. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg & L. Soete (Eds.) (1988). *Technical Change and Economic Theory*. London: Pinter Publishers, 531-559.
- Silverberg, G. (1987). Technical progress, capital accumulation, and effective demand: A self-organization model. In D. Batten, J. Casti & B. Johansson (Eds.) (1987). *Economic evolution and structural adjustment*. Berlin: Springer-Verlag, 116-144.
- Silverberg, G. (1984). Embodied technical progress in a dynamic economic model: The self-organisation paradigm. In R.M. Goodwin, M. Krüger & A. Vercelli (Eds.) (1984). *Nonlinear models of fluctuating growth. Lecture Notes in Economics and Mathematical Systems No. 228*, Springer-Verlag, 192-208.
- Silverberg, G., Dosi, G., & Orsenigo, L. (1988). Innovation, diversity and diffusion: A self-organisation model. *The Economic Journal*, Volume 98 (December), 1032-1054.
- Silverberg, G., & Lehnert, D. (1996). Evolutionary chaos: Growth fluctuations in a Schumpeterian model of creative destruction. In W. Barnett, A. Kirman & M. Salmon (Eds.). *Nonlinear dynamics and economics: Proceedings of the tenth international symposium in economic theory and econometrics*. Cambridge: Cambridge University Press, 45-74.
- Silverberg, G., & Lehnert, D. (1994). Growth fluctuations in an evolutionary model of creative destruction. In G. Silverberg & L. Soete (1994) (Eds.). *The economics of growth and technical change: Technologies, nations, agents*. Edward Elgar, Aldershot, 74-108.
- Silverberg, G., & Verspagen, B. (1998). Economic growth and economic evolution: A modelling perspective. In F. Schweitzer & G. Silverberg (Eds.) (1998). *Evolution and self-organization in economics, Selbstorganisation-Jahrbuch für Komplexität in den Natur-Sozial und Geisteswissenschaften*, Bd. 9, Berlin: Duncker & Humblot, 239-264.
- Silverberg, G., & Verspagen, B. (1995a). Evolutionary theorizing on economic growth. In K. Dopfer (2004). *The Evolutionary Foundations of Economics*. Cambridge University Press (September).
- Silverberg, G., & Verspagen, B. (1995b). From the artificial to the endogenous: Modelling evolutionary adaptation and economic growth. *International Institute for Applied Systems Analysis (IIASA) Working Paper WP-95-08*.
- Silverberg, G., & Verspagen, B. (1995c). An evolutionary model of long term cyclical variations of catching up and falling behind. *International Institute for Applied Systems Analysis (IIASA) Working Paper WP-95-09*.
- Silverberg, G., & Verspagen, B. (1994a). Learning, innovation and economic growth: A long-run model of industrial dynamics. *Industrial dynamics and corporate change*, Volume 3, No. 1, 199-223.
- Silverberg, G., & Verspagen, B. (1994b). Collective learning, innovation and growth in a boundedly rational, evolutionary world. *Journal of Evolutionary Economics*, Volume 4, Issue 3, 207-226.
- Silverberg, G., & Verspagen, B. (1994c). Economic dynamics and behavioural adaptation: An application to an evolutionary endogenous growth model. *International Institute for Applied Systems Analysis (IIASA) Working Paper WP-94-84*.
- Simon, H. (1957). *Models of man*. New York: John Wiley and Sons, Inc.
- Simon, H. (1955). A behavioural model of rational choice. *The Quarterly Journal of Economics*, Volume 69, No. 1 (February), 99-118.
- Smith, A. (1776). *An inquiry into the nature and the causes of the wealth of nations*, Reprint: New York 1937: Random House.

- Smith, K. (1991). Innovation policy in an evolutionary context. In P. Saviotti & J.S. Metcalfe (1991a). *Evolutionary theories of economic and technological change*. Switzerland: Harwood Academic Publishers, 256-275.
- Solow, R. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, vol. 70, 65-94.
- Solow, R. (1957). Technical progress and the aggregate production function. *Review of Economics and Statistics*, vol. 39, 312-320.
- Solow, R. (2000). *Growth theory: An exposition*, New York: Oxford University Press.
- Spencer, H. (1890). *First principles*, 5th edition. London: Williams & Norgate.
- Spencer, H. (1851). *Social statics*. London: Chapman.
- Swan, T. (1956). Economic growth and capital accumulation. *Economic Record* 32: 344-361.
- Thomas, H. (1999). *Bionomic Analysis of Predatory Exclusion of Technologies*. Quarterly Report (August), University of Auburn.
- Uzawa, H. (1965). Optimum technical change in an aggregative model of economic growth. *International Economic Review*, Volume 6, Issue 1 (January), 18-31.
- Van Meijl, H. (1995). *Endogenous technological change: The case of information technology*. PhD dissertation. University of Maastricht.
- Veblen, T. (1898). Why is economics not an evolutionary science? *Quarterly Journal of Economics*, Volume 12, No. 4 (July), 373-397.
- Vega-Redondo, F. (1994). Technological change and path dependence: A co-evolutionary model on a directed graph. *Journal of Evolutionary Economics*, Volume 4, Issue No. 1, 59-80.
- Verspagen, B. (2000). *Economic growth and technological change: An evolutionary interpretation*. Draft paper, Eindhoven Centre for Innovation Studies (ECIS) and MERIT.
- Verspagen, B. (1993). *Uneven growth between interdependent economies: An evolutionary view on technology gaps, trade and growth*. Aldershot: Avery.
- Verspagen, B. (1992). Endogenous innovation in neo-classical growth models: A survey. *Journal of Macroeconomics*, Volume 14, No. 4, 631-662.
- Verspagen, B. (1990). 'New' neoclassical growth models and their relation to evolutionary theories of economic growth: an interpretative survey of some recent literature,' *MERIT Research Memorandum* 90-007 (June).
- Volterra, V. (1926). *Variazioni e fluttuazioni del numero d'individui in specie animali conviventi*. Mem. R. Accademia Nazionale dei Lincei, Serie VI, vol. 2.
- Winter, S. (1984). Schumpeterian competition in alternative technological regimes. *Journal of Economic Behaviour and Organization*, Volume 5, Issues 3-4 (September-December), 287-320.
- Zhang, J. (1997). Fertility, growth and public investments in children. *The Canadian Journal of Economics*, Volume 30, No. 4a (November), 835-843.