The sectoral structure of an emergent economy in light of I-O analysis

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Abstract

1) The paper attempts to reveal the main structural changes (in sectoral profile) produced during the transition – study case: Romania.

2) As a leading method the I-O techniques are used, in Leontief model version.

3) There are involved information resulted from the I-O tables, homogenized as annual series for entire period 1989-2014. Extended classification of 88 branches was compacted into a fourteen sectors structure. Current prices were preponderantly used.

4) Contributions:

4.1. The paper explains, including analytically, the comprehensive significance of sectoral shares in GDP as an indicator of sectoral structure. It synthetizes both groups of factors influencing economic life - supply-sided and demand-sided.

4.2. Two measures of structural changes speed are involved: moving structural change coefficient (estimates intensity of adjustments produced between two successive years), and referential one (compares registered sectoral shares with a given fixed vector). Computing these parameters, the paper concludes that Romania has registered, from this standpoint, three distinct phases:

a) Decade 1990-1999. Dominated especially by demolition – along with the centrally planned mechanism - of the main industries, transportation networks, large agrarian exploitations, educational system. At a macro-structural level this phase distinguished itself by a convulsive evolution.

b) Pre-accession to EU period, 2000-2006. Characterized by ceasing of the chaotic institutional changes and implementation of complex reforms based on the adopted Program for Integration and negotiations with European Commission. This phase induced a more stable sectoral structure.

c) Status as EU full member 2007-2014. Unfortunately, the official accession to the EU could not be integrally fructified because of the latest world crisis. Years 2009-2011 registered a slowdown and serious decline, followed by a modest recovery (2012-2014). The changes in sectoral structure intensified again.

4.3. The technical coefficients are used to reveal the intensity of inter-sectoral linkages. Over half of them belong to nonsignificant or very weak classes, and approximately a quarter to the moderate one. 22-23% of them are characterized by important inter-sectoral linkage intensity, being defined as nodal technical coefficients. The “cumulated direct effects”, consisting in the row/column sums of A matrix are also analyzed.

4.4. The paper evaluates real-nominal discrepancies which can occur during economic changes. Relating to output, the sectoral structure was determined in three variants: a) current prices; b) previous year prices (in I-O applications these are usually labelled as constant); and c) base 1995 prices. Thus there were identified three groups of aggregated sectors. One (sectors 1, 4, 5, 7, 11) is characterized by a long-lasting relative nominal depreciation; another (sectors 2, 6, 8) displays an approximately

convergent dynamics; the last category (sectors 3, 9, 10, 12, 13, 14) reunites the main "winners" of this sui-generis "real-nominal competition".

4.5. Overall, five patterns of sectoral dynamics were identified:

- The shares in GDP of sectors 1 (agriculture, forestry, hunting, fishing) and 5 (textiles, leather, pulp and paper, furniture) have been placed on a descending trajectory.

- The sectors 2 (mining and quarrying), 7 (other manufacturing industries), and 14 (professional services - mainly businesses) also knew initially a descending evolution but, during the last period, one of them (2) has shown some signs of stabilization, while the others – even an increasing trend.

- There are sectors which have begun the transition on an ascending trend, only to continue by a descending evolution. The sectors 9 (transports, post and telecommunications) and 10 (trading services) are in such a situation.

- Oscillating dynamics do not lack as well. In some cases it ends by stabilization: sectors 3 (production and distribution of electric and thermal power) and 6 (machinery and equipment, transport means, other metal products). In others, however, the last part of interval seems to be associated rather with a descending trend (sector 4 - food, beverages and tobacco) or, on the contrary, with an ascending one (sector 11 - financial services and real estate transactions).

- The clearly defined ascending dynamics was also present. This concerns sector 13 - creative services.

The tendencies revealed by other authors for transitional economies – mainly "de- and re-agrarization" (the latter as a temporary phenomenon), "de-industrialization", and "tertiarization" - are also visible in the I-O analysis.

JEL Classification: C67; C82; P23
Key-words: sectoral structure, I-O table; I-O coefficients

I. Introduction: Romanian I-O tables

1. The pioneering attempts to assimilate the Input-Output techniques by the official Romanian statistics emerged at the end of the sixties. The main inspirational source was the US experience, obviously adapted to be in accord with the accountability system of material production. Two professional Seminars with participation of American experts have been organized: in Bucharest (1969) and in Washington-Boston (1970). The most current I-O tables of USA at that time were extensively described in (Dobrescu, 1970).

The first Romanian I-O tables were therefore built on exhaustive recorded data (not just a selected sample) concerning inter-sectoral flows for the year 1970. The obtained information, especially the resulted matrices A and $(I-A)^{-1}$ of technical coefficients, were involved in planning simulations for subsequent 70^{th} (Dobrescu, 1976, 1979).

2. Unfortunately, this benefic start was abandoned during the eighties, being revived after 1989, together with the transition of Romania – similarly to other Central and East-European countries - from the centrally planned economy to the market mechanisms. Naturally, this time the statistical background was provided by the fully adopted new national accounting system.

Since then, the Romanian National Institute of Statistics (INS) has estimated yearly input-output tables, using special surveys for a representative sample of enterprises, corroborated with other available informational sources.

The data were systematized initially on the basis of NACE Rev.1, according to ESA 79 methodology, subsequently applying the current European System of Regional and National Accounts - ESA 2010 NACE Rev. 2 (Commission Regulation EU - No 715/2010, 2010). Our present analysis involves the homogenized series for the entire interval 1989-2014, structured by ESA 2010 for 88 branches (listed in Appendix 1).

3. Some researches developed on this issue within the Seminar of Macroeconomic Modeling (National Institute for Economic Research of the Romanian Academy) tried to merge - into a coherent set of equations - the input-output equilibrium identities with the macroeconomic behavioral relationships (for global output, employment, main labor and capital revenues, taxation, public budget expenditures, consumption, investments, foreign trade, monetary variables). In order to not overcomplicate such a system, the I-O block has been configured in a consolidated sectoral structure.

3.1. Thus, the 2005 version of the Romanian macromodel (Dobrescu, 2006a, 2006b) has aggregated the primary data into six sectors (in brackets the numerical code), namely:

- Agriculture, forestry, hunting, and fishing (1);
- Mining and energy (2);
- Manufacturing industry (3);
- Construction (4);
- Transport, post, and communications (5);
- Trade and services (6).

The correspondence of the extended branch nomenclature with these six sectors is explained in Appendix 2. Through simple additional operations – linking the first position with the second, the third with the fourth, and the fifth with the sixth – this classification becomes equivalent to the well known classical three mega-fields (primary, secondary, and tertiary) structure. The Romanian macromodel has maintained such a systematization of I-O table until 2011, based, of course, on yearly updated information in accordance to new statistical sources.

3.2. The 2012 version has augmented the I-O block, switching from the 6x6 matrix A to a 10x10 one, with the following ten sectors:

- Agriculture, forestry, hunting and fishing (1);
- Mining and quarrying (2);
- Production and distribution of electric and thermal power (3);
- Food, beverages and tobacco (4);
- Textiles, leather, pulp and paper, furniture (5);
- Machinery and equipment, transport means, other metal products (6);
- Other manufacturing industries (7);
- Constructions (8);
- Transport, post and telecommunications (9); and
- Trade, business services, and public services (10).

Comparatively to the previous version, this new structure separates on one hand the production and distribution of electric and thermal power, and on the other it itemises the manufacturing industries (four positions). Its correspondence with the extended classification (of 88 branches) is again described in Appendix 2.

As expected, such I-O disaggregation has allowed a deeper investigation of the sectoral restructuring of the Romanian economy, in its transition to the market system.

3.3. Nevertheless, the macromodels' analytical and forecasting potential remained yet limited, especially regarding the services that were becoming a more and more significant field of the Romanian economy. Consequently, its new ongoing version organizes I-O tables into a fourteen sector structure:

- Agriculture, forestry, hunting and fishing (1);
- Mining and quarrying (2);
- Production and distribution of electric and thermal power (3);
- Food, beverages and tobacco (4);
- Textiles, leather, pulp and paper, furniture (5);
- Machinery and equipment, transport means, other metal products (6);
- Other manufacturing industries (7);
- Constructions (8);
- Transports, post and telecommunications (9);
- Trading services (10);
- Financial services and real estate transactions (11);
- Social services (12);
- Creative services (13); and
- Professional services (mainly businesses) (14).

As in previous versions, the accounting links between this structure and the extended classification (of 88 branches) are developed in Appendix 2. Obviously, a matrix A with 196 technical coefficients (14x14) describes more realistically the complexity of the Romanian economy in its pro-modernization course.

4. The rest of the paper attempts to depict the most important features of the sectoral changes recorded by the Romanian economy during the last quarter, using cognitive tools provided by the input-output analysis (see Leontief, 1936, 1970, 1986; Ghosh, 1958; Stone, 1961; United Nations, 1999; Pilat and Wölfl, 2005; Wixted et al., 2006; Ritzmann, editor, 2008; Miller and Blair, 2009; McLennan. 2016). Our analysis is centered on the fourteen sectors; generally, these will be specified by the numerical code mentioned in the previous list, and in only a few other occasions by the complete denomination.

Hence, the second chapter insists on sectoral shares in gross domestic product (at current prices) as a relevant macro-structural mirror of the economy.

The third one is devoted to the main determinants of structural transformations produced in the Romanian economy, especially the final demand (consumption, gross fixed capital formation, and export), the most important supply-side factors (technological and scale efficiency changes reflected in technical coefficients, output, import), the sectoral deflators, the evolution of indirect taxation, the degree of the economy openness.

The fourth chapter begins by analyzing the speed with which this entire process has developed, involving, with this aim, two quantitative indicators: moving and the referential structural change coefficient, respectively. The former approximates the amplitude of adjustments in sectoral shares between two successive years, whilst the latter compares them to a fixed vector, adopted as benchmark. Some distinct intervals of transitional process are identified on this basis.

There are also examined – in the case of the Romanian economy – the intensity of inter-sectoral linkages decoded by I-O coefficients and the main structural trends.

The paper ends by a set of concluding remarks.

II. Methodological Framework

The above presented consolidated I-O tables have observed as much as possible the standard methodology. Some specific solutions were, however, adopted taking into account the reliability of available data and the main objective of macroeconomic analyses.

1. As main inter-flows indicators, it has been operated with the monetary values of transactions from each sector i to each sector j, in both directions as supplied and used resources.

1.1. The main components of the supplied resources (R) are:

$$R=Q+NIT+M \quad (1)$$

where
Q – output (production exclusively of resident units), at producer prices;
NIT – net indirect taxes; and
M – imports (competitive and non-competitive together) of goods and services, at purchaser prices.

In counterpart, the used resources (U) comprise:

$$U=Z+AD+X \quad (2)$$

where
Z – intermediate consumption (inputs in sector j from sector i), at mixed prices (domestic entries at producer prices and imports at purchaser ones, respectively);
AD – domestic absorption, including consumption of households, public consumption (financed by the general consolidated budget), gross fixed capital formation, inventory change, all at purchaser prices, diverse balancing corrections;
X – export of goods and services, at purchaser prices.

For i=j the equality R=U is axiomatically admitted.

1.2. The gap between producer prices and purchaser ones contains many concrete components. In order to unburden the format, our paper groups all of them into the aggregate indicator Net Indirect Taxes (value added tax, excises, custom duties, subsidies on product, other similar add-ons).

1.3. The gross value added (GVA) appears as such, not being separated into its components (labor revenues, capital depreciation, taxes included in production costs, operating surplus). Consequently, the output appears as a sum of intermediate consumption on column and gross value added:

1.4. The direct I-O coefficients - representing technical coefficients (a_{ij}) in Leontief model, and the allocation coefficients (b_{ij}) in Ghosh model - are calculated by dividing the elements of Z matrix to the corresponding outputs (Q). They contain therefore not only purely domestic sources, but also necessary productive imports.

2. According to the generally adopted methodological principles of I-O tables, the Romanian ones are also built on the equality of supplied and used resources, either for each sector as a separate entity or, correspondingly, for the national economy as a whole. This fundamental accounting assumption (identities (1) and (2) at macro-level) is translated in sectoral profile by the relationships (1a) and (2a):

$$R_j=Q_j+NIT_j+M_j=\sum_j z_{ij}+GVA_j+NIT_j+M_j \quad (j=fix;\ i,j=1,\ 2,\ldots,\ m) \quad (1a)$$

$$U_i=\sum_i z_{ij}+DA_i+X_i \text{ (i=fix)} \quad (2a)$$

where:
i,j – numerical code of the sector as rows (i) and columns (j) of I-O table;
m – number of sectors;
Q_j - sectoral output, current producer prices;
z_{ij} – intermediate consumption of resources provided by the sector i for obtaining the output of the sector j, current producer prices;
DA_i – resources of sector i allocated to the domestic absorption.

3. At a sectoral level, the equilibrium between supplied and used resources, for i=j, means:

$$\sum_j z_{ji}+GVA_j+NIT_j=\sum_i z_{ij}+DA_i+NX_i \quad (3)$$

where
NX_i – net export (difference between export and import) at sectoral level.

A useful simplification may be obtained by introducing net inter-sectoral flows (NIF) definable as the difference between the total intermediate consumption on row, and the same indicator on column, that is:

$$NIF_i=\sum_i z_{ij}-\sum_j z_{ji} \quad (3a)$$

Hence, the relationship (3) can be rewritten as:

$$GVA_j+NIT_j=NIF_i+DA_i+NX_i \quad (3b)$$

This formula has a clear economic sense. It shows that – in a maximally compressed expression – the net output (gross output minus own intermediate consumption) provided by each sector has a triple possible destination:

- as productive usage in other sectors,
- as domestic final demand, and
- for external final demand (net export).

Evidently, the sums of all inter-sectoral transactions on rows and columns are identical. This explains why at the macro-level, respectively when determining the gross domestic product, neither NIF, nor other equivalent indicator appears.

4. The sectoral contribution to gross domestic product (noted G) can be therefore expressed at the supply side as follows:

$$G_j=GVA_j+NIT_j \quad (4),$$

and at the demand side as

$$G_i=NIF_i+DA_i+NX_i \quad (4a),$$

both estimations (4) and (4a) being equal for i=j. In a normalized expression, i. e. as shares in gross domestic product, the relationships (4) and (4a) become:

$$sG_j=G_j/GDP \quad (5) \text{ and}$$

$$sG_i=G_i/GDP \quad (5a).$$

The equality $sG_j=sG_i$, for j=i, further supports the statements about the methodological advantages of sG as a measure of sectoral structure. Unlike other indicators used with such goal, it synthetizes the influences of both groups of factors – supply-sided and demand-sided – conditioning the economic life. The Appendix 3 details the series for 1989–2014 of the sectoral contributions to GDP, according to the last updated Romanian I-O tables.

5. Consequently, the main determinants of structural changes are going to be defined in relation to the variation of sectoral contributions to gross domestic product (at current prices). They can be systemized in four groups of macroeconomic aggregates:

5.1. The structure of domestic absorption and of export, as preponderantly demand-side impulse.

a) The first aggregates following main components;

$$AD=CH+CG+GFCF+STOCK+COR \quad (6)$$

where:
CH – consumption of households, at purchaser prices;
CG – public consumption (financed by the general consolidated budget), at purchaser prices;
GFCF – gross fixed capital formation, at purchaser prices;
STOCK – inventory change, at purchaser prices;
COR – diverse balancing corrections.

Taking into account their different macroeconomic role, the concrete analysis will be centered on total consumption (CH+CG) and on gross fixed capital formation. Due to informational constraints, the last two terms of (6) – inventory change and diverse balancing corrections – have in some cases, especially at sectoral level, a residual computational function.

b) The export is evaluated in national currency, as a global indicator including both its components – goods and services.

5.2. The sectoral structure is also influenced by the changes in output, technical coefficients, and derived inter-flows transactions, on one hand, and by import on the other, all these as main supply-side vectors.

a) The net inter-flows could be deciphered by technical coefficients as follows:

$$NIF_i=\sum_i z_{ij}-\sum_j z_{ji}=Q_i*\sum_i a_{ij}-\sum_j a_{ji}*Q_j \quad (3c)$$

Such a breakdown can be refined by introducing the output and technical coefficient at constant prices, the real processes being this way explicitly:

$$\hat{Q}_i=Q_i/P_i \quad (7)$$

$$\hat{Q}_j=Q_j/P_j \quad (7a)$$

$$\hat{a}_{ij}=a_{ij}*(P_j/P_i) \quad (8)$$

where:
$\hat{Q}_i$, $\hat{Q}_j$ – sectoral output, constant prices;
P_i, P_j – annual output deflators;

$\hat{a}_{ij}$ – I-O technical coefficients, constant prices.

b) Identically to export, the import is estimated in national currency and as global indicator (goods and services together).

5.3. As economic structure determinants, the sectoral deflators and the indirect taxation essentially contribute to nominal cleaning demand-supply "scissor".

5.4. It would be useful, for a more complex representation of economic structure determinants, to examine distinctly the openness degree of the economy (OP), as a ratio of total foreign trade (export plus import) to gross domestic product. Functionally, it operates as a coupling channel between internal and international markets.

III. Main Determinants of Structural Changes in Romanian Economy

The factors synthetized in the previous chapter are obviously not isolated. They interact multi-directionally, influencing conflictingly, sometimes not just alone, but as two or more market coordinates – demand, supply, prices. Their comprehensive analysis in case of the Romanian economy exceeds the proposed topic of the present paper. Hereinafter we resume observing the most representative of them.

1. As we have already mentioned, on demand-side two factors are primordial: the domestic absorption and the export of goods and services. Relating to the domestic absorption, the paper focuses on total consumption and gross fixed capital formation.

1.1. Practically in all contemporary countries, the domestic absorption distinguishes itself as main share of the final usage of resources obtainable from internal and foreign markets. It is by far a decisive vector, which induces the structural changes in economy, not only on short-term (impacting the utilization of existing productive capacities), but also on the long-run (through the investment processes). I-O tables provide relevant data about its main components, namely the consumption (private and public) and the fixed capital formation.

As expected, after 1989 the liberalization of domestic market and foreign trade, associated with the dismantling of the centrally planned system, has provoked a spectacular modification of consumption structure (Figure 1 and Figure 2).

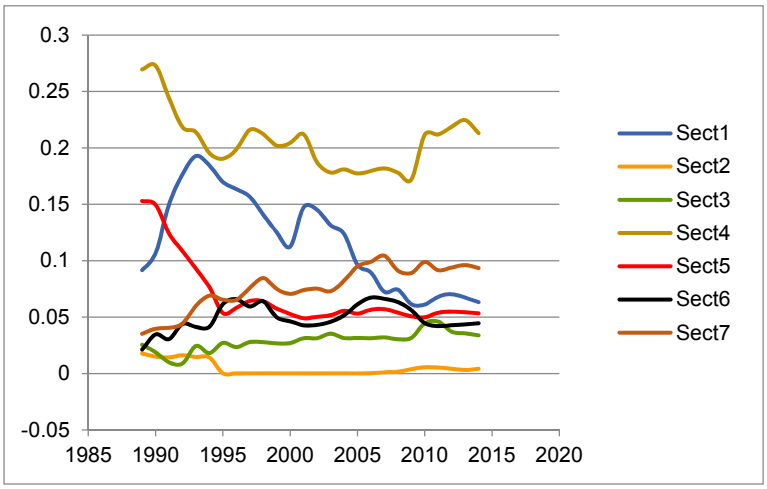

Fig. 1. Consumption structure (shares of the sectors 1-7)

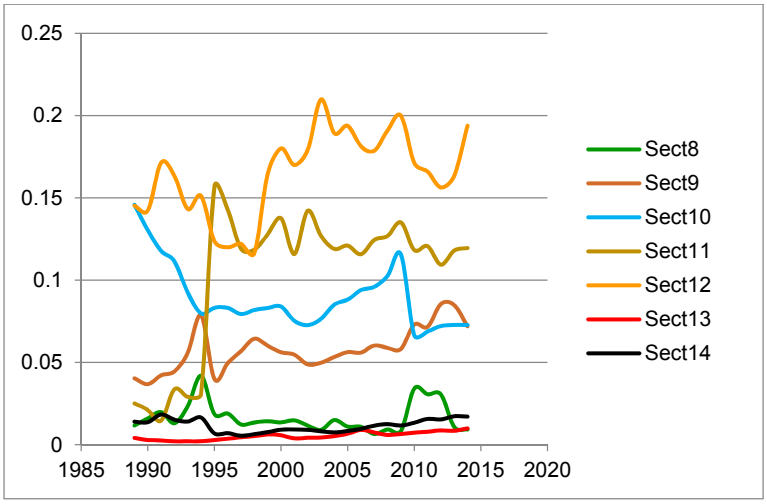

Fig. 2. Consumption structure (shares of the sectors 8-14)

Excepting sectors 2, 3, 12, and 14, which have quantitatively modest positions anyhow, all the others distinguish themselves by a highly fluctuant evolution. This resulted not only from the changing consumer preferences in society, but also from mutations in the social distribution of real revenues, and especially from hyper-inflation and generally unstable existing economic environment.

1.2. As expected, the gross fixed capital formation is dominated by few sectors only, the top positions being filled by 6 (machinery and equipment, transport means, other metal products) and 8 (constructions). The rest of them are presented together (Figure 3).

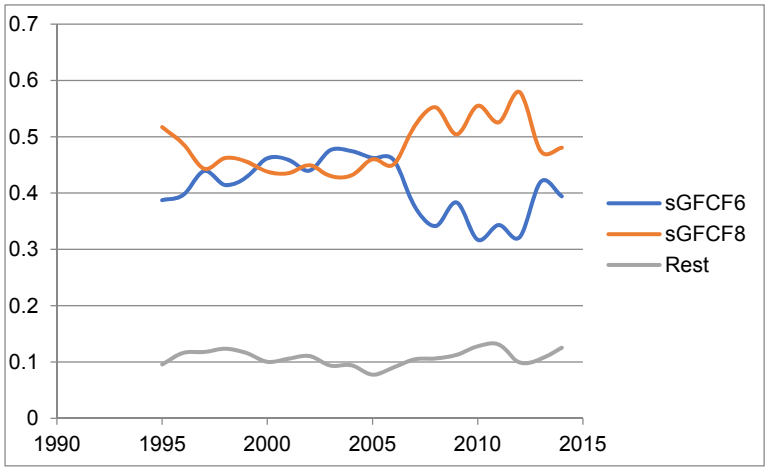

Fig. 3. Sectoral structure of the gross fixed capital formation

The almost symmetrical evolution of sectors 6 and 8 cannot be explained by certain regularities (at least unknown currently). It is inferred rather from the contextually determined discrepancies among different concrete investment processes. The relative stability of the remaining sectors is apparent, deriving greatly from the computational aggregating operation.

1.3. As illustrated in Figure 4, after 1989 the sectoral structure of export registered noticeable changes, as well.

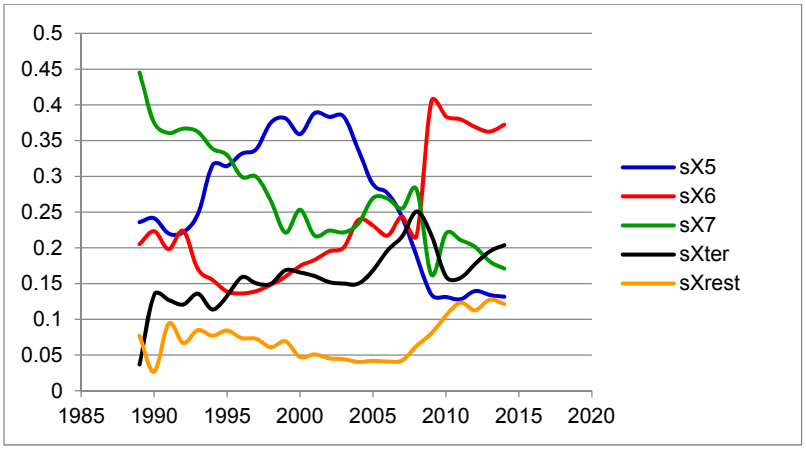

Fig.4. Sectoral structure of export

Romania's export relies preponderantly on the sectors: 5 (textiles, leather, pulp and paper, furniture), 6 (machinery and equipment, transport means, other metal products), and 7 (other manufacturing industries). It seems significant the ascending trend – despite some oscillations – of services (sectors 8÷14 representing the so-called tertiary mega-field).

2. Concerning the supply-side determinants, we focus on the sectoral changes in output and their technical coefficients, on the resulted modifications in the structure of intermediary consumption, and on the import of goods and services. Net indirect taxes are going to be discussed further on, in the context of prices' problem.

2.1. The output restructuring was marked by significant changes in the corresponding sectoral shares, computed at fixed base prices (1995 being the first term of available series).

● One group decreased: sector 1 abruptly, 2 and 3 smoother (Figure 5).

● Another group contains sectors (4, 6, 7, 8, and 12) with oscillatory evolution, sometimes of a large amplitude (Figure 6).

● The output shares of three sectors (10, 13, and 14) registered a clear ascending tendency (Figure 7).

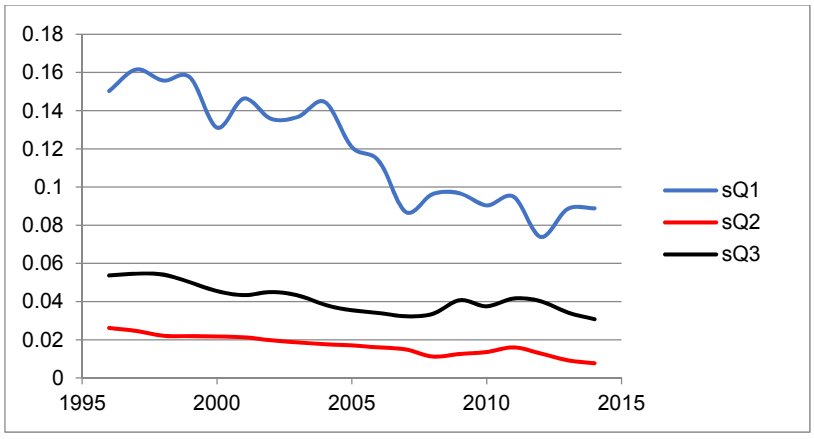

Fig.5. Output shares of descending sectors

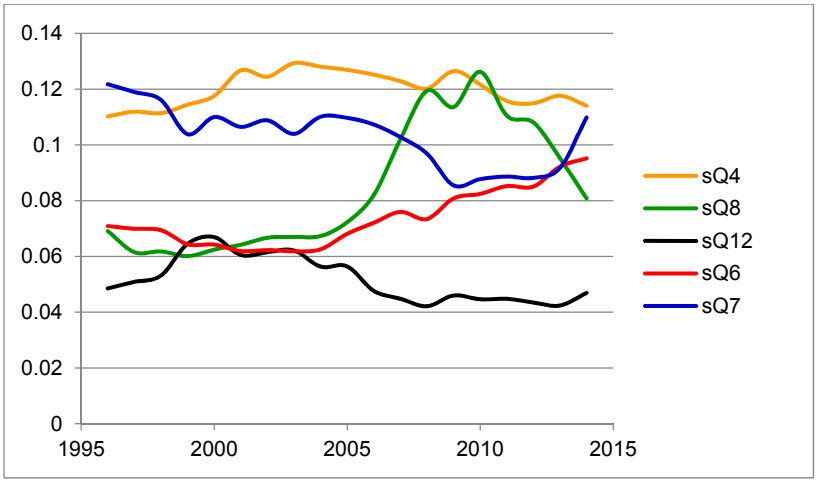

Fig.6. Output shares of sectors with oscillatory evolution

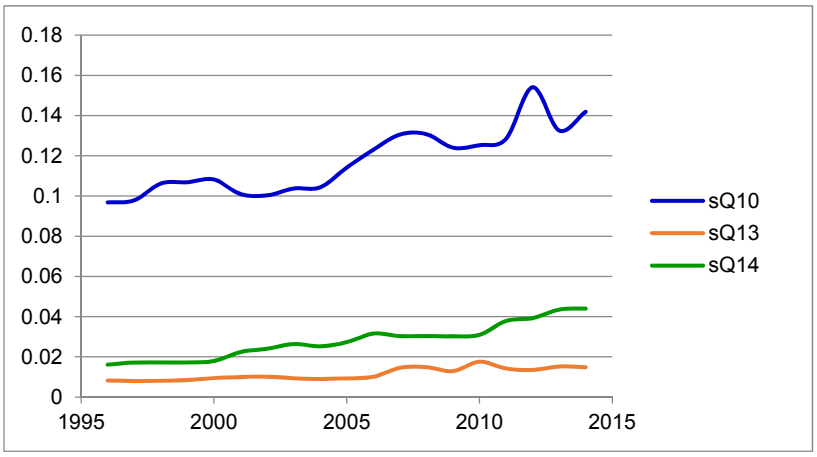

Fig.7. Output shares of ascending sectors

2.2. The intermediate consumption represents an important – in many sectors even leading – share of the fabrication costs of goods and services. It depends preponderantly on the energetic and material intensity of production (as an intrinsic effect of applied technology), as well as on the scale efficiency (the dimension of business), and on the degree of vertical integration.

2.2.1. The influences of all these factors are absorbed by the technical coefficients in real terms (see, for instance, Miller and Blair, 2009, p. 307). Concerning Romanian I-O tables, such technical coefficients (noted $a^{\wedge}_{ij}$) have been approximated indirectly, deflating values at current prices by the respective price indices of output ($P95_{it}$). The available data allowed applying such an algorithm starting with 1995 – the first year against which it has been possible to compute deflators with fixed base. This way, the series of constant prices (1995) coefficients $a^{\wedge}_{ij}$ were computed for the entire 1996-2014 interval. Appendix 4 contains the necessary details.

By becoming analogous, the $a^{\wedge}_{ij}$ values so estimated were subsequently aggregated into corresponding means, standard deviations and resulted variation coefficients ($a^{\wedge}_{ij}CV$) for all 196 series. The first and the last of these are illustrated in Figures 8 and 9 for both clusters of sectors (1-7 and 8-14).

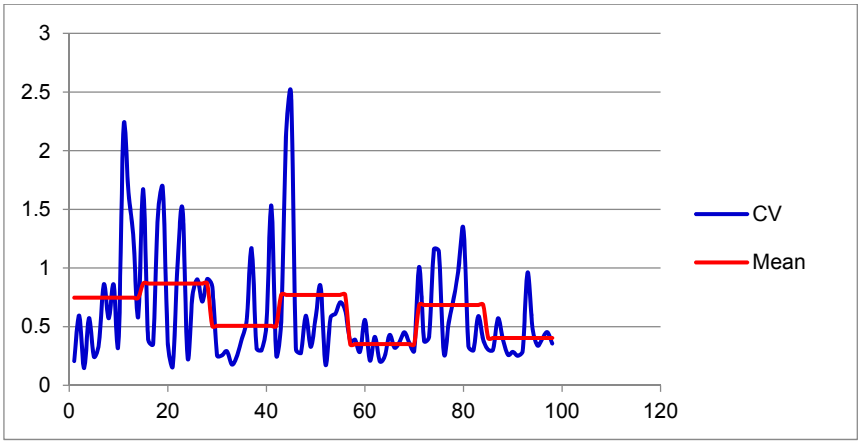

Fig.8. Means and coefficients of variation for $a^{\wedge}_{ij}$ in sectors 1-7

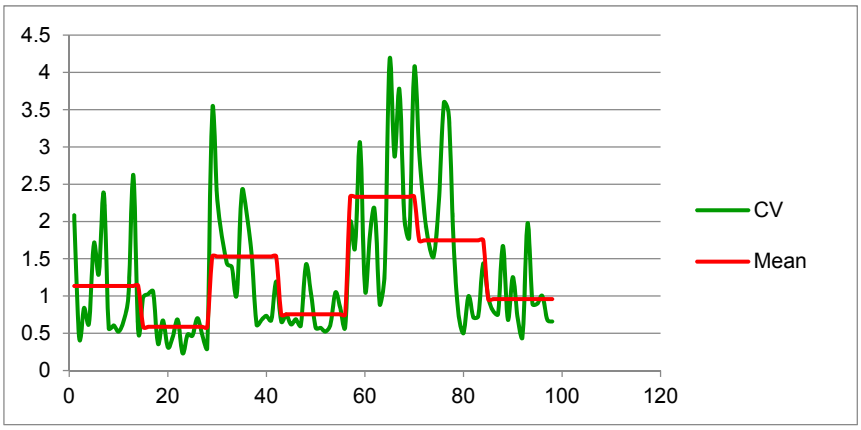

Fig.9. Means and coefficients of variation for $a^{\wedge}_{ij}$ in sectors 8-14

The variation of technical coefficients is, therefore, considerably differentiated by sectors. Much more significant is, of course, its preponderant high level. In other words, the most representative indicator of real inter-sectoral flows is characterized by an accentuated temporal instability. This has been induced mainly by the technological modernization of some existent firms, by new productive operators entering the market, by changes occurred in fabrication nomenclature as well as in scale efficiency.

2.2.2. The structural changes of output and technical coefficients generated ample mutations in the role exerted by different sectors within the productive cooperation. This role is quantitatively outlined by the sectoral weights in the total of inter-flows transactions (sIF_i):

$$sIF_i=(\sum_i z_{ij}+\sum_j z_{ji})/(2*Z) \quad (9)$$

where Z represents the total of inter-flows transactions. Such a definition enables considering the alternative position of sectors, as suppliers and buyers simultaneously. This is why Z is doubly accounted, its value being the same whether it is calculated by rows or by columns of the I-O table. Under this assumption, the sum of sIF_i maintains itself equal to unity, which facilitates the interpretation of data.

Regarding the net inter-flow transactions, there were identified the following groups of sectors:

- with positive balance (1, 2, 3, 7, 13, 14);
- with negative balance (8, 10, 12); and

● some with mixt position (4, 5, 6, 9, 11), respectively with alternating algebraic sign in different years.

Their shares in the total of inter-flows transactions shift as illustrated in Figure 10.

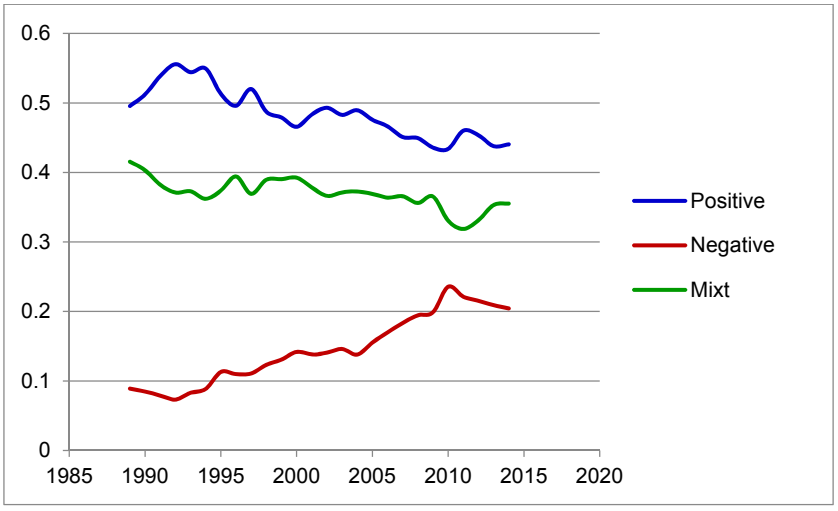

Fig.10. Structure of inter-flows transactions

2.3. The import played an increasingly important role in the Romanian economy. Its weight in forming the total resources has grown almost continuously until 2007. A short decrease occurred during 2008-2009, after which it recovered and stabilized. Due to the changes produced during the transition, the sectoral structure of import suffered profound mutations, too (Figure 11 and Figure 12).

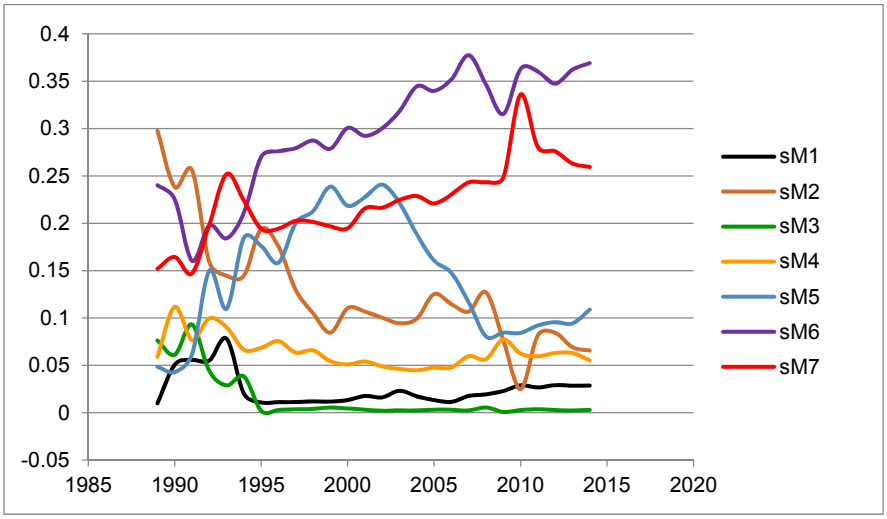

Fig.11. Shares of the sectors 1-7 in import

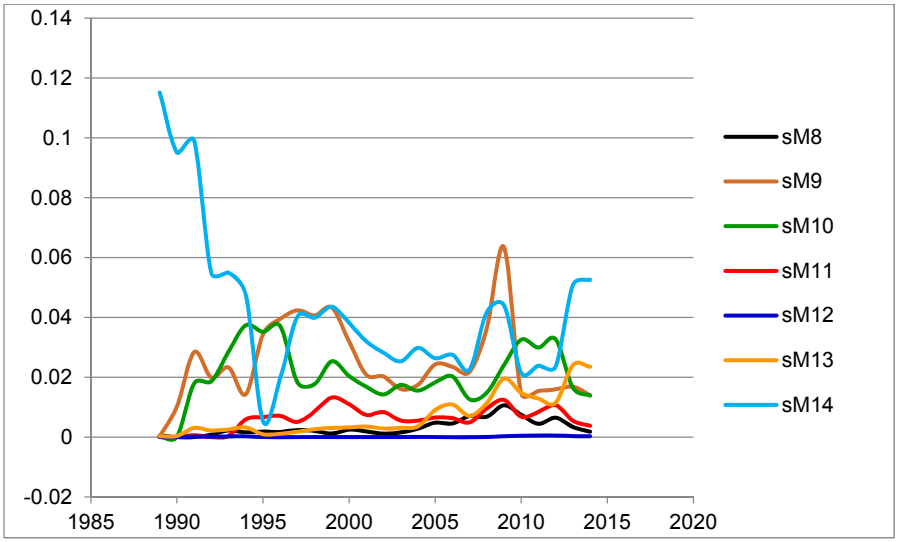

Fig.12. Shares of the sectors 8-14 in import

3. As it was already mentioned, I-O tables – in the above simplified form – operate with a double price system.

As a rule, the transactions for intermediary consumption provided from internal sources involve the producer prices. Consequently, the sectoral deflators significantly influence the economic structure in nominal expression.

The final demand from internal sources and the transactions linked with foreign trade are accounted at prices which include different forms of indirect taxation.

Both these issues are hereinafter explored.

3.1. As we noticed tangentially, the annual deflators have been computed at sectoral level beginning with 1996. Although shorter than the samples typically used in our paper (26 observations), the available series (19 observations) remain however relevant.

The turbulent environment specific to the first years of post-socialist regime reverberated strikingly on inflation (Figure 13).

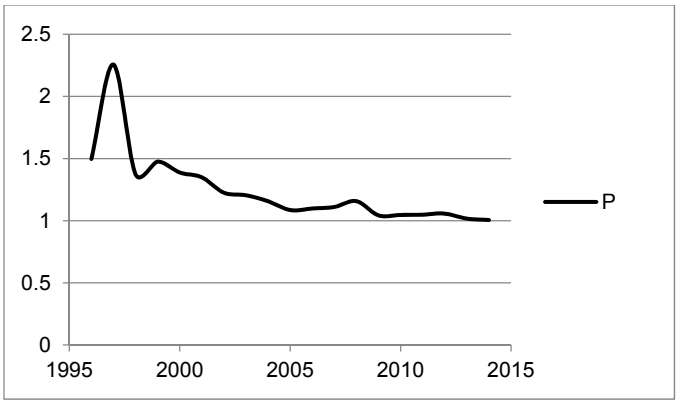

Fig.13. Total deflator of output

The total deflator of output (P) registered initially very high levels, but afterwards it decreased towards progressively lower ones.

This pattern has resulted from a differentiated sectoral evolution. Hence, there are observed three tendencies concerning the relative difference (in module) between sectoral and total deflator (as weighted mean for economy).

One group (Figure 14) is characterized by a pronounced deviation against mean even after the initial shock of transition. It includes sectors 2, 3, 12, and 13.

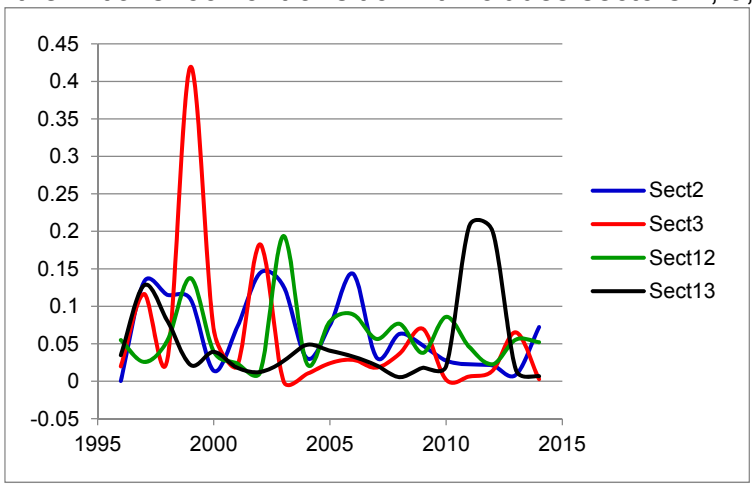

Fig.14. Sectoral deflators with accentuated deviation against mean

Another group (Figure 15) – comprising sectors 1, 4, 7, 9, 11, and 14 – distinguishes itself by a descending such a deviation, however towards moderate limits.

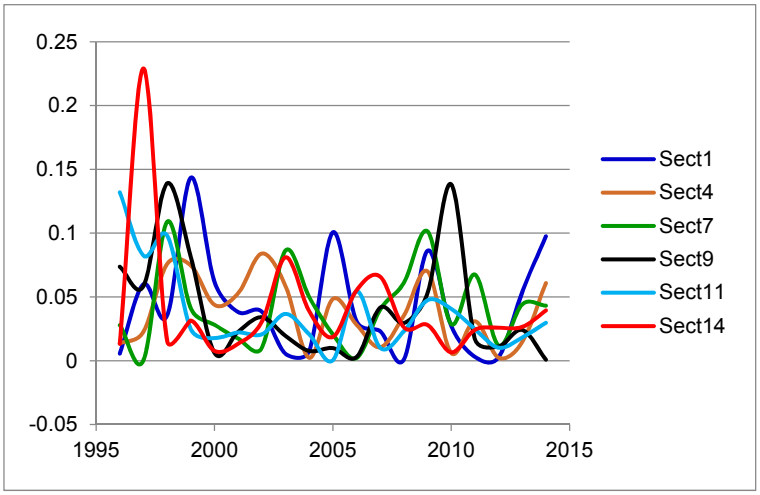

Fig.15. Sectoral deflators with descending (but still significant) deviation against mean

In the matter of the last category (Figure 16), the variation of sectoral deflators around the mean becomes increasingly weak towards insignificant. Such an evolution can be seen in the case of sectors 5, 6, 8, and 10.

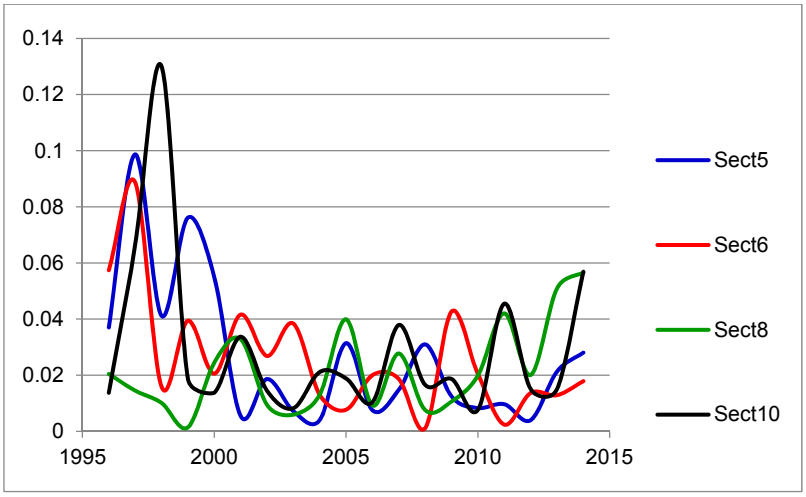

Fig.16. Sectoral deflators which gradually close to mean

3.2. The above-mentioned differences influenced the correlations between real (at constant prices) and nominal (at current prices) sectoral structure. Such an impact may be better highlighted using the deflators with a fixed base. Consequently, the annual deflators were transformed by a simple successive multiplication into similar indices against the year 1995 (noted P95). Using these, the sectoral outputs between 1996 and 2014 were estimated in three alternative ways:

- in current prices,
- in previous year prices (designated as constant in I-O applications), and
- in base 1995 prices.

The resulted sectoral shares in total output are symbolized by $sPCS_i$, $sPKS_i$, and $sP95S_i$ ($i=1, 2,\ldots, 14$). The algebraic differences $dsPC_i=(sPCS_i-sP95S_i)$ and $dsPK_i=(sPKS_i-sP95S_i)$ are useful in revealing the real-nominal discrepancies inducible by the dispersion of sectoral deflators.

This way we have identified three groups of sectors. In the case of the first group (sectors 1, 4, 5, 7, 11), these differences are almost constantly negative, which could be interpreted as a relatively persisting nominal depreciation of the goods and services provided by the respective sectors. Another group (sectors 2, 6, 8) displays very low such differences, which infers an approximately convergent dynamics of the real-nominal processes. The last category (sectors 3, 9, 10, 12, 13, 14) reunites top "winners" of this sui-generis "real-nominal competition"; their $dsPC_i$ and $dsPK_i$ have significantly positive signs. An analytical investigation of these trends would require more complex further research, which exceeds the intended goal of this paper.

3.3. The producer price deflators explain only a part (undoubtedly important, yet a part) of the nominal economic magnitudes. The purchaser prices – considerably conditioned by indirect taxation – also interfere. During transition the sectoral structure of collected value added taxes, excises, custom duties and other forms of indirect taxation have recorded variations.

The Figure 17 displays the trajectories of moving and referential structural change coefficients determined for sectoral shares in total NIT (for technical details see page 18, point 1.1).

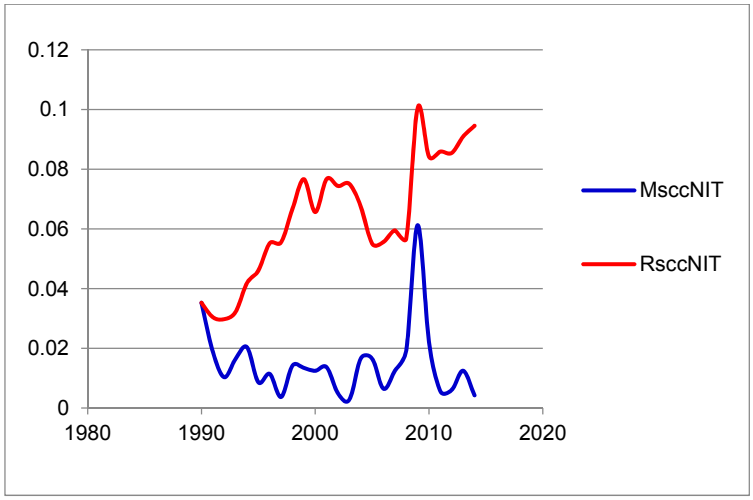

Fig.17. Dynamics of the sectoral structure of NIT

Overall, the sectors are classified in several groups depending on their position as contributors to the total volume of net indirect taxes:

● Shifting contributors are sectors 1, 2, and 3; they build the primary mega-field of economy and are characterized by both negative (especially in the first years of transition) and positive statuses

● Small contributors are the sectors 9 to 14, generally belonging to the tertiary mega-field of economy. They are constantly positive, but at modest quota.

● As middle contributors can be considered the sectors 5, 6, and 8, while the sectors 4 and 7 are in a leading position.

It is worthwhile to notice how the first five contributors to collected indirect taxes changed:

● sectors 4, 2, 14, 7, 5 at the beginning of transition,

● sectors 4, 7, 5, 6, 10 in 2000, and

● sectors 7, 4, 8, 6, 14 at the end of the timespan.

Two of the above-mentioned sectors – food, beverages and tobacco (4) and other manufacturing industries (7), respectively – are never-failing. Three other clusters – textiles, leather, pulp and paper, furniture (5), machinery and equipment, transport means, other metal products (6), and professional services (14) – appear two times. Despite the frequent changes occurred in the sequence of NIT contributors, the upper part of the hierarchy seems stable enough.

4. As the main communication channel between each country and the rest of the world, foreign trade exerts a complex influence on the sectoral structure of produced and used resources. First of all, it increases the stimulating role of domestic competition, thus amplifying the level at which the comparative advantages of a given national economy are genuinely exploited. Normally, such an impact depends on the degree to which the respective country is connected to international markets.

Our analysis will be centered on two issues, relevantly described by the I-O tables: the global dynamics of the Romanian economy degree of openness on the whole, and the sectoral particularities in this area.

As aforementioned, the openness degree is estimated by the ratio of total foreign trade (sum of export and import of goods and services) to gross domestic product. After an oscillating evolution during the 90s, the Romanian economy degree of openness has maintained a relatively high level, severed by the latest global crisis.

The sectoral evolution, however, was strikingly different. The Pearson correlation with global dynamics was highly positive only for sectors 5, 6, 7, and 13, becoming moderately positive for sectors 1, 2, and 10. It was weak or completely absent for sectors 4, 8, 9, 11, and 12, being even negative for sectors 3 and 14. These contradictory tendencies are depicted in Figure 18, which illustrates the changes in the openness degree from 1989 to 2014, together with the corresponding sectoral standard deviations (weighted by the sectors' shares in the foreign trade).

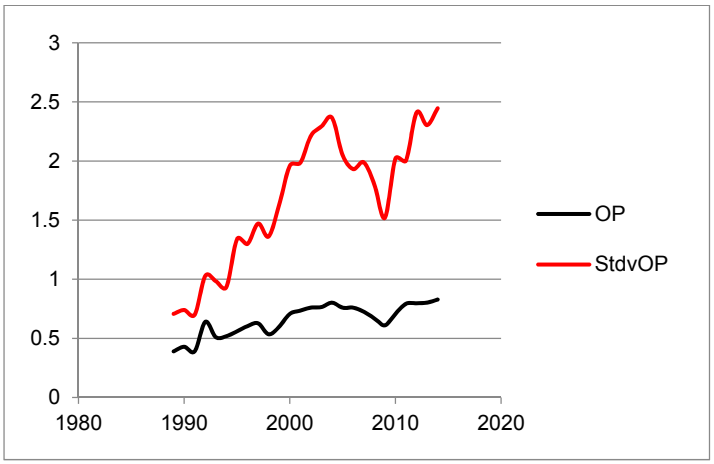

Fig.18.Evolution of the openness degree

The openness degree has been, therefore, highly volatile. Many factors could be invoked in explaining ~~of~~ this phenomenon, starting with hesitations in institutional transformations, incoherencies in the true modernization of the productive potential, or macroeconomic policy mistakes, and, last but not least, various circumstantial factors. Briefly, it attests that the Romanian economy is still a long way from achieving a stabilized structural profile, at least from an external perspective.

IV. Structural Trends

A synthesis of this paper, the present chapter attempts to provide a global image of the structural changes undergone by the Romanian economy during its post-socialist evolution. This issue can be obviously addressed from a wide array of angles. From such a multitude of possible approaches, we selected three, critical in shaping a relevant picture of the transforming tendencies specific to this complicated process.

● One concerns the temporal range. The facts confirmed that the restructuring reforms (institutional, socio-economic, and cultural) did not occur smoothly, with relatively same effects in each period on various society segments. From this standpoint, our intention is to reveal – using I-O tables and parameters derived from them – those transition stages from a centrally planned to market system which could be considered ~~as~~ historically distinct.

● The second objective of this chapter is to uncover – by analyzing the I-O technical coefficients – primary productive linkages and their influences on the macroeconomic indicators of inter-sectoral transactions.

● As a corollary of the entire work, the final section identifies global sectoral trends. This step is taken not only from the perspective of the fourteen sector classification (used in this paper), but also by considering a more aggregating image

of the mega-fields trinity – primary, secondary, and tertiary – a leading mainstream in the modern theory of development.

IVA. Temporal speed

1. This problem is going to be quantitatively evaluated through two structural coefficients: Mssc and Rssc.

1.1. These are computed as Euclidean distances between two vectors of the normalized sectors' shares in a given indicator:

$$Mssc=((1/n)*\sum(s_{kt}-s_{k(t-1)})^2)^{0.5} \quad (10) \text{ and}$$

$$Rssc=((1/n)*\sum(s_{kt}-s_{kr})^2)^{0.5} \quad (10a)$$

where:
n – sample size (number of observations);
s_k – normalized shares of sectors in indicator k; equality $\sum s_k=1$ is admitted for every t;
r – sectoral shares adopted as a benchmark.

The methodological advantages of such a solution consist not only in their computational simplicity, but in the possibility to estimate these two indicators annually as well, which allows measuring the sectoral changes as dynamic series.

1.2. Therefore, Mscc estimates the intensity of the adjustments produced in the sectoral shares between two successive years (t and (t-1)), while Rscc compares the registered s_k with a given fixed vector. Thus, the former is named moving structural change coefficient, and the latter – referential coefficient.

The referential vector maybe grounded on the data for a base year or for another entity (country, region, world as a whole). It could be simply represented by exogenous values derived from a desirable scenario or other normative criteria.

2. As we have already outlined, the most representative indicator measuring the macroeconomic role played by a sector is its share in the gross domestic product (sG), which practically merges all the macroeconomic effects (supply-sided or demand-sided) induced by the respective sector.

2.1. The first parameter (MsccG) does not raise calculus issues. It operates with I-O data per se.

The other one (RsccG), however, needs a benchmark vector. For the present paper we preferred the simplest choice for such a role, which is the statistics corresponding to the final year of the centrally planned system (namely 1989). The referential structural change coefficient is therefore formulated as a measure of the intensity with which the sectoral structure of the Romanian economy has drifted away from the one left by the socialist regime.

2.2. Figure 19 displays Mscc and Rscc indicators relating to the sectoral shares in gross domestic product (sG).

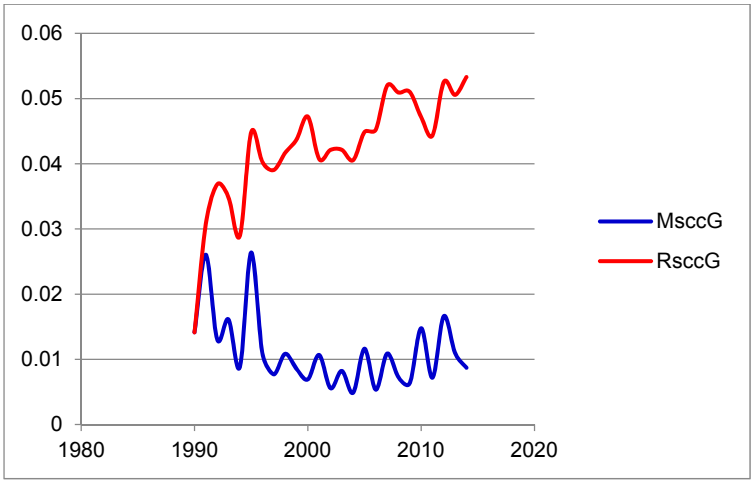

Fig.19.Moving and referential structural change coefficient at GDP level

Both indicators attest a very dynamic structural process. Nevertheless, it is rather easy to identify three distinct phases:

2.2.1. The first decade (1990-1999 years) is marked by frequent and sudden sectoral shifts. We do not intend to examine here the degree to which this restructuring process was correctly managed or not, our goal being to evaluate its intensity only. In any case, it was probably the most distressing stage of transition from the centrally planned to the market system.

2.2.2. The subsequent interval concurs with implementing of EU pre-accession reforms. It is worthy of note that in 2000 Romania adopted officially – with the massive support of political parties, civic organizations, and public opinion – the National Program for Integration into European Union. As per Figure 19, the timespan 2000-2006 is characterized by a noticeable decline of the sectoral structure volatility.

2.2.3. Since 2007 – especially in the context of turbulences generated by the recent global crisis – the sectoral structure becomes highly fluid again. This time, however, the range of variation is more limited than in the first stage of transition.

3. The picture will be completed by computing Mscc and Rscc base on the series of consumption (C), gross fixed capital formation (GFCF), export (X), inter-flows (IF), output (Q), import (M), net indirect taxes (NIT), and openness degree (OP). Generally, the sectoral shares have been normalized simply by dividing each sectoral contribution by the total for the respective indicator.

This procedure was slightly adapted in order to achieve a better comparability of data. The sectoral openness degrees were first weighted by corresponding shares in foreign trade, after which the resulted estimations were submitted to the usual algorithm of normalization.

The historical pattern identified regarding mutations of the sectoral shares in gross domestic product (sG) is only partially replicated in the case of the above-mentioned macroeconomic indicators. Figures 20 and 21 are conclusive.

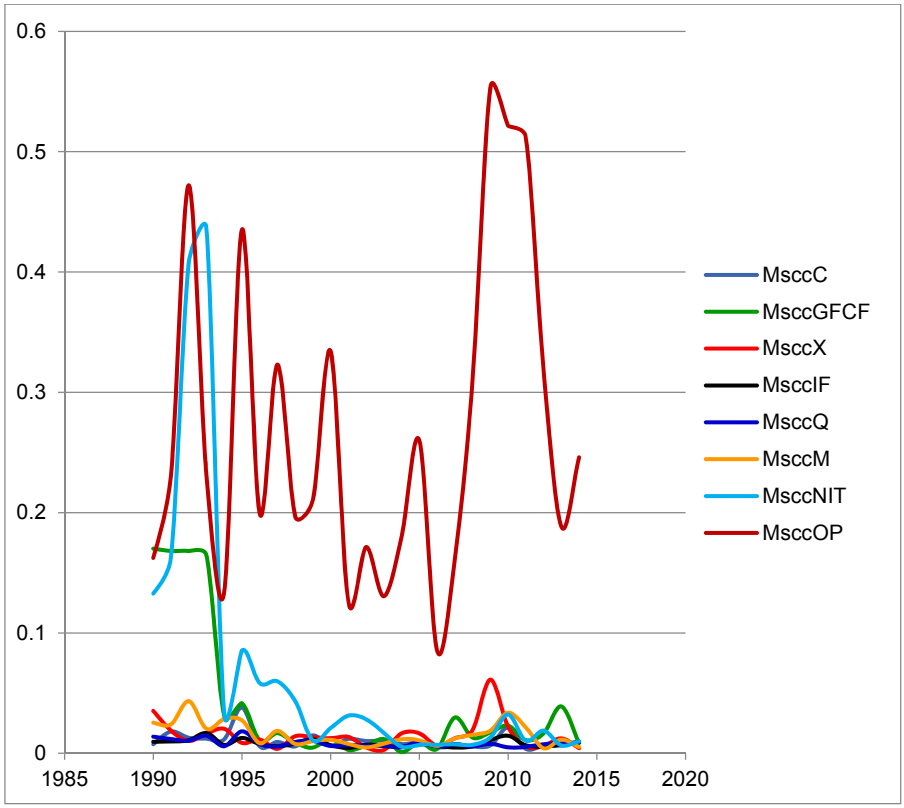

Fig.20. Moving structural change coefficient for main macroeconomic indicators

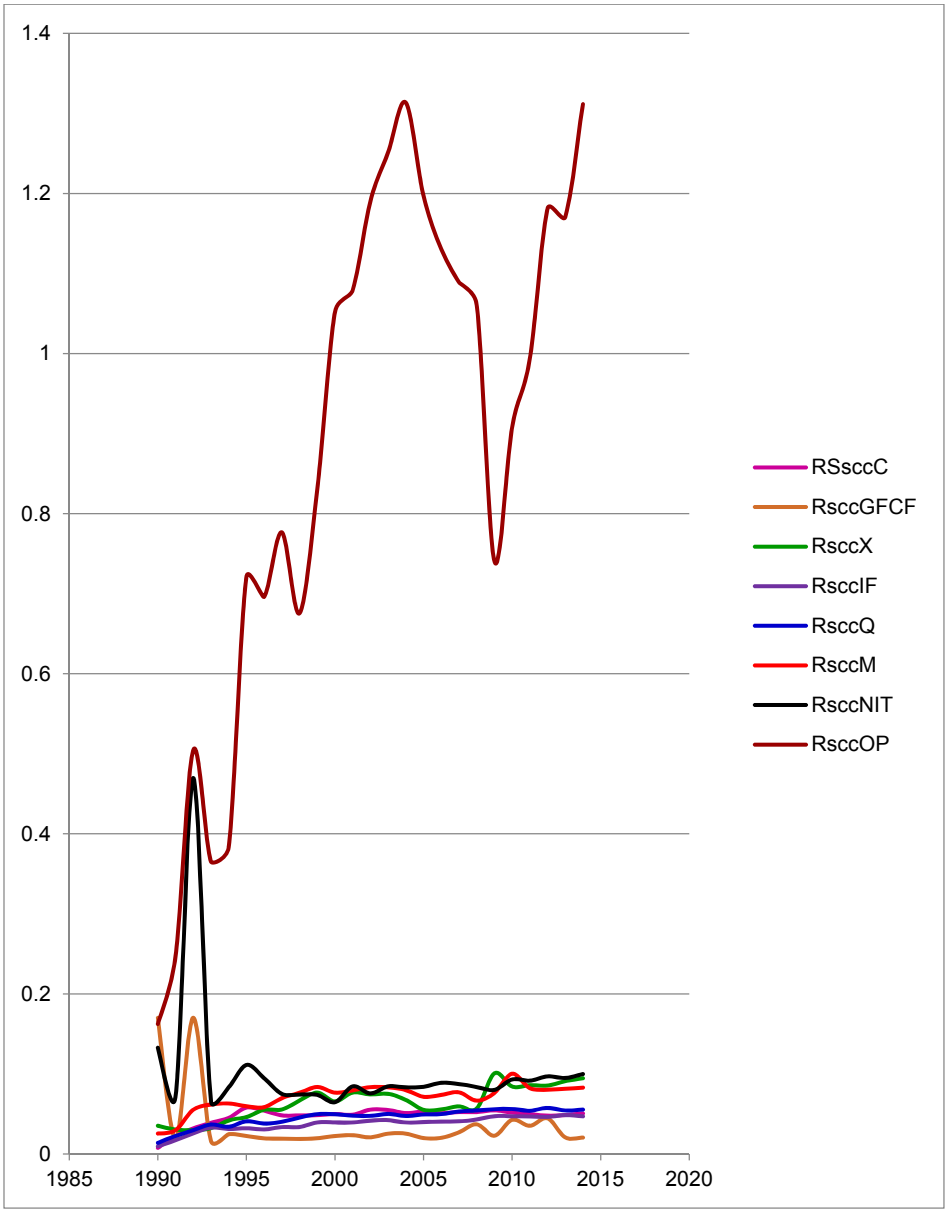

Fig.21. Referential structural change coefficient for main macroeconomic indicators

Variables GFCF, X, IF, Q, and M generally conformed to the previously presented schema. This is illustrated only for the first mentioned phase (1990 to 1999) in the case of C and NIT, and for the first (1990-1999) and second (2000-2007) ones in the case of OP. It seems clear the aggregated pattern derived from a diversity (sometimes contradictory) of involved macroeconomic processes.

It is however striking the spectacular structural re-design of import. That was strongly linked with the shift from positive net export during the last years of socialist regime (enforcing the liquidation of external debt) to chronical deficits (in some years at alarming levels). The correlation between net export rate (rNX=(X-M)/GDP) and MsccM was very weak (0.0535), instead it reached a dramatically high negative level (-0.97) in the case of RsccM. Except the latter describes, however, the long-run trend. In other words, Romania has become significantly import-dependent.

Yet it is important to acknowledge the visible improving of the commercial balance of late, which means that Romania's economy has become more and more

conditioned not only by import, but also by export. In other words, the openness degree already represents a structural support of economic growth.

IVB. Main Productive Linkages

1. Prestigious theoretical and empirical research has attested the remarkable ability of I-O tables to tag the intensity of productive connections and to reveal so-named backward and forward inter-sectoral linkages, which combine – on the demand and supply sides of economic life – a lot of simple and propagated inter-sectoral effects (to note illustratively Hirschman, 1958; Chenery et Watanabe, 1958; Robles and Sanjuán, 2005; Horowitz and Planting, 2006; Reis and Rua, 2006; Ritzmann, 2008; Miller and Blair, 2009; Ghosh et al., 2009).

The monetary homogeneity confers to nominal I-O coefficients obvious advantages in examining the inter-sectoral linkages. Their perfect temporal and cross-sectional comparability is one of the most important features. In order to avoid possible scaling complications, our analysis will use the tables in current prices.

2. Being a large database (196*26=5096 observations), it was loosely systematized based on two discriminating criteria.

2.1. The economic signification was taken into account by the delimitation of five thresholds coefficient dimensions, expressing different degrees of inter-sectoral linkage intensity:

● at levels below 0.01, the coefficients admittedly yield a nonsignificant such intensity;

● for limits between 0.01 and 0.02, intensity is considered very weak;

● same intensity is appreciated as moderate when the coefficients stand between 0.02 and 0.05;

● higher coefficient levels are associated with a relevant such intensity, due to which these technical coefficients will be named nodal.

2.2. The deep economic transformations occurred between 1989 and 2014 justify the approximation of these classes not only for the entire timespan, but also for the already established three historical sub-intervals: 1989-1999, 2000-2006, and 2007-2014.

3. The primary data are aggregated in mean levels for each of these 20 assembled groups. Table 1 synthetizes the obtained results.

Table 1. Temporal distribution of all a_{ij} (mean for each period) depending on inter-sectoral linkages intensity

Intensity	Thresholds	1989-2014	1989-1999	2000-2006	2007-2014
Nonsignificant	<0.01	63	68	73	63
Weak	0.01-0.02	40	36	35	37
Moderate	0.02-0.05	49	48	45	50
Important (nodal coefficients)	>0.05	44	44	43	46
Total		196	196	196	196

Consequently, over half of the technical coefficients belong to non-significant or very weak classes. Approximately a quart of them are placed in a moderate one. A share of 22-23% is characterized by significant inter-sectoral linkage intensity. The historical delimited sub-intervals mimic a similar distribution.

4. The sectoral distribution of nodal technical coefficients can be a relevant sign of internal inter-dependency of a given economy. Due to the already mentioned closeness of historical sub-intervals, Schema A focuses on linkages intensity distribution for the 1989-2014 interval only.

Schema A. Distribution of "important" a_{ij} during 1989-2014

Sector	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	x						x								2
2		x	x			x	x								4
3		x	x												2
4	x			x											2
5	x				x		x								3
6			x			x	x								3
7		x	x				x								3
8						x	x	x							3
9			x		x	x	x	x	x	x	x			x	9
10				x											1
11							x								1
12					x		x								2
13			x		x	x	x						x	x	6
14						x	x							x	3
Total	3	3	6	2	4	6	11	2	1	1	1		1	3	44

With blue marks are represented the self-supply coefficients (11 cells) and with red marks the bidirectional links (only two pairs); all the rest, however, represent unidirectional links. As an overall evaluation, the distribution of nodal technical coefficients describes an economy with a relatively low degree of internal interdependency.

5. The intensity of productive linkages is augmented by the I-O multipliers extendedly debated in economic literature (Dietzenbacher and Volkerink, 1998; Jiemin and Planting, 2000; Pilat and Wölfl, 2005; Robles and Sanjuán, 2005; Horowitz and Planting, 2006; Reis and Rua, 2006; Ritzmann, 2008; Ghosh et al., 2009; Miller and Blair, 2009; Rueda et al., 2009; D'Hernoncourt et al., 2011; Hambÿe et al., 2014; McLennan, 2016). The two most frequent forms of such integrating measure are used.

5.1. The simplest one can be considered the "cumulated direct effects", consisting in the row/column sums of A matrix (noted sra_i and sca_i). These approximate:

● the instantaneous (immediate) increment of total output in sector i which would be necessary for an increase with unity of output in each sector of economy ($sra_i=\sum_i a_{ij}$);

● the instantaneous (immediate) increment of output in all the sectors of economy which would be necessary for an increase with a unity of output in sector i ($sca_i=\sum_j a_{ij}$).

5.2. Another one, the so-named total multipliers, captures not only the direct, but also the indirect (propagated) effects of input-output relationships.

6. The present paper limits itself to a brief examination of the row and column sums of A matrix. The data are classified into four ranks according to their macroeconomic role (magnitude limits of the respective row-col sums of a_{ij} coefficients are enclosed in parentheses):

a) Negligible (<0.25);
b) Minor (0.25-0.5);
c) Middle (0.5-0.75); and
d) Major (>0.75).

Table 2. Row sums (sra_i) and column sums (sca_i) of the technical coeficients (a_{ij})

	Row sum (sra_i)				Column sum (sca_i)			
Macro-economic Role	Negligible	Minor	Middle	Major	Negligible	Minor	Middle	Major
Sect1			20	6		16	10	
Sect2		1	14	11		1	25	
Sect3			1	25			13	13
Sect4	1	14	11				25	1
Sect5		1	3	22		2	24	
Sect6			3	23			26	
Sect7	1			25			11	15
Sect8	16	6	4				26	
Sect9		5	9	12			1	25
Sect10	13	12		1	5	20	1	
Sect11	5	19	2		12	14		
Sect12	25	1				26		
Sect13	6	19	1			1	8	17
Sect14		10	7	9		11	15	
Total	67	88	75	134	17	91	185	71

Despite some differences, both distributions show a preponderance of the last two groups (middle and major). This “discrepancy” by comparison to the distribution of individual technical coefficients is a first important symptom of the inter-sectoral influences.

IVC. Global Trends and Sectoral Hierarchy Changes

1. The previous analyses have pinpointed – using I-O analytical tools – the amplitude and sources of structural mutations produced in the Romanian economy. The present section attempts to provide a synthetic outlook on these mutations, using as leading indicator the sectoral shares in gross domestic product, indicator which

concentrates the influences of all determinant factors. As main objectives we pursue:

a) to identify the trends recorded by each of the sectors defined in the lattermost I-O tables, and
b) to reveal their impact on the sectors' hierarchy.

2. Our research has revealed five patterns of the sectoral dynamics.

2.1. The shares in GDP of sectors 1 (agriculture, forestry, hunting, fishing) and 5 (textiles, leather, pulp and paper, furniture) have registered a descending trajectory. Such a tendency cannot be considered intrinsically positive (as a structural modernization) because it resulted greatly from a detrimental restructuration occurred during the first decade of transition.

2.2. Sectors 2 (mining and quarrying), 7 (other manufacturing industries), and 14 (professional services - mainly businesses) also knew initially a descending evolution, toward the end of the interval, however, sector 2 shows some signs of stabilization, while the others register an increasing trend.

2.3. There are sectors which began the transition with an upward trend, only to continue it by a descending evolution. Such sectors are 9 (transports, post and telecommunications) and 10 (trading services).

2.4. Oscillating dynamics do not lack as well. In some cases it ends by stabilizing, which happens to sectors 3 (production and distribution of electric and thermal power) and 6 (machinery and equipment, transport means, other metal products).

In other cases, however, the last part of the timespan seems to be associated either with a descending trend (sector 4 – food, beverages and tobacco) or, by contrary, with an ascending one (sector 11 – financial services and real estate transactions).

2.5. A clearly defined ascending dynamics was also present. This is the case of sector 13 – creative services.

2.6. This rather blatant diversity should come as no surprise. The aforementioned (partly, at least) structural shifts of the Romanian economy have resulted from a mix of transitional circumstances: the mass privatization of state enterprises, prices' liberalization, a large external exposure, unequal assimilation of new technologies, a radical modification of the required entrepreneurial skills, the implementation of a completely different (compared to the old system) macroeconomic management, emigration of an important share of labor force, an accentuated population ageing, significant changes in consumption behavior, very fluid domestic and international environments.

3. The above described trends frequently changed the hierarchy of productive sectors, depending on the relative contribution to forming the gross domestic product. Their annual line-ups can be seen in Appendix 5.

For the entire timespan, the disparity between the weights of the upper group of sectors (the first six), noted wS, and the rest (last eight sectors), noted wR, is noticeable. It is described in Figure 22.

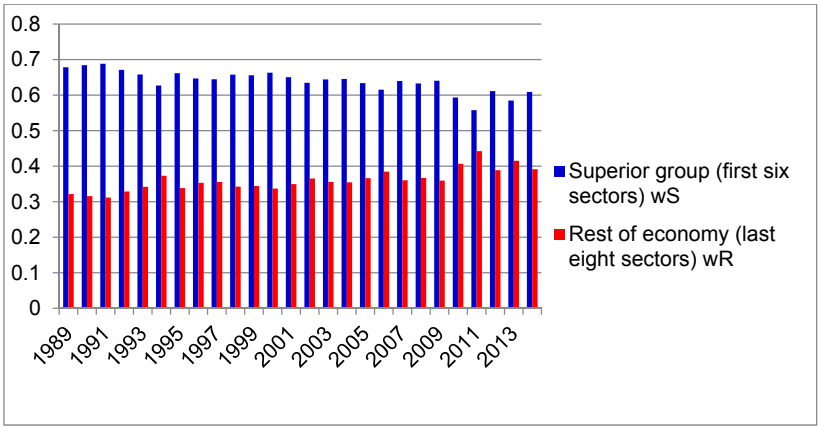

Fig.22. Disparity between superior group of sectors (first six, noted wS) and the rest (last eight, noted wR) depending on their weights in forming GDP

Despite a small gap compression, the discrepancy between the above-mentioned groups of sectors remains important.

4. Appendix 6 shows also many – and sometimes significant – displacements of sector's positions in the adopted hierarchy.

4.1. As a global image, Table 3 illustrates the mean rank (RankM) held by the sectors during the whole timespan 1989-2014.

Table 3. RankM$_i$ 1989-2014

sGc10	2.076923	sGc4	5.615385	sGc14	11.46154
sGc1	4.269231	sGc7	6.5	sGc3	11.65385
sGc9	4.538462	sGc8	7.346154	sGc2	12.73077
sGc11	4.538462	sGc6	7.384615	sGc13	13.65385
sGc12	5.230769	sGc5	8		

4.2. The sub-intervals data outline better the sectoral restructuring occurred in the Romanian economy (Table 4).

Table 4. Sectoral rank mean by historical sub-intervals

Sectors	1989-1999	2000-2006	2007-2014	Sectors	1989-1999	2000-2006	2007-2014
sGc1	1.272727	2.857143	9.625	sGc8	9	8.571429	4
sGc2	11.63636	13	14	sGc9	5.636364	3.571429	3.875
sGc3	11.72727	11.28571	11.875	sGc10	2.636364	1.142857	2.125
sGc4	4.636364	5.857143	6.75	sGc11	6.818182	3.714286	2.125
sGc5	6.181818	8.571429	10	sGc12	7.545455	3.857143	3.25
sGc6	6.181818	9.571429	7.125	sGc13	14	14	12.875
sGc7	5.454545	7.285714	7.25	sGc14	12.27273	11.71429	10.125

The sectors climbing in hierarchy are marked with blue, while the descending ones are marked with red; all the others insignificantly changed their relative ranks. The top five positions in this hierarchy changed as illustrated in Table 5.

Table 5. Hierarchy of sectors depending on their share in GDP

Place	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
1	sG6	sG1	sG1	sG1	sG1	sG1	sG1
2	sG1	sG6	sG10	sG10	sG10	sG10	sG11
3	sG5	sG4	sG6	sG9	sG9	sG9	sG10
4	sG4	sG5	sG7	sG7	sG4	sG4	sG4
5	sG7	sG10	sG5	sG6	sG7	sG7	sG7
Place	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
1	sG1	sG1	sG10	sG10	sG10	sG10	sG10
2	sG10	sG10	sG1	sG1	sG11	sG1	sG1
3	sG11	sG4	sG11	sG11	sG1	sG11	sG11
4	sG4	sG11	sG4	sG9	sG9	sG9	sG9
5	sG5	sG9	sG9	sG4	sG12	sG4	sG12
Place	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
1	sG10	sG1	sG10	sG10	sG10	sG10	sG10
2	sG1	sG10	sG12	sG9	sG9	sG8	sG9
3	sG12	sG12	sG9	sG12	sG11	sG9	sG11
4	sG9	sG9	sG11	sG11	sG12	sG12	sG12
5	sG11	sG11	sG1	sG1	sG8	sG11	sG8
Place	**2010**	**2011**	**2012**	**2013**	**2014**		
1	sG11	sG11	sG10	sG11	sG11		
2	sG12	sG12	sG11	sG10	sG10		
3	sG8	sG8	sG8	sG12	sG12		
4	sG9	sG10	sG12	sG9	sG7		
5	sG10	sG6	sG9	sG8	sG9		

5. The main trends become obvious in an aggregated classification into three mega-fields: primary (sectors 1-3), secondary (4-7), and tertiary (8-14):

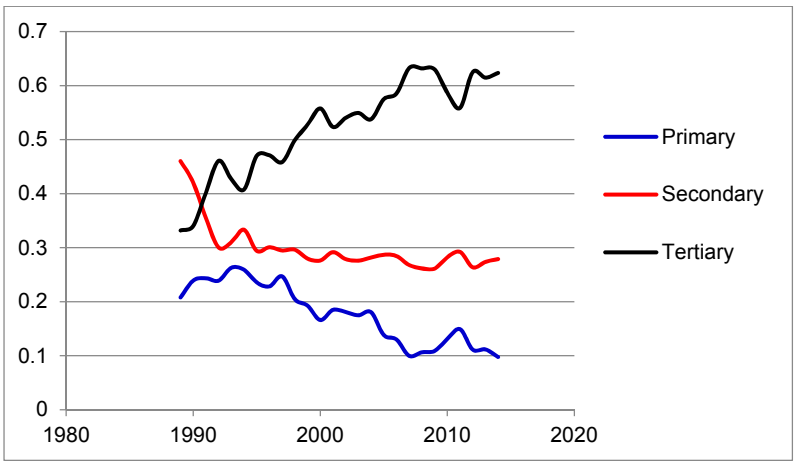

Fig.23. Trends of the primary, secondary, and tertiary mega-fields

The tendencies revealed by other authors (Landesmann, 2000, for instance) for transitional economies – mainly "de-" and "re-agrarization" (the latter as a temporary phenomenon), "deindustrialization", and "tertiarization" – are all visible in the I-O analysis of Romanian economy as well.

V. Final Remarks

1. Involving I-O analytical tools, the paper described – based on continuous statistical series for 1989-2014 – the most significant features of Romanian economy as an emergent market system. There were explored issues as: the national experience in I-O statistics; methodological I-O framework of the entire research; the sectoral shares in gross domestic product as a leading measure of sectoral structure; the determinants of its change; the nodal technical coefficients of A matrix as sensors of inter-sectoral productive linkages; speed and the main trends which characterize the structural dynamics during the above-mentioned timespan.

2. There were identified three distinct historical phases:

a) Decade 1990-1999. Dominated especially by the demolition – simultaneously with the centrally planned mechanism – of the main industries, transporting networks, great agrarian exploitations, education system; at a macro-structural level, this phase is characterized by a convulsive evolution.

b) Pre-accession to EU interval, 2000-2006. By stopping the chaotic institutional changes and implementing complex reforms as per the adopted Program for Integration in EU and following negotiations with the European Commission, this phase recovered the socio-economic domestic climate, inducing a more stable sectoral structure as well.

c) Status of EU full member, 2007-2014. Unfortunately, the official accession to EU could not be fully exploited because of the last world crisis. Years 2009 to 2011 registered a slowdown and serious decline, followed by a modest relaunch (2012-2014). The changes in sectoral structure intensified again.

3. Many problems remain however open.

3.1. Relating to I-O techniques as such, further research for the Romanian economy must complete the empirical Leontief model with a Ghosh replication. At the same time, inverse matrices for both series of technical and allocation coefficients would extend the applicative valences of I-O tables, including the macroeconomic policies.

3.2. Some statistical questions are also waiting for solutions. A full methodological homogenization of the series for the whole timespan, in both current and constant prices, is of utmost importance.

3.3. Concerning purely economic problems, there could be observed, for instance, the causes of real-nominal sectoral discrepancies or the quantitative separation of influences on sectoral structure exerted by its main determinants.

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Appendices

Appendix 1
Extended classification of economic activities (88 branches) included in I-O Tables
The industries in NACE Rev.2 – ESA2010

Code	Branch
1	01 Crop and animal production, hunting and related service activities;
2	02 Forestry and logging;
3	03 Fishing and aquaculture;
4	05 Mining of coal and lignite;
5	06 Extraction of crude petroleum and natural gas;
6	07 Mining of metal ores;
7	08 Other mining and quarrying;
8	09 Mining support service activities;
9	10 Manufacture of food products;
10	11 Manufacture of beverages;
11	12 Manufacture of tobacco products;
12	13 Manufacture of textiles;
13	14 Manufacture of wearing apparel;
14	15 Manufacture of leather and related products;
15	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials;
16	17 Manufacture of paper and paper products;
17	18 Printing and reproduction of recorded media;
18	19 Manufacture of coke and refined petroleum products;
19	20 Manufacture of chemicals and chemical products;
20	21 Manufacture of basic pharmaceutical products and pharmaceutical preparations;
21	22 Manufacture of rubber and plastic products;
22	23 Manufacture of other non-metallic mineral products;
23	24 Manufacture of basic metals;
24	25 Manufacture of fabricated metal products, except machinery and equipment;
25	26 Manufacture of computer, electronic and optical products;
26	27 Manufacture of electrical equipment;
27	28 Manufacture of machinery and equipment n.e.c.;
28	29 Manufacture of motor vehicles, trailers and semi-trailers;
29	30 Manufacture of other transport equipment;
30	31 Manufacture of furniture;
31	32 Other manufacturing n.e.c.;
32	33 Repair and installation of machinery and equipment;
33	35 Electricity, gas, steam and air conditioning supply;
34	36 Water collection, treatment and supply;
35	37 Sewerage;
36	38 Waste collection, treatment and disposal activities; materials recovery;
37	39 Remediation activities and other waste management services;
38	41 Construction of buildings;

Code	Branch
39	42 Civil engineering;
40	43 Specialised construction activities;
41	45 Wholesale and retail trade and repair of motor vehicles and motorcycles;
42	46 Wholesale trade, except of motor vehicles and motorcycles;
43	47 Retail trade, except of motor vehicles and motorcycles;
44	49 Land transport and transport via pipelines;
45	50 Water transport;
46	51 Air transport;
47	52 Warehousing and support activities for transportation;
48	53 Postal and courier activities;
49	55 Accommodation;
50	56 Food and beverage service activities;
51	58 Publishing activities;
52	59 Motion picture, video and television programme production, sound recording and music publishing activities;
53	60 Programming and broadcasting activities;
54	61 Telecommunications;
55	62 Computer programming, consultancy and related activities;
56	63 Information service activities;
57	64 Financial service activities, except insurance and pension funding;
58	65 Insurance, reinsurance and pension funding, except compulsory social security;
59	66 Activities auxiliary to financial services and insurance activities;
60	68 Real estate activities;
61	69 Legal and accounting activities;
62	70 Activities of head offices; management consultancy activities;
63	71 Architectural and engineering activities; technical testing and analysis;
64	72 Scientific research and development;
65	73 Publicity, advertisement
66	74 Other professional, scientific and technical activities;
67	75 Veterinary activities;
68	77 Rental and leasing activities;
69	78 Employment activities;
70	79 Travel agency, tour operator and other reservation service and related activities;
71	80 Security and investigation activities;
72	81 Services to buildings and landscape activities;
73	82 Office administrative, office support and other business support activities;
74	84 Public administration and defence, compulsory social security;
75	85 Education;
76	86 Human health activities;
77	87 Residential care activities;
78	88 Social work activities without accommodation;
79	90 Creative, arts and entertainment activities;
80	91 Libraries, archives, museums and other cultural activities;
81	92 Gambling and betting activities;

Code	Branch
82	93 Sports activities and amusement and recreation activities;
83	94 Activities of membership organisations;
84	95 Repair of computers and personal and household goods;
85	96 Other personal service activities;
86	97 Hoseholds activities;
87	98 Private households activities;
88	99 Activities of extrateritorial organizations and bodies;
	>Territorial correction;
	>Adjustment CIF-FOB;
	Total;

From the list of the 'NACE Rev.2' industries are missing the branches 4, 34, 40, 48, 54, 57, 67, 76, 81, 89, and the structure used was agreed by the National Institute of Statistics (INSSE) according with EUROSTAT.

Appendix 2
Aggregated I-O classifications of economic activities included in Romanian macromodel

Aggregate Sectors	Corresponding codes in extended branch (88) classification
I. 6-sectors classification	The structure can be translated into three-sectors: primary (a+b), secondary (c+d), and tertiary (e+f). The rule was adopted for next versions[1].
1-a) agriculture, forestry, hunting, fishing and food;	6 branches; 1,2,3,9,10,11
2-b) mining and energy;	10 branches;4,5,6,7,8,33,34,35,36,37
3-c) manufacturing industry;	21 branches; 12-32,
4-d) construction;	3 branches; 41,42,43
5-e) transport, post, and communications;	6 branches; 44-48, 54
6-f) trade and services.	42 branches; 41-43, 49-53, 55-88.
I. 10-sectors classification	
1 Agriculture, forestry, hunting and fishing	3 branches; 1,2,3,
2 Extractive industry	5 branches; 4,5,6,7,8,
3 Production and distribution of electricity and heat	5 branches; 33,34,35,36,37
4 Food, drinks and tobacco	3 branches; 9,10,11
5 Textiles, leather, pulp and paper, furniture industry	9 branches; 12-17, 30,31,32
6 Equipment industries, machinery, transport equipment, other metal products	6 branches;24-29
7 Other manufacturing industries	6 branches; 18-23
8 Construction	3 branches; 38,39,40
9 Transport, post, of telecommunication	6 branches; 44-48, 54
10 Services	42 branches; 41-43, 49-53, 55-88.
I. 14-sectors classification	In the extended aggregation to 14 sectors the ten sector "10 Services" was divided in other five sectors:
1 Agriculture, forestry, hunting and fishing	3 branches; 1,2,3,
2 Extractive industry	5 branches; 4,5,6,7,8,
3 Production and distribution of electricity and heat	5 branches; 33,34,35,36,37
4 Food, drinks and tobacco	3 branches; 9,10,11
5 Textiles, leather, pulp and paper, furniture industry	9 branches; 12-17, 30,31,32
6 Equipment industries, machinery, transport equipment, other metal products	6 branches;24-29
7 Other manufacturing industries	6 branches; 18-23
8 Construction	3 branches; 38,39,40
9 Transport, post, of telecommunication	6 branches; 44-48, 54
10 Trading services	15 branches; 41-43, 49-50, 79-88.
11 Financial services and real estate transactions	4 branches; 57-60
12 Social services	5 branches; 74-78
13 Creative services	5 branches; 51-53, 55,56
14 Professional services (mainly businesses)	13 branches; 61-73

[1] http://www.cnp.ro/user/repository/b6139a4ae94e801847b4.pdf

Appendix 3 - Sectoral shares in the gross domestic product, current prices

sGi	Sect1	Sect2	Sect3	Sect4	Sect5	Sect6	Sect7
1989	0.142773362	0.044582247	0.020520211	0.105295217	0.125067668	0.149137286	0.080787511
1990	0.18025756	0.044315822	0.014549742	0.117213187	0.107553573	0.130131339	0.06568537
1991	0.187049743	0.030959319	0.025382013	0.080545461	0.090457951	0.091912906	0.091687571
1992	0.184348099	0.032933373	0.021666162	0.060880338	0.071104211	0.083812039	0.084530675
1993	0.196394869	0.027820552	0.038604277	0.093036292	0.071517915	0.067376275	0.078347951
1994	0.187790544	0.029383879	0.041882793	0.090105788	0.081460752	0.079251649	0.082355827
1995	0.171431557	0.02201993	0.042276699	0.084853788	0.063878694	0.067888255	0.077526872
1996	0.163510272	0.025698958	0.039124177	0.092327823	0.074959655	0.05922275	0.074287957
1997	0.171084234	0.034364769	0.041375525	0.098423067	0.06767851	0.055506032	0.073159433
1998	0.143964099	0.020191691	0.040404854	0.099391002	0.062518285	0.062609541	0.071812958
1999	0.125540291	0.023021157	0.044070412	0.094256607	0.063409121	0.057861116	0.064304949
2000	0.107935621	0.02224169	0.03585099	0.092420452	0.065717383	0.053838005	0.064277831
2001	0.129793488	0.019751165	0.035297041	0.096566132	0.067028545	0.059139403	0.06895456
2002	0.118138636	0.019592479	0.043169757	0.088212016	0.067726528	0.054277665	0.068580227
2003	0.120594318	0.015656181	0.038528263	0.08578829	0.06384365	0.056161549	0.07013155
2004	0.130631367	0.015321538	0.034563308	0.0860624	0.063770441	0.059085854	0.072779788
2005	0.091259911	0.015699322	0.03123306	0.086418049	0.059966439	0.064673482	0.075806051
2006	0.085236502	0.015723838	0.029079579	0.08180283	0.057048118	0.069602871	0.076154265
2007	0.056497263	0.014806882	0.028448309	0.07594953	0.053268044	0.07024448	0.068304773
2008	0.066281055	0.012992995	0.027083673	0.074450412	0.048177533	0.071244608	0.067921729
2009	0.061483405	0.013811966	0.033508174	0.074872332	0.046728463	0.07797956	0.061602779
2010	0.058962242	0.017857154	0.054144086	0.076368453	0.059957395	0.084933538	0.060888383
2011	0.071377033	0.014873492	0.062854418	0.078695112	0.06319734	0.08557384	0.064743379
2012	0.050368077	0.018564343	0.042385259	0.0754136	0.053996982	0.064677889	0.069526372
2013	0.057770889	0.011971807	0.041897794	0.074809085	0.056056104	0.066925874	0.075798173
2014	0.05046954	0.009180661	0.037989139	0.067580831	0.051454657	0.06631748	0.093499062

sGi	Sect8	Sect9	Sect10	Sect11	Sect12	Sect13	Sect14	Total
1989	0.049812908	0.075420257	0.072231174	0.031019005	0.064556017	0.004104056	0.03469308	1
1990	0.048454764	0.062336789	0.075179019	0.03669419	0.073689318	0.004210469	0.039728858	1
1991	0.041552407	0.070154951	0.14623025	0.033139914	0.080797083	0.003135703	0.026994728	1
1992	0.045504065	0.087226853	0.151085979	0.067090114	0.080022848	0.002756113	0.027039131	1
1993	0.046507729	0.104754171	0.113163344	0.063450711	0.072407192	0.003738101	0.022880621	1
1994	0.058956098	0.091945249	0.093162771	0.061834475	0.075204658	0.003577859	0.023087658	1
1995	0.068815547	0.054788617	0.116329489	0.142816096	0.057688038	0.009886766	0.019799653	1
1996	0.070440965	0.072421163	0.127700964	0.113944258	0.055593841	0.010956514	0.019810704	1
1997	0.059932033	0.075732509	0.132161111	0.093911425	0.058421665	0.012624031	0.025625654	1
1998	0.058253417	0.088875111	0.151554435	0.102096468	0.061425899	0.013135469	0.023766772	1
1999	0.054061508	0.094656755	0.151284981	0.106616149	0.083438177	0.013194086	0.024284689	1
2000	0.053585776	0.093895685	0.161609985	0.113655686	0.093519187	0.016205415	0.025246293	1
2001	0.060021703	0.098121987	0.131789648	0.105415323	0.088766573	0.015306709	0.024047725	1
2002	0.064389701	0.101700845	0.127936841	0.103735177	0.095048156	0.01610496	0.031387014	1
2003	0.06358749	0.103616089	0.129032245	0.086442063	0.118748398	0.013892833	0.033977082	1
2004	0.065123913	0.104463096	0.130581089	0.088455404	0.10524705	0.012819504	0.031095247	1
2005	0.0721857	0.107299455	0.14178742	0.09609002	0.110773503	0.013658183	0.033149405	1
2006	0.081537997	0.107487229	0.149094012	0.089073736	0.102746577	0.015259031	0.040153416	1
2007	0.095920324	0.111270959	0.149597699	0.107669431	0.099113723	0.026982879	0.041925704	1
2008	0.114240253	0.104623092	0.146232427	0.093524164	0.099735035	0.028088712	0.04540431	1
2009	0.104590548	0.107985124	0.137930714	0.106956008	0.104956922	0.022477698	0.045116306	1
2010	0.101103323	0.095371914	0.091956448	0.111976891	0.107978036	0.027421124	0.051081013	1
2011	0.091811816	0.080991082	0.087239688	0.111108509	0.100904442	0.026316672	0.060313179	1
2012	0.103609547	0.09074037	0.133282999	0.112560218	0.095808065	0.032666506	0.056399771	1
2013	0.088535052	0.094916512	0.10259014	0.121213072	0.101595561	0.034121414	0.071798524	1
2014	0.079634677	0.084267963	0.117840237	0.119744019	0.113802632	0.032208944	0.076010157	1

Appendix 4 - a^ij at 1995 prices

	a11	a12	a13	a14	a15	a16	a17	a18	a19	a1_10
1996	0.212322705	0.001039791	0	0.589458134	0.057119812	0.000221312	0.00338093	0.000210086	0	0.021306903
1997	0.14951888	0.001450205	0	0.56934629	0.034727904	0.000213339	0.001591314	0.000222819	0	0.015388724
1998	0.187832316	0.000109282	0	0.57616144	0.02531857	0	0.002135227	0	0	0.007695614
1999	0.204524419	0.000970959	0	0.577191886	0.038847016	0.000312844	0.003138267	0.000144026	0	0.004643853
2000	0.251132316	0.000921896	0	0.51957459	0.053547992	0.00046273	0.004286415	0.000193779	0	0.004940585
2001	0.253567284	0.001245772	0	0.430507373	0.038126768	0.000413144	0.002355803	0.000549429	0.009857726	0.01194885
2002	0.26326587	0.000949873	0.000883012	0.345692864	0.048145888	0	0.000888816	0.001396977	0.018218297	0.008898435
2003	0.333550829	0.00409641	0.000617023	0.195232583	0.072224051	0.000253217	0.000829801	0.001016075	0.009078028	0.020569914
2004	0.34159597	0.003833146	0.000699102	0.221582366	0.074899441	0.000330527	0.000978343	0.001356988	0.009713898	0.021044017
2005	0.333461531	0.004012615	0.000742371	0.218381905	0.065327972	0.000283991	0.000774404	0.001046333	0.004343648	0.021944874
2006	0.311940711	0.003620079	0.000714706	0.204728044	0.068577101	0.000263994	0.000755677	0.001037063	0.003485173	0.018045559
2007	0.304805025	0.004580367	0.000770973	0.181751735	0.071126783	0.000269876	0.000646154	0.001205354	0.003094416	0.013075823
2008	0.284293844	0.004558173	0.000678848	0.164209258	0.060186609	0.000274694	0.000442555	0.001049711	0.002172518	0.014304818
2009	0.299709291	0.002523933	0.000537507	0.151591723	0.049378846	0.000191942	0.000465619	0.000620754	0.002073465	0.016379768
2010	0.317823628	0.003154958	0.00063462	0.169958802	0.057718357	0.000262626	0.000670547	0.00065065	0.003161735	0.020131568
2011	0.329564295	0.002555903	0.000632047	0.192771186	0.059233021	0.000215012	0.000828219	0.000568095	0.003569763	0.021148341
2012	0.336691374	0.00195805	0.000550448	0.162794832	0.054916366	0.000155325	0.000520918	0.000582842	0.002869902	0.016211003
2013	0.320271924	0.001616877	0.000553892	0.171644695	0.054482089	0.000125566	0.000478454	0.000437657	0.002474927	0.017918224
2014	0.343789076	0.001859422	0.000636392	0.153733265	0.058775969	0.000138628	0.000403927	0.000535193	0.00190741	0.016899657

	a1_11	a1_12	a1_13	a1_14	a21	a22	a23	a24	a25	a26
1996	0	5.1531E-06	0.000300587	0.00100191	0.003254029	0.113137858	0.312419107	0.000814384	0.002281373	0.005415303
1997	0	2.02776E-06	0.000141739	0.000577007	0.000947645	0.092205099	0.272395228	0.000495104	0.001626416	0.002845744
1998	0	4.56846E-06	0.000610996	0.000798593	0.005588874	0.038615966	0.091320383	0.004868695	0.015295345	0.001634541
1999	0	7.90953E-06	0.000913405	0.001509494	0.002243418	0.122805	0.267944175	0.000816916	0.001945053	0.00411265
2000	0	1.89342E-05	0.005757009	0.005473771	0.001177427	0.093187578	0.229622003	0.000325399	0.002008938	0.003897299
2001	0	0.001024183	0.004236081	0.005805867	0.001305113	0.106088027	0.27818638	0.000270649	0.001330842	0.004369905
2002	0.000199464	0.00042112	0.000505173	0.005895476	0.001029548	0.116541014	0.450414203	0.001450296	0.0018206	0.007364911
2003	0	0.000312243	0	0.01368944	0	0.2375	0.661379222	0.000696264	0.001036737	0.009369901
2004	0	0.000328103	0	0.011532368	0	0.252272428	0.549539437	0.00049267	0.001005164	0.009457774
2005	0	0.000926469	0	0.008925135	6.52209E-06	0.231833691	0.439057556	0.000522529	0.000696641	0.006085546
2006	0	0.000261512	0	0.008766984	4.18377E-06	0.259075536	0.328159252	0.000319365	0.000768329	0.007436372
2007	0	0.00015459	0	0.00657548	3.25972E-06	0.22572087	0.401922285	0.000418295	0.00090318	0.008983365
2008	5.94831E-06	0.000183975	0	0.005949346	6.13266E-06	0.225924592	0.471996618	0.00043423	0.000830938	0.008695652
2009	0	0.009383752	0	0.005448816	3.10218E-06	0.224869509	0.40562363	0.000279481	0.000589102	0.006450394
2010	4.21053E-06	0.010239252	0	0.006855155	2.53523E-06	0.196146	0.418926073	0.000244509	0.000814868	0.008632911
2011	3.2443E-06	0.011207488	0	0.006907309	2.8497E-06	0.215988083	0.463901396	0.000230395	0.000829139	0.008264652
2012	2.67978E-06	0.010984442	0	0.005589726	6.84941E-06	0.256404463	0.526250068	0.000307585	0.000956592	0.008136433
2013	2.57913E-06	0.029290374	0	0.005466626	4.913E-06	0.240769887	0.580094007	0.000324765	0.001153903	0.008824352
2014	0	0.016568465	0	0.004861786	7.23146E-06	0.271595328	0.566936932	0.000308717	0.001130068	0.008201381

	a27	a28	a29	a2_10	a2_11	a2_12	a2_13	a2_14	a31	a32
1996	0.19162444	0.037521316	0.016654904	0.001574845	0.001337466	0.002688061	0.00084421	0.001907714	0.029716843	0.037012664
1997	0.167022382	0.036992957	0.016593977	0.001602034	0.000481999	0.001169894	0.00050037	0.00202405	0.019356247	0.065818451
1998	0.138487472	0.000777064	0.003583329	0.000616862	0.000251803	0.00173792	0.000814368	0.000440522	0.021847541	0.03122686
1999	0.121169926	0.04718386	0.03841741	0.001720499	0.001419715	0.00438429	0.001712468	0.002377097	0.029595485	0.074604068
2000	0.141180595	0.041707758	0.01550179	0.000912486	0.001152884	0.003058689	0.003667066	0.002767145	0.019594892	0.064969573
2001	0.151566978	0.02292578	0.016280454	0.000844705	0.001282122	0.003866051	0.003321943	0.00292699	0.017296224	0.06227887
2002	0.126811416	0.007450519	0.043799988	0.001648437	0.003141006	0.006932387	0.004148058	0.025393963	0.011450556	0.059026178
2003	0.189540078	0.008100802	0.002936992	0.00185171	0.013197058	0.026770062	0	0.00671047	0.004299976	0.050133228
2004	0.188354007	0.007389221	0.002701636	0.001469453	0.01064646	0.023911914	0	0.005558378	0.003524474	0.047773428
2005	0.154556348	0.005601061	0.001468319	0.001521497	0.00796599	0.001045275	0	0.003689313	0.003977966	0.046597043
2006	0.136530348	0.006533844	0.000911721	0.001268201	0.004827678	0.000781847	0	0.004437381	0.004779111	0.068222308
2007	0.147906041	0.007255077	0.000932484	0.001178253	0.006075278	0.030534893	0	0.005116627	0.004975847	0.074339673
2008	0.161458009	0.006560737	0.000901389	0.001685288	0.005961944	0.024199116	0	0.007366065	0.005459829	0.073207798
2009	0.123284436	0.004687289	0.000636138	0.001300141	0.006280993	0.036301543	0	0.004340244	0.005680832	0.086647734
2010	0.11431498	0.005336157	0.000755431	0.001375521	0.00539455	0.036527904	0	0.006173608	0.004347754	0.091529133
2011	0.12895104	0.005551529	0.00077943	0.001252815	0.004730026	0.038393941	0	0.006197376	0.003714156	0.087427354
2012	0.167357699	0.006501524	0.001051084	0.001455479	0.004132586	0.044470922	0	0.006747846	0.004899351	0.07492014
2013	0.152789065	0.005546402	0.000767204	0.001765009	0.004492527	0.04187835	0	0.007860717	0.004419444	0.071313927
2014	0.124661542	0.0053691	0.000728922	0.001688862	0	0.053317114	0	0.007588585	0.005266594	0.070722042

	a33	a34	a35	a36	a37	a38	a39	a3_10	a3_11	a3_12
1996	0.236967166	0.007629141	0.023725504	0.025085898	0.115868449	0.023400732	0.233084366	0.006346845	0.011459499	0.029296097
1997	0.306357861	0.015031982	0.0232971	0.025120485	0.118963635	0.024408596	0.308352254	0.008419481	0.012240279	0.027665578
1998	0.071727762	0.005649184	0.025849475	0.006271163	0.067875281	0.02005805	1.215964889	0.014228179	0.011978676	0.06895434
1999	0.303926288	0.014962273	0.024466213	0.031613642	0.091095561	0.02365276	0.52169431	0.007414559	0.019029498	0.041335692
2000	0.244300964	0.007734881	0.020946727	0.034078211	0.089090818	0.029592144	0.37642005	0.005367933	0.017815094	0.035400004
2001	0.216875799	0.005958293	0.01893878	0.037244182	0.080057029	0.050514711	0.368877118	0.007155549	0.020814433	0.030833054
2002	0.171798857	0.007204955	0.015841008	0.038725535	0.066217246	0.014675555	0.214794531	0.010891699	0.011308879	0.012882587
2003	0.222505435	0.012089369	0.0163644	0.031534922	0.042882331	0.013050725	0.195447635	0.005563229	0.011169069	0.021624315
2004	0.263409371	0.010272143	0.016492864	0.033842818	0.048431571	0.013675603	0.171535764	0.00554715	0.01407595	0.021261201
2005	0.27372902	0.014218754	0.015684579	0.027230403	0.047113156	0.012242876	0.080136172	0.005456866	0.01057748	0.030387601
2006	0.363827409	0.016488518	0.019101042	0.035746	0.062159768	0.01594033	0.098182573	0.006358056	0.012927332	0.042114133
2007	0.296486573	0.013587962	0.017822617	0.033437095	0.050480615	0.013808293	0.080900597	0.00498674	0.013047182	0.019216632
2008	0.291949876	0.015391077	0.01633889	0.031788422	0.051676009	0.013214051	0.076331865	0.006639728	0.010243943	0.016338816
2009	0.346527913	0.014886017	0.017934654	0.036856879	0.051587981	0.014325922	0.084954255	0.007402092	0.01209755	0.020688629
2010	0.3500594	0.0122065	0.016785914	0.032780524	0.049431758	0.012294912	0.092210794	0.006641385	0.014826446	0.014547682
2011	0.327976709	0.0110425	0.015776401	0.029944205	0.049682972	0.01184784	0.087617626	0.006059711	0.012464703	0.016013109
2012	0.286448099	0.0120521	0.016748132	0.027917468	0.044265153	0.011516641	0.087001558	0.006108342	0.010511369	0.018455664
2013	0.26165458	0.012154611	0.015873061	0.023531147	0.037037853	0.008674566	0.071908263	0.005959183	0.009411839	0.017771605
2014	0.24981062	0.012087988	0.016881469	0.023298996	0.034718451	0.008310253	0.058763524	0.006066814	0.003634705	0.018792593

	a3_13	a3_14	a41	a42	a43	a44	a45	a46	a47	a48
1996	0.022910642	0.011832515	0.087934272	0.000887555	0.000373144	0.126596584	0.008619301	0.001621913	0.008048954	0.000258098
1997	0.023147562	0.022717548	0.083675601	0.000606766	0.000224112	0.123455713	0.010845613	0.000697555	0.007064189	0.000104191
1998	0.46939251	0.043591198	0	0.056944393	0.185374263	0	0	0	0.0233153	0
1999	0.036959742	0.043838407	0.058959697	0.000628623	0.000283078	0.137605761	0.004958906	0.000904149	0.012607431	8.49205E-05
2000	0.042348142	0.039850116	0.068187973	0.00097897	0.000543986	0.116302125	0.00734348	0.001642801	0.014005939	0.000149209
2001	0.045468498	0.043541349	0.07158858	0.010587541	0.000536137	0.153706672	0.008422078	0.004431614	0.019934387	0.011144298
2002	0.02981096	0.048241377	0.069331211	0.015367535	0.003210862	0.201124376	0.015130754	0.012667648	0.019070416	0.010334789
2003	0.053942209	0.044555282	0.031510031	0.002436268	0.012293286	0.342454629	0.017943918	0.007379219	0.015719188	0.012085856
2004	0.038600549	0.036085414	0.02498711	0.003487602	0.012387871	0.306390739	0.01593624	0.006995865	0.014386231	0.011629325
2005	0.027133444	0.030784034	0.020906967	0.001727508	0.011035596	0.255948004	0.011549078	0.004300615	0.010501972	0.009422842
2006	0.021762461	0.043834104	0.02273445	0.001964259	0.010631696	0.277467311	0.013589055	0.005057597	0.011949473	0.010518379
2007	0.020114616	0.037673643	0.027090226	0.002134944	0.011243498	0.300791827	0.015330747	0.005381075	0.012808407	0.010979565
2008	0.039846463	0.058941082	0.023871868	0.001670771	0.008364593	0.24963586	0.011124152	0.004162571	0.01095947	0.008608202
2009	0.062009481	0.05324292	0.029613204	0.002253374	0.009437229	0.26957909	0.013264128	0.00510112	0.010218266	0.009261462
2010	0.058445119	0.050477372	0.028249959	0.002876988	0.011295461	0.274218029	0.015451443	0.005625443	0.012979193	0.009865359
2011	0.063640202	0.04578512	0.026626275	0.002935523	0.011142457	0.272008362	0.015000083	0.00543678	0.013936462	0.010324723
2012	0.051689589	0.044324626	0.033009789	0.002250417	0.009386245	0.270862319	0.013958475	0.004547315	0.010403024	0.008784175
2013	0.05127112	0.038912309	0.027451054	0.001990417	0.008377657	0.257927403	0.013447266	0.003730951	0.0085905	0.005993811
2014	0.072440037	0.039570256	0.037796411	0.002159214	0.009001097	0.290729979	0.014985767	0.004060321	0.009039503	0.006137376

	a49	a4_10	a4_11	a4_12	a4_13	a4_14	a51	a52	a53	a54
1996	0.000764904	0.234346401	4.23955E-06	0.001169571	0.004392395	0.00020393	0.008036537	0.020844158	0.008585141	0.004654166
1997	0.000561304	0.25348542	1.27731E-06	0.000679558	0.001966713	0.000126576	0.006114822	0.039047418	0.012677907	0.010339515
1998	0	0	0	0	0	0	0.005230281	0.019858785	0.001723128	0.003112949
1999	0.001021257	0.170316389	0	0.003329839	0.004675283	0.000277387	0.006874308	0.038479535	0.012054637	0.008241865
2000	0.001646224	0.163259417	0	0.005588587	0.007730999	0.0004477	0.004012506	0.0322088	0.010959079	0.003524653
2001	0.045290783	0.134778702	0.004258179	0.115403863	0.015636473	0.013268707	0.006078618	0.032795393	0.014565145	0.003193515
2002	0.074225736	0.157533929	0.005184382	0.117086444	0.023888603	0.032193545	0.005446173	0.047154182	0.014172302	0.008660926
2003	0.113918853	0.169207333	0.022579075	0.092664735	0.068723602	0.077468122	0.013370144	0.019462643	0.013729026	0.027310266
2004	0.087334755	0.14604357	0.020489741	0.086630397	0.04833846	0.052639319	0.011089191	0.019992635	0.015908357	0.023235945
2005	0.036107042	0.154268371	0.014360296	0.056107678	0.035705388	0.039785285	0.013076404	0.021836136	0.017512745	0.030028613
2006	0.034497273	0.169560219	0.016130491	0.069518542	0.034559642	0.047193169	0.014722619	0.020641242	0.013647692	0.028174414
2007	0.034754964	0.145128617	0.017553392	0.049966034	0.034490656	0.051197458	0.014090298	0.019141017	0.012678866	0.028066155
2008	0.025666868	0.16612029	0.013331569	0.047609456	0.044528755	0.049265145	0.015447687	0.018244505	0.011825058	0.029292186
2009	0.028779004	0.190546457	0.018349516	0.089087928	0.052697228	0.048450206	0.015413191	0.021340778	0.011525847	0.027630547
2010	0.036693542	0.216490389	0.021318809	0.106106675	0.063599683	0.053826071	0.011125009	0.019644026	0.010668813	0.02229407
2011	0.03716717	0.198679188	0.018388694	0.07825755	0.076264825	0.05384963	0.010091529	0.018616256	0.010703659	0.021209002
2012	0.033701439	0.177398562	0.013184625	0.079909595	0.073920463	0.050797561	0.009979342	0.015933937	0.010031565	0.021045781
2013	0.027210956	0.173852994	0.012476901	0.067315877	0.07226467	0.042681531	0.008763973	0.0136377	0.009055284	0.020772398
2014	0.025089873	0.186347027	0.007324724	0.099883004	0.10914881	0.049972741	0.007912675	0.015479501	0.009559781	0.021109634

	a55	a56	a57	a58	a59	a5_10	a5_11	a5_12	a5_13	a5_14
1996	0.279745997	0.014616394	0.028081332	0.029553483	0.194183902	0.021645316	0.012077695	0.105260565	0.308760132	0.067041457
1997	0.309329221	0.016077869	0.032266864	0.033544171	0.201185639	0.030360939	0.013230951	0.107723743	0.416322199	0.063705729
1998	0.07688717	0.009554456	0.036445968	0.065219984	0.051365568	0.003848169	0.00157306	0.002917436	0.001720141	0.005827296
1999	0.362904863	0.021397489	0.026585632	0.031575491	0.308356131	0.027552068	0.02128656	0.153646628	0.634315752	0.086638785
2000	0.312712943	0.022450214	0.023373383	0.034159719	0.157524428	0.021878828	0.018967645	0.141980743	0.528816397	0.07401634
2001	0.294762417	0.030292948	0.022304203	0.038157291	0.239827222	0.024568012	0.020019094	0.181756245	0.529900273	0.062436018
2002	0.314927966	0.047751472	0.029231661	0.037786709	0.178083336	0.045572413	0.01826569	0.18500884	0.439455876	0.083205517
2003	0.292704082	0.05948648	0.02455427	0.069326483	0.313319242	0.042360346	0.033495998	0.361756316	0.36505507	0.117201752
2004	0.27981615	0.054789874	0.024006194	0.057315898	0.23354486	0.040192037	0.026363116	0.323806447	0.261092948	0.091148546
2005	0.273790227	0.056911325	0.026050903	0.056160773	0.155549199	0.046121964	0.028148257	0.314291419	0.284543092	0.085235612
2006	0.265813056	0.056695886	0.02676748	0.06003307	0.132577377	0.043797848	0.026988892	0.352503988	0.300961763	0.091365355
2007	0.260318554	0.055798577	0.023833935	0.048855594	0.12154259	0.033925385	0.023606613	0.344839083	0.306954577	0.089664896
2008	0.261015258	0.053333428	0.025072345	0.053865786	0.115566855	0.045231801	0.022709044	0.373872445	0.349269432	0.123484482
2009	0.268279398	0.056970129	0.022376809	0.053375263	0.118968746	0.049231443	0.02990714	0.287891574	0.37114976	0.104880158
2010	0.249720358	0.051755222	0.022236408	0.046119855	0.13020984	0.043262918	0.030393821	0.23318396	0.356661266	0.09876437
2011	0.253915504	0.050893177	0.02238859	0.05159678	0.131335335	0.04197356	0.029376803	0.225107847	0.430040647	0.096215757
2012	0.245755852	0.043616811	0.018267127	0.056419349	0.127799972	0.039820425	0.027443615	0.198010172	0.44662906	0.090306315
2013	0.226463031	0.038182251	0.016102056	0.041187501	0.108687949	0.036651606	0.021199069	0.217255952	0.452544776	0.08095235
2014	0.231987305	0.034884088	0.015521805	0.045255598	0.08730844	0.038737711	0.011241305	0.186602942	0.597666054	0.080165878

	a61	a62	a63	a64	a65	a66	a67	a68	a69	a6_10
1996	0.024332287	0.13300712	0.068101349	0.017825116	0.063181372	0.312468287	0.095380244	0.204761754	1.866407082	0.009542432
1997	0.021334784	0.202847655	0.0837767	0.028119665	0.050421659	0.273117033	0.086846166	0.182048913	2.129770131	0.009278904
1998	0.074747333	0.005003764	0.000611609	0.059750767	0.240010935	0.004554384	0.011937888	0.001587554	0.022428219	0.119635944
1999	0.017615154	0.147983966	0.096987372	0.016314549	0.037250364	0.255627464	0.056892852	0.113677499	2.299245734	0.009584723
2000	0.008527416	0.085273997	0.062085427	0.005355636	0.028407337	0.22460613	0.039311151	0.0892518	1.175396082	0.005426431
2001	0.007223305	0.079633579	0.056169582	0.003099837	0.025189316	0.191241502	0.030101493	0.071785895	0.930404975	0.007981853
2002	0.006742358	0.101075388	0.091339959	0.007836772	0.033350943	0.198200492	0.040049357	0.095306123	0.638199503	0.018773714
2003	0.01025781	0.103661587	0.036145396	0.007991564	0.031501619	0.237073273	0.035343408	0.061150221	0.647203905	0.01129864
2004	0.006802664	0.074865164	0.037453292	0.006094137	0.02682234	0.217128808	0.029072361	0.045392672	0.508782873	0.009821361
2005	0.010822001	0.09604268	0.069897793	0.00863369	0.032635514	0.241942689	0.037149017	0.050260965	0.394141188	0.014200104
2006	0.010133787	0.093982422	0.052712185	0.007840168	0.031354534	0.231264188	0.034536424	0.049398434	0.347388303	0.016974751
2007	0.010777842	0.089963795	0.049243563	0.006308969	0.025281039	0.222049189	0.025674016	0.043273855	0.284816013	0.011799352
2008	0.011490688	0.084056702	0.042898818	0.00588785	0.022330203	0.202442965	0.026579339	0.039857027	0.238695081	0.0147111
2009	0.00803255	0.079838655	0.038314864	0.004333765	0.019460986	0.189561063	0.021124273	0.035699934	0.207824191	0.012746079
2010	0.008230102	0.096857084	0.044547017	0.004898307	0.024098665	0.206991079	0.027624397	0.039000592	0.273167575	0.015267018
2011	0.008706479	0.101527747	0.045731127	0.005180824	0.026567384	0.211659009	0.033874086	0.045091782	0.279801081	0.015519315
2012	0.011687288	0.092393449	0.043743939	0.005867628	0.027766993	0.204363987	0.031654134	0.046181976	0.295215234	0.014871722
2013	0.013221432	0.102876415	0.050852475	0.007400403	0.03280576	0.218089079	0.033676437	0.042813613	0.293223969	0.018149895
2014	0.016437637	0.106820559	0.049406267	0.006981127	0.034459476	0.218182415	0.035030316	0.041888261	0.242544943	0.017761205

	a6_11	a6_12	a6_13	a6_14	a71	a72	a73	a74	a75	a76
1996	0.026159811	0.059364455	0.09232084	0.127605913	0.090148604	0.086213236	0.076222237	0.00851284	0.099800248	0.25305235
1997	0.019836848	0.044664703	0.068815693	0.168461955	0.067937049	0.13206978	0.096000044	0.01918806	0.11187803	0.240661666
1998	6.38825E-05	0.055427644	0.019638976	0.00651189	0.000437255	0.000401196	0.000155805	0.04717683	0.00614231	0.000570947
1999	0.025822353	0.053088525	0.072205373	0.181743482	0.084517429	0.144310639	0.166338329	0.018607191	0.130455786	0.325646801
2000	0.019559745	0.032375775	0.071245991	0.137876139	0.061748243	0.091791978	0.158008916	0.007985996	0.099361685	0.261351941
2001	0.020288245	0.034637165	0.055700075	0.116589308	0.054472492	0.09151289	0.139589233	0.007344323	0.093880207	0.259773349
2002	0.015372853	0.037068455	0.040395746	0.102654972	0.047944657	0.146031253	0.076721307	0.019346275	0.083821456	0.254869529
2003	0.017722575	0.042420169	0.068222365	0.088931123	0.069671093	0.13672283	0.059164397	0.029528642	0.10551494	0.276040788
2004	0.016457425	0.04062323	0.044895488	0.065443381	0.059235882	0.120547609	0.063420469	0.027862902	0.100990507	0.271539529
2005	0.021067332	0.053112036	0.049242887	0.086728681	0.054494065	0.115397986	0.066747755	0.031019146	0.089797764	0.222583624
2006	0.020772569	0.0590353	0.051746424	0.090615112	0.068439183	0.125522634	0.058658437	0.027855317	0.092471751	0.2090396
2007	0.019149188	0.055109667	0.053971609	0.078321065	0.077240129	0.13965818	0.055979964	0.03068983	0.089141517	0.206560005
2008	0.016114911	0.047768984	0.097619497	0.099107918	0.076002545	0.138731821	0.050413669	0.030280723	0.079073302	0.209827085
2009	0.017227657	0.030299255	0.092638587	0.071413788	0.069396847	0.161927144	0.052712395	0.030010029	0.087483742	0.230922669
2010	0.021443324	0.029049028	0.105293638	0.080955715	0.057572247	0.166608057	0.053269698	0.027386762	0.09071348	0.212772413
2011	0.020906427	0.020558188	0.122931403	0.084668467	0.048859644	0.157649919	0.050341297	0.024848976	0.084303021	0.205451816
2012	0.018368235	0.030849914	0.136037107	0.086113424	0.059241831	0.136720915	0.047101225	0.026383139	0.083493014	0.198945657
2013	0.020719178	0.023219533	0.166353357	0.09603196	0.063847403	0.148011989	0.049768259	0.031177286	0.094777975	0.196854103
2014	0.006341671	0.033801975	0.235108984	0.096541649	0.08049994	0.154549993	0.050660672	0.032704251	0.105700585	0.207803593

	a77	a78	a79	a7_10	a7_11	a7_12	a7_13	a7_14	a81	a82
1996	0.306514768	0.285015771	1.303866422	0.007479924	0.040472258	0.077554436	0.143158321	0.101383714	0.007272225	0.003991871
1997	0.323740288	0.258031405	1.851999181	0.010226678	0.033552783	0.061708925	0.150549119	0.130643474	0.00588812	0.006404402
1998	0.005587516	7.35683E-05	0.000618984	0.071980313	0	0.001445852	0.001928429	0.000138525	0.042342721	0.006373291
1999	0.273144482	0.327509401	3.041942438	0.01051329	0.064132248	0.095075114	0.253013524	0.172874695	0.004375766	0.003014583
2000	0.247914568	0.241883692	2.473865409	0.007694779	0.049503482	0.091468411	0.215492474	0.135891433	0.003164617	0.003643699
2001	0.251636675	0.218199828	2.556493296	0.021690921	0.038064567	0.093026251	0.194352758	0.11757134	0.003426035	0.00609031
2002	0.287297444	0.240551854	1.243067639	0.032993091	0.045793014	0.098958243	0.150818391	0.134821615	0.003634725	0.01077115
2003	0.327943772	0.258568048	1.046883285	0.034933054	0.106194258	0.152901934	0.112266575	0.124648385	0.000586676	0.002242235
2004	0.333669309	0.245977995	0.892401326	0.033252497	0.099780479	0.130447283	0.087642426	0.092177005	0.000712052	0.00286115
2005	0.324248529	0.229994138	0.457740058	0.030615563	0.092375298	0.135575606	0.060535442	0.077174828	0.000721865	0.002705052
2006	0.30329394	0.22809708	0.379662917	0.040689927	0.086987258	0.17610704	0.152165891	0.087072654	0.000801518	0.002988458
2007	0.284351219	0.22227273	0.330539167	0.032793436	0.084137608	0.184896724	0.06762451	0.076878738	0.000967064	0.003324016
2008	0.301963561	0.210514214	0.300699205	0.041992437	0.078417223	0.187858433	0.096351955	0.098815314	0.001048716	0.003116296
2009	0.291675481	0.228801458	0.327294892	0.046374938	0.104902407	0.197664709	0.110954183	0.091352518	0.00117615	0.003981096
2010	0.3111873	0.202358594	0.371857216	0.044438507	0.108034418	0.155926303	0.11624316	0.090006668	0.001342517	0.005801722
2011	0.324839838	0.199738251	0.360850508	0.039863057	0.094040428	0.164257883	0.129275057	0.083029993	0.00099256	0.004485807
2012	0.291274517	0.201037654	0.359690696	0.036729393	0.07994513	0.148321343	0.132762713	0.080400605	0.001519858	0.004304539
2013	0.293282752	0.177831354	0.34258405	0.043035401	0.083247884	0.16129227	0.156849166	0.083926407	0.002409134	0.006648485
2014	0.314940652	0.181534382	0.291589797	0.044293904	0.053722068	0.194896149	0.228760711	0.089716938	0.002955996	0.006607359

	a83	a84	a85	a86	a87	a88	a89	a8_10	a8_11	a8_12
1996	0.026561367	0.001547863	0.003833208	0.002549106	0.008372449	0.04247947	0.049866918	0.005687957	0.027096158	0.055275456
1997	0.032109556	0.002372467	0.002901024	0.002023119	0.007370741	0.037512303	0.066154806	0.005709372	0.01786005	0.047388464
1998	0.004138745	0.001819944	0.024271274	0.016315618	0.05298184	0.016769713	0.05132183	0.002689754	0.004849153	0.000611778
1999	0.016850798	0.000847764	0.001144632	0.000974666	0.002295061	0.013269868	0.045236003	0.002025737	0.011779981	0.030192974
2000	0.022484657	0.000473245	0.001537919	0.001287542	0.002628649	0.019076717	0.0491761	0.002316536	0.014114999	0.032527494
2001	0.022014631	0.000429115	0.001693053	0.001170761	0.001866696	0.02054194	0.06669643	0.002322357	0.004872949	0.028018122
2002	0.011842626	0.0013559	0.005380909	0.002364471	0.001974109	0.050335703	0.117268085	0.005575812	0.015702168	0.013354
2003	0.003715111	0.000500441	0.001029027	0.001575446	0.000690839	0.121657053	0.044456001	0.001503767	0.019519937	0.005890731
2004	0.004415111	0.000688292	0.001401254	0.001847479	0.001171809	0.118348182	0.033037121	0.001757553	0.023705128	0.005396992
2005	0.005087228	0.00070607	0.001207171	0.001470885	0.001059089	0.124666938	0.024596997	0.001752211	0.021612131	0.006435641
2006	0.004865943	0.000764182	0.001237805	0.001604781	0.001255758	0.124149168	0.0181649	0.001635727	0.022976079	0.007202688
2007	0.004433544	0.000773062	0.00121756	0.001598446	0.001127718	0.127564879	0.021489983	0.001478921	0.02187008	0.007320372
2008	0.004732714	0.000762179	0.001148253	0.001666915	0.00110236	0.140350171	0.026078934	0.001935745	0.020998315	0.006076858
2009	0.004694327	0.000791866	0.001307809	0.001811791	0.001204886	0.132125611	0.022066445	0.002394057	0.027881466	0.007708326
2010	0.006011951	0.000999564	0.001890217	0.002204785	0.001684541	0.141384714	0.027240594	0.002977282	0.037612101	0.005569437
2011	0.005828578	0.000782479	0.001540271	0.001903175	0.001439928	0.144472523	0.030054316	0.002293025	0.030441742	0.006211161
2012	0.005156636	0.001008204	0.001895109	0.001891495	0.001562	0.124978204	0.022045135	0.002626821	0.026555461	0.017668329
2013	0.00791182	0.001764827	0.003103412	0.002722785	0.002267884	0.161784669	0.034155514	0.00478681	0.040017231	0.008030135
2014	0.007748655	-0.00030408	0.000820435	0.00217036	0.002198975	0.147086726	0.013592048	0.001817798	0.079837878	0.006156387

	a8_13	a8_14	a91	a92	a93	a94	a95	a96	a97	a98
1996	0.002827715	0.00629263	0.01942231	0.131952691	0.047580455	0.008019575	0.018370432	0.023073362	0.03584225	0.031652246
1997	0.003821926	0.008773775	0.01017165	0.104780418	0.045115533	0.011692648	0.012956541	0.017574082	0.023117393	0.02112046
1998	0.084221173	0.011463623	0.009651273	0.031610431	0.002741314	0.008878266	0.052425167	0.034170145	0.025799433	0.017879514
1999	0.001931626	0.005215692	0.015635871	0.093211925	0.058330282	0.011781398	0.014336166	0.021260491	0.01823416	0.019300489
2000	0.002936711	0.006420353	0.015812643	0.150225074	0.08562387	0.010829263	0.021958622	0.035629951	0.032875081	0.032405511
2001	0.00340272	0.006082684	0.011187147	0.094203445	0.044436341	0.002890086	0.012646476	0.021344117	0.030836825	0.026753283
2002	0.011490026	0.012346199	0.002864278	0.028910274	0.008601958	0.004741431	0.007490282	0.010597392	0.010796279	0.016626517
2003	0.001220618	0.002664224	0.001134251	0.007867276	0.00521405	0.003744694	0.006487036	0.012189026	0.007457301	0.004555926
2004	0.000504343	0.002807497	0.000849369	0.007354497	0.0058819	0.003364945	0.006063674	0.012073859	0.0080388	0.004089213
2005	0.000703824	0.002568131	0.002031404	0.012287072	0.011954294	0.006798485	0.010630617	0.018246011	0.014363133	0.007263585
2006	0.000640614	0.002931987	0.002455246	0.017519654	0.012854128	0.008492229	0.014165418	0.024973105	0.01914571	0.009734292
2007	0.0005926	0.002719126	0.003007721	0.019191813	0.013223068	0.00868226	0.014680887	0.025051404	0.016570706	0.00979616
2008	0.001367181	0.003712687	0.003056632	0.016846248	0.010830613	0.008095242	0.012430886	0.021384277	0.014804785	0.008460323
2009	0.001668613	0.003592449	0.003000024	0.020332763	0.010497343	0.007273892	0.012934808	0.023368755	0.014282588	0.008816977
2010	0.002317929	0.004681787	0.00233956	0.019253218	0.009995712	0.006188782	0.012489594	0.020767808	0.013754114	0.007716036
2011	0.002248864	0.00408975	0.001992662	0.017532061	0.010059382	0.005792575	0.011832633	0.019575994	0.013285869	0.007667626
2012	0.002780861	0.004450475	0.002166518	0.020023183	0.008848316	0.005491345	0.010686823	0.017058247	0.013601188	0.006755138
2013	0.004733766	0.006795159	0.002421266	0.02281449	0.009044587	0.00657926	0.012300932	0.017278185	0.013705724	0.006185486
2014	0.007106382	0.006345017	0.003195289	0.02512201	0.009158904	0.006977154	0.013919708	0.018375803	0.014318044	0.006305596

	a99	a9_10	a9_11	a9_12	a9_13	a9_14	a10_1	a10_2	a10_3	a10_4
1996	0.430747556	0.027609017	0.00851664	0.083643659	0.028210064	0.015433234	0.000690898	0.001417599	0.000393412	0.000143081
1997	0.41692196	0.023527383	0.005369335	0.061417042	0.042079771	0.032675103	0.000350675	0.002072715	0.000441534	0.000219425
1998	0.349355924	0.002657915	0.002068646	0.00537005	0.0519172	0.016130462	0.070650345	0.167897113	0.293276643	0.032576365
1999	0.602902299	0.021590958	0.006309467	0.063985296	0.037634035	0.035106573	0.001338566	0.003822542	0.001408294	0.000524584
2000	0.856056765	0.025210439	0.010402478	0.07702994	0.064697143	0.05477328	0.001393955	0.005989007	0.002501713	0.000425465
2001	0.440345963	0.012981389	0.004894954	0.020470093	0.033314396	0.039708651	0.000697544	0.006024882	0.002235381	0.000431276
2002	0.45895715	0.00741674	0.008202694	0.015040287	0.052254225	0.028149155	0.001508457	0.022069172	0.007123732	0.003740976
2003	0.55369863	0.005087796	0.008786437	0.01762177	0.011012795	0.026290973	0.000435388	0.003781435	0.02125754	0.003724675
2004	0.491289967	0.005314149	0.009735965	0.015162619	0.008903737	0.019308369	0.000431865	0.004355081	0.018173861	0.003505005
2005	0.408695185	0.010874176	0.015568515	0.027064821	0.01021365	0.033955148	0.000903381	0.005414972	0.017237049	0.004188496
2006	0.424036709	0.014290573	0.018800976	0.039336067	0.016935019	0.046514503	0.000602039	0.005970091	0.025754344	0.004468761
2007	0.403122585	0.012366589	0.018468135	0.025242403	0.017834881	0.046476842	0.000756636	0.007411417	0.045275828	0.005213544
2008	0.39653738	0.015649845	0.016726602	0.029557286	0.032809697	0.050503208	0.000903995	0.007508426	0.03326929	0.005225472
2009	0.431072163	0.015154016	0.018542088	0.027808621	0.034681471	0.042373509	0.001564696	0.014506751	0.037413268	0.006850331
2010	0.484904941	0.013924827	0.019336092	0.020421716	0.033468728	0.037159903	0.001213433	0.013532694	0.035193741	0.005528045
2011	0.497751411	0.013492522	0.019417199	0.018220381	0.040641949	0.039984863	0.000795028	0.009366849	0.027286159	0.00392906
2012	0.583446157	0.011327759	0.014493359	0.01625145	0.036718872	0.035973829	0.000742013	0.006734922	0.030998291	0.003611633
2013	0.575338472	0.012940889	0.014287916	0.023008968	0.040967251	0.037231905	0.001049918	0.009178431	0.042084441	0.004936143
2014	0.473061017	0.013702291	0.008232115	0.021913976	0.061621059	0.040377889	0.001009522	0.007264311	0.037644424	0.003545953

	a10_5	a10_6	a10_7	a10_8	a10_9	a10_10	a10_11	a10_12	a10_13	a10_14
1996	0.000525944	0.000936347	0.000517894	0.001102349	0.019761857	0.005964246	0.000751506	0.024114654	0.003144296	0.003478772
1997	0.000419851	0.000786859	0.000435399	0.000951972	0.019299816	0.005584528	0.000845121	0.017042965	0.005859522	0.006573481
1998	0.051654956	0.055115083	0.12805981	0.083177559	1.0931764	0.048541909	0.033362012	0.147912467	0.134100719	0.133453847
1999	0.001110801	0.001452685	0.001146949	0.005245879	0.068456138	0.004655521	0.002828673	0.030730998	0.011801348	0.009585069
2000	0.001987801	0.00261111	0.00225675	0.012975474	0.097406331	0.004310113	0.003149409	0.039685583	0.024720456	0.020100239
2001	0.002120741	0.002837727	0.001601447	0.014472054	0.090261698	0.004261878	0.004247217	0.037003345	0.019324169	0.014485428
2002	0.007509285	0.01325289	0.007185814	0.014731825	0.15877408	0.016547855	0.01071329	0.051710349	0.049388493	0.044313731
2003	0.006972631	0.010881754	0.005840219	0.002263519	0.212672776	0.03014064	0.015972483	0.023213148	0.062858412	0.014742994
2004	0.006190298	0.011425851	0.006448521	0.002448462	0.139276937	0.040739959	0.018018161	0.026554608	0.094315314	0.015750581
2005	0.006040926	0.010106883	0.006264573	0.001530023	0.078374063	0.03143766	0.008453923	0.037030564	0.136689205	0.010620507
2006	0.006608846	0.011612985	0.007539315	0.002866099	0.086851364	0.019973741	0.01246782	0.033414489	0.036111642	0.015819144
2007	0.008047689	0.013108049	0.007676048	0.006344948	0.143580291	0.047537324	0.019766077	0.031215791	0.060077618	0.023628375
2008	0.006717136	0.012071094	0.007522302	0.003430143	0.095109569	0.030795103	0.017963167	0.036412513	0.084741752	0.022464798
2009	0.009818126	0.018643261	0.009513562	0.00405447	0.112510125	0.033142939	0.022006544	0.041983198	0.068698377	0.02561304
2010	0.009037003	0.016045742	0.00902418	0.003164736	0.091387705	0.029147869	0.020677635	0.030385096	0.055601888	0.021400293
2011	0.006697186	0.011055671	0.006895277	0.001855323	0.085329342	0.024030567	0.008282342	0.027208377	0.031471046	0.012219108
2012	0.005978241	0.008883018	0.005639108	0.002481315	0.108764649	0.041484011	0.013510761	0.027801346	0.052387804	0.014994386
2013	0.007694563	0.009923593	0.006370327	0.002698461	0.105467761	0.047461567	0.017175079	0.033116252	0.071664549	0.0206148
2014	0.005444135	0.006867954	0.004349716	0.001880747	0.043375453	0.054139533	0.008779043	0.023074875	0.064438335	0.015925438

	a11_1	a11_2	a11_3	a11_4	a11_5	a11_6	a11_7	a11_8	a11_9	a11_10
1996	0.001442271	0.00247929	0.000888195	0.000202249	0.000726774	0.001456857	0.001589393	0.001232927	0.02705882	0.003659501
1997	0.000760313	0.002743846	0.000838618	0.000266375	0.00048667	0.000961342	0.001145407	0.000802457	0.041029006	0.003340598
1998	0.004477331	0.07019765	0.02780101	0.006970626	0.023574649	0.190074503	0.083295564	0.030721905	0.354224537	0.004249651
1999	0.003787607	0.00504931	0.003107377	0.001256081	0.001459719	0.003860189	0.002322397	0.003523078	0.173216764	0.003742581
2000	0.003222179	0.00730008	0.00540042	0.000969336	0.001951982	0.005924636	0.003075702	0.005690451	0.247864628	0.006137969
2001	0.00270795	0.004814739	0.004618134	0.000580237	0.001667655	0.005107088	0.002468945	0.009251421	0.131116278	0.005359191
2002	0.026953564	0.032617958	0.049524448	0.022148482	0.023285433	0.029921426	0.026142449	0.025615803	0.277459671	0.016293041
2003	0.011337905	0.015303075	0.017960036	0.010745951	0.01447052	0.027995603	0.014764209	0.040688442	0.256689462	0.015510031
2004	0.007618482	0.012499337	0.018490506	0.008570831	0.012212789	0.024623047	0.01420417	0.034683497	0.190510404	0.01289076
2005	0.012271981	0.015402448	0.024102125	0.012112063	0.014289758	0.025644287	0.019267585	0.039980226	0.126765667	0.025830372
2006	0.013604259	0.022398705	0.033245638	0.016860532	0.017394545	0.030912559	0.023823483	0.048104141	0.132834184	0.019855381
2007	0.016330431	0.027194921	0.027475292	0.013963712	0.017613254	0.031473181	0.021037317	0.047121063	0.131359064	0.019248718
2008	0.015060955	0.026904147	0.028811313	0.014499991	0.01711462	0.029699935	0.020629259	0.046323273	0.11591725	0.023400574
2009	0.011391025	0.022075582	0.021317606	0.009307778	0.012687083	0.023358358	0.01390279	0.032590217	0.082316392	0.017799731
2010	0.00797597	0.019978016	0.020325734	0.007407316	0.011302846	0.019492193	0.012072655	0.026595194	0.081409595	0.014941896
2011	0.008725025	0.025740963	0.027121795	0.009307048	0.014963761	0.024486715	0.016210306	0.036623914	0.109970221	0.0182168
2012	0.011382686	0.025282892	0.026997074	0.010904521	0.01693541	0.024763694	0.016518742	0.038617212	0.122534208	0.01946994
2013	0.010143999	0.023452862	0.025344088	0.011216185	0.016300131	0.021119051	0.013963794	0.029711538	0.103268479	0.019312062
2014	0.013475177	0.024771172	0.025462156	0.011796857	0.018178218	0.022279323	0.013791963	0.029529803	0.09149898	0.021322992

	a11_11	a11_12	a11_13	a11_14	a12_1	a12_2	a12_3	a12_4	a12_5	a12_6
1996	0.007986013	0.002089819	0.004601501	0.002744328	7.85288E-06	7.12062E-06	1.96758E-06	8.30832E-07	2.19349E-06	3.46138E-06
1997	0.005380429	0.001490982	0.003547548	0.002513517	3.96761E-06	8.53512E-06	2.08277E-06	1.08084E-06	1.75539E-06	2.65495E-06
1998	0.003924942	0.000767439	0.057842868	0.038575744	0.001464582	0.004742487	0.00684421	0.000627098	0.003844784	0.007874728
1999	0.018336661	0.001587929	0.001223234	0.004317816	7.9514E-06	9.72713E-06	4.8574E-06	1.57355E-06	2.51224E-06	3.04508E-06
2000	0.029603831	0.003000107	0.003603219	0.007732568	3.79895E-06	7.21004E-06	4.5259E-06	5.4272E-07	1.66497E-06	2.54164E-06
2001	0.018275393	0.002883233	0.003988483	0.005375751	4.36184E-06	9.40328E-06	5.28539E-06	5.75139E-07	3.21982E-06	7.87318E-06
2002	0.115098488	0.034011274	0.068731209	0.047329828	1.29089E-05	0.000112178	3.68539E-05	3.10068E-05	4.57356E-05	8.53751E-05
2003	0.048570534	0.017413491	0.052066383	0.056416381	7.18719E-05	0.000307652	8.49571E-05	0.000130789	0.000298672	0.000522976
2004	0.046912131	0.015193959	0.031792504	0.039926103	4.7953E-05	0.000142112	7.22586E-05	7.5387E-05	0.000173495	0.000244265
2005	0.049926365	0.021422166	0.029538727	0.043786323	2.33433E-05	4.52308E-05	5.4071E-05	4.95051E-05	9.54904E-05	0.000147895
2006	0.060563615	0.025565483	0.036971158	0.056482652	6.60206E-05	0.000423583	0.000192677	0.000165622	0.000376251	0.000528215
2007	0.056435423	0.051717634	0.038014426	0.054564966	0.000165082	0.000806414	0.000381226	0.000318215	0.000654907	0.000966377
2008	0.07756154	0.073790367	0.08123248	0.079131023	0.000144927	0.000613548	0.00026297	0.00022777	0.000432263	0.000700983
2009	0.057587604	0.013548621	0.062063659	0.049358443	0.000142391	0.000703574	0.000151252	0.000170909	0.000343615	0.00066819
2010	0.050457308	0.009318061	0.055999623	0.044161222	0.000151947	0.000795531	0.000182113	0.000184768	0.000416548	0.000783304
2011	0.078402876	0.013665	0.089315707	0.056431412	6.04668E-05	0.000376271	0.000148562	9.91836E-05	0.00026019	0.000377073
2012	0.078666818	0.015954123	0.10757493	0.061013909	9.01138E-05	0.000493082	0.000227442	0.000142453	0.000371106	0.000419744
2013	0.073733938	0.015925948	0.109071791	0.056007663	0.00034134	0.001434797	0.000375564	0.000382154	0.000762022	0.001073478
2014	0.038029872	0.018848954	0.165571968	0.060199304	0.000381288	0.001518239	0.000547098	0.000415274	0.000949295	0.001071596

	a12_7	a12_8	a12_9	a12_10	a12_11	a12_12	a12_13	a12_14	a13_1	a13_2
1996	1.11188E-06	2.79142E-06	2.36E-05	2.96724E-05	9.03154E-06	7.33843E-05	6.13848E-06	5.55272E-06	0.00018808	0.002558401
1997	8.68609E-07	2.20792E-06	2.17273E-05	3.72553E-05	9.0498E-06	4.84805E-05	8.29828E-06	7.875E-06	0.000137391	0.004789497
1998	0.000690247	7.69598E-05	0.284029479	0.005497047	0.0071643	0.02135783	0.012994455	0.025086294	0.004301798	0.026543717
1999	8.352E-07	2.82154E-06	4.78963E-05	2.06305E-05	2.67082E-05	7.98298E-05	1.12326E-05	1.02786E-05	0.000262613	0.002452875
2000	5.56774E-07	2.53287E-06	3.04504E-05	1.0231E-05	1.99729E-05	4.91341E-05	9.46844E-06	7.96293E-06	0.000340772	0.002794265
2001	2.10765E-06	1.53213E-05	4.80106E-05	1.22062E-05	2.25801E-05	8.15478E-05	2.513E-05	1.79973E-05	0.000345284	0.003601133
2002	5.39828E-05	5.87693E-05	0.000416329	4.01699E-05	9.83937E-05	0.000397318	0.000221947	0.000184453	0.000294748	0.007974787
2003	0.000338531	0	0.001999906	0.000152836	0	0.001977644	0	0.00022847	0	0
2004	0.000217252	0	0.000920352	9.29987E-05	0	0.000969896	0.000359057	7.99496E-05	0	5.35433E-05
2005	0.000150964	0	0.000365585	6.40661E-05	0	0.001032045	0.000241255	5.86866E-05	2.19033E-05	5.30507E-05
2006	0.000525475	0	0.000464889	0.000220655	2.52274E-05	0.003255774	0.000932218	0.000143415	3.88785E-06	0.000139687
2007	0.000822996	1.79895E-05	0.001809861	0.000306859	3.12254E-05	0.002672321	0.001530583	0.00021947	6.12189E-06	0.000201312
2008	0.000593628	3.19333E-05	0.001032641	0.000260743	2.25187E-05	0.002304188	0.001279878	0.000137638	3.61639E-06	0.000159319
2009	0.000475587	8.26663E-06	0.000589876	0.000166327	1.49851E-05	0.001330358	0.001053878	7.49926E-05	2.92733E-06	0.000166026
2010	0.000587825	6.7997E-06	0.000758592	0.00017752	2.21187E-05	0.001153237	0.001310517	8.65658E-05	5.78308E-06	0.00028927
2011	0.000327389	5.70829E-06	0.000683573	0.000138094	1.36916E-05	0.001201732	0.000963422	6.36217E-05	2.79707E-06	0.000186819
2012	0.000401276	7.89318E-06	0.001033215	0.000212069	1.61568E-05	0.001614942	0.001468593	0.000111748	4.85646E-06	0.00018882
2013	0.000947736	6.3345E-06	0.000915842	0.000277191	3.28499E-05	0.001715247	0.003612576	0.000114636	6.53366E-06	0.000208953
2014	0.000965616	1.03902E-05	0.001297793	0.000438125	4.5278E-05	0.002642074	0.005169964	0.000193777	6.37016E-06	0.000211932

	a13_3	a13_4	a13_5	a13_6	a13_7	a13_8	a13_9	a13_10	a13_11	a13_12
1996	0.001119809	0.000174465	0.00085134	0.001845078	0.001222314	0.001777403	0.020520952	0.00252749	0.000773124	0.005983394
1997	0.001351318	0.000370634	0.000713896	0.001582333	0.001072586	0.001533266	0.026180564	0.004034956	0.001296536	0.007013667
1998	0.007976903	0.001129814	0.008357826	0.097438095	0.050839906	0.187916053	0.00419688	0.001837369	0.005115143	0.00093022
1999	0.001290148	0.000306075	0.000629933	0.001518102	0.000821969	0.002029288	0.038857298	0.00155303	0.002436444	0.011884593
2000	0.002189326	0.000204455	0.00087981	0.002417977	0.001061355	0.004308532	0.04178031	0.001481943	0.002426963	0.009662969
2001	0.001866531	0.000158804	0.00104557	0.003442083	0.001171632	0.003221702	0.020752844	0.00242419	0.002892029	0.015255304
2002	0.002159817	0.000483543	0.001961688	0.004372147	0.001400989	0.006466858	0.029398521	0.00430159	0.003400041	0.018344224
2003	0.000187185	9.00522E-05	8.97358E-05	0.000345681	0.000298353	0.019595565	0.028641443	0.007934493	0.000744102	0.014587574
2004	0.000204186	2.55631E-05	0.000130735	0.000424761	0.000540233	0.022815613	0.01976531	0.006727483	0.000642392	0.018678905
2005	0.000221967	2.58062E-05	0.000112	0.000362698	0.000615508	0.024347922	0.007879028	0.005867365	0.000568488	0.01727951
2006	0.000193599	4.59794E-05	0.00010429	0.00037818	0.00076855	0.023652589	0.009561631	0.009380536	0.000580274	0.002255317
2007	0.000256063	4.01389E-05	0.000137945	0.000453861	0.000681975	0.024665217	0.010954994	0.008723762	0.00060324	0.012193286
2008	0.000223479	3.8966E-05	9.97734E-05	0.000330709	0.000507019	0.019306438	0.00760613	0.009973833	0.000508334	0.024210331
2009	0.000171023	3.03135E-05	8.45373E-05	0.000319239	0.000456336	0.020085232	0.006869895	0.008531963	0.000526107	0.027355624
2010	0.000262401	4.15342E-05	0.0001519	0.00047673	0.000560543	0.025563371	0.010016299	0.008989619	0.000923474	0.019748303
2011	0.000168326	2.46843E-05	9.00766E-05	0.000301655	0.000329349	0.017286296	0.006606549	0.00606473	0.000523149	0.015538051
2012	0.000210944	3.29508E-05	0.000110889	0.000358847	0.000457912	0.018909663	0.007078432	0.006372172	0.000512368	0.0005885
2013	0.000217088	3.81573E-05	0.000118972	0.0003474	0.000374294	0.016301488	0.005209354	0.004905881	0.000425593	0.000651402
2014	0.000221886	3.85523E-05	0.000116464	0.00033575	0.000261932	0.015381139	0.004202723	0.004983136	0.000189406	0.000730372

	a13_13	a13_14	a14_1	a14_2	a14_3	a14_4	a14_5	a14_6	a14_7	a14_8
1996	0.015778523	0.008436352	0.002580331	0.007568724	0.091873739	0.000450464	0.003178724	0.018793991	0.062134629	0.01704933
1997	0.013434229	0.011033429	0.00116641	0.011570453	0.102000341	0.000590223	0.002395373	0.01404241	0.056295652	0.01936199
1998	0.003787642	0.05340859	0.013344688	0.080681607	0.04972973	0.014854685	0.02848408	0.16406959	0.034497387	0.087772439
1999	0.01133254	0.007492407	0.002118533	0.012247479	0.063138866	0.000562532	0.002092089	0.011397964	0.0395986	0.021961456
2000	0.016298396	0.009054956	0.002383892	0.012892056	0.046682172	0.000411636	0.003341954	0.015657746	0.044765118	0.0417239
2001	0.012766833	0.006511762	0.000451059	0.011246071	0.050293027	0.000279329	0.002434071	0.011541699	0.042936208	0.026524077
2002	0.087047955	0.014347056	0.000536426	0.023776772	0.145304164	0.001260178	0.003622587	0.012119488	0.038163558	0.020938726
2003	0.319188192	0.005033867	0.00098614	0.00573655	0.008697762	0.000690206	0.006820487	0.010303504	0.005073674	0.017001883
2004	0.313717532	0.003976171	0.001556827	0.012136526	0.023237958	0.001236446	0.013995228	0.022962051	0.011402271	0.035053144
2005	0.27532541	0.003716972	0.001809218	0.012387835	0.02491718	0.001681526	0.012973976	0.019053315	0.012286993	0.033284438
2006	0.291666667	0.003857483	0.001596616	0.011989694	0.021694714	0.001431137	0.011701942	0.0176512	0.011342598	0.031967193
2007	0.35335074	0.003837453	0.001996987	0.015594062	0.020652338	0.001524012	0.012729268	0.019638753	0.011075821	0.032645489
2008	0.402743527	0.002963202	0.002275441	0.015386175	0.019709126	0.001377471	0.011984428	0.018666816	0.010947846	0.027979754
2009	0.362237602	0.002556573	0.002663207	0.018365743	0.02293242	0.001308161	0.013888808	0.022232238	0.011066477	0.032099916
2010	0.386752141	0.003678697	0.002925599	0.028492231	0.032592108	0.001464454	0.018525206	0.027558588	0.015257983	0.038072187
2011	0.373886497	0.002466506	0.002549317	0.028031767	0.033340312	0.00141737	0.019346719	0.026754036	0.016076033	0.039119929
2012	0.396414666	0.003030976	0.003698386	0.025942292	0.032563187	0.001675515	0.02191693	0.026774102	0.016379435	0.040845044
2013	0.391909217	0.003215146	0.004228584	0.030367143	0.036607003	0.002087328	0.025582084	0.027558729	0.017470744	0.037266283
2014	0.443902192	0.003182892	0.00481105	0.026504907	0.031491453	0.001855485	0.024115029	0.024248209	0.015389884	0.0319329

	a14_9	a14_10	a14_11	a14_12	a14_13	a14_14
1996	0.04994892	0.000798943	0.000912034	0.005848213	0.012666921	0.019880984
1997	0.045611817	0.000391431	0.000792318	0.000476314	0.010249795	0.02883621
1998	1.440810078	0.008468592	0.008997264	0.041018274	0.053919611	0.116121533
1999	0.078180031	0.000406055	0.002028492	0.002005029	0.015591491	0.030511578
2000	0.079489167	0.000544375	0.003058242	0.002521613	0.028441077	0.037001358
2001	0.04862078	0.000924359	0.000720341	0.002000621	0.014868218	0.035135773
2002	0.109618384	0.00267826	0.002341062	0.004937862	0.027578063	0.069929727
2003	0.084959434	0.000685569	0.000774888	0.011616265	0.011489689	0.104653967
2004	0.159061889	0.001613211	0.001489264	0.017515115	0.016550798	0.151011313
2005	0.08906486	0.001826236	0.001393246	0.01281338	0.013160175	0.140189409
2006	0.067870243	0.001579059	0.00131965	0.012604316	0.014370089	0.138057191
2007	0.068406522	0.001436186	0.001408444	0.008330161	0.015223193	0.14508859
2008	0.062344741	0.001736734	0.001169929	0.009860182	0.023413499	0.231508752
2009	0.071340593	0.001935417	0.001464542	0.004815184	0.026896968	0.219781513
2010	0.10658898	0.002372999	0.002330103	0.005089816	0.036007946	0.276223312
2011	0.110569681	0.002223517	0.001962337	0.005777147	0.038713419	0.277637803
2012	0.118657165	0.002363518	0.002067412	0.006443688	0.049881241	0.280797067
2013	0.120452649	0.00291532	0.002358347	0.007682013	0.061043028	0.291220015
2014	0.089434057	0.002695737	0.001669472	0.007761025	0.080321573	0.271361997

Appendix 5 - Hierarchy of sectors depending on their share in GDP

Place	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	sG6	sG1	sG1	sG1	sG1	sG1	sG1	sG1	sG1	sG10	sG10	sG10	sG10
2	sG1	sG6	sG10	sG10	sG10	sG10	sG11	sG10	sG10	sG1	sG1	sG11	sG1
3	sG5	sG4	sG6	sG9	sG9	sG9	sG10	sG11	sG4	sG11	sG11	sG1	sG11
4	sG4	sG5	sG7	sG7	sG4	sG4	sG4	sG4	sG11	sG4	sG9	sG9	sG9
5	sG7	sG10	sG5	sG6	sG7	sG7	sG7	sG5	sG9	sG9	sG4	sG12	sG4
6	sG9	sG12	sG12	sG12	sG12	sG5	sG8	sG7	sG7	sG7	sG12	sG4	sG12
7	sG10	sG7	sG4	sG5	sG5	sG6	sG6	sG9	sG5	sG6	sG7	sG5	sG7
8	sG12	sG9	sG9	sG11	sG6	sG12	sG5	sG8	sG8	sG5	sG5	sG7	sG5
9	sG8	sG8	sG8	sG4	sG11	sG11	sG12	sG6	sG12	sG12	sG6	sG6	sG8
10	sG2	sG2	sG11	sG8	sG8	sG8	sG9	sG12	sG6	sG8	sG8	sG8	sG6
11	sG14	sG14	sG2	sG2	sG3	sG3	sG3	sG3	sG3	sG3	sG3	sG3	sG3
12	sG11	sG11	sG14	sG14	sG2	sG2	sG2	sG2	sG2	sG14	sG14	sG14	sG14
13	sG3	sG3	sG3	sG3	sG14	sG14	sG14	sG14	sG14	sG2	sG2	sG2	sG2
14	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13	sG13

Place	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	sG10	sG10	sG1	sG10	sG10	sG10	sG10	sG10	sG11	sG11	sG10	sG11	sG11
2	sG1	sG1	sG10	sG12	sG9	sG9	sG8	sG9	sG12	sG12	sG11	sG10	sG10
3	sG11	sG12	sG12	sG9	sG12	sG11	sG9	sG11	sG8	sG8	sG8	sG12	sG12
4	sG9	sG9	sG9	sG11	sG11	sG12	sG12	sG12	sG9	sG10	sG12	sG9	sG7
5	sG12	sG11	sG11	sG1	sG1	sG8	sG11	sG8	sG10	sG6	sG9	sG8	sG9
6	sG4	sG4	sG4	sG4	sG4	sG4	sG4	sG6	sG6	sG9	sG4	sG7	sG8
7	sG7	sG7	sG7	sG7	sG8	sG6	sG6	sG4	sG4	sG4	sG7	sG4	sG14
8	sG5	sG5	sG8	sG8	sG7	sG7	sG7	sG7	sG7	sG1	sG6	sG14	sG4
9	sG8	sG8	sG5	sG6	sG6	sG1	sG1	sG1	sG5	sG7	sG14	sG6	sG6
10	sG6	sG6	sG6	sG5	sG5	sG5	sG5	sG5	sG1	sG5	sG5	sG1	sG5
11	sG3	sG3	sG3	sG14	sG14	sG14	sG14	sG14	sG3	sG3	sG1	sG5	sG1
12	sG14	sG14	sG14	sG3	sG3	sG3	sG13	sG3	sG14	sG14	sG3	sG3	sG3
13	sG2	sG2	sG2	sG2	sG2	sG13	sG3	sG13	sG13	sG13	sG13	sG13	sG13
14	sG13	sG13	sG13	sG13	sG13	sG2	sG2	sG2	sG2	sG2	sG2	sG2	sG2

Appendix 6 - Rank (place in hierarchy) of sectors depending on their share in GDP

Sectors	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
sG1	2	1	1	1	1	1	1	1	1	2	2	3	2	2
sG2	10	10	11	11	12	12	12	12	12	13	13	13	13	13
sG3	13	13	13	13	11	11	11	11	11	11	11	11	11	11
sG4	4	3	7	9	4	4	4	4	3	4	5	6	5	6
sG5	3	4	5	7	7	6	8	5	7	8	8	7	8	8
sG6	1	2	3	5	8	7	7	9	10	7	9	9	10	10
sG7	5	7	4	4	5	5	5	6	6	6	7	8	7	7
sG8	9	9	9	10	10	10	6	8	8	10	10	10	9	9
sG9	6	8	8	3	3	3	10	7	5	5	4	4	4	4
sG10	7	5	2	2	2	2	3	2	2	1	1	1	1	1
sG11	12	12	10	8	9	9	2	3	4	3	3	2	3	3
sG12	8	6	6	6	6	8	9	10	9	9	6	5	6	5
sG13	14	14	14	14	14	14	14	14	14	14	14	14	14	14
sG14	11	11	12	12	13	13	13	13	13	12	12	12	12	12

Sectors	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Rank mean
sG1	2	1	5	5	9	9	9	10	8	11	10	11	4.269230769
sG2	13	13	13	13	14	14	14	14	14	14	14	14	12.73076923
sG3	11	11	12	12	12	13	12	11	11	12	12	12	11.65384615
sG4	6	6	6	6	6	6	7	7	7	6	7	8	5.615384615
sG5	8	9	10	10	10	10	10	9	10	10	11	10	8
sG6	10	10	9	9	7	7	6	6	5	8	9	9	7.384615385
sG7	7	7	7	8	8	8	8	8	9	7	6	4	6.5
sG8	9	8	8	7	5	2	5	3	3	3	5	6	7.346153846
sG9	4	4	3	2	2	3	2	4	6	5	4	5	4.538461538
sG10	1	2	1	1	1	1	1	5	4	1	2	2	2.076923077
sG11	5	5	4	4	3	5	3	1	1	2	1	1	4.538461538
sG12	3	3	2	3	4	4	4	2	2	4	3	3	5.230769231
sG13	14	14	14	14	13	12	13	13	13	13	13	13	13.65384615
sG14	12	12	11	11	11	11	11	12	12	9	8	7	11.46153846