Title: The transport system as determinant of patterns of linkages and multipliers: a multi-regional input-output model for São Paulo's Roads

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1. Introduction

This paper assumes that the location of firms in space is more than determining where to produce, but also the cost structure and pricing, easiness of access to the consumer market and infrastructure.

This assumption came from the development of Location Theory and the New Economic Geography, seeking to explain the distribution and organization of economic activities in space, focusing mainly on the influence that gains in scale and costs transport generate to form agglomerations. This premise is important because it could find differences in the multipliers of production at regions better supplied with these resources. Thus, regions that have greater access to infrastructure and transport systems probably have higher production multipliers. While regions with fewer infrastructure be present multiplier of production probably lowers.

In Brazil it is possible to observe quite a strong difference in access to infrastructure. Brazil is the fifth largest country in the world with approximately 8.5 million square kilometers of area (IBGE 2006), occupying almost 50% of the territory of South America (Figure 1). Throughout the territory there are 1,355,000 km of roads (ANTT 2007), and only 144 thousand kilometers are paved and 25% of paved roads located in the State of São Paulo (ANTT 2007) that occupies less than 250 thousand km2, or less than 3% of national territory (IBGE 2006), resulting in 58.4 km of paved roads per km2. According to the Brazilian Institute for Geography and Statistics (IBGE 2006), São Paulo is responsible for more than 30% of Brazilian GDP and 21% of the population occupies its territory. In contrast, the Northeast region occupies 18.3% of the territory and has only 29 km of paved roads per 1000 km2. The North region presents

even greater disparity. This is mainly due to the presence of the Amazon forest and low occupation of its territory. Summarizing, the density of transport is 3.2 km/1000km2, occupies 45.2% of the country, about 8% of the population and 5% of gross domestic product (IBGE 2008).

This paper seeks to identify the influence that investment in infrastructure, especially road transport system, generated on the distribution of production and production structure in Brazil and especially in São Paulo state. For this we divided the state of São Paulo in eight regions focusing on the seven major state roads and the Metropolitan Region of São Paulo. And the rest of the country in its five macro-regions: South, Midwest, North, Northeast and the rest of the Southeast (Espírito Santo, Minas Gerais and Rio de Janeiro).

The seven roads chosen for the State of São Paulo and the Metropolitan Region are described according to their main characteristics in Table 1, with the aggregation of micro-regions to the State of São Paulo. In figure 2 the Brazilian map is divided according to the proposal structure except the state of São Paulo, which is divided in Figure 3A according to the numbers outlined in Table 1 and in Figure 3B that is according to the road study.

The microregion of Sao Paulo and ABCD is made by the municipalities of Diadema, Mauá, Ribeirão Pires, Rio Grande da Serra, Santo André, São Bernardo do Campo, São Caetano do Sul and São Paulo; the roads of the study leave it. The region is characterized by high level of industrialization (mainly automotive and metallurgical, but also electronics and petrochemicals). Recently the region stands out for its dynamism in the provision of services. Accounts for more than 50% of the state

production and has within its network of influence 40.5% of GDP according to the study Regiões de Influência das Cidades 2007 released by the IBGE in 2008.

The second region is the first of the axes chosen for the study, receiving the names of roads that include Rodovia Anchieta (SP-150), Immigrants (SP-160), and Rio-Santos (SP-060). This region includes much of the coast and the main port of Brazil and Latin America, the Port of Santos. Due to the extensive coastal strip the main activity is tourism, complemented by trade and services. Within the region is also added to complex of refineries and chemical industries in the region of Cubatao that account for much of the industry of its kind in the state. Investments in transport infrastructure in the region are the expense of the Ecovias concessionaire that manages the complex Anchieta-Imigrantes and the federal government responsible for the Rio-Santos. Since 1998, when it was contemplated with the management of the Anchieta-Imigrantes, the Ecovias invested more than $ 1 billion in expansion, duplication, maintenance, among others (INTELOG, 2005).

The third area of study is called Rod. President Dutra (BR-116), connecting the two major cities and states in the country - São Paulo and Rio de Janeiro - and through one of the richest regions of state - the Vale do Paraíba. It established metallurgical industries, war material, the largest aerospace complex in Latin America, some automakers, automotive and electronics industries. According to NovaDutra, the concessionaire controller, have invested more than 6 billion Reais from March 1996 until December 2007 in works that include repaving, expanding the number of bands and marginal slopes, location of walkways, construction of bridges, viaducts and access, among others.

The Rodovia Fernão Dias (BR-381) is responsible for defining the fourth axes of transport. It links Victoria, Espirito Santo main city, to Sao Paulo capital across the state of Minas Gerais. Throughout its journey are important manufacturing industries, and cities that back its production to agriculture and furniture industry. The stretch of highway in São Paulo was privatized in 1998, and the OHL, the company which holds the concession provided for investment approximately 500 million Reais over the 20 years of the contract. In 2008, again was an auction for that investment not only in Sao Paulo stretch, but in the federal too and are planned R$ 1.5 billion of investments according to the OHL and the National Agency for Land Transport.

The fifth road comprises Anhanguera highways (BR-050) and Bandeirantes (SP-348), linking the city of São Paulo to the north and northeast of the state. Within its area is mesoregion of Campinas totaling approximately one third of the industrial park of Sao Paulo. Your industry is focused on high technology and metallurgy, and is also an important scientific and technological center. The areas further north of the state are major producers of fabrics, natural and synthetic fibers, as well as alcohol, sugar, coffee and shoes. Despite the large extent of the stretch, this is one of the most successful of the promoted program of road concessions in the state of São Paulo. The Autoban, which controls the stretch since 1998, won several awards in the best qualification of highway in Brazil, having invested about 1.5 billion reais in the period, according to the concessionaire.

The sixth section includes several highways: Castelo Branco (SP-280), Marechal Rondon (SP-330) and Santos Dumont (SP-075). For didactic reasons, is called Marechal Rondon as the road that reaches the most distant from the capital. This region of the state is historically important producer of coffee, sugar cane and cattle, and now there is

also the non-metallic mining industry and processing industry. Castelo Branco Road is the first one was auctioned under the concession model, and since then the Rodovia das Colinas pledged to invest 1.4 billion reais in infrastructure. Recently, the Marechal Rondon was granted to the Brasinfra consortium which promised to invest 1.6 billion reais over the 30 years of the concession.

The Raposo Tavares highway (SP-270) connects the west of the capital to the west of São Paulo State. The most prominent economic activities are beef cattle, the agribusiness exporter of cereals, the industry of paper, wood and cellulose. Your route is administered by the Department Departament de Estradas de Rodagem do Estado de São Paulo, and the concessionaires Via Oeste, SPVias and Invepar. According to ViaOeste which manages 170 km of highway will be invested about 2 billion reais in the 25 years of grant to be distributed among works of doubling, of access loops, bridges and roads.

The eighth axis of the study is Regis Bittencourt Highway (SP-230) that connects the states of São Paulo and Paraná. The connection is very important due to the volume of traffic and the importance to national production. Throughout the journey there is the production of agricultural goods with emphasis on the production of bananas, tea and rush. However, by linking the southern and southeastern regions promotes great dynamics for the industry in both regions. In 2008 the highway was auctioned in the form of grant, and secured by the OHL that is committed to doubling the number of tracks in the stretch between Juquitiba and Miracatu by 2012 and invest throughout the concession period approximately 2 billion reais.

Defined the areas of study based on the pre-existing infrastructure of transport and investment proposed by the concessionaires to provide quality services and thus stimulate regional development, makes the theoretical assumptions discussed in the review and looks for the magnitude of these multiplier effects on production, wages, employment and value added. It is used an input-output inter-regional model, rather a model suitable for analysis of the type.

2. Methodology:

The input-output model was originally presented in this format by Wassily Leontief (1906-1999). He says the method is "an adaptation of the neoclassical general equilibrium theory to the empirical study of the interdependence between quantity of inter-related economic activities" (Leontief, 1966, p.134), i.e., it is a way to relate the actual flows of an economy between economic actors.

The United Nations has developed an international standard System of National Accounts in 2006, thereby establishing rules for the measurement of input-output tables.

Brazil follows this system and IBGE publishes the national accounts data from the perspective of input-output in the form of an array of production and other of use and resources. These matrices describe the relationship between n productive sectors in m products. However, as explained in Miller and Blair (1985) and discussed in Stone (1981) and Mesnard (2004), the presentation of the matrices can be mathematical transformed to make them unique and inter-industry or cross product.

The choice between the technologies based on industry or on product depends on several conditions, however, based on the technology industry is the closest to the model proposed by Leontief and also the reality. The analysis to be done from the perspective of regional and sectoral inequality also makes it the choice for the technology based on industry the ideal. The industries focuses of study are listed in Table 2. As in Table 3 are the regions previously shown in Figures 1 and 2, according to the acronyms used in tables for denotation of the regions.

a. The Inter-regional input-output model:

The input-output model to be estimated is based on the matrix of input-output obtained from Guilhoto (2008) which is the updated matrix of Brazilian national accounts using the methodology developed in Guilhoto and Sesso Filho (2005) and is consistent for 2004. The structure of the inter-regional input-output model to be analyzed is shown in Figure 3. Where there are n = 20 sectors for r = 13 regions:

Where:

$Z^{rr}_{(nxn)}$ is the matrix of intermediate consumption inter-sectoral e inter-regional formed by z^{st}_{ij} coefficients of sells from the sector i from region s to the sector j from region t or the consumption of sector j of region t provided by the sector i of region s; $(s, t \in r), (i, j \in n)$.

$I^{r}_{(1xn)}$ is the vector of wages in all sectors of region r r formed by coefficients i^{t}_{j} of wages paid by sector j of region t.

$T^r_{(1xn)}$ is the vector of employments in all sectors of region r formed by coefficients t^t_j of workers occupied by sector j of region t.

$V^r_{(1xn)}$ is the vector of value added in all sectors of region r formed by v^t_j coefficients of value added by the sector j of region t.

$Y^{rr}_{(nxf)}$ is the matrix of final demand f region r by the production of region s formed by five vectors $(f = 5)$ of: household consumption, government spending, exports, gross fixed capital formation and change of inventories. With coefficients y^{st}_i of consumption of sector i from region s for the vector of final demand in region t.

$X^r_{(1xn)}$ is the vector of total production of all sectors of region r formed by the coefficients x^t_j of total production of sector j of region t (sum of the columns) and x^s_i of total production of sector i from region s (sum of the rows).

This type of model was first applied by Isard in 1951 and consists of a fairly large volume of data. Ichihara (2007) summarizes different methods of estimation proposed during the twentieth century to achieve such inter-regional data, while Guilhoto (2007) explains the various ways to handle and examine them.

In summary, the equations developed by Leontief in 1951 and 1986 shall remain valid for inter-regional level can be represented as:

$$X^r_1 = \sum_{r=1}^{13} \sum_{n=1}^{20} z^r_{1n} + Y^r_1$$

As X^r_1 is the total of good 1produced in the region .

The technical coefficients of production can be calculated for all combinations of regions by the way shown below:

$$A^{rr} = Z^{rr} \left(\hat{X}^r \right)^{-1}$$

The definition to the matrix A is:

$$A = \begin{bmatrix} A^{11} & \cdots & A^{1r} \\ \vdots & \ddots & \vdots \\ A^{r1} & \cdots & A^{rr} \end{bmatrix}$$

And the input-output inter-regional system can be represented by:

$$X = (I - A)^{-1} Y$$

Where $(I - A)^{-1} = B$ is the inverse matrix of Leontief or the matrix of direct and indirect coefficients on which the elements b_{ij}^{st} may be interpreted as the total production of sector i of region s which is required to produce a unit of final demand of j of region t.

b. The input-output model extended or endogened:

Is necessary to make endogen the consumption and income of families for the calculation of the induced effect. Thus, build up the following matrix:

$$\overline{A} = \begin{bmatrix} A & H_c \\ H_r & 0 \end{bmatrix}$$

Where, $\overline{A}$ is the matriz which contains the income H_r and the household consumption, H_c. For the system be completed is required the construction of new vectores $\overline{X}$ and $\overline{Y}$:

$$\overline{X} = \begin{bmatrix} X \\ X_{n+1} \end{bmatrix}$$

$$\overline{Y} = \begin{bmatrix} Y \\ Y_{n+1} \end{bmatrix}$$

X_{n+1} and Y_{n+1} are related with the endogenized households consumption and income. And the input-output system can be represented by:

$$\overline{X} = (I - \overline{A})^{-1}\overline{Y}$$

As $(I - \overline{A})^{-1} = \overline{B}$ is the inverse matrix of Leontief endogenized or matrix of direct, indirect and endogenized coefficients.

c. Production Multpliers:

Production Multipliers are a indicator of how much is produced in the economy as a whole in direct and indirect (Type I) or through direct, indirect and induced (Type II) for each unit spent on final consumption. And are calculated for the second sector j sector by the equation below where b_{ij} is the coefficient related with the sector j of the matrix inverse of Leotief (Type I) or the inverse of Leontief endogenizada (Type II).

$$MP_j = \sum_{i=1}^{n} b_{ij}$$

The concept of a production multiplier is based on the ratio of production generated in the production chain as a whole from the need to produce one unit more to final demand. Thus, to get a Production Multiplier of Type I equal to 2.32 in the region of São Paulo and in the ABCD area of Food, Beverages and Tobacco, means that in addition to the unit direct produced there was 1.32 plus indirect way. And observing the Production Multiplier of Type II for the same sector and region, 3.90, note the existence of an effect of 1.58 units of national product induced by the consumption and income of the families. The results are shown in tables of numbers 4 to 29 attached.

3. The roads axis and the empirical evidences:

In order to clarify the influence that investment in infrastructure and transportation have on the regional production structure, this section seek to highlight results from the existence of gains of scale and multiplier effects.

From the premise that an efficient transport system mainly influences the movement of raw materials and products over the space, in this section we ignore the services sectors (Industrial Services of Public Utility, Construction, Trade, Transportation, Services and Administration and Public Services), therefore are considered non-tradable, i.e., are not negotiable between different regions and therefore do not influence or are influenced directly by the transport system.

Another restriction is that it is on the regions analyzed. Due to the need to concentrate efforts in the definition of transport infrastructure and urban agglomerations as determinants of the multiplier effects and gains of scale, will be analyzed only the

regions defined for the State of São Paulo. Thus, it is intended to capture the influence of roads and their quality on the magnitude of gains of scale and multiplier effects.

The first analysis can be made based on the largest Production Multipliers of type II in all regions of the State of São Paulo in comparison with the smallest.

The choice of Production Multipliers as a factor in the selection of the sector for comparison was due to its relevance as an indicator of potential capacity to stimulate the economy, i.e., the dependence of the production sector through the whole production chain before, be it regional or not. Thus, sectors with greater multiplier of production mean sectors better linked with its suppliers of inputs, and disregarding the merits of cause and effect, are dependent on local suppliers of raw materials and infrastructure for efficient transport to its import.

The existence of gains of scale, externalities or access to transport infrastructure, these regions will also be dynamic in the generation of wages, jobs and value added (Araújo, 2006 and Eberts, 2000).

The 20 sectors with higher multipliers for Production of Type II are listed in Table 32. The table is organized by region of origin of the sector (see table 3). In the table are listed the values of the Multipliers of Type I and II and the generators Total Wages, Employment and Value Added. As in Table 33 are the 20 sectors with lower Production Multiplier of Type II under the same aspects of the table 73.

Both tables have sectors belonging to all regions. However, as table 32 have 9 sectors between 20 from the regions of São Paulo and ABCD, Rod Anchieta-Imigrantes and Rio-Santos and Rod Pres. Dutra. And these same regions only have 5 multipliers between the 20 lowers multipliers of table 33. Moreover, the regions of Rod Fernao

Dias and Régis Bittencourt doubled the number of sectors between the lowers multipliers in comparison with the table 32.

In the bottom row of the two tables, is also an average of the values of the generators of income, employment and value added. As you can see, the generators of wages are approximately 45% lower among the 20 lowest multiplier of production. This trend remains when comparing the generation of employment, 63% lower, and value added, 34%.

Comparing the regions with the 20 largest Production Multipliers, the generators of Rod. Fernao Dias and Régis Bittencourt are 62% lower for wages, 57% lower for employments and 60% lower for value-added in comparison with the mean.

This same trend is found among the 20 lowest multiplier of production too. The values of the generators of wages, jobs and value added are respectively smaller in the order of 67%, 68% and 58%.

This evidence supports this paper hypothesis of the investment in infrastructure and especially in transport systems has an intrinsic relationship with the cities and regions of higher growth and economic development even if it is indefinite in its order of causality.

Thus, regions that receive greater investment in infrastructure and transport, are most likely to generate urban agglomerations and otherwise provide suitable conditions for the transport of goods in order to meet its economy with imports of raw materials and export their products.

This dynamic is driving on benefits to production, wages, employments and income, so public policies for investment in infrastructure for disadvantaged regions can generate benefits for the reduction of regional inequalities.

4. Conclusion

This work presented an inter-regional input-output system which aimed to identify from the choice of regions defined in the layout of the main roads of the State of São Paulo and Brazilian regions, the existence of gains of scale and multiplier effects as suggested by some studies within the New Economic Geography and the Location Theory.

From the analysis of the results obtained is possible to conclude that the Brazilian economy is very diversified . And despite the dynamic centers that have eventually attract greater volume of business and investment in infrastructure in all regions studied the productive activity takes place in almost all sectors, except for the Petroleum Refining.

Some regions, due to difficulties of access and transport are not dynamic in the production of goods in order to meet the national demand. Usually these sectors are concentrated in regions that have good infrastructure and ease the flow of production.

The analysis of the Production Multipliers of type I and II decomposed observe how this chain of sectors occurs. São Paulo and ABCD are regions that stimulate the

production of other dynamic areas nearby and as they are stimulated by the production of all regions of the country.

Finally, the joint analysis of all indicators corroborate the hypothesis stipulated that the influence of investment in infrastructure and transport encourage urban and industrial agglomerations, and provide gains of scale and multiplier effects.

This hypothesis can be observed in the magnitude of the Production Multipliers of type I and II, which put downward after the Brazilian macro-regions regions with greater investments in infrastructure or with greater proximity to the economic center that is the region of São Paulo and ABCD.

Thus, it is expected to have collaborated with the discussion of the issue of influence in determining the firm location, the formation of settlements and the impacts on the production chain, the distribution of income, in generating employment and stimulating the growth and economic development through value added.

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Table 1: Micro-regions aggregation to São Paulo State

Region	Micro-regions agregated
1 São Paulo e ABCD	São Paulo
2 Rod. Anchieta-Imigrantes e Rio-Santos	Caraguatatuba, Moji das Cruzes e Santos
3 Rod. Pres. Dutra	Campos do Jordão, São José dos Campos, Guaratinguetá, Bananal, Paraibuna/Paraitinga e Guarulhos
4 Rod. Fernão Dias	Bragança Paulista e Franco da Rocha
5 Rod. Anhanguera-Bandeirantes	Jales, Fernandópolis, Votuporanga, São José do Rio Preto, Catanduva, Auriflama, Nhandeara, Novo Horizonte, Barretos, São Joaquim da Barra, Ituverava, Franca, Jaboticabal, Ribeirão Preto, Batatais, Araraquara, São Carlos, Rio Claro, Limeira, Piracicaba, Pirassununga, São João da Boa Vista, Moji-Mirim, Campinas, Amparo e Jundiaí
6 Rod. Marechal Rondon	Andradina, Araçatuba, Birigui, Lins, Bauru, Jau, Botucatu, Tatuí, Sorocaba
7 Rod. Raposo Tavares	Avaré, Dracena, Adamantina, Presidente Prudente, Tupã, Marília, Assis, Ourinhos, Itapeva, Itapetininga, Capão Bonito, Piedade e Osasco
8 Rod. Regis Bittencourt	Registro, Itanhaem e Itapecerica da Serra

Source: Author

Figure 1: South America Map

Figure 2: Brazil – Macro-regions analyzed

Source: Author

Figure 3A: Zoom: São Paulo – Axis Analyzed
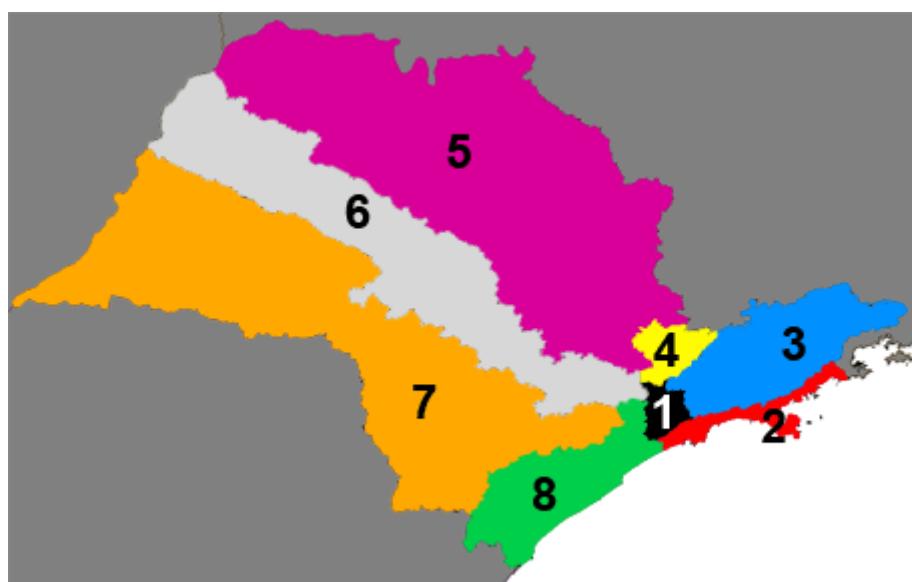
Source: Author

Figure 3B: Zoom: São Paulo – Main Roads and Regions Analyzed
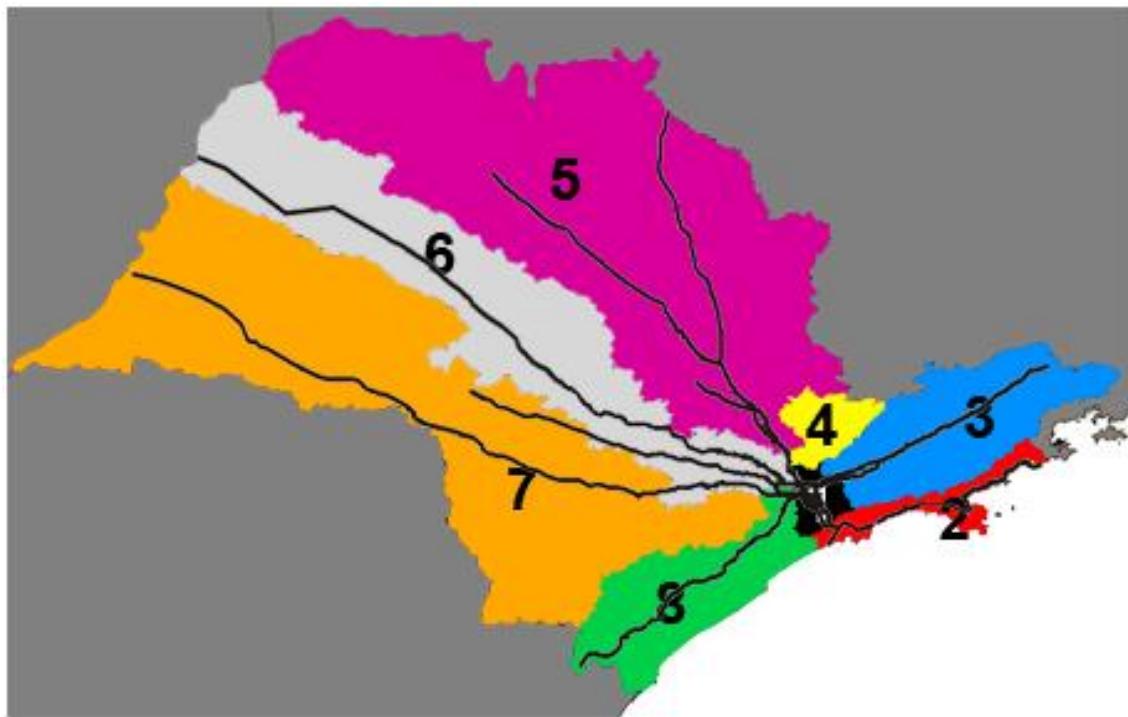
Source: Ministério dos Transports, Author

Table 2: Sectors Analyzed

	Sectors
1	Agriculture e Cattle
2	Extractive
3	Food, drinks and tobacco
4	Textiles, clothing and footwear
5	Paper, Wood and Graphics
6	Oil Refine
7	Alcohol
8	Chemicals and Rubber
9	Non-metallic mineral products
10	Metallurgical Industry
11	Machinery, Equipment and Maintenance
12	Miscellaneous Equipment
13	Cars, Trucks and Buses
14	Miscellaneous industries
15	Industrial Services of Public Utility
16	Construction
17	Trade
18	Transport
19	Services
20	Administration and Public Services

Source: Author

Table 3: Regions Agregation and Code

	Code	Region
1	SP	São Paulo e ABCD
2	LI	Rod. Anchieta-Imigrantes e Rio-Santos
3	RJ	Rod. Pres. Dutra
4	MG	Rod. Fernão Dias
5	AB	Rod. Anhanguera-Bandeirantes
6	MR	Rod. Marechal Rondon
7	RT	Rod. Raposo Tavares
8	RB	Rod. Régis Bittencourt
9	SUL	South Region States
10	COE	Mid-West Region States
11	NOR	North Region States
12	NET	Northeast Region States
13	SET	South Region States except São Paulo

Source: Author

Figure 4: Matrix notation to inter-regional input-output model

$$
\begin{array}{cccccccccccccc}
\mathbf{Z}^{11}_{(n\times n)} & \cdots & \mathbf{Z}^{1t}_{(n\times n)} & \cdots & \mathbf{Z}^{1r}_{(n\times n)} & \mathbf{Y}^{11}_{(n\times 5)} & \cdots & \mathbf{Y}^{1t}_{(n\times 5)} & \cdots & \mathbf{Y}^{1r}_{(n\times 5)} & \mathbf{X}^{1}_{(n\times 1)} \\
\vdots & \ddots & & & \vdots & \vdots & \ddots & & & \vdots & \vdots \\
\mathbf{Z}^{s1}_{(n\times n)} & & \mathbf{Z}^{st}_{(n\times n)} & & \mathbf{Z}^{sr}_{(n\times n)} & \mathbf{Y}^{s1}_{(n\times 5)} & & \mathbf{Y}^{st}_{(n\times 5)} & & \mathbf{Y}^{sr}_{(n\times 5)} & \mathbf{X}^{s}_{(n\times 1)} \\
\vdots & & & \ddots & \vdots & \vdots & & & \ddots & \vdots \\
\mathbf{Z}^{r1}_{(n\times n)} & \cdots & \mathbf{Z}^{rt}_{(n\times n)} & \cdots & \mathbf{Z}^{rr}_{(n\times n)} & \mathbf{Y}^{r1}_{(n\times 5)} & \cdots & \mathbf{Y}^{rt}_{(n\times 5)} & \cdots & \mathbf{Y}^{rr}_{(n\times 5)} & \mathbf{X}^{r}_{(n\times 1)} \\
\mathbf{I}^{1}_{(1\times n)} & \cdots & \mathbf{I}^{t}_{(1\times n)} & \cdots & \mathbf{I}^{r}_{(1\times n)} \\
\mathbf{T}^{1}_{(1\times n)} & \cdots & \mathbf{T}^{t}_{(1\times n)} & \cdots & \mathbf{T}^{r}_{(1\times n)} \\
\mathbf{V}^{1}_{(1\times n)} & \cdots & \mathbf{V}^{t}_{(1\times n)} & \cdots & \mathbf{V}^{r}_{(1\times n)} \\
\mathbf{X}^{1}_{(1\times n)} & \cdots & \mathbf{X}^{t}_{(1\times n)} & \cdots & \mathbf{X}^{r}_{(1\times n)} \\
\end{array}
$$

Source: Ichihara (2007)

Table 4: São Paulo e ABCD - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	1.57	0.01	0.01	0.00	0.06	0.01	0.02	0.00	0.09	0.04	0.02	0.04	0.08	1.95	9
Extractive	1.68	0.01	0.03	0.00	0.04	0.01	0.01	0.00	0.03	0.01	0.01	0.03	0.09	1.95	10
Foods, drinks and tobacco	1.43	0.01	0.01	0.00	0.08	0.01	0.03	0.00	0.29	0.15	0.05	0.08	0.17	2.32	1
Textiles, Clothing and footwear	1.55	0.01	0.03	0.01	0.17	0.01	0.01	0.00	0.04	0.04	0.01	0.04	0.05	1.98	8
Paper, wood and graphics	1.47	0.02	0.02	0.00	0.05	0.01	0.02	0.00	0.09	0.01	0.03	0.06	0.10	1.88	14
Oil Refine	1.31	0.01	0.01	0.00	0.03	0.01	0.02	0.00	0.05	0.01	0.03	0.11	0.54	2.13	3
Alcohol	1.59	0.01	0.01	0.00	0.04	0.01	0.02	0.00	0.10	0.04	0.02	0.06	0.09	1.98	7
Chemicals and Rubber	1.44	0.03	0.02	0.00	0.05	0.01	0.02	0.00	0.16	0.02	0.04	0.13	0.15	2.07	4
Non-metallic mineral products	1.48	0.02	0.03	0.00	0.04	0.00	0.01	0.00	0.08	0.02	0.04	0.06	0.16	1.94	11
Metallurgical Industry	1.40	0.02	0.02	0.00	0.03	0.01	0.01	0.00	0.07	0.02	0.03	0.05	0.26	1.91	13
Machinery, Equipment and Maintenance	1.51	0.02	0.02	0.00	0.03	0.01	0.01	0.00	0.08	0.01	0.03	0.04	0.28	2.04	5
Miscellaneous Equipment	1.55	0.01	0.02	0.00	0.04	0.01	0.01	0.00	0.07	0.01	0.04	0.05	0.16	1.98	6
Cars, Trucks and Buses	1.71	0.01	0.02	0.00	0.05	0.01	0.01	0.00	0.13	0.02	0.04	0.05	0.25	2.30	2
Miscellaneous Industries	1.48	0.03	0.02	0.00	0.06	0.01	0.01	0.00	0.12	0.02	0.05	0.03	0.08	1.92	12
Industrial Services of Public Utility	1.49	0.01	0.02	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.06	1.65	17
Construction	1.40	0.02	0.03	0.00	0.07	0.01	0.01	0.00	0.06	0.01	0.03	0.03	0.10	1.76	16
Trade	1.32	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.45	20
Transport	1.42	0.02	0.06	0.00	0.07	0.01	0.01	0.00	0.03	0.01	0.01	0.02	0.10	1.76	15
Services	1.37	0.01	0.01	0.00	0.03	0.00	0.02	0.00	0.04	0.01	0.01	0.02	0.04	1.55	18
Administration and Public Services	1.41	0.01	0.01	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.02	1.53	19

Source: Author

Table 5: São Paulo e ABCD- Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	MP2R	Ranking
Agriculture and Cattle	2.45	0.03	0.04	0.00	0.17	0.03	0.06	0.00	0.32	0.10	0.07	0.16	0.32	3.76	2
Extractive	2.34	0.03	0.05	0.00	0.12	0.02	0.04	0.00	0.19	0.05	0.05	0.10	0.27	3.25	15
Foods, drinks and tobacco	1.98	0.03	0.04	0.00	0.16	0.03	0.06	0.00	0.59	0.24	0.11	0.23	0.44	3.90	1
Textiles, Clothing and footwear	2.41	0.03	0.06	0.01	0.28	0.03	0.05	0.00	0.25	0.10	0.05	0.16	0.26	3.69	3
Paper, wood and graphics	2.16	0.04	0.05	0.00	0.13	0.02	0.05	0.00	0.28	0.06	0.08	0.16	0.31	3.36	11
Oil Refine	1.59	0.01	0.03	0.00	0.08	0.02	0.03	0.00	0.18	0.04	0.05	0.22	0.87	3.14	19
Alcohol	2.26	0.02	0.03	0.00	0.12	0.02	0.04	0.00	0.30	0.09	0.06	0.18	0.30	3.44	6
Chemicals and Rubber	1.99	0.04	0.04	0.00	0.12	0.02	0.05	0.00	0.35	0.06	0.08	0.25	0.35	3.37	10
Non-metallic mineral products	2.16	0.03	0.05	0.00	0.12	0.02	0.04	0.00	0.27	0.07	0.09	0.16	0.39	3.41	8
Metallurgical Industry	2.01	0.03	0.04	0.00	0.10	0.02	0.04	0.00	0.24	0.06	0.06	0.13	0.50	3.24	16
Machinery, Equipment and Maintenance	2.14	0.03	0.05	0.00	0.11	0.02	0.04	0.00	0.26	0.06	0.07	0.14	0.53	3.44	7
Miscellaneous Equipment	2.15	0.03	0.05	0.00	0.11	0.02	0.04	0.00	0.24	0.05	0.08	0.13	0.36	3.26	14
Cars, Trucks and Buses	2.29	0.03	0.05	0.00	0.12	0.02	0.04	0.00	0.32	0.06	0.08	0.14	0.49	3.64	4
Miscellaneous Industries	2.19	0.05	0.05	0.00	0.15	0.02	0.04	0.00	0.33	0.06	0.10	0.12	0.28	3.40	9
Industrial Services of Public Utility	2.11	0.02	0.05	0.00	0.09	0.01	0.03	0.00	0.15	0.04	0.04	0.08	0.21	2.85	20
Construction	2.17	0.04	0.06	0.00	0.16	0.03	0.04	0.00	0.25	0.06	0.07	0.12	0.30	3.30	13
Trade	2.28	0.03	0.05	0.00	0.13	0.02	0.05	0.00	0.22	0.06	0.05	0.10	0.23	3.23	17
Transport	2.22	0.03	0.09	0.00	0.16	0.02	0.04	0.00	0.22	0.05	0.05	0.12	0.31	3.33	12
Services	2.21	0.02	0.04	0.00	0.12	0.02	0.05	0.00	0.23	0.06	0.06	0.11	0.24	3.16	18
Administration and Public Services	2.50	0.03	0.05	0.00	0.14	0.02	0.06	0.00	0.25	0.07	0.06	0.12	0.25	3.56	5

Source: Author

Table 6: Anchieta-Imigrantes e Rio-Santos - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.21	1.28	0.02	0.00	0.08	0.01	0.02	0.00	0.07	0.03	0.02	0.03	0.08	1.87	14
Extractive	0.53	1.15	0.04	0.00	0.07	0.01	0.02	0.00	0.03	0.01	0.01	0.03	0.10	1.98	7
Foods, drinks and tobacco	0.18	1.32	0.01	0.00	0.05	0.01	0.02	0.00	0.29	0.15	0.05	0.08	0.17	2.32	1
Textiles, Clothing and footwear	0.24	1.40	0.02	0.00	0.05	0.00	0.01	0.00	0.06	0.06	0.01	0.07	0.08	2.01	6
Paper, wood and graphics	0.30	1.19	0.02	0.00	0.04	0.01	0.01	0.00	0.12	0.02	0.05	0.08	0.15	1.98	8
Oil Refine	0.15	1.16	0.01	0.00	0.03	0.02	0.02	0.00	0.05	0.01	0.03	0.11	0.54	2.13	3
Alcohol	0.10	1.48	0.01	0.00	0.04	0.01	0.01	0.00	0.09	0.04	0.02	0.06	0.09	1.95	10
Chemicals and Rubber	0.33	1.27	0.05	0.00	0.08	0.01	0.02	0.00	0.07	0.02	0.02	0.07	0.19	2.12	4
Non-metallic mineral products	0.32	1.16	0.03	0.00	0.05	0.01	0.01	0.00	0.08	0.02	0.04	0.06	0.17	1.96	9
Metallurgical Industry	0.34	1.19	0.03	0.00	0.04	0.01	0.01	0.00	0.04	0.01	0.02	0.02	0.18	1.90	13
Machinery, Equipment and Maintenance	0.25	1.30	0.02	0.00	0.03	0.01	0.01	0.00	0.07	0.01	0.03	0.04	0.27	2.04	5
Miscellaneous Equipment	0.20	1.33	0.02	0.00	0.03	0.00	0.01	0.00	0.08	0.01	0.04	0.05	0.18	1.95	11
Cars, Trucks and Buses	0.15	1.48	0.01	0.00	0.02	0.00	0.01	0.00	0.09	0.01	0.03	0.05	0.28	2.14	2
Miscellaneous Industries	0.32	1.21	0.02	0.00	0.05	0.01	0.01	0.00	0.12	0.02	0.05	0.03	0.08	1.93	12
Industrial Services of Public Utility	0.12	1.40	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.06	1.64	17
Construction	0.24	1.21	0.02	0.00	0.05	0.01	0.01	0.00	0.06	0.01	0.03	0.03	0.09	1.75	15
Trade	0.15	1.19	0.01	0.00	0.02	0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.44	19
Transport	0.26	1.25	0.02	0.00	0.03	0.01	0.01	0.00	0.03	0.01	0.01	0.02	0.10	1.75	16
Services	0.13	1.10	0.01	0.00	0.02	0.00	0.01	0.00	0.03	0.01	0.01	0.01	0.03	1.36	20
Administration and Public Services	0.20	1.21	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.02	1.51	18

Source: Author

Table 7: Anchieta-Imigrantes e Rio-Santos - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II													Total	Ranking
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET		
Agriculture and Cattle	0.96	1.46	0.06	0.00	0.18	0.03	0.05	0.00	0.30	0.09	0.07	0.15	0.32	3.67	2
Extractive	1.18	1.26	0.07	0.00	0.15	0.02	0.04	0.00	0.20	0.05	0.05	0.11	0.30	3.45	11
Foods, drinks and tobacco	0.69	1.42	0.04	0.00	0.12	0.02	0.04	0.00	0.59	0.25	0.11	0.23	0.45	3.97	1
Textiles, Clothing and footwear	0.89	1.55	0.05	0.00	0.13	0.02	0.04	0.00	0.26	0.13	0.06	0.19	0.29	3.62	3
Paper, wood and graphics	0.86	1.30	0.05	0.00	0.12	0.02	0.04	0.00	0.33	0.07	0.11	0.20	0.39	3.50	8
Oil Refine	0.43	1.19	0.03	0.00	0.08	0.02	0.03	0.00	0.18	0.04	0.06	0.22	0.88	3.17	18
Alcohol	0.73	1.64	0.04	0.00	0.13	0.02	0.04	0.00	0.31	0.10	0.07	0.18	0.32	3.59	6
Chemicals and Rubber	0.78	1.34	0.07	0.00	0.14	0.02	0.04	0.00	0.22	0.06	0.05	0.16	0.39	3.28	16
Non-metallic mineral products	0.94	1.28	0.06	0.00	0.13	0.02	0.04	0.00	0.29	0.08	0.09	0.17	0.41	3.53	7
Metallurgical Industry	0.86	1.29	0.05	0.00	0.11	0.02	0.04	0.00	0.19	0.05	0.06	0.10	0.39	3.18	17
Machinery, Equipment and Maintenance	0.81	1.42	0.05	0.00	0.10	0.02	0.03	0.00	0.26	0.06	0.07	0.13	0.53	3.49	9
Miscellaneous Equipment	0.75	1.46	0.04	0.00	0.10	0.02	0.03	0.00	0.26	0.05	0.08	0.15	0.40	3.34	15
Cars, Trucks and Buses	0.69	1.60	0.04	0.00	0.09	0.02	0.03	0.00	0.29	0.06	0.07	0.15	0.55	3.59	5
Miscellaneous Industries	0.97	1.35	0.05	0.00	0.13	0.02	0.04	0.00	0.34	0.07	0.11	0.12	0.29	3.49	10
Industrial Services of Public Utility	0.74	1.56	0.04	0.00	0.09	0.02	0.03	0.00	0.18	0.05	0.04	0.09	0.24	3.08	19
Construction	0.94	1.38	0.05	0.00	0.14	0.02	0.04	0.00	0.26	0.06	0.07	0.13	0.31	3.42	13
Trade	0.98	1.42	0.05	0.00	0.12	0.02	0.04	0.00	0.24	0.06	0.05	0.11	0.25	3.35	14
Transport	0.97	1.42	0.05	0.00	0.12	0.02	0.04	0.00	0.23	0.06	0.05	0.12	0.32	3.43	12
Services	0.84	1.30	0.04	0.00	0.10	0.02	0.04	0.00	0.23	0.06	0.05	0.10	0.23	3.01	20
Administration and Public Services	1.12	1.46	0.05	0.00	0.13	0.02	0.05	0.00	0.26	0.07	0.06	0.12	0.26	3.59	4

Source: Author

Table 8: Rod. Pres. Dutra - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Administration and Public Services	0.20	0.00	1.24	0.00	0.01	0.00	0.01	0.00	0.02	0.01	0.01	0.01	0.03	1.54	19
Services	0.17	0.00	1.24	0.00	0.02	0.00	0.01	0.00	0.05	0.02	0.02	0.02	0.05	1.60	18
Transport	0.24	0.02	1.26	0.00	0.07	0.00	0.01	0.00	0.03	0.01	0.01	0.03	0.10	1.76	15
Trade	0.14	0.00	1.21	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.45	20
Construction	0.12	0.01	1.38	0.00	0.02	0.00	0.01	0.00	0.06	0.01	0.03	0.03	0.09	1.76	16
Industrial Services of Public Utility	0.19	0.01	1.32	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.06	1.65	17
Miscellaneous Industries	0.26	0.02	1.28	0.00	0.04	0.01	0.01	0.00	0.13	0.02	0.05	0.03	0.08	1.93	12
Cars, Trucks and Buses	0.50	0.02	1.25	0.00	0.06	0.01	0.01	0.00	0.08	0.01	0.02	0.04	0.24	2.26	2
Miscellaneous Equipment	0.38	0.01	1.34	0.00	0.03	0.01	0.01	0.00	0.06	0.01	0.05	0.04	0.13	2.08	5
Machinery, Equipment and Maintenance	0.30	0.01	1.24	0.00	0.03	0.01	0.01	0.00	0.08	0.01	0.03	0.04	0.27	2.04	6
Metallurgical Industry	0.27	0.02	1.24	0.00	0.03	0.01	0.01	0.00	0.05	0.01	0.02	0.03	0.20	1.91	14
Non-metallic mineral products	0.24	0.02	1.27	0.00	0.04	0.00	0.01	0.00	0.08	0.02	0.04	0.06	0.17	1.95	11
Chemicals and Rubber	0.24	0.02	1.21	0.00	0.04	0.01	0.02	0.00	0.18	0.02	0.04	0.15	0.17	2.10	4
Alcohol	0.11	0.01	1.47	0.00	0.05	0.01	0.02	0.00	0.10	0.04	0.02	0.06	0.09	1.97	10
Oil Refine	0.16	0.01	1.15	0.00	0.04	0.02	0.02	0.00	0.05	0.01	0.03	0.11	0.54	2.13	3
Paper, wood and graphics	0.27	0.01	1.23	0.00	0.04	0.01	0.01	0.00	0.12	0.02	0.05	0.08	0.15	1.98	9
Textiles, Clothing and footwear	0.21	0.01	1.41	0.00	0.04	0.00	0.01	0.00	0.07	0.07	0.02	0.07	0.08	1.99	7
Foods, drinks and tobacco	0.19	0.01	1.30	0.00	0.05	0.01	0.02	0.00	0.29	0.15	0.05	0.08	0.17	2.33	1
Extractive	0.51	0.02	1.20	0.00	0.06	0.01	0.02	0.00	0.03	0.01	0.01	0.03	0.10	1.99	8
Agriculture and Cattle	0.24	0.02	1.25	0.00	0.09	0.02	0.03	0.00	0.08	0.03	0.02	0.04	0.08	1.91	13

Source: Author

Table 9: Rod. Pres. Dutra - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II													Total	Ranking
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET		
Administration and Public Services	1.15	0.02	1.47	0.00	0.12	0.02	0.05	0.00	0.26	0.07	0.06	0.12	0.26	3.61	3
Services	0.97	0.02	1.44	0.00	0.11	0.02	0.04	0.00	0.28	0.07	0.07	0.13	0.27	3.43	12
Transport	0.95	0.03	1.41	0.00	0.15	0.02	0.04	0.00	0.23	0.06	0.05	0.12	0.32	3.38	13
Trade	0.98	0.02	1.42	0.00	0.11	0.02	0.04	0.00	0.23	0.06	0.05	0.11	0.24	3.30	17
Construction	0.80	0.02	1.54	0.00	0.10	0.02	0.03	0.00	0.26	0.06	0.07	0.13	0.31	3.35	15
Industrial Services of Public Utility	0.77	0.02	1.45	0.00	0.09	0.01	0.03	0.00	0.16	0.04	0.04	0.09	0.22	2.93	20
Miscellaneous Industries	0.90	0.03	1.41	0.00	0.12	0.02	0.04	0.00	0.34	0.07	0.11	0.13	0.28	3.44	10
Cars, Trucks and Buses	1.03	0.03	1.33	0.00	0.13	0.02	0.04	0.00	0.26	0.05	0.06	0.13	0.46	3.54	5
Miscellaneous Equipment	0.90	0.02	1.43	0.00	0.10	0.02	0.04	0.00	0.22	0.05	0.09	0.12	0.32	3.30	16
Machinery, Equipment and Maintenance	0.87	0.02	1.35	0.00	0.10	0.02	0.04	0.00	0.26	0.06	0.07	0.14	0.53	3.46	8
Metallurgical Industry	0.78	0.03	1.34	0.00	0.10	0.02	0.03	0.00	0.20	0.05	0.06	0.11	0.41	3.15	19
Non-metallic mineral products	0.85	0.03	1.40	0.00	0.12	0.02	0.04	0.00	0.28	0.07	0.09	0.17	0.40	3.48	7
Chemicals and Rubber	0.75	0.04	1.30	0.00	0.11	0.02	0.04	0.00	0.38	0.06	0.08	0.28	0.38	3.44	9
Alcohol	0.71	0.02	1.61	0.00	0.13	0.02	0.04	0.00	0.31	0.10	0.06	0.18	0.31	3.49	6
Oil Refine	0.43	0.02	1.18	0.00	0.08	0.02	0.03	0.00	0.18	0.04	0.06	0.22	0.87	3.15	18
Paper, wood and graphics	0.83	0.03	1.34	0.00	0.11	0.02	0.04	0.00	0.32	0.07	0.10	0.20	0.38	3.43	11
Textiles, Clothing and footwear	0.85	0.03	1.55	0.00	0.12	0.02	0.04	0.00	0.27	0.13	0.06	0.20	0.28	3.55	4
Foods, drinks and tobacco	0.70	0.03	1.38	0.00	0.13	0.02	0.04	0.00	0.59	0.25	0.11	0.23	0.45	3.94	1
Extractive	1.14	0.03	1.30	0.00	0.13	0.02	0.04	0.00	0.19	0.05	0.05	0.11	0.29	3.37	14
Agriculture and Cattle	1.01	0.04	1.42	0.00	0.19	0.03	0.06	0.00	0.32	0.10	0.07	0.16	0.32	3.73	2

Source: Author

Table 10: Rod. Fernão Dias - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.29	0.05	0.02	1.10	0.11	0.01	0.03	0.00	0.08	0.03	0.02	0.04	0.08	1.86	14
Extractive	0.45	0.03	0.05	1.16	0.08	0.01	0.02	0.00	0.03	0.01	0.01	0.03	0.09	1.96	8
Foods, drinks and tobacco	0.25	0.01	0.02	1.23	0.05	0.01	0.01	0.00	0.29	0.15	0.05	0.08	0.17	2.33	1
Textiles, Clothing and footwear	0.30	0.02	0.02	1.29	0.05	0.00	0.01	0.00	0.06	0.06	0.01	0.07	0.07	1.99	6
Paper, wood and graphics	0.29	0.01	0.02	1.20	0.04	0.01	0.01	0.00	0.11	0.02	0.05	0.07	0.15	1.98	7
Oil Refine	0.09	0.01	0.01	1.26	0.02	0.00	0.00	0.00	0.05	0.01	0.03	0.11	0.54	2.13	3
Alcohol	0.12	0.02	0.01	1.42	0.05	0.01	0.02	0.00	0.10	0.04	0.02	0.06	0.09	1.96	10
Chemicals and Rubber	0.26	0.04	0.02	1.17	0.06	0.01	0.02	0.00	0.16	0.02	0.04	0.14	0.15	2.07	4
Non-metallic mineral products	0.32	0.02	0.04	1.16	0.05	0.01	0.01	0.00	0.06	0.02	0.03	0.04	0.13	1.88	13
Metallurgical Industry	0.19	0.02	0.02	1.17	0.03	0.01	0.01	0.00	0.08	0.02	0.03	0.05	0.29	1.90	12
Machinery, Equipment and Maintenance	0.25	0.02	0.02	1.26	0.03	0.01	0.01	0.00	0.08	0.01	0.03	0.05	0.28	2.04	5
Miscellaneous Equipment	0.29	0.01	0.02	1.16	0.04	0.01	0.01	0.00	0.09	0.01	0.05	0.07	0.20	1.96	9
Cars, Trucks and Buses	0.31	0.01	0.02	1.27	0.03	0.01	0.01	0.00	0.10	0.01	0.03	0.05	0.28	2.14	2
Miscellaneous Industries	0.26	0.03	0.02	1.25	0.04	0.01	0.01	0.00	0.13	0.02	0.05	0.03	0.08	1.92	11
Industrial Services of Public Utility	0.12	0.01	0.01	1.39	0.02	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.06	1.65	17
Construction	0.13	0.01	0.02	1.33	0.02	0.00	0.01	0.00	0.06	0.01	0.03	0.03	0.09	1.75	16
Trade	0.16	0.01	0.01	1.17	0.02	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.45	20
Transport	0.17	0.02	0.06	1.27	0.07	0.00	0.01	0.00	0.03	0.01	0.01	0.03	0.10	1.76	15
Services	0.24	0.01	0.01	1.19	0.02	0.00	0.01	0.00	0.04	0.01	0.02	0.02	0.05	1.61	18
Administration and Public Services	0.22	0.01	0.01	1.21	0.02	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.54	19

Source: Author

Table 11: Rod. Fernão Dias - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II													Total	Ranking
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET		
Agriculture and Cattle	1.01	0.07	0.06	1.27	0.19	0.03	0.06	0.00	0.31	0.09	0.07	0.15	0.31	3.62	2
Extractive	0.99	0.04	0.07	1.25	0.15	0.02	0.04	0.00	0.18	0.05	0.04	0.11	0.27	3.21	15
Foods, drinks and tobacco	0.72	0.03	0.04	1.30	0.12	0.02	0.04	0.00	0.58	0.24	0.11	0.23	0.44	3.87	1
Textiles, Clothing and footwear	0.89	0.03	0.05	1.41	0.12	0.02	0.04	0.00	0.25	0.13	0.05	0.20	0.27	3.46	5
Paper, wood and graphics	0.79	0.03	0.05	1.29	0.10	0.02	0.03	0.00	0.30	0.07	0.10	0.19	0.36	3.32	9
Oil Refine	0.33	0.01	0.02	1.29	0.06	0.01	0.02	0.00	0.18	0.04	0.05	0.22	0.87	3.11	19
Alcohol	0.62	0.03	0.04	1.54	0.11	0.02	0.04	0.00	0.28	0.09	0.06	0.17	0.28	3.28	11
Chemicals and Rubber	0.71	0.06	0.04	1.25	0.11	0.02	0.04	0.00	0.35	0.06	0.08	0.26	0.34	3.31	10
Non-metallic mineral products	0.82	0.04	0.06	1.25	0.11	0.02	0.03	0.00	0.22	0.06	0.06	0.13	0.32	3.12	18
Metallurgical Industry	0.69	0.03	0.04	1.27	0.09	0.02	0.03	0.00	0.25	0.06	0.06	0.14	0.55	3.23	14
Machinery, Equipment and Maintenance	0.77	0.03	0.05	1.36	0.09	0.02	0.03	0.00	0.26	0.06	0.07	0.14	0.54	3.40	6
Miscellaneous Equipment	0.79	0.03	0.05	1.25	0.10	0.02	0.03	0.00	0.27	0.05	0.09	0.16	0.42	3.26	13
Cars, Trucks and Buses	0.82	0.03	0.05	1.37	0.10	0.02	0.03	0.00	0.28	0.06	0.07	0.15	0.54	3.50	4
Miscellaneous Industries	0.82	0.04	0.05	1.37	0.11	0.02	0.03	0.00	0.32	0.06	0.10	0.12	0.27	3.33	8
Industrial Services of Public Utility	0.55	0.02	0.04	1.51	0.07	0.01	0.02	0.00	0.13	0.03	0.03	0.08	0.20	2.69	20
Construction	0.72	0.03	0.05	1.49	0.09	0.01	0.03	0.00	0.24	0.06	0.07	0.12	0.29	3.19	16
Trade	0.91	0.02	0.05	1.38	0.10	0.02	0.04	0.00	0.21	0.05	0.05	0.10	0.23	3.16	17
Transport	0.79	0.03	0.09	1.43	0.14	0.02	0.03	0.00	0.21	0.05	0.05	0.12	0.31	3.27	12
Services	1.01	0.02	0.05	1.38	0.10	0.02	0.04	0.00	0.26	0.07	0.06	0.12	0.26	3.39	7
Administration and Public Services	1.10	0.03	0.05	1.45	0.11	0.02	0.04	0.00	0.25	0.07	0.06	0.12	0.25	3.55	3

Source: Author

Table 12: Anhanguera-Bandeirantes - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.27	0.05	0.02	0.00	1.19	0.01	0.03	0.00	0.07	0.03	0.02	0.04	0.08	1.80	14
Extractive	0.50	0.02	0.04	0.00	1.23	0.01	0.02	0.00	0.03	0.01	0.01	0.03	0.10	1.98	9
Foods, drinks and tobacco	0.27	0.02	0.02	0.00	1.25	0.01	0.02	0.00	0.29	0.15	0.05	0.08	0.17	2.33	1
Textiles, Clothing and footwear	0.34	0.02	0.02	0.00	1.36	0.01	0.02	0.00	0.07	0.06	0.02	0.06	0.07	2.05	5
Paper, wood and graphics	0.26	0.01	0.02	0.00	1.27	0.00	0.01	0.00	0.11	0.02	0.05	0.07	0.15	1.98	8
Oil Refine	0.16	0.01	0.01	0.00	1.18	0.02	0.02	0.00	0.05	0.01	0.03	0.11	0.54	2.13	3
Alcohol	0.19	0.02	0.02	0.00	1.31	0.03	0.06	0.00	0.09	0.04	0.02	0.06	0.09	1.94	11
Chemicals and Rubber	0.27	0.02	0.03	0.00	1.31	0.01	0.02	0.00	0.13	0.02	0.03	0.11	0.16	2.10	4
Non-metallic mineral products	0.32	0.02	0.03	0.00	1.19	0.01	0.01	0.00	0.08	0.03	0.04	0.06	0.17	1.96	10
Metallurgical Industry	0.20	0.01	0.01	0.00	1.28	0.01	0.01	0.00	0.06	0.02	0.02	0.04	0.24	1.91	13
Machinery, Equipment and Maintenance	0.34	0.02	0.02	0.00	1.20	0.01	0.01	0.00	0.08	0.01	0.03	0.04	0.28	2.04	6
Miscellaneous Equipment	0.41	0.01	0.02	0.00	1.30	0.01	0.01	0.00	0.05	0.01	0.06	0.03	0.11	2.04	7
Cars, Trucks and Buses	0.30	0.01	0.02	0.00	1.33	0.01	0.01	0.00	0.10	0.01	0.03	0.05	0.28	2.15	2
Miscellaneous Industries	0.29	0.02	0.02	0.00	1.27	0.01	0.01	0.00	0.12	0.02	0.05	0.03	0.08	1.93	12
Industrial Services of Public Utility	0.13	0.00	0.01	0.00	1.41	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.06	1.65	17
Construction	0.15	0.01	0.01	0.00	1.36	0.00	0.01	0.00	0.06	0.01	0.03	0.03	0.10	1.76	15
Trade	0.15	0.00	0.01	0.00	1.21	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.45	20
Transport	0.17	0.01	0.02	0.00	1.37	0.00	0.01	0.00	0.03	0.01	0.01	0.02	0.10	1.76	16
Services	0.19	0.00	0.01	0.00	1.24	0.00	0.01	0.00	0.05	0.02	0.02	0.02	0.05	1.61	18
Administration and Public Services	0.20	0.00	0.01	0.00	1.20	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.02	1.47	19

Source: Author

Table 13: Anhanguera-Bandeirantes - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	1.01	0.07	0.06	0.00	1.43	0.02	0.06	0.00	0.30	0.09	0.07	0.15	0.30	3.56	4
Extractive	1.08	0.04	0.06	0.00	1.37	0.02	0.04	0.00	0.18	0.05	0.05	0.11	0.28	3.28	14
Foods, drinks and tobacco	0.76	0.03	0.04	0.00	1.38	0.02	0.04	0.00	0.59	0.25	0.11	0.23	0.44	3.89	1
Textiles, Clothing and footwear	0.99	0.04	0.05	0.00	1.55	0.02	0.05	0.00	0.27	0.12	0.06	0.18	0.28	3.60	2
Paper, wood and graphics	0.78	0.02	0.04	0.00	1.42	0.02	0.03	0.00	0.31	0.07	0.10	0.19	0.37	3.36	10
Oil Refine	0.42	0.02	0.03	0.00	1.24	0.02	0.03	0.00	0.18	0.04	0.05	0.22	0.87	3.13	19
Alcohol	0.74	0.04	0.04	0.00	1.47	0.05	0.09	0.01	0.29	0.09	0.06	0.17	0.29	3.34	11
Chemicals and Rubber	0.72	0.03	0.05	0.00	1.44	0.02	0.04	0.00	0.30	0.06	0.07	0.22	0.36	3.31	13
Non-metallic mineral products	0.92	0.03	0.06	0.00	1.36	0.02	0.04	0.00	0.28	0.07	0.09	0.17	0.41	3.45	6
Metallurgical Industry	0.69	0.02	0.04	0.00	1.44	0.02	0.03	0.00	0.22	0.06	0.06	0.12	0.48	3.17	18
Machinery, Equipment and Maintenance	0.89	0.03	0.05	0.00	1.35	0.02	0.03	0.00	0.26	0.06	0.07	0.14	0.53	3.43	7
Miscellaneous Equipment	0.91	0.02	0.04	0.00	1.43	0.02	0.04	0.00	0.20	0.05	0.10	0.11	0.28	3.20	17
Cars, Trucks and Buses	0.83	0.02	0.04	0.00	1.48	0.02	0.03	0.00	0.29	0.06	0.07	0.15	0.53	3.53	5
Miscellaneous Industries	0.89	0.04	0.05	0.00	1.45	0.02	0.04	0.00	0.33	0.06	0.10	0.12	0.28	3.38	9
Industrial Services of Public Utility	0.63	0.01	0.03	0.00	1.57	0.01	0.02	0.00	0.14	0.04	0.03	0.08	0.21	2.78	20
Construction	0.78	0.02	0.04	0.00	1.57	0.02	0.03	0.00	0.24	0.06	0.07	0.12	0.30	3.27	15
Trade	0.94	0.02	0.04	0.00	1.48	0.02	0.04	0.00	0.22	0.06	0.05	0.10	0.23	3.21	16
Transport	0.84	0.02	0.05	0.00	1.59	0.02	0.03	0.00	0.22	0.05	0.05	0.12	0.31	3.32	12
Services	0.98	0.02	0.04	0.00	1.50	0.02	0.04	0.00	0.27	0.07	0.06	0.12	0.27	3.41	8
Administration and Public Services	1.15	0.03	0.05	0.00	1.52	0.02	0.04	0.00	0.26	0.07	0.06	0.12	0.26	3.59	3

Source: Author

Table 14: Rod. Marechal Rondon - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.28	0.05	0.02	0.00	0.10	1.12	0.03	0.00	0.08	0.03	0.02	0.04	0.08	1.85	14
Extractive	0.42	0.02	0.05	0.00	0.07	1.16	0.02	0.00	0.02	0.00	0.01	0.02	0.08	1.87	13
Foods, drinks and tobacco	0.27	0.02	0.02	0.00	0.06	1.19	0.02	0.00	0.29	0.15	0.05	0.08	0.17	2.33	1
Textiles, Clothing and footwear	0.42	0.03	0.02	0.00	0.11	1.32	0.03	0.00	0.07	0.04	0.02	0.04	0.07	2.18	2
Paper, wood and graphics	0.28	0.02	0.02	0.00	0.06	1.26	0.02	0.00	0.08	0.02	0.03	0.05	0.11	1.95	8
Oil Refine	0.09	0.01	0.01	0.00	0.02	1.26	0.01	0.00	0.05	0.01	0.03	0.11	0.54	2.13	5
Alcohol	0.20	0.02	0.02	0.00	0.22	1.10	0.08	0.01	0.09	0.04	0.02	0.06	0.09	1.94	10
Chemicals and Rubber	0.27	0.03	0.02	0.00	0.05	1.18	0.02	0.00	0.19	0.02	0.04	0.16	0.16	2.14	4
Non-metallic mineral products	0.33	0.02	0.03	0.00	0.06	1.12	0.01	0.00	0.08	0.02	0.04	0.06	0.16	1.95	9
Metallurgical Industry	0.31	0.02	0.03	0.00	0.04	1.16	0.01	0.00	0.06	0.03	0.03	0.04	0.19	1.92	12
Machinery, Equipment and Maintenance	0.28	0.01	0.02	0.00	0.03	1.25	0.01	0.00	0.08	0.01	0.03	0.04	0.27	2.04	6
Miscellaneous Equipment	0.31	0.01	0.02	0.00	0.04	1.27	0.01	0.00	0.07	0.01	0.06	0.04	0.14	1.98	7
Cars, Trucks and Buses	0.30	0.01	0.02	0.00	0.03	1.30	0.01	0.00	0.10	0.01	0.03	0.05	0.28	2.15	3
Miscellaneous Industries	0.29	0.02	0.02	0.00	0.05	1.23	0.01	0.00	0.13	0.02	0.05	0.03	0.08	1.93	11
Industrial Services of Public Utility	0.10	0.00	0.01	0.00	0.02	1.41	0.00	0.00	0.01	0.00	0.01	0.02	0.06	1.65	17
Construction	0.20	0.01	0.02	0.00	0.04	1.25	0.01	0.00	0.06	0.01	0.03	0.03	0.09	1.76	15
Trade	0.19	0.01	0.01	0.00	0.02	1.15	0.01	0.00	0.02	0.00	0.01	0.01	0.03	1.45	20
Transport	0.22	0.02	0.06	0.00	0.07	1.21	0.01	0.00	0.03	0.01	0.01	0.03	0.10	1.76	16
Services	0.20	0.01	0.01	0.00	0.02	1.19	0.01	0.00	0.05	0.01	0.02	0.02	0.05	1.58	18
Administration and Public Services	0.25	0.01	0.01	0.00	0.02	1.19	0.01	0.00	0.02	0.01	0.01	0.01	0.03	1.56	19

Source: Author

Table 15: Rod. Marechal Rondon - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	1.06	0.07	0.06	0.00	0.19	1.26	0.06	0.00	0.31	0.09	0.07	0.16	0.31	3.64	3
Extractive	0.94	0.04	0.07	0.00	0.13	1.22	0.04	0.00	0.16	0.04	0.04	0.08	0.23	2.98	19
Foods, drinks and tobacco	0.79	0.03	0.04	0.00	0.13	1.26	0.04	0.00	0.59	0.25	0.11	0.23	0.45	3.91	1
Textiles, Clothing and footwear	1.14	0.05	0.06	0.00	0.20	1.43	0.06	0.00	0.28	0.10	0.06	0.15	0.28	3.82	2
Paper, wood and graphics	0.90	0.03	0.05	0.00	0.14	1.36	0.05	0.00	0.28	0.06	0.08	0.16	0.32	3.43	8
Oil Refine	0.36	0.01	0.03	0.00	0.06	1.29	0.02	0.00	0.18	0.04	0.06	0.22	0.87	3.15	18
Alcohol	0.79	0.04	0.05	0.00	0.31	1.18	0.12	0.01	0.30	0.09	0.06	0.18	0.30	3.41	11
Chemicals and Rubber	0.77	0.04	0.04	0.00	0.11	1.26	0.04	0.00	0.39	0.06	0.08	0.30	0.36	3.46	6
Non-metallic mineral products	0.95	0.04	0.06	0.00	0.13	1.22	0.04	0.00	0.27	0.07	0.09	0.17	0.39	3.43	9
Metallurgical Industry	0.82	0.04	0.05	0.00	0.10	1.23	0.03	0.00	0.22	0.07	0.06	0.13	0.40	3.16	17
Machinery, Equipment and Maintenance	0.85	0.03	0.05	0.00	0.10	1.34	0.03	0.00	0.26	0.06	0.07	0.14	0.53	3.45	7
Miscellaneous Equipment	0.84	0.02	0.05	0.00	0.10	1.34	0.03	0.00	0.23	0.05	0.10	0.13	0.33	3.23	16
Cars, Trucks and Buses	0.85	0.02	0.05	0.00	0.10	1.38	0.03	0.00	0.29	0.06	0.07	0.15	0.54	3.54	5
Miscellaneous Industries	0.93	0.04	0.05	0.00	0.12	1.34	0.04	0.00	0.33	0.06	0.11	0.13	0.28	3.42	10
Industrial Services of Public Utility	0.66	0.02	0.04	0.00	0.08	1.53	0.02	0.00	0.16	0.04	0.04	0.09	0.22	2.88	20
Construction	0.89	0.03	0.05	0.00	0.12	1.38	0.03	0.00	0.25	0.06	0.07	0.13	0.30	3.32	14
Trade	1.03	0.02	0.05	0.00	0.11	1.32	0.04	0.00	0.23	0.06	0.05	0.11	0.24	3.26	15
Transport	0.93	0.03	0.09	0.00	0.15	1.35	0.04	0.00	0.22	0.05	0.05	0.12	0.32	3.36	12
Services	0.99	0.02	0.05	0.00	0.11	1.35	0.04	0.00	0.27	0.07	0.06	0.12	0.26	3.35	13
Administration and Public Services	1.19	0.03	0.05	0.00	0.12	1.38	0.05	0.00	0.26	0.07	0.06	0.12	0.26	3.59	4

Source: Author

Table 16: Rod. Raposo Tavares - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I													Total	Ranking
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET		
Agriculture and Cattle	0.29	0.05	0.02	0.00	0.10	0.01	1.12	0.00	0.08	0.03	0.02	0.04	0.08	1.84	14
Extractive	0.44	0.02	0.05	0.00	0.09	0.01	1.18	0.00	0.03	0.01	0.01	0.03	0.09	1.96	8
Foods, drinks and tobacco	0.25	0.01	0.02	0.00	0.06	0.01	1.22	0.00	0.29	0.15	0.05	0.08	0.17	2.33	1
Textiles, Clothing and footwear	0.37	0.03	0.02	0.00	0.10	0.01	1.38	0.00	0.07	0.04	0.02	0.04	0.07	2.15	2
Paper, wood and graphics	0.23	0.01	0.02	0.00	0.04	0.00	1.30	0.00	0.10	0.02	0.04	0.06	0.12	1.93	10
Oil Refine	0.09	0.01	0.01	0.00	0.02	0.01	1.25	0.00	0.05	0.01	0.03	0.11	0.54	2.13	4
Alcohol	0.20	0.02	0.02	0.00	0.22	0.04	1.14	0.01	0.09	0.04	0.02	0.06	0.09	1.94	9
Chemicals and Rubber	0.28	0.02	0.05	0.00	0.08	0.01	1.23	0.00	0.11	0.02	0.03	0.10	0.18	2.11	5
Non-metallic mineral products	0.23	0.02	0.03	0.00	0.05	0.00	1.27	0.00	0.07	0.02	0.03	0.05	0.15	1.92	12
Metallurgical Industry	0.17	0.01	0.02	0.00	0.03	0.01	1.27	0.00	0.07	0.02	0.02	0.04	0.26	1.91	13
Machinery, Equipment and Maintenance	0.21	0.01	0.02	0.00	0.03	0.01	1.32	0.00	0.08	0.01	0.03	0.04	0.28	2.04	6
Miscellaneous Equipment	0.22	0.01	0.02	0.00	0.04	0.01	1.38	0.00	0.08	0.01	0.05	0.05	0.16	2.02	7
Cars, Trucks and Buses	0.14	0.01	0.02	0.00	0.02	0.00	1.48	0.00	0.10	0.01	0.03	0.05	0.28	2.15	3
Miscellaneous Industries	0.20	0.02	0.02	0.00	0.04	0.01	1.33	0.00	0.12	0.02	0.05	0.03	0.09	1.93	11
Industrial Services of Public Utility	0.08	0.00	0.01	0.00	0.02	0.00	1.45	0.00	0.01	0.00	0.01	0.01	0.06	1.66	17
Construction	0.11	0.01	0.02	0.00	0.03	0.00	1.37	0.00	0.05	0.01	0.03	0.03	0.10	1.76	16
Trade	0.10	0.00	0.01	0.00	0.02	0.00	1.24	0.00	0.01	0.00	0.01	0.01	0.03	1.45	20
Transport	0.18	0.02	0.06	0.00	0.07	0.00	1.26	0.00	0.03	0.01	0.01	0.02	0.10	1.76	15
Services	0.15	0.00	0.01	0.00	0.02	0.00	1.33	0.00	0.03	0.01	0.01	0.02	0.04	1.62	18
Administration and Public Services	0.13	0.00	0.01	0.00	0.01	0.00	1.34	0.00	0.02	0.00	0.01	0.01	0.03	1.56	19

Source: Author

Table 17: Rod. Raposo Tavares - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	1.00	0.07	0.06	0.00	0.19	0.03	1.33	0.00	0.30	0.09	0.07	0.15	0.31	3.60	3
Extractive	1.00	0.04	0.08	0.00	0.16	0.02	1.31	0.00	0.18	0.05	0.05	0.11	0.27	3.26	15
Foods, drinks and tobacco	0.74	0.03	0.04	0.00	0.14	0.02	1.31	0.00	0.58	0.24	0.11	0.22	0.44	3.88	1
Textiles, Clothing and footwear	1.04	0.04	0.06	0.00	0.18	0.03	1.55	0.00	0.27	0.10	0.06	0.15	0.28	3.77	2
Paper, wood and graphics	0.76	0.02	0.05	0.00	0.10	0.02	1.44	0.00	0.29	0.06	0.09	0.17	0.33	3.34	8
Oil Refine	0.34	0.01	0.03	0.00	0.07	0.01	1.30	0.00	0.18	0.04	0.05	0.22	0.87	3.12	19
Alcohol	0.73	0.04	0.04	0.00	0.31	0.06	1.26	0.01	0.29	0.09	0.06	0.17	0.29	3.34	9
Chemicals and Rubber	0.70	0.03	0.07	0.00	0.13	0.02	1.33	0.00	0.28	0.06	0.06	0.21	0.38	3.27	12
Non-metallic mineral products	0.75	0.03	0.06	0.00	0.11	0.02	1.42	0.00	0.24	0.06	0.07	0.15	0.36	3.27	13
Metallurgical Industry	0.64	0.03	0.04	0.00	0.09	0.02	1.41	0.00	0.23	0.06	0.06	0.13	0.49	3.19	18
Machinery, Equipment and Maintenance	0.73	0.03	0.05	0.00	0.09	0.02	1.46	0.00	0.25	0.05	0.07	0.13	0.53	3.42	6
Miscellaneous Equipment	0.69	0.02	0.05	0.00	0.10	0.02	1.51	0.00	0.24	0.05	0.09	0.14	0.36	3.27	14
Cars, Trucks and Buses	0.63	0.02	0.04	0.00	0.09	0.01	1.63	0.00	0.28	0.06	0.07	0.14	0.54	3.51	5
Miscellaneous Industries	0.77	0.03	0.05	0.00	0.11	0.02	1.50	0.00	0.32	0.06	0.10	0.12	0.28	3.37	7
Industrial Services of Public Utility	0.53	0.02	0.04	0.00	0.07	0.01	1.61	0.00	0.14	0.04	0.03	0.08	0.21	2.78	20
Construction	0.70	0.02	0.05	0.00	0.10	0.02	1.57	0.00	0.24	0.06	0.07	0.12	0.30	3.24	16
Trade	0.84	0.02	0.05	0.00	0.10	0.02	1.51	0.00	0.21	0.05	0.05	0.10	0.23	3.20	17
Transport	0.81	0.03	0.09	0.00	0.15	0.02	1.46	0.00	0.21	0.05	0.05	0.12	0.31	3.31	10
Services	0.84	0.02	0.04	0.00	0.10	0.02	1.56	0.00	0.23	0.06	0.06	0.11	0.24	3.27	11
Administration and Public Services	0.97	0.02	0.05	0.00	0.11	0.02	1.64	0.00	0.25	0.06	0.05	0.11	0.25	3.55	4

Source: Author

Table 18: Rod. Régis Bittencourt - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.26	0.05	0.02	0.00	0.08	0.01	0.03	1.10	0.07	0.03	0.02	0.04	0.07	1.78	14
Extractive	0.41	0.03	0.05	0.00	0.08	0.01	0.02	1.20	0.03	0.01	0.01	0.03	0.09	1.96	8
Foods, drinks and tobacco	0.21	0.01	0.02	0.00	0.06	0.01	0.02	1.26	0.29	0.15	0.05	0.08	0.17	2.32	1
Textiles, Clothing and footwear	0.24	0.02	0.02	0.00	0.05	0.00	0.01	1.36	0.06	0.07	0.01	0.07	0.07	1.99	7
Paper, wood and graphics	0.15	0.01	0.01	0.00	0.03	0.01	0.01	1.38	0.09	0.02	0.04	0.06	0.12	1.93	10
Oil Refine	0.09	0.01	0.01	0.00	0.02	0.00	0.01	1.26	0.05	0.01	0.03	0.11	0.54	2.13	3
Alcohol	0.11	0.02	0.01	0.00	0.04	0.01	0.01	1.42	0.09	0.04	0.02	0.06	0.09	1.93	9
Chemicals and Rubber	0.29	0.02	0.02	0.00	0.05	0.01	0.02	1.13	0.15	0.02	0.03	0.12	0.14	1.99	6
Non-metallic mineral products	0.28	0.02	0.04	0.00	0.06	0.01	0.01	1.22	0.04	0.01	0.02	0.03	0.10	1.83	13
Metallurgical Industry	0.16	0.02	0.01	0.00	0.02	0.01	0.01	1.24	0.07	0.01	0.03	0.05	0.28	1.90	12
Machinery, Equipment and Maintenance	0.27	0.02	0.02	0.00	0.03	0.01	0.01	1.24	0.08	0.01	0.03	0.04	0.28	2.04	4
Miscellaneous Equipment	0.27	0.01	0.02	0.00	0.04	0.01	0.01	1.26	0.09	0.01	0.04	0.06	0.19	2.00	5
Cars, Trucks and Buses	0.19	0.01	0.01	0.00	0.02	0.00	0.01	1.41	0.10	0.01	0.03	0.05	0.28	2.14	2
Miscellaneous Industries	0.30	0.03	0.02	0.00	0.05	0.01	0.01	1.19	0.12	0.02	0.05	0.03	0.08	1.92	11
Industrial Services of Public Utility	0.14	0.01	0.01	0.00	0.02	0.00	0.01	1.37	0.01	0.00	0.01	0.01	0.06	1.65	17
Construction	0.14	0.01	0.02	0.00	0.04	0.01	0.00	1.32	0.06	0.01	0.03	0.03	0.09	1.75	16
Trade	0.14	0.01	0.01	0.00	0.02	0.00	0.01	1.20	0.02	0.00	0.01	0.01	0.03	1.45	20
Transport	0.16	0.02	0.05	0.00	0.07	0.00	0.01	1.28	0.03	0.01	0.01	0.02	0.10	1.76	15
Services	0.27	0.01	0.01	0.00	0.02	0.00	0.01	1.18	0.03	0.01	0.01	0.02	0.04	1.60	18
Administration and Public Services	0.21	0.01	0.01	0.00	0.02	0.00	0.01	1.27	0.02	0.00	0.01	0.01	0.03	1.58	19

Source: Author

Table 19: Rod. Régis Bittencourt - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II													Total	Ranking
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET		
Agriculture and Cattle	0.99	0.07	0.06	0.00	0.18	0.03	0.06	1.26	0.30	0.09	0.07	0.15	0.30	3.54	3
Extractive	0.98	0.04	0.07	0.00	0.15	0.02	0.04	1.29	0.19	0.05	0.05	0.11	0.27	3.26	14
Foods, drinks and tobacco	0.69	0.03	0.04	0.00	0.13	0.02	0.04	1.32	0.59	0.24	0.11	0.23	0.44	3.89	1
Textiles, Clothing and footwear	0.83	0.03	0.05	0.00	0.12	0.02	0.04	1.48	0.26	0.13	0.05	0.20	0.27	3.49	5
Paper, wood and graphics	0.69	0.02	0.04	0.00	0.10	0.02	0.03	1.50	0.29	0.06	0.09	0.17	0.33	3.35	9
Oil Refine	0.34	0.01	0.02	0.00	0.06	0.01	0.02	1.29	0.18	0.04	0.05	0.22	0.87	3.13	18
Alcohol	0.64	0.03	0.04	0.00	0.12	0.02	0.04	1.54	0.29	0.09	0.06	0.17	0.29	3.33	11
Chemicals and Rubber	0.81	0.03	0.04	0.00	0.11	0.02	0.04	1.22	0.35	0.07	0.07	0.24	0.34	3.35	10
Non-metallic mineral products	0.77	0.03	0.06	0.00	0.12	0.02	0.03	1.30	0.18	0.05	0.05	0.11	0.27	2.99	19
Metallurgical Industry	0.66	0.03	0.04	0.00	0.09	0.02	0.03	1.34	0.25	0.06	0.06	0.14	0.53	3.24	16
Machinery, Equipment and Maintenance	0.80	0.03	0.05	0.00	0.10	0.02	0.03	1.34	0.26	0.06	0.07	0.14	0.53	3.43	6
Miscellaneous Equipment	0.77	0.03	0.05	0.00	0.10	0.02	0.03	1.35	0.26	0.05	0.08	0.15	0.40	3.30	13
Cars, Trucks and Buses	0.71	0.02	0.04	0.00	0.09	0.02	0.03	1.51	0.29	0.06	0.07	0.15	0.54	3.52	4
Miscellaneous Industries	0.90	0.05	0.05	0.00	0.13	0.02	0.04	1.30	0.33	0.06	0.10	0.12	0.27	3.37	7
Industrial Services of Public Utility	0.62	0.02	0.04	0.00	0.08	0.01	0.03	1.49	0.14	0.04	0.03	0.08	0.21	2.78	20
Construction	0.76	0.03	0.05	0.00	0.12	0.02	0.03	1.47	0.24	0.06	0.07	0.12	0.29	3.25	15
Trade	0.91	0.02	0.05	0.00	0.11	0.02	0.04	1.40	0.22	0.06	0.05	0.10	0.23	3.21	17
Transport	0.81	0.03	0.09	0.00	0.15	0.02	0.03	1.44	0.22	0.05	0.05	0.12	0.31	3.32	12
Services	1.04	0.02	0.05	0.00	0.11	0.02	0.04	1.36	0.24	0.06	0.06	0.11	0.25	3.37	8
Administration and Public Services	1.08	0.03	0.05	0.00	0.12	0.02	0.04	1.48	0.25	0.06	0.06	0.12	0.25	3.56	2

Source: Author

Table 20: South Region - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.10	0.01	0.01	0.00	0.04	0.01	0.01	0.00	1.51	0.03	0.01	0.04	0.08	1.85	14
Extractive	0.06	0.01	0.01	0.00	0.02	0.00	0.00	0.00	1.64	0.01	0.01	0.03	0.08	1.87	13
Foods, drinks and tobacco	0.13	0.01	0.01	0.00	0.08	0.01	0.02	0.00	1.88	0.09	0.02	0.05	0.10	2.41	2
Textiles, Clothing and footwear	0.18	0.01	0.01	0.00	0.10	0.01	0.01	0.00	1.57	0.06	0.02	0.08	0.09	2.16	5
Paper, wood and graphics	0.12	0.01	0.01	0.00	0.03	0.01	0.01	0.00	1.67	0.02	0.02	0.04	0.09	2.03	8
Oil Refine	0.09	0.01	0.01	0.00	0.02	0.01	0.01	0.00	1.58	0.02	0.02	0.08	0.45	2.29	3
Alcohol	0.11	0.01	0.01	0.00	0.12	0.02	0.04	0.00	1.55	0.05	0.01	0.04	0.06	2.03	9
Chemicals and Rubber	0.15	0.02	0.03	0.00	0.05	0.01	0.01	0.00	1.73	0.02	0.01	0.07	0.14	2.25	4
Non-metallic mineral products	0.10	0.01	0.01	0.00	0.03	0.00	0.01	0.00	1.63	0.02	0.02	0.05	0.12	1.99	12
Metallurgical Industry	0.12	0.03	0.02	0.00	0.02	0.01	0.01	0.00	1.56	0.01	0.03	0.04	0.19	2.03	10
Machinery, Equipment and Maintenance	0.20	0.03	0.02	0.00	0.03	0.01	0.01	0.00	1.56	0.01	0.02	0.04	0.20	2.14	6
Miscellaneous Equipment	0.18	0.02	0.02	0.00	0.03	0.01	0.01	0.00	1.60	0.01	0.03	0.04	0.15	2.10	7
Cars, Trucks and Buses	0.28	0.02	0.02	0.00	0.05	0.01	0.01	0.00	1.76	0.02	0.02	0.04	0.19	2.43	1
Miscellaneous Industries	0.19	0.02	0.02	0.00	0.04	0.01	0.01	0.00	1.53	0.02	0.02	0.05	0.12	2.02	11
Industrial Services of Public Utility	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.51	0.00	0.00	0.02	0.06	1.65	17
Construction	0.07	0.01	0.01	0.00	0.01	0.00	0.00	0.00	1.59	0.01	0.01	0.02	0.07	1.80	15
Trade	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.31	0.01	0.00	0.01	0.03	1.42	20
Transport	0.07	0.01	0.02	0.00	0.02	0.00	0.00	0.00	1.53	0.01	0.01	0.03	0.09	1.79	16
Services	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.43	0.01	0.00	0.01	0.03	1.55	18
Administration and Public Services	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.43	0.01	0.00	0.01	0.02	1.52	19

Source: Author

Table 21: South Region - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.41	0.02	0.03	0.00	0.10	0.02	0.03	0.00	2.45	0.09	0.04	0.14	0.27	3.62	4
Extractive	0.28	0.01	0.02	0.00	0.06	0.01	0.02	0.00	2.32	0.05	0.03	0.09	0.22	3.12	18
Foods, drinks and tobacco	0.44	0.02	0.03	0.00	0.14	0.03	0.04	0.00	2.59	0.16	0.05	0.16	0.30	3.97	1
Textiles, Clothing and footwear	0.52	0.03	0.04	0.00	0.17	0.02	0.03	0.00	2.32	0.12	0.05	0.21	0.29	3.80	3
Paper, wood and graphics	0.37	0.02	0.03	0.00	0.08	0.01	0.02	0.00	2.32	0.07	0.04	0.12	0.25	3.36	11
Oil Refine	0.27	0.01	0.02	0.00	0.06	0.02	0.02	0.00	1.89	0.05	0.04	0.17	0.73	3.29	15
Alcohol	0.40	0.02	0.03	0.00	0.18	0.03	0.06	0.00	2.17	0.11	0.04	0.12	0.23	3.40	9
Chemicals and Rubber	0.37	0.03	0.04	0.00	0.10	0.01	0.03	0.00	2.23	0.06	0.04	0.15	0.30	3.36	10
Non-metallic mineral products	0.34	0.02	0.03	0.00	0.07	0.01	0.02	0.00	2.30	0.06	0.04	0.13	0.29	3.32	13
Metallurgical Industry	0.36	0.04	0.03	0.00	0.07	0.02	0.02	0.00	2.16	0.05	0.06	0.12	0.38	3.31	14
Machinery, Equipment and Maintenance	0.48	0.04	0.04	0.00	0.08	0.02	0.02	0.00	2.18	0.06	0.05	0.12	0.41	3.51	6
Miscellaneous Equipment	0.43	0.03	0.03	0.00	0.08	0.02	0.02	0.00	2.17	0.05	0.06	0.12	0.32	3.32	12
Cars, Trucks and Buses	0.58	0.04	0.04	0.00	0.10	0.02	0.03	0.00	2.37	0.06	0.05	0.12	0.39	3.81	2
Miscellaneous Industries	0.47	0.03	0.03	0.00	0.10	0.02	0.03	0.00	2.19	0.07	0.05	0.14	0.30	3.42	7
Industrial Services of Public Utility	0.22	0.01	0.02	0.00	0.04	0.01	0.01	0.00	2.09	0.04	0.02	0.07	0.18	2.70	20
Construction	0.31	0.02	0.02	0.00	0.06	0.01	0.02	0.00	2.36	0.05	0.03	0.09	0.23	3.21	16
Trade	0.33	0.01	0.02	0.00	0.07	0.01	0.02	0.00	2.33	0.06	0.03	0.09	0.20	3.18	17
Transport	0.35	0.02	0.03	0.00	0.08	0.01	0.02	0.00	2.42	0.06	0.04	0.11	0.28	3.41	8
Services	0.29	0.01	0.02	0.00	0.06	0.01	0.02	0.00	2.26	0.05	0.03	0.08	0.17	3.02	19
Administration and Public Services	0.37	0.01	0.03	0.00	0.08	0.01	0.02	0.00	2.63	0.07	0.04	0.10	0.22	3.57	5

Source: Author

Table 22: Mid-west Region - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.11	0.02	0.01	0.00	0.05	0.01	0.01	0.00	0.14	1.25	0.01	0.07	0.12	1.80	15
Extractive	0.17	0.01	0.03	0.00	0.05	0.01	0.01	0.00	0.11	1.43	0.02	0.07	0.17	2.07	12
Foods, drinks and tobacco	0.15	0.01	0.01	0.00	0.08	0.01	0.02	0.00	0.18	1.74	0.02	0.07	0.15	2.45	2
Textiles, Clothing and footwear	0.19	0.01	0.02	0.00	0.10	0.01	0.01	0.00	0.15	1.48	0.01	0.12	0.14	2.25	5
Paper, wood and graphics	0.14	0.01	0.02	0.00	0.04	0.01	0.01	0.00	0.13	1.54	0.03	0.06	0.10	2.07	10
Oil Refine	0.11	0.01	0.03	0.00	0.05	0.00	0.01	0.00	0.10	1.19	0.03	0.16	0.68	2.38	3
Alcohol	0.11	0.01	0.01	0.00	0.07	0.01	0.02	0.00	0.10	1.58	0.01	0.05	0.09	2.07	11
Chemicals and Rubber	0.17	0.03	0.03	0.00	0.06	0.01	0.01	0.00	0.12	1.59	0.02	0.11	0.17	2.31	4
Non-metallic mineral products	0.12	0.01	0.02	0.00	0.04	0.00	0.01	0.00	0.09	1.52	0.02	0.06	0.15	2.03	13
Metallurgical Industry	0.15	0.03	0.02	0.00	0.03	0.01	0.01	0.00	0.10	1.42	0.02	0.06	0.29	2.12	8
Machinery, Equipment and Maintenance	0.26	0.03	0.03	0.00	0.04	0.01	0.01	0.00	0.14	1.28	0.03	0.07	0.32	2.23	6
Miscellaneous Equipment	0.18	0.02	0.02	0.00	0.04	0.01	0.01	0.00	0.10	1.52	0.06	0.06	0.20	2.21	7
Cars, Trucks and Buses	0.39	0.02	0.03	0.00	0.07	0.01	0.01	0.00	0.20	1.50	0.03	0.05	0.31	2.62	1
Miscellaneous Industries	0.17	0.02	0.02	0.00	0.04	0.01	0.01	0.00	0.13	1.48	0.02	0.07	0.15	2.12	9
Industrial Services of Public Utility	0.06	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.03	1.43	0.01	0.02	0.08	1.67	17
Construction	0.15	0.01	0.02	0.00	0.04	0.01	0.01	0.00	0.11	1.25	0.02	0.04	0.15	1.79	16
Trade	0.06	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.04	1.29	0.01	0.02	0.05	1.49	20
Transport	0.13	0.01	0.04	0.00	0.05	0.00	0.01	0.00	0.09	1.36	0.02	0.06	0.16	1.92	14
Services	0.07	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.04	1.37	0.01	0.02	0.04	1.59	19
Administration and Public Services	0.07	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.04	1.38	0.01	0.02	0.05	1.60	18

Source: Author

Table 23: Mid-west Region - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.37	0.03	0.03	0.00	0.10	0.02	0.03	0.00	0.33	1.70	0.05	0.17	0.32	3.17	8
Extractive	0.36	0.02	0.04	0.00	0.09	0.01	0.02	0.00	0.24	1.66	0.04	0.14	0.34	2.96	15
Foods, drinks and tobacco	0.40	0.02	0.03	0.00	0.13	0.02	0.04	0.00	0.38	2.03	0.06	0.18	0.36	3.66	2
Textiles, Clothing and footwear	0.47	0.02	0.04	0.00	0.16	0.02	0.03	0.00	0.35	1.81	0.04	0.25	0.35	3.55	3
Paper, wood and graphics	0.35	0.02	0.03	0.00	0.08	0.01	0.02	0.00	0.29	1.84	0.06	0.14	0.25	3.10	10
Oil Refine	0.31	0.02	0.05	0.00	0.09	0.01	0.02	0.00	0.24	1.27	0.06	0.29	1.06	3.42	4
Alcohol	0.32	0.02	0.03	0.00	0.11	0.02	0.04	0.00	0.25	1.86	0.04	0.14	0.24	3.06	11
Chemicals and Rubber	0.37	0.03	0.04	0.00	0.09	0.01	0.03	0.00	0.25	1.80	0.04	0.21	0.33	3.21	7
Non-metallic mineral products	0.28	0.02	0.03	0.00	0.07	0.01	0.02	0.00	0.20	1.75	0.04	0.13	0.30	2.85	16
Metallurgical Industry	0.34	0.04	0.03	0.00	0.06	0.01	0.02	0.00	0.22	1.61	0.04	0.13	0.50	3.02	14
Machinery, Equipment and Maintenance	0.53	0.04	0.04	0.00	0.09	0.02	0.02	0.00	0.32	1.52	0.07	0.16	0.57	3.39	5
Miscellaneous Equipment	0.39	0.03	0.04	0.00	0.08	0.01	0.02	0.00	0.25	1.78	0.10	0.14	0.38	3.21	6
Cars, Trucks and Buses	0.68	0.03	0.05	0.00	0.12	0.02	0.03	0.00	0.38	1.73	0.06	0.14	0.54	3.79	1
Miscellaneous Industries	0.39	0.03	0.03	0.00	0.08	0.01	0.02	0.00	0.28	1.74	0.05	0.16	0.32	3.11	9
Industrial Services of Public Utility	0.15	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.10	1.58	0.02	0.06	0.17	2.15	20
Construction	0.36	0.02	0.03	0.00	0.08	0.01	0.02	0.00	0.25	1.55	0.04	0.12	0.32	2.80	17
Trade	0.26	0.01	0.02	0.00	0.06	0.01	0.01	0.00	0.18	1.72	0.03	0.09	0.19	2.58	18
Transport	0.34	0.02	0.05	0.00	0.09	0.01	0.02	0.00	0.24	1.73	0.04	0.15	0.34	3.04	12
Services	0.24	0.01	0.02	0.00	0.05	0.01	0.01	0.00	0.16	1.72	0.03	0.08	0.17	2.51	19
Administration and Public Services	0.32	0.01	0.03	0.00	0.07	0.01	0.02	0.00	0.22	1.96	0.04	0.11	0.24	3.03	13

Source: Author

Table 24: North Region - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.07	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.09	0.05	1.14	0.06	0.08	1.55	17
Extractive	0.09	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.06	0.01	1.39	0.05	0.09	1.74	15
Foods, drinks and tobacco	0.12	0.01	0.01	0.00	0.08	0.01	0.02	0.00	0.21	0.14	1.47	0.09	0.12	2.29	1
Textiles, Clothing and footwear	0.12	0.01	0.01	0.00	0.06	0.01	0.01	0.00	0.12	0.05	1.48	0.10	0.08	2.05	4
Paper, wood and graphics	0.11	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.08	0.02	1.45	0.05	0.07	1.85	11
Oil Refine	0.07	0.01	0.02	0.00	0.04	0.01	0.01	0.00	0.05	0.02	1.66	0.04	0.10	2.02	6
Alcohol	0.09	0.01	0.01	0.00	0.11	0.02	0.04	0.00	0.08	0.06	1.27	0.12	0.08	1.88	10
Chemicals and Rubber	0.13	0.03	0.02	0.00	0.04	0.00	0.01	0.00	0.11	0.02	1.44	0.13	0.11	2.04	5
Non-metallic mineral products	0.08	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.06	0.01	1.46	0.05	0.10	1.82	13
Metallurgical Industry	0.12	0.02	0.01	0.00	0.02	0.00	0.01	0.00	0.09	0.02	1.39	0.06	0.16	1.91	8
Machinery, Equipment and Maintenance	0.11	0.02	0.01	0.00	0.02	0.00	0.01	0.00	0.06	0.01	1.53	0.03	0.19	2.01	7
Miscellaneous Equipment	0.20	0.01	0.02	0.00	0.03	0.01	0.01	0.00	0.08	0.01	1.56	0.04	0.11	2.10	3
Cars, Trucks and Buses	0.15	0.02	0.03	0.00	0.03	0.01	0.01	0.00	0.08	0.01	1.53	0.04	0.20	2.11	2
Miscellaneous Industries	0.14	0.02	0.01	0.00	0.04	0.00	0.01	0.00	0.10	0.02	1.38	0.06	0.11	1.88	9
Industrial Services of Public Utility	0.06	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.04	0.01	1.58	0.03	0.07	1.82	12
Construction	0.12	0.01	0.01	0.00	0.03	0.00	0.00	0.00	0.08	0.02	1.27	0.04	0.11	1.70	16
Trade	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	1.21	0.01	0.03	1.34	20
Transport	0.09	0.01	0.03	0.00	0.04	0.00	0.00	0.00	0.07	0.01	1.37	0.05	0.11	1.78	14
Services	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.01	1.29	0.02	0.03	1.44	18
Administration and Public Services	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	1.25	0.01	0.03	1.38	19

Source: Author

Table 25: North Region - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.40	0.02	0.03	0.00	0.12	0.02	0.03	0.00	0.40	0.14	1.89	0.23	0.33	3.63	3
Extractive	0.30	0.01	0.03	0.00	0.07	0.01	0.02	0.00	0.23	0.07	1.82	0.15	0.25	2.97	17
Foods, drinks and tobacco	0.41	0.02	0.03	0.00	0.14	0.03	0.04	0.00	0.49	0.23	1.87	0.25	0.36	3.88	1
Textiles, Clothing and footwear	0.41	0.02	0.03	0.00	0.12	0.02	0.03	0.00	0.36	0.12	1.98	0.27	0.29	3.66	2
Paper, wood and graphics	0.37	0.02	0.03	0.00	0.09	0.01	0.03	0.00	0.30	0.08	1.95	0.18	0.26	3.33	8
Oil Refine	0.22	0.01	0.03	0.00	0.07	0.02	0.02	0.00	0.17	0.05	1.92	0.12	0.23	2.85	20
Alcohol	0.39	0.02	0.03	0.00	0.18	0.03	0.06	0.00	0.31	0.13	1.67	0.31	0.29	3.43	5
Chemicals and Rubber	0.34	0.04	0.03	0.00	0.09	0.01	0.03	0.00	0.29	0.06	1.78	0.25	0.28	3.20	13
Non-metallic mineral products	0.30	0.02	0.03	0.00	0.08	0.01	0.02	0.00	0.25	0.07	1.91	0.16	0.27	3.11	14
Metallurgical Industry	0.34	0.03	0.03	0.00	0.07	0.01	0.02	0.00	0.26	0.07	1.74	0.16	0.35	3.07	16
Machinery, Equipment and Maintenance	0.34	0.03	0.03	0.00	0.07	0.01	0.02	0.00	0.25	0.06	1.94	0.13	0.40	3.30	10
Miscellaneous Equipment	0.44	0.02	0.03	0.00	0.08	0.02	0.02	0.00	0.25	0.06	1.90	0.14	0.28	3.24	11
Cars, Trucks and Buses	0.40	0.03	0.04	0.00	0.08	0.01	0.02	0.00	0.26	0.06	1.90	0.14	0.41	3.37	7
Miscellaneous Industries	0.41	0.03	0.03	0.00	0.10	0.02	0.02	0.00	0.31	0.07	1.84	0.18	0.31	3.32	9
Industrial Services of Public Utility	0.24	0.01	0.02	0.00	0.06	0.01	0.02	0.00	0.18	0.05	1.96	0.11	0.22	2.88	19
Construction	0.38	0.02	0.03	0.00	0.09	0.01	0.02	0.00	0.30	0.08	1.78	0.17	0.32	3.21	12
Trade	0.31	0.01	0.03	0.00	0.08	0.01	0.02	0.00	0.27	0.08	1.92	0.14	0.23	3.10	15
Transport	0.36	0.02	0.05	0.00	0.10	0.01	0.02	0.00	0.29	0.07	1.96	0.17	0.32	3.39	6
Services	0.28	0.01	0.02	0.00	0.07	0.01	0.02	0.00	0.24	0.07	1.89	0.13	0.21	2.96	18
Administration and Public Services	0.38	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.32	0.10	2.13	0.17	0.27	3.55	4

Source: Author

Table 26: Northeast Region - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.05	0.01	0.01	0.00	0.02	0.00	0.01	0.00	0.06	0.02	0.01	1.28	0.06	1.51	17
Extractive	0.11	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.07	0.01	0.01	1.55	0.09	1.90	11
Foods, drinks and tobacco	0.10	0.01	0.01	0.00	0.06	0.01	0.02	0.00	0.18	0.10	0.03	1.66	0.12	2.29	3
Textiles, Clothing and footwear	0.11	0.01	0.01	0.00	0.05	0.01	0.01	0.00	0.11	0.06	0.02	1.62	0.09	2.10	6
Paper, wood and graphics	0.12	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.08	0.01	0.02	1.55	0.08	1.92	10
Oil Refine	0.09	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.06	0.01	0.02	1.77	0.29	2.33	2
Alcohol	0.06	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.06	0.02	0.01	1.59	0.05	1.85	13
Chemicals and Rubber	0.13	0.02	0.02	0.00	0.04	0.01	0.01	0.00	0.09	0.02	0.02	1.71	0.16	2.23	4
Non-metallic mineral products	0.09	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.07	0.01	0.02	1.52	0.11	1.88	12
Metallurgical Industry	0.11	0.02	0.01	0.00	0.02	0.01	0.01	0.00	0.08	0.02	0.03	1.48	0.21	1.99	8
Machinery, Equipment and Maintenance	0.13	0.02	0.01	0.00	0.02	0.01	0.01	0.00	0.07	0.01	0.02	1.60	0.20	2.10	5
Miscellaneous Equipment	0.15	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.06	0.01	0.07	1.57	0.11	2.05	7
Cars, Trucks and Buses	0.35	0.02	0.03	0.00	0.06	0.01	0.01	0.00	0.15	0.01	0.02	1.60	0.23	2.49	1
Miscellaneous Industries	0.14	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.14	0.02	0.03	1.45	0.11	1.96	9
Industrial Services of Public Utility	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.01	1.43	0.05	1.58	16
Construction	0.11	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.08	0.01	0.02	1.33	0.11	1.71	15
Trade	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	1.22	0.03	1.34	20
Transport	0.09	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.01	1.41	0.11	1.77	14
Services	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.01	0.01	1.33	0.03	1.48	18
Administration and Public Services	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	0.01	1.32	0.03	1.46	19

Source: Author

Table 27: Northeast Region - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.45	0.02	0.04	0.00	0.12	0.02	0.03	0.00	0.41	0.11	0.07	2.63	0.38	4.29	5
Extractive	0.47	0.02	0.04	0.00	0.10	0.02	0.03	0.00	0.35	0.09	0.07	2.60	0.38	4.17	12
Foods, drinks and tobacco	0.47	0.02	0.04	0.00	0.14	0.03	0.04	0.00	0.52	0.20	0.09	2.59	0.43	4.58	1
Textiles, Clothing and footwear	0.48	0.02	0.04	0.00	0.13	0.02	0.03	0.00	0.41	0.14	0.07	2.64	0.39	4.39	3
Paper, wood and graphics	0.48	0.03	0.04	0.00	0.11	0.02	0.03	0.00	0.38	0.08	0.07	2.61	0.36	4.22	7
Oil Refine	0.36	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.27	0.07	0.06	2.41	0.58	3.94	20
Alcohol	0.45	0.02	0.04	0.00	0.12	0.02	0.04	0.00	0.38	0.11	0.07	2.84	0.36	4.45	2
Chemicals and Rubber	0.44	0.03	0.04	0.00	0.11	0.02	0.03	0.00	0.33	0.08	0.06	2.48	0.42	4.04	17
Non-metallic mineral products	0.44	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.35	0.09	0.07	2.56	0.40	4.12	15
Metallurgical Industry	0.45	0.03	0.04	0.00	0.10	0.02	0.03	0.00	0.34	0.08	0.08	2.38	0.51	4.06	16
Machinery, Equipment and Maintenance	0.46	0.03	0.04	0.00	0.10	0.02	0.03	0.00	0.34	0.08	0.07	2.51	0.51	4.17	10
Miscellaneous Equipment	0.48	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.31	0.07	0.13	2.42	0.37	3.99	18
Cars, Trucks and Buses	0.71	0.03	0.05	0.00	0.13	0.02	0.03	0.00	0.39	0.07	0.07	2.23	0.51	4.26	6
Miscellaneous Industries	0.49	0.03	0.04	0.00	0.11	0.02	0.03	0.00	0.44	0.09	0.09	2.43	0.39	4.17	11
Industrial Services of Public Utility	0.39	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.31	0.08	0.06	2.61	0.33	3.97	19
Construction	0.49	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.39	0.09	0.08	2.45	0.42	4.14	14
Trade	0.44	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.37	0.09	0.07	2.65	0.35	4.19	8
Transport	0.46	0.02	0.05	0.00	0.12	0.02	0.03	0.00	0.36	0.08	0.07	2.55	0.42	4.18	9
Services	0.44	0.02	0.03	0.00	0.10	0.02	0.03	0.00	0.36	0.09	0.07	2.64	0.34	4.15	13
Administration and Public Services	0.47	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.38	0.10	0.07	2.75	0.37	4.36	4

Source: Author

Table 28: Southeast Region except São Paulo - Production Multipliers of Type I Decomposed

Sectors	Production Multiplier of Type I														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.05	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.05	0.02	0.01	0.02	1.32	1.51	17
Extractive	0.15	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.07	0.02	0.01	0.03	1.55	1.88	10
Foods, drinks and tobacco	0.12	0.01	0.01	0.00	0.07	0.01	0.02	0.00	0.19	0.12	0.02	0.05	1.65	2.27	2
Textiles, Clothing and footwear	0.12	0.01	0.01	0.00	0.05	0.00	0.01	0.00	0.07	0.05	0.01	0.06	1.61	1.99	7
Paper, wood and graphics	0.12	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.09	0.01	0.01	0.03	1.43	1.77	13
Oil Refine	0.09	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.05	0.01	0.01	0.06	1.82	2.12	3
Alcohol	0.06	0.01	0.01	0.00	0.04	0.01	0.01	0.00	0.05	0.02	0.01	0.03	1.59	1.83	12
Chemicals and Rubber	0.15	0.03	0.02	0.00	0.05	0.01	0.02	0.00	0.09	0.02	0.01	0.08	1.59	2.05	4
Non-metallic mineral products	0.11	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.07	0.02	0.01	0.04	1.52	1.83	11
Metallurgical Industry	0.13	0.01	0.01	0.00	0.02	0.01	0.01	0.00	0.08	0.03	0.02	0.05	1.61	1.98	8
Machinery, Equipment and Maintenance	0.09	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.05	0.01	0.01	0.02	1.81	2.03	5
Miscellaneous Equipment	0.15	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.06	0.01	0.05	0.03	1.65	2.02	6
Cars, Trucks and Buses	0.32	0.01	0.02	0.00	0.05	0.01	0.01	0.00	0.14	0.02	0.02	0.04	1.76	2.40	1
Miscellaneous Industries	0.14	0.01	0.01	0.00	0.03	0.01	0.01	0.00	0.14	0.02	0.02	0.04	1.46	1.89	9
Industrial Services of Public Utility	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.01	1.54	1.65	16
Construction	0.12	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.07	0.01	0.01	0.03	1.40	1.68	15
Trade	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	0.00	0.01	1.32	1.43	19
Transport	0.09	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.04	0.01	0.01	0.02	1.49	1.72	14
Services	0.06	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.01	0.01	0.01	1.35	1.49	18
Administration and Public Services	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	0.00	0.01	1.33	1.42	20

Source: Author

Table 29: Southeast Region except São Paulo - Production Multipliers of Type II Decomposed

Sectors	Production Multiplier of Type II														
	SP	LI	RJ	MG	AB	MR	RT	RB	SUL	COE	NOR	NET	SET	Total	Ranking
Agriculture and Cattle	0.42	0.02	0.03	0.00	0.10	0.02	0.03	0.00	0.30	0.09	0.05	0.14	2.56	3.75	4
Extractive	0.43	0.02	0.03	0.00	0.08	0.01	0.02	0.00	0.26	0.07	0.04	0.12	2.34	3.44	16
Foods, drinks and tobacco	0.45	0.02	0.03	0.00	0.14	0.03	0.05	0.00	0.46	0.20	0.06	0.17	2.46	4.08	1
Textiles, Clothing and footwear	0.45	0.02	0.03	0.00	0.12	0.02	0.03	0.00	0.30	0.12	0.04	0.17	2.57	3.88	3
Paper, wood and graphics	0.42	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.29	0.06	0.04	0.13	2.28	3.42	17
Oil Refine	0.29	0.01	0.03	0.00	0.07	0.02	0.02	0.00	0.18	0.05	0.04	0.15	2.35	3.20	19
Alcohol	0.38	0.02	0.03	0.00	0.11	0.02	0.04	0.00	0.26	0.09	0.04	0.14	2.59	3.70	6
Chemicals and Rubber	0.42	0.04	0.03	0.00	0.10	0.02	0.03	0.00	0.27	0.07	0.04	0.18	2.32	3.52	11
Non-metallic mineral products	0.39	0.02	0.03	0.00	0.08	0.01	0.02	0.00	0.26	0.07	0.04	0.14	2.35	3.44	15
Metallurgical Industry	0.40	0.02	0.03	0.00	0.08	0.02	0.02	0.00	0.27	0.08	0.05	0.14	2.35	3.45	14
Machinery, Equipment and Maintenance	0.36	0.02	0.02	0.00	0.07	0.01	0.02	0.00	0.23	0.06	0.04	0.11	2.67	3.63	7
Miscellaneous Equipment	0.43	0.02	0.03	0.00	0.09	0.01	0.02	0.00	0.24	0.06	0.09	0.12	2.45	3.57	9
Cars, Trucks and Buses	0.64	0.02	0.04	0.00	0.11	0.02	0.03	0.00	0.34	0.07	0.05	0.13	2.44	3.90	2
Miscellaneous Industries	0.44	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.37	0.08	0.06	0.14	2.32	3.60	8
Industrial Services of Public Utility	0.30	0.01	0.02	0.00	0.06	0.01	0.02	0.00	0.19	0.05	0.03	0.09	2.39	3.17	20
Construction	0.44	0.02	0.03	0.00	0.09	0.02	0.03	0.00	0.29	0.07	0.05	0.12	2.40	3.56	10
Trade	0.38	0.01	0.03	0.00	0.08	0.02	0.03	0.00	0.25	0.07	0.04	0.11	2.50	3.51	13
Transport	0.39	0.02	0.04	0.00	0.09	0.02	0.02	0.00	0.25	0.06	0.04	0.12	2.48	3.52	12
Services	0.37	0.01	0.02	0.00	0.08	0.01	0.02	0.00	0.24	0.07	0.04	0.10	2.42	3.40	18
Administration and Public Services	0.41	0.01	0.03	0.00	0.09	0.02	0.03	0.00	0.27	0.08	0.04	0.11	2.65	3.73	5

Source: Author

Table 30: 20 Larger Production Multipliers

Region	Sector	Multiplier		Generator Effect		
		Type I	Type II	Wages	Employ	Vallue
LI	Foods and Drinks	2.32	3.97	119	17	379
RJ	Foods and Drinks	2.33	3.94	140	20	426
MR	Foods and Drinks	2.33	3.91	313	46	914
SP	Foods and Drinks	2.32	3.90	876	138	2561
AB	Foods and Drinks	2.33	3.89	949	145	2759
RB	Foods and Drinks	2.32	3.89	98	13	314
RT	Foods and Drinks	2.33	3.88	348	52	1017
MG	Foods and Drinks	2.33	3.87	154	20	461
MR	Textiles and Clothing	2.18	3.82	301	58	572
RT	Textiles and Clothing	2.15	3.77	252	52	470
SP	Agriculture and Cattle	1.95	3.76	236	66	630
RJ	Agriculture and Cattle	1.91	3.73	227	64	627
SP	Textiles and Clothing	1.98	3.69	796	138	2222
LI	Agriculture and Cattle	1.87	3.67	226	65	654
SP	Cars and Trucks	2.30	3.64	1034	126	2779
MR	Agriculture and Cattle	1.85	3.64	296	76	834
MG	Agriculture and Cattle	1.86	3.62	229	65	663
LI	Textiles and Clothing	2.01	3.62	181	49	480
RT	Agriculture and Cattle	1.84	3.60	362	87	1068
AB	Textiles and Clothing	2.05	3.60	568	111	1514
	Mean			385.19	70.45	1067.14

Source: Author

Table 31: 20 Smaller Production Multipliers

Region	Sector	Multiplier		Generator Effect		
		Type I	Type II	Wages	Employ	Vallue added
MR	Miscellaneous	1.98	3.23	160	11	415
MG	Metallurgical Industry	1.90	3.23	166	12	512
MG	Extractive	1.96	3.21	102	11	416
AB	Miscellaneous	2.04	3.20	234	24	617
RT	Metallurgical Industry	1.91	3.19	168	15	557
LI	Metallurgical Industry	1.90	3.18	207	24	756
LI	Oil Refine	2.13	3.17	257	34	844
AB	Metallurgical Industry	1.91	3.17	182	18	618
MR	Metallurgical Industry	1.92	3.16	173	17	588
RJ	Oil Refine	2.13	3.15	682	94	2107
MR	Oil Refine	2.13	3.15	17	0	113
RJ	Metallurgical Industry	1.91	3.15	173	20	638
SP	Oil Refine	2.13	3.14	529	74	1649
RB	Oil Refine	2.13	3.13	17	0	114
AB	Oil Refine	2.13	3.13	823	114	2532
RT	Oil Refine	2.13	3.12	17	0	113
MG	Non-Metallic Minerals	1.88	3.12	131	21	493
MG	Oil Refine	2.13	3.11	17	0	114
RB	Non-Metallic Minerals	1.83	2.99	80	19	485
MR	Extractive	1.87	2.98	36	11	441
	Mean			208.61	25.99	706.18

Source: Author