



Munich Personal RePEc Archive

Identifying a Country As Developed Based On Their Structural Similarities

Soza-Amigo, Sergio and Aroca, Patricio

Universidad Austral de Chile, Universidad Adolfo Ibáñez

1 January 2015

Online at <https://mpra.ub.uni-muenchen.de/77421/>
MPRA Paper No. 77421, posted 11 Mar 2017 14:36 UTC

Identifying a Country As "Developed" Based On Their Structural Similarities

Sergio Soza-Amigo^{1*}

Patricio Aroca^{2**}

ABSTRACT

This research begins with the following questions: Is there consistency between the identification of development and the economic structure it possesses?; Are there similarities between the economies identified with differences in their levels of development?; and, are there non- developed economies with the same structure of developed economies? To answer these questions, similarities of input-output tables obtained from the OECD (Mid90, Early00 and Mid00) are reviewed, and after, a case study is performed on the Chilean economy. The similarities and changes are investigated by using a structural similarity index, and then by comparing correlations. The results show that: traditional indicators can only be used as references and are non-categorical in their identifications of development; the economies show significant similarities according to their level of development, and there exists significant structural similarities between developed economies and the economy of Chile.

Key words: Analysis Input-Output, Linkage, Structural Change.

JEL: C49, C67, D57, F02, R11.

^{1*}Facultad de Ciencias Económicas y Jurídicas, Universidad de Magallanes, Chile, e-mail: sergio.soza@umag.cl.

^{2**}Business School, Universidad Adolfo Ibáñez, Chile, e-mail: patricio.aroca@uai.cl.

INTRODUCTION

International empirical evidence shows that the economic development of a country determines different productive structures in their growth process. Generally, less developed economies tend to be more intensive in primary production, while more developed economies succeed in advanced manufacturing at the service sector. This investigation contrasts various productive structures, using input-output matrices of countries at different stages of development.

The idea to characterise and explain the process of development of economies is attributed by

Clark (1940) to Petty's work presented in 1899, where the core idea was that less developed economies are characterised by low incomes per capita and a greater labour engagement in the agrarian sector. In other words, there is a relation between engagement, transfer and increase of labour from the agricultural to the industrial sector, as long as an economy is developing (Clark, 1940, chapters ix and x).

Fisher (1935 and 1939) and Fourastié (1949) state that the shift from an economy based on agriculture towards an urban-industrial one, is set by the evolution and transfer of the kinds of employment that it creates (from the agricultural sector to industry and services), which would be explained by the change of the demand structure of goods and services.

The ideas that a high income per capita is correlated to high-level jobs in the tertiary sector, that low incomes are associated to a poor level of development, and that high incomes per capita induce producers to develop the tertiary sector, is proposed by Clark in 1940.

It is Fisher, finally, who closes in 1935 this first cycle claiming that development of activities in the tertiary sector shall be a good indicator of an economy's degree of development.

The comparison of productive structures considers the measurements of the following changes: the "industrial complex" and "technological cookbook" (Leontief, 1963, 1951, 1941 and 1936), specialties (Imbs and Wacziarg, 2003), "The Fundamentals of Economic Structures" in a seasonal sense and in different geographic scales (Hewings et al, 1998; Hewings, Jensen and West, 1988 and West and Brown, 2003, Thakur, 2011 2010 and 2008), "key" activities or development motors (Sonis et al, 1995 and Hewings (1982)), change structural (Zakariah and Ahmad (1999), Kohama and Kajiwara (1986) and Hewings (1982)), complexity and division of labor (Carter, 1970). Impact or substitution changed economic policies (Goldar and Aggarwal (2012), Clements *et al* (2007) and Abimanyu (2000), indirect relationships and number of branches (Aroche-Reyes, 2006 2002 and 1996), the zero coefficients and most important (Forsel, 1988), the demand and sale of inputs and outputs and cluster size (Noguera-Mendez and Semitiel-García, 2011), the similarities of their production functions in the division of activities and number of their interrelationships (Soza-Amigo, 2011). Determining the level of development of an economy through the analysis of change in their productive structures allows for a better design of policies aimed at promoting development of industrial sectors (Soza-Amigo, 2011, Soza-Amigo and Aroca, 2010, Hidalgo and Hausmann, 2008 and 2009 and, Hidalgo et al, 2007, Brown et al, 2005, West and Brown, 2003, Rao and Harmston, 1979, Hirschman, 1958).

Analysis was performed using data collected by the Organization for Economic Cooperation and Development (OECD, Table 1 in Annex) with 116 input-output tables with varying stages of development. The information is divided into three periods; the mid-90s (Mid90), beginning of 2000s (Early00); and mid-2000s (Mid00). Any country with a high per capita GDP, measured in PPP (Purchasing Power Parity), will be identified as a "developed economy". This information is collected from the World Bank for 2009 (Table 1 in Appendix). The results show that generally, there are common and differential patterns

between countries with similar and distinct levels of development. Furthermore, the classification of high development GDP per capita (PPP) is not consistent with its structure . This investigation consists of three sections; first exhibiting two comparative approaches, "structural similarities" and "linkage", following, results are displayed, and finally, principal conclusions are presented.

METHODOLOGY

To identify the level of development of an economy, a PIB indicator (PPP) per capita is often used, however, this approach ignores the economic situation from which it resulted. If an economy is classified as developed using this indicator, it is reflected in their production structure by showing an abundance of exchange relations, Important Coefficients (IC) and a significant absence of zero coefficients. Having defined the economies and knowing their limitations, this is used as a proxy of the level of development per capita, GDP PPP (see Appendix, Table 1). The economy that presents the highest level of development will be the highest GDP per capita. Next, the structural similarities are identified for each economy. The preceding allows us to address two aspects; common features of the economies and the similarities of production functions in economies with different levels of development. As expected, even when two economies are classified as developed, it does not ensure that their structures or specialties are identical; but if certain similarities should be present, the same relationship should be observed in the group of less developed economies.

Initially, the structures of all available economies are compared by observing the degree of difference between the developed and the less developed economies. Then, a comparison is made between the more and less developed groups; the comparison seeks to detect the similarities of economies belonging to the same group. Given the absence of zero coefficients, we expect to find a greater degree of similarity between developed economies.

Finally, the Chilean economy is incorporated as a case study, including observation of which groups and economies are most similar.

To detect structural similarity, technical coefficients are compared considering the average of the total input streams of each activity for each economy, utilizing Le Masne index (1988). To isolate the size effects, such equation is weighed by " p_d "; corresponding to the average value of intermediate consumption of each pair of economies (see the section "formulas employed" attached).

Based on the works of Le Masne, it is expected that overall similarities of developed economies will exceed 75%. Once these similarities are obtained, we proceed to a "smoothing chart" where Garcia's 2010 method is applied. This mechanism detects structural similarities in terms of their GDP per capita and structural similarity. If these indicators are consistent with the structures, the graph should be characterized by having at least two distinct groups. One, which represents developed countries (high GDP per capita with significant structural similarity between them) and other, less developed, where its GDP is low and the similarities vary according to their specialties and exploited commodities. The possibility of a third and fourth group depends on the presence of similar but divergent GDP economies among them and vice versa, respectively.

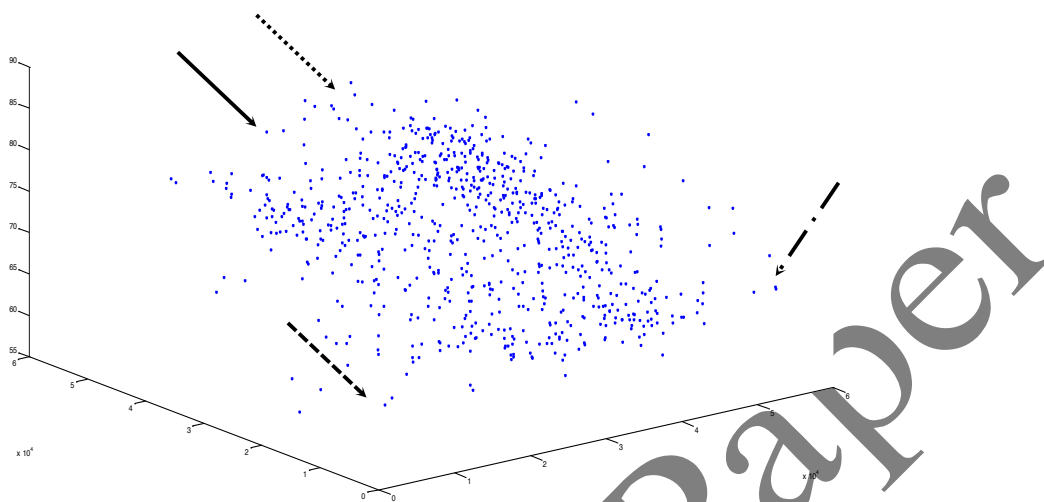
With the help of Le Masne's index and the gathering of correlations, the existence of an important interrelationship between their activities will emerge and observations will be made of structural characteristics. The hypothesis will be supported by verifying the existence of similarities amongst them and an important interrelationship and subdivision of activities in the more developed economies. An objective is bringing this research closer to the classic notion of "key industries as a consequence of development". Links are determined using Rasmussen's technique corrected by Ghoshy, and weighed by their respective dispersions (see appendix). Once these links are made, the identification of the structural similarities is

complemented by using the “cluster” technique. With an array of distances between the various economies, the similarities and differences that exist from the point of view of the push and pull of different industries is investigated. The measurement of distance used is the Euclidean $[d(i,j)^2 = \sum_k (x_{ik} - x_{jk})^2]$. Finally, the links formed are reviewed and grouped using a hierarchical cluster, allowing following of the "evolution of the group"; from one group, to as many groups as there are elements. When assembling groups, individual economies are considered as cases, and links as variables.

RESULTS

Structural similarities obtained with the help of Le Masne's index (1988) reveal that for the three time periods, that the majority of developed economies share important similarities, both in the totality and particularity of its structures (production functions). In contrast, the less developed economies have low structural similarity. The bases of Graph 1 represent the different per capita GDP, the lower vertex being the convergence of economies with lower GDP, and at its high points, the similarities between pairs of economies according to Le Masne's structural similarities index. From the point cloud that forms, two aspects are emphasized. First, the obvious correlation between economies with high GDP in respect to their structures, and in turn, lack thereof for economies with lower GDP. Second, four extreme cases are highlighted; one where a low similarity is observed between economies with extreme and opposite values of their according to Le Masne's structural similarities index of extreme and opposite values of GDP (right arrow with single point); another where their GDPs and the structural similarities are low (bottom and center, segmented arrow) another where the GDPs and similarities are high (top center, dotted arrow) and finally, a particular case where an economy is observed with low GDP, but high structural similarity with those economies having a high GDP (top left, continuous arrow).

Graph 1: Structural Similarity vs GDP per capita.



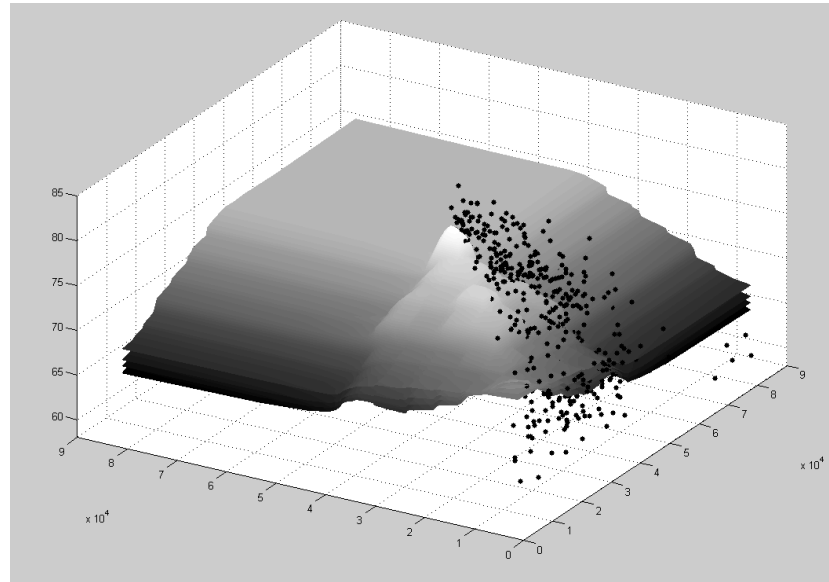
Source: Own based on results Mid00.

Figure 2, which is "softened" i.e. the similarities achieved for Mid00 economies (Graph 1), shows the relationship between per capita GDP (base) and their structural similarities (high). The graph corroborates the idea planted earlier: as GDP increases, economies tend to increase in structural similarity. In addition, it appears that less developed economies present more distinct structures in comparison to the more developed.

The similarities of the developed economies are greater than those shown by the less developed, there is a difference in the average of 5-15 points. In general, for the three data, it was observed that the more developed economies share structural similarities that can be positioned in range of 78 to 82% with an average of 79%. Therefore, if a less developed economy resembles a developed economy, it could be considered that the former has the structure of a developed economy (see Annex, Tables 2, 3 and 4) Except for in special cases, such as Argentina, Brazil and Chile, in the data considered no similarities were detected

between more developed and less developed economies.

Graph 2: Structural Similarity vs GDP per capita, softened.



Source: Own based on results Mid00.

In general, it appears that less developed economies bear a minor similarity to less developed economies. In order to observe the dynamics of each change, the "developed" economies that presented matrices for the three time periods considered were reviewed. Results indicate that the change between the mid-90s to early 2000s are more accentuated than what appears between of the early 2000s and mid 2000s, and even less similarities are seen in the decade between mid 1990s and mid 2000s. Therefore, the changes are greater in the beginning, making the structural variations slow as development level is consolidated. In short: with further development, less changes. On average the dynamics show that similarities for both Mid90 to Early00 and Early00 to Mid00 and the decade from Mid90 to Mid00 are similar and increase, however excluding Slovakia, an economy that presents major differences in their structures.

Facilitating the exploration of economies, it's meaningful to distinguish whether Chile structurally resembles a developed economy. With this, the objective is to compare structures, given the following requirements: they must be developed and have at least one structural similarity to Chile greater than 75% in at least one of the evaluated periods. In addition, the comparison should be relative to Chile's data in the mid-2000s, strictly speaking, for the table of Chile in 2003. Thus, an objective is to identify the current status of the Chilean economy in respect to the processes and similarities with other economies. The comparison is performed on two groups, with the first group consisting of economies that share at least one similarity with Chile, with an average that is over 75% (G1) Australia, Poland, Canada, Germany, France, Finland and the Netherlands. The second group compared consisting of economies with the first condition, however with an average under 75% (G2), including Portugal, USA, Denmark, Spain, Greece, Norway and the United Kingdom (UK). It appears the greatest similarities with Chile in 2003 are with Austria (9 of 37 industries, 24.32%), with Canada (7 of 37: 18.91%) and the Netherlands (5 of 37: 13.51%). The greatest similarities are achieved for data related to the second cycle; ie early to mid 2000 with 70.27%, indicating that Chile not only has important structural similarities and characteristics of more developed economies; but in addition, before 2003 its structure is generally contemporary with that of the more developed economies.

Considering the first group (Table 10 in Appendix) and the greatest individual similarities for production functions, in 2003 Chile submitted an average similarity of 84.29%. Such similarities coincide with those presented by the developed economies as well as the close or equal ones that occupy the greatest values in the distinct data considered; Mid 90: 85.00% (Austria with Germany); Early 00: 85.70% (France and Germany) and Mid 00: 84.60% (Germany with Austria). On average, when considering major individual similarities, Chile is equivalent to any developed economy. Analyzing the production functions of

developed economies and Chile, high similarities are detected and highlighted, there are 7 of 37 industries (18.91%) which present a higher similarity than 90% and 23 (62.16%) between 80 and 90%; that is, over 80% of Chilean industries have similarities greater than 80% with a developed economy, which according to the parameters explained, correspond to strong evidence of proper similarities of developed economies. These high similarities exist with large economies which simultaneously highlight activities in mining; for example, with Canada and Australia (4 of 37 industries: 10.81%), therefore it is expected that their structure corresponds to those of developed economies which possess high activity in mining as well as in agriculture, forestry, and fishing.

Repeating the above exercise for the second group (G2; Table 11 in annex), a similarity equal to 82.29% was obtained, which corresponds to similarities found in developed economies and Chile and which are closest to the greatest similarities mentioned. Ten similarities were observed between Portugal and Chile in 2003, representing over 27% of all industries, followed by the UK and Greece with 5 each. With respect to when the greatest similarities are made, the majority (59.46%) are reported for the second cycle; from Early00s to Mid00s, leaving 40.54% occurring in the Mid90s. As shown, for this second group, though most similarity is achieved after 2000, it is observed that a significant number of them are presented in the Mid90s. From a dynamic perspective, it appears that Chile, in respect to groups G1 and G2, presented similarities with certain economies and even in the lower cases, the same ones increase as you progress through the base used, observing the greatest similarities with Chile in the Mid90s. Presuming that the Chilean economy, in general, suffered some delays compared to the other economies. In particular, similarities were detected that indicated a proper path, which was then lost; for example, in 1996 to 2003, the Chilean economy abandons some characteristics of developed countries (referring to the table of Chile in 2008, the matrix is obtained from Banco Central de Chile).

Revising from a second perspective, the evolution of economic framework as a last resort, the level of development and structural similarities are analyzed under Rasmussen's proposal edited by Ghosh and weighed by the scattered coefficients which in turn are also analyzed, a classic technique used to evaluate them. Initially employed matrices correspond to all of the various bases. After grouping them by their respective structures, the existence of two groups (developed and less developed) is observed; of which the lesser developed are excluded, except for the Chilean economy given that its characteristics and level of development maintained. Having established this, the Hierarchical Cluster Technique (Table 13 in the Appendix) was applied. The results indicate that the developed economies; in general are not grouped with the less developed, an exception being the case of Chile (and Argentina that resembles that of Germany's in the mid-90s).

The ratio of key branches and promoters, compared to the base and islands, is very similar for the set of analyzed tables. In the case of developed economies and taking into consideration the three data, very few changes are detected in the typology of the various activities, confirming that economies are rather static once developed. Clusters, in general, coincide with high similarities previously detected; virtually all similarity is observed in the results, highlighting that the greatest similarities identified with Le Masne's index coincide with those obtained with the technique of hierarchical cluster (see Annex dendrograms); Reviewing the Mid90 base, the similarity between Italy and Spain; and between Austria and Hungary; in the Early00 base, note the cases of Spain and France, Portugal and the Czech Republic and, Italy with the UK; finally in the Mid00 base, see the cases of Spain, Slovakia and Slovenia; Netherlands and Hungary; Poland, Portugal and the UK; Austria and Canada; and Japan, Luxembourg and Italy. The developed economies are similar, regardless of the chosen technique; it was also concluded according to the cluster technique that the Chilean economy would have the structure of a developed economy. It is especially observed in the

Early00 and Mid00 bases, where a high similarity is achieved for the first case with New Zealand and the second with Austria, Canada, Belgium, Germany and especially so with Australia.

Lastly, the difference between the economies traditionally accepted as being developed and Chile's, can be attributed among other causes to; the final domestic demand, the net effect, which would be justified by the existence of an inverse importance between the composition of the goods and services demanded and gross capital formation, in respects to the final demand and the added value, justified by the importance of exports in the developed economies. In the more developed economies, exports have a greater importance in the final demand and have a different structure (developed economies mainly export manufactured goods and services, while Chile's economy is based on copper exports).

CONCLUSIONS

A significant heterogeneity was discovered in the analysis of production structures of countries with different levels of development, as measured by its GDP per capita. This correlation is associated with the levels of development of countries with higher GDP per capita, and greater homogeneity in their production structures, while those with lower per capita GDP show various structures. To make this comparison, input-output matrices were used for 44 countries with different levels of development, which were approximated using a GDP per capita ranging from 2,985 for the less developed economies, to 82,901 for more developed economies. All correlations between pairs of economies were calculated for each of the countries utilizing chains as a measurement of productive structures as well as Le Masne's index. Next, the pattern of these correlations were studied, offering the following conclusions; Developed countries generally tend to have more diversity in the development of their productive sectors, especially in manufacturing and services, while countries with low

GDP per capita show greater specialization in primary sectors. The developed economies present greater links among industries and their economies, while it is easier to find productive enclaved sectors in less developed economies. The results seem to be dominated by the latter effect, as production structures of countries with high GDP show correlations between them significantly higher than that of the less developed economies.

Working Paper

BIBLIOGRAPHY

- ABIMANYU, A. (2000). Impact of Agriculture Trade and Subsidy Policy on the Macroeconomy, Distribution, and Environment in Indonesia: A strategy for future industrial development. *The Developing Economies*, 38(4): 547-71.
- AROCHE, F. (2006): Trees of the Essential Economic Structures: A qualitative input-output method. *Journal of Regional Science*, 46(2):333-353.
- _____. (2002): Structural Transformations and Important Coefficients in the North American Economies. *Economic Systems Research*, 14(3):257-273.
- _____. (1996): Important Coefficients and Structural Change: A multi-layer approach. *Economic Systems Research*, 8(3):235-247.
- BROWN, D., R. RIOLO, D. ROBINSON, M. NORTH and W. RAND. (2005). Spatial Process and Data Models: Toward integration of agent-based models and GIS. *Journal of Geograph Systems*, 7:25-47.
- CARTER, A. (1970): *Structural Change in the American Economy*. Cambridge, Harvard University Press.
- CLEMENTS, B., H-S. JUNG and S. GUPTA. Real and Distributive Effects of Petroleum Price Liberalization: The case of Indonesia. *The Developing Economies*, 45(2): 220-37.
- FORSELL, O. (1988). Growth and Changes in the Structure of the Finnish Economy in the 1960s and 1970s. In: M. CIASCHINI (Ed), *Input-Output Analysis*, Chapman and Hall, New York, 1988, pp. 287-302.
- GARCIA, D. (2010). Robust Smoothing of Gridded data in One and Higher Dimensions with Missing Values. *Computational Statistics and Data Analysis*, 54(4): 1167-1178.
- GHOSH, A. (1968). A Note on Leontief Models with Non-Homogeneous Production Functions. En su: *Planning programming and Input-output models: Selected papers on Indian planning*. Monographs, University of Cambridge Department of Applied Economics at the University press, New York, 1968. p 45.
- GOLDAR, B. and S. Ch. AGGARWAL. (2012). Informalization of Industrial Labor in India: Effects of labor market rigidities and import competition. *The Deloping Economies*, 50(2): 141-69.
- HAIR, J., R. ANDERSON, R. TATHAM y W. BLACK. (1999). *Análisis Multivariante*. Quinta edición, Madrid, Ed. Prentice Hall, 1999, 31-140 pp.
- HEWINGS, G. (1982). The Empirical Identification of Key Sectors in an Economy. *The Developing Economies*, 20(2):173-195.

- HEWINGS, G., M. FONSECA, J. GUILHOTO and M. SONIS. (1989). Key Sectors and Structural Change in the Brazilian Economy: A Comparison of Alternative Approaches and their Policy Implications. *Journal of Policy Modeling*, 11(1):67- 90.
- HEWINGS, G., M. SONIS, J. GUO, P. ISRAILEVICH and G. SCHINDLER (1998). The Hollowing out Process in the Chicago Economy: 1975- 2011. *Geographical Analysis*, 30(3): 217-233.
- HEWINGS, G., R.C. JENSEN and G. R. WEST (1988). Fields of Influence of Technological Change in Input-Output Models. *Papers of Regional Science Association*, 64: 25-36.
- HIDALGO, C. y R. HAUSMANN (2009): The building blocks of economic complexity. *Proceedings of the National Academy of Sciences USA (PNAS)*, 106(26): 10570- 10575.
- _____. (2008): A Network View of Economic Development. *Developing Alternatives*, 12(1): 5-10.
- HIDALGO, César, B. Klinger, A.-L. Barabási and R. Hausmann (2007): The Product Space Conditions the Development of Nations. *Science* 317: 482-487.
- HIRSCHMAN, A. (1958): *The Strategy of Economic Development*. New Haven, Connecticut, USA, Yale University Press.
- IMBS, Jean and Romain WACZIARG (2003): Stages of Diversification. *The American Economic Journal*, 93(1):63- 86.
- KOHAMA, H. and H. KAJIWARA. (1986): Structural Change in Steel Trade and International Industrial Adjustements. *The Developing Economies*, 24(2): 109-130.
- Le MASNE, P. (1988): Le système productif français face a ses voisins européens. Troisième Colloque de Comptabilité Nationale, Paris, 12-14 décembre.
- LEONTIEF, W. (1963): The Structure of Development. *Scientific American* 209, pp. 148-166.
- _____. (1951): *The Structure of American Economy, 1919-1939*. New York, Oxford University Press.
- _____. (1941): *The Structure of American Economy, 1919-1929: An Empirical Application of Equilibrium Analysis*. Harvard University Press.
- _____. (1936): Quantitative Input and Output Relations in the Economic Systems of the United States. *The Review of Economic Statistics*, 18(3): 105-125.
- NOGURERA-MÉNDEZ, P., and M. SEMITIEL-GARCÍA. (2011). The Embeddedness of the Agro-Food System in the Spanish Interindustrial Structure. *International Regional Science Review*, 34(1): 34- 74.
- RAO, V. and F. HARMSTON (1979): Identification of Key Sectors in a Region of a Developed Economy. *Annals of Regional Science*, 13(3): 78-90.

- RASMUSSEN, P. (1956): *Studies in Inter-Sectoral Relations*. Amsterdam, North- Holland P. C.
- SONIS, M., J. GUILHOTO, G. HEWINGS, and E. MARTINS. (1995). Linkages, Key Sectors, and Structural Change: Some New Perspectives. *The Developing Economics*, 33(3): 233- 270.
- SOZA-AMIGO, S. (2011): Linkages and Structural Similarities for the Regions of Chile. *Economic Analysis Review*, 26(2): 81-110.
- SOZA-AMIGO, S. and P. AROCA. (2010). Lost Opportunities in Magallanes. *Magallania*, 38(2):89-101.
- SOZA-AMIGO, S. and C. RAMOS. (2011). The Aggregation in the Input-Output Model: A review from the perspective of the branches that do not join. *Revista de Economía Mundial*, 28: 247- 276.
- THAKUR, S. (2011). Fundamental Economic Structure and Structural Change in Regional Economies: A methodological approach. *Région et Développement*, 33: 9- 38.
- _____. (2010). Identification of Regional Fundamental Economic Structure (FES): An Input-Output and Field of Influence Approach. In: Amelia U. Santos-Paulino and Guanghua Wan (eds.), *The Rise of China and India: Impacts, prospects and implications*, Palgrave-Macmillan, 312 pp.
- _____. (2008). Identification of Temporal Fundamental Economic Structure (FES) of India: An Input- Output and Cross-Entropy Analysis. *Structural Change and Economic Dynamics*, 19(2): 132- 151.
- WEST, G. and R. BROWN. (2003). *Structural Change, Inter Sectoral Linkages and Hollowing Out in the Taiwanese Economy, 1976- 1994*, Unpublished Paper, School of Economics, The University of Queensland, 1-41.
- ZAKARIAH, A. R. and E. E. AHMAD. (1999). Sources of Industrial Growth Using the Factor Decomposition Approach: Malaysia, 1978-87. *The Developing Economics*, 37(2): 162-96.

Working Paper

APPENDIX

Formulas employed.

Le Masne (1988)

$$S^{a-b} = 100 \left[1 - \frac{1}{2} \sum_{i=1}^{n+1} |a_{ij}^a - a_{ij}^b| \right] p_d$$

Where

$a_{ij} = x_{ij}/X_j$, con $a_{ij} \in A$. A , is the matrix of technical coefficients and, X , represents the production total, therefore x_{ij} , corresponds to the inputs. At the same time super indexes “a” and “b”; indicate the economies compared.

Furthermore; $p_d = \frac{(x_{ij}^n + x_{ij}^{(n+1)})}{(\sum_i x_{ij}^n + \sum_i x_{ij}^{(n+1)})}$; Indicates that Le Masne’s expression of is weighed by “ p_d ”.

Rasmussen (1956)

$$BL^R = \frac{n \cdot (I - A)^{-1} \cdot v_j^p}{i \cdot (I - A)^{-1} \cdot i}$$

$$v_j^p = \frac{\sqrt{\frac{1}{n-1} \sum_{i=1}^n (b_{ij} - \frac{x_i}{x} b_j)^2}}{\frac{x_i}{x} b_j}, \text{ con } j = 1, 2, \dots, n.$$

$$FL^{R-G} = \frac{n \cdot (I - B)^{-1} \cdot v_i^p}{i \cdot (I - B)^{-1} \cdot i}$$

$$v_i^p = \frac{\sqrt{\frac{1}{n-1} \sum_{j=1}^n (b_{ij} - \frac{x_i}{x} b_i)^2}}{\frac{x_i}{x} b_i}, \text{ con } i = 1, 2, \dots, n.$$

A : Matrix of Technical Coefficients: $A = a_{ij} = \frac{z_{ij}}{x_j} = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$

$(I-A)^{-1}$: Leontief Inverse Matrix: $(I - A)^{-1} = [b_{ij}]$

\vec{A} : Matrix of Distribution Coefficients: $\vec{A} = [\vec{a}_{ij} = \frac{z_{ij}}{x_i}]$

\vec{B} : Ghosh’s inverse matrix: $\vec{B} = (I - \vec{A})^{-1} = [\vec{b}_{ij}]$

i : vector row (unitary).

t : Indicates that a vector or matrix is transposed.

Classification of sectors according to linkage

	BL < Promedio (BL)	BL > average (BL)
FL < average (FL)	independents	drivers
FL > average (FL)	base	keys

Source: Own, based on Rasmussen (1956) and Hirschman (1958).

Table 1: Matrices available as period and PGB per capita average to PPP for 2009.

		Mid 1990	Early 2000	Mid 2000	PGB/ pc a PPP
	OCDE	--	--	--	--
1	Luxemburg	x	x	x	82901
2	Norway	x	x	x	54694
3	United States	x	x	x	45192
4	Switzerland	***	x	***	45108
5	The Netherlands	x	x	x	41082
6	Ireland	x	x	x	39836
7	Australia	x	x	x	39040
8	Austria	x	x	x	38828
9	Denmark	x	x	x	38295
10	Canada	x	x	x	37842
11	Sweden	x	x	x	37341
12	Belgium	x	x	x	36722
13	Germany	x	x	x	36040
14	Finland	x	x	x	35697
15	United Kingdom	x	x	x	34476
16	France	x	x	x	33549
17	Italy	x	x	x	32250
18	Spain	x	x	x	32164
19	Japan	x	x	x	32107
20	New Zealand	x	x	***	29496
21	Greece	x	x	x	29384
22	Slovenia	x	x	x	27179
23	Korea	***	x	x	26931
24	Czech Republic	x	x	x	25627
25	Israel	x	***	x	25472
26	Portugal	x	x	x	24938
27	Slovakia	x	x	x	22580
28	Hungary	x	x	x	20157
29	Estonia	x	x	x	19793
30	Poland	x	x	x	18927
31	Chile	x	***	x	15177
32	Turkey	x	x	x	14454
33	Mexico	***	***	x	13806
	No OCDE	--	--	--	--
1	Taiwan	x	x	x	31900
2	Russia	x	x	***	18891
3	Argentina	x	***	***	14563
4	Romania	***	x	x	14365
5	Brazil	x	x	x	10389
6	South Africa	x	x	x	10265
7	Thailand	***	***	x	7856
8	China	x	x	x	6810
9	Indonesia	x	x	x	4056
10	India	x	x	x	3086
11	Vietnam	***	x	***	2985

Source: OECD and World Bank.

Table 2: Global similarity for developed economies (base; mid 1990s).

	Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	p18	p19	p20	p21	p22	p23	p24	p25	p26	p27	Max
p1	GermanyM90																												0,00
p2	AustraliaM9495	76,8																											76,8
p3	AustriaM90	85,0	77,6																										85,0
p4	BelgiumM90	79,3	74,4	79,6																									79,6
p5	CanadaM90	72,8	74,5	73,2	68,8																								74,5
p6	DenmarkM90	83,0	77,8	83,6	77,1	73,7																							83,6
p7	SlovakiaM90	76,1	74,0	79,8	77,5	68,6	76,5																						79,8
p8	SloveniaM90	72,9	71,8	72,9	74,5	67,4	73,1	74,9																					74,9
p9	SpainM90	82,3	77,2	84,4	79,8	72,0	83,0	77,6	74,9																				84,4
p10	UnitedStatesM90	82,5	78,1	82,9	77,0	73,7	83,0	77,3	73,4	81,2																			83,0
p11	EstoniaM97	72,3	72,2	73,7	73,0	66,8	72,4	75,9	73,0	74,3	73,5																		75,9
p12	FinlandM90	80,2	75,2	80,4	75,2	70,9	80,7	76,4	73,9	80,6	78,6	72,8																	80,7
p13	FranceM90	84,2	76,3	83,8	78,7	71,8	80,7	76,2	72,5	82,2	81,3	71,4	78,9																84,2
p14	GreeceM90	76,2	73,9	79,2	73,9	70,9	78,3	72,2	68,9	78,4	77,3	66,9	75,4	76,4															79,2
p15	NetherlandsM90	81,6	77,3	81,5	77,9	72,9	81,7	76,1	73,4	81,2	80,3	71,2	78,7	80,7	75,3														81,7
p16	HungaryM90	79,0	74,6	80,4	77,7	70,2	78,3	79,3	77,0	80,1	78,5	77,3	78,7	79,5	73,6	77,7													80,4
p17	IrelandM90	74,8	67,9	74,1	71,5	65,4	74,1	69,4	66,0	75,1	73,2	65,4	71,3	74,4	69,3	73,0	71,9												75,1
p18	IsraelM90	72,1	69,2	73,0	67,4	70,4	71,7	66,1	63,9	70,8	71,8	64,5	67,6	70,7	69,2	70,9	69,5	67,2											73,0
p19	ItalyM90	81,3	78,1	83,9	79,4	69,8	82,9	78,1	75,1	84,3	82,1	74,3	78,5	81,4	77,4	80,9	79,1	73,2	70,5										84,3
p20	JapanM90	78,0	75,6	81,4	75,3	72,8	79,1	75,9	73,5	79,5	79,6	71,1	77,1	80,5	76,2	76,0	77,7	70,4	72,4	79,0									81,4
p21	LuxemburgM90	74,6	69,6	75,0	71,9	65,8	73,6	68,5	65,4	72,3	75,5	64,0	70,5	75,0	72,3	72,1	71,4	69,2	67,0	73,7	72,3								75,5
p22	NorwayM90	79,3	77,3	81,5	77,3	71,8	83,2	76,6	74,8	81,2	80,2	73,0	79,6	78,8	76,0	79,9	76,7	72,3	68,9	82,0	76,9	70,5							83,2
p23	NewZealandM9596	76,4	77,8	78,3	75,1	71,4	77,6	74,5	74,1	76,6	78,9	73,8	76,0	77,1	73,0	76,8	78,5	69,6	67,7	77,4	74,4	69,7	77,1						78,9
p24	PolandM90	72,4	73,4	73,2	69,6	70,5	70,9	71,4	65,0	69,7	72,7	69,2	69,0	71,0	68,0	70,6	70,6	65,4	64,9	70,8	68,0	65,6	69,2	69,2					73,4
p25	PortugalM90	77,5	75,0	80,0	78,5	68,9	78,3	76,6	73,6	79,9	76,8	72,4	76,6	78,4	75,2	79,2	76,7	71,4	66,5	77,8	76,0	69,2	78,2	77,0	67,4				80,0
p26	UnitedKingdomM90	81,9	76,3	83,5	78,0	70,4	83,1	77,5	75,2	82,5	83,0	72,4	78,7	81,7	75,2	81,4	79,2	76,9	72,5	83,2	78,1	72,8	81,4	78,7	70,7	78,4			83,5
p27	CzechRepublicM90	78,2	75,6	80,9	78,4	69,2	78,5	83,2	74,7	79,7	79,9	76,7	77,4	78,1	73,2	79,4	80,7	70,7	66,1	81,4	75,5	69,6	78,8	76,5	72,7	78,4	79,9		83,2
p28	SwedenM90	80,6	76,2	82,3	77,0	71,6	81,7	76,8	73,5	80,7	80,3	72,8	81,1	80,3	75,5	78,0	77,3	70,8	69,7	81,4	76,9	71,5	82,0	76,4	69,4	76,2	80,4	78,5	82,3
	Maximum	85,0	78,1	84,4	79,8	73,7	83,2	83,2	77,0	84,3	83,0	77,3	81,1	81,7	77,4	81,4	80,7	76,9	72,5	83,2	78,1	72,8	82,0	78,7	72,7	78,4	80,4	78,5	

Source: Own, based on OECD data.

Table 3: Global similarity for developed economies (base; early 2000).

Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	p18	p19	p20	p21	p22	p23	p24	p25	p26	p27	p28	Max
p1 GermanyE00																													0,0
p2 AustraliaE0102	77,5																												77,5
p3 AustriaE00	84,1	76,9																											84,1
p4 BelgiumE00	81,0	74,6	79,3																										81,0
p5 CanadaE00	80,0	77,2	79,4	76,0																									80,0
p6 KoreaE00	72,1	68,9	72,6	70,7	73,3																								73,3
p7 DenmarkE00	81,0	75,5	80,5	76,8	78,8	70,3																							81,0
p8 SlovakiaE00	75,6	74,9	76,5	77,3	73,4	68,9	72,5																						77,3
p9 SloveniaE00	78,9	75,6	79,8	79,6	76,3	71,4	77,5	77,1																					79,8
p10 SpainE00	82,4	76,2	82,2	79,5	77,4	74,5	78,9	76,1	80,2																				82,4
p11 UnitedStatesE00	78,1	78,2	78,9	72,7	76,3	68,7	76,5	72,4	74,9	74,9																			78,9
p12 EstoniaE00	74,6	74,9	75,7	75,4	73,6	71,5	75,3	77,2	77,9	76,9	73,3																		77,9
p13 FinlandE00	77,9	75,6	79,3	75,6	76,6	70,7	78,3	72,9	76,1	79,6	74,6	75,4																	79,6
p14 FranceE00	85,7	77,0	83,9	80,8	79,2	72,8	79,7	76,5	80,9	83,1	77,3	76,1	79,4																85,7
p15 GreeceE00	77,1	74,3	78,4	74,6	77,0	71,1	78,8	70,9	75,2	77,0	74,0	71,5	75,1	76,8															78,8
p16 NetherlandsE00	81,3	75,5	80,9	80,0	79,9	72,1	79,0	75,8	78,3	80,6	75,4	73,8	77,0	82,9	74,6														82,9
p17 HungaryE00	77,4	75,4	77,3	77,4	74,0	72,5	74,2	77,4	78,4	78,5	74,3	80,1	76,9	79,1	71,6	76,4													80,1
p18 IrelandE00	76,8	70,8	77,0	74,3	73,3	66,1	74,5	69,3	74,7	76,2	72,1	71,0	73,5	77,6	72,1	74,8	72,6												77,6
p19 ItalyE00	81,0	77,9	83,4	81,3	77,6	71,8	81,4	77,1	80,4	82,8	75,0	77,6	77,9	83,4	78,7	80,6	77,0	75,1											83,4
p20 JapanE00	78,6	74,0	80,6	75,0	75,2	72,3	76,0	72,5	75,8	77,2	75,6	72,2	74,6	79,4	75,5	74,7	74,4	72,3	77,3										80,6
p21 LuxemburgE00	75,4	69,0	74,1	71,9	70,4	63,9	70,2	65,4	70,6	69,2	66,5	69,0	74,1	72,1	71,7	69,1	71,7	71,9	70,3										75,4
p22 NorwayE00	78,9	76,0	80,1	77,7	77,3	69,2	81,7	73,9	78,0	78,5	74,8	74,7	79,4	79,8	77,7	78,5	73,5	74,5	80,7	75,4	69,4								81,7
p23 NewZealandE0203	71,5	74,6	72,7	71,0	72,4	62,7	70,0	71,2	72,3	70,5	74,1	73,1	70,2	72,1	68,0	72,1	71,3	72,4	71,2	69,0	68,2	71,6							74,6
p24 PolandE00	78,3	76,3	79,0	76,3	74,1	69,0	76,9	77,2	77,6	78,0	76,3	76,6	74,2	77,6	75,8	75,8	78,7	71,9	79,2	75,6	68,9	76,0	72,1						79,2
p25 PortugalE00	79,9	76,2	82,7	81,1	77,9	74,0	79,0	77,6	80,6	81,9	75,8	77,0	78,1	81,2	78,6	81,5	77,9	74,8	81,6	78,1	70,9	80,0	72,5	77,5					82,7
p26 UnitedKingdomE00	80,5	75,1	81,8	76,7	78,3	69,3	80,1	75,1	78,0	78,9	76,1	73,7	75,8	81,1	76,8	79,7	73,5	76,1	81,6	77,1	71,3	79,9	73,2	76,2	80,6				81,8
p27 CzechRepublicE00	78,6	73,6	79,0	79,6	76,1	72,7	75,0	80,0	80,2	79,3	73,6	79,3	75,8	80,1	71,9	79,9	80,2	73,1	78,1	72,9	69,2	76,0	72,9	77,0	80,5	76,9			80,5
p28 SwedenE00	80,5	75,9	80,3	77,8	78,3	70,1	79,9	73,1	77,4	79,7	76,4	73,5	79,5	81,2	77,0	77,8	74,2	73,1	80,1	77,2	69,8	80,6	70,0	75,3	78,2	78,2	75,6		81,2
p29 SwitzerlandE00	78,8	74,3	79,9	75,7	73,7	67,7	74,1	72,8	76,0	76,4	72,3	71,7	73,5	79,2	72,4	77,0	73,8	75,5	77,0	74,3	73,3	73,6	74,5	72,8	77,2	75,4	75,0	74,1	79,9
Maximum	85,7	78,2	83,9	81,3	79,9	74,5	81,7	80,0	80,9	83,1	77,3	80,1	79,5	83,4	78,7	81,5	80,2	76,1	81,6	78,1	73,3	80,6	74,5	77,5	80,6	78,2	75,6	74,1	

Source: Own, based on OECD data.

Table 4: Global similarity for developed economies (base; mid 2000).

Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	p18	p19	p20	p21	p22	p23	p24	p25	p26	p27	Max
p1 GermanyM00																												0,0
p2 AustraliaM0405	75,4																											75,4
p3 AustriaM00	84,6	75,2																										84,6
p4 BelgiumM00	82,0	75,1	81,0																									82,0
p5 CanadaM00	78,2	76,6	78,5	75,6																								78,5
p6 KoreaM00	73,1	68,6	74,1	72,0	71,3																							74,1
p7 DenmarkM00	80,6	73,4	80,2	79,0	76,3	70,8																						80,6
p8 SlovakiaM00	76,4	74,1	80,6	77,1	75,8	72,2	74,1																					80,6
p9 SloveniaM00	79,6	74,2	80,8	80,5	76,0	72,4	77,2	80,2																				80,8
p10 SpainM00	81,8	75,3	81,1	80,7	74,7	74,4	78,1	79,2	81,3																			81,8
p11 United StatesM00	78,1	73,6	78,5	75,1	80,0	71,7	76,4	74,7	75,4	75,2																		80,0
p12 EstoniaM00	76,9	73,1	76,7	76,6	74,3	72,6	75,9	78,1	79,5	78,8	72,6																	79,5
p13 FinlandM00	80,5	76,9	80,7	79,5	79,0	72,6	78,8	76,1	78,9	80,5	77,5	78,3																80,7
p14 FranceM00	83,9	75,9	82,9	82,4	77,5	72,9	79,6	77,2	82,0	82,1	78,5	77,3	80,7															83,9
p15 GreeceM00	75,9	72,4	77,4	74,5	74,9	69,1	74,5	73,0	75,0	75,3	74,1	71,4	74,7	75,5														77,4
p16 NetherlandsM00	80,9	76,1	81,3	80,2	79,0	71,8	78,5	77,3	78,8	79,7	76,1	76,2	79,1	82,5	73,1													82,5
p17 HungaryM00	78,3	73,2	78,1	78,3	75,5	73,0	74,5	79,4	78,9	78,1	74,9	78,7	77,1	78,6	71,7	75,9												79,4
p18 IrelandM00	75,1	68,9	73,4	74,2	69,4	64,3	71,2	68,6	73,1	72,5	68,6	70,0	72,6	73,7	67,7	73,5	70,7											75,1
p19 IsraelM04	75,8	73,4	74,5	73,7	77,0	68,1	72,9	72,4	74,3	71,9	74,8	71,3	73,6	75,0	74,7	73,8	72,6	70,0										77,0
p20 ItalyM00	80,2	77,0	83,1	82,1	76,1	73,4	80,0	78,9	80,6	82,1	76,2	77,9	79,7	83,5	77,5	80,3	78,4	71,4	73,4									83,5
p21 JapanM00	75,7	71,0	75,9	75,5	76,1	76,2	73,5	74,2	75,2	76,1	75,9	73,5	75,3	77,2	74,7	73,9	73,6	67,3	72,5	75,3								77,2
p22 LuxemburgM00	71,3	66,4	69,0	71,2	66,0	63,2	67,0	64,0	70,0	68,5	65,3	68,3	69,8	71,3	68,8	70,2	68,9	68,4	67,4	70,1	65,5							71,3
p23 NorwayM00	77,2	74,1	77,6	77,4	75,0	67,4	79,0	73,0	77,9	76,1	74,1	74,6	78,1	77,2	74,3	77,1	73,5	73,5	70,4	77,2	71,6	69,0						79,0
p24 PolandM00	80,1	77,4	81,7	79,7	77,1	73,7	77,6	81,0	84,5	81,8	76,5	79,7	79,8	81,3	77,1	80,1	80,3	70,0	72,4	82,8	76,2	67,3	77,5					82,8
p25 PortugalM00	78,7	74,7	81,7	81,5	76,3	75,6	76,9	79,1	80,2	82,2	74,5	77,7	79,4	80,6	76,6	80,8	78,7	71,7	72,9	80,4	77,1	68,5	75,0	81,1				82,2
p26 UnitedKingdom00	81,6	75,7	81,8	79,9	78,2	71,1	79,8	76,5	79,2	79,9	77,9	74,2	77,6	81,3	77,2	80,8	74,2	74,8	75,2	81,0	75,9	69,0	77,8	79,8	79,4			81,8
p27 CzechRepublicM00	77,2	72,9	78,2	77,4	73,8	73,0	74,2	79,3	79,6	78,6	72,1	79,7	77,5	77,5	69,5	78,5	76,6	70,0	70,1	78,2	71,7	67,4	73,0	78,9	79,5	75,5		79,7
p28 SwedenM00	76,2	72,3	76,6	73,9	72,9	71,3	74,8	72,7	72,3	74,0	76,2	72,7	77,0	74,9	70,4	73,1	71,5	66,6	67,4	74,5	72,2	61,6	74,1	75,9	74,0	73,7	72,3	77,0
Maximum	84,6	77,4	83,1	82,4	80,0	76,2	80,0	81,0	82,0	82,2	78,5	79,7	80,7	83,5	77,5	80,8	80,3	74,8	75,2	82,8	77,1	69,0	77,8	81,1	79,5	75,5	72,3	

Source: Own, based on OECD data.

Table 5: Global similarities for less developed economies (base; mid 1990).

	Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	Maximum
p1	ChileM96											0,0
p2	ChileM03	90,0										90,0
p3	ArgentinaM97	82,0	80,1									82,0
p4	TurkeyM96	73,0	72,1	77,3								77,3
p5	BrazilM90	75,8	73,4	77,4	75,2							77,4
p6	ChinaM90	67,6	67,8	70,9	65,7	69,7						70,9
p7	IndiaM9394	72,5	71,7	75,0	73,1	74,1	69,1					75,0
p8	IndonesiaM90	69,1	66,7	71,5	72,2	71,2	62,9	70,8				72,2
p9	RussiaM90	68,7	68,9	68,0	65,8	62,6	65,7	63,8	60,6			68,9
p10	SouthAfricaM93	75,9	75,0	78,2	73,9	74,4	73,5	74,6	69,2	66,7		78,2
p11	TaiwanM96	70,3	69,9	73,7	73,7	76,6	68,5	71,5	72,5	61,0	72,1	76,6
	Maximum	90,0	80,1	78,2	75,2	76,6	73,5	74,6	72,5	66,7	72,1	

Source: Own, based on OECD data.

Table 6: Global similarity for less developed economies (base; early 2000).

	Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	Maximum
p1	ChileM96													0,0
p2	ChileM03	90,0												90,0
p3	ArgentinaM97	82,0	80,1											82,0
p4	TurkeyE98	74,0	72,8	77,1										77,1
p5	BrazilE00	77,6	75,4	79,3	77,2									79,3
p6	ChinaE00	70,4	69,7	72,9	67,6	71,8								72,9
p7	IndiaE9899	71,8	71,2	73,9	72,7	74,1	68,8							74,1
p8	IndonesiaE00	68,1	67,6	69,5	71,6	72,3	66,4	69,7						72,3
p9	RomaniaE00	69,8	68,6	72,2	72,3	72,8	67,5	71,0	68,8					72,8
p10	RussiaE00	69,3	69,0	68,1	65,6	62,8	60,7	62,7	58,5	63,9				69,3
p11	SouthAfricaE00	75,8	75,3	78,2	72,4	75,8	73,1	73,8	69,9	71,5	68,1			78,2
p12	TaiwanE01	71,7	70,6	75,5	74,7	77,3	70,3	69,7	71,3	69,0	60,3	73,3		77,3
p13	VietnamE00	69,8	69,4	70,9	70,1	69,8	68,2	63,8	64,5	63,9	68,6	70,0	69,8	70,9
	Maximum	90,0	80,1	79,3	77,2	77,3	73,1	73,8	71,3	71,5	68,6	73,3	69,8	

Source: Own, based on OECD data.

Table 7: Global similarity for less developed economies (base; mid 2000).

	Countries	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	Maximum
p1	ChileM96													0,0
p2	ChileM03	90,0												90,0
p3	ArgentinaM97	82,0	80,1											82,0
p4	MexicoM03	80,4	78,6	79,7										80,4
p5	TurkeyM02	74,3	73,8	77,9	75,7									77,9
p6	BrazilM00	80,4	78,0	82,5	75,5	77,6								82,5
p7	ChinaM00	67,7	66,7	70,0	64,1	70,7	71,8							71,8
p8	IndiaM00	70,0	69,3	73,3	71,3	72,9	73,1	68,8						73,3
p9	IndonesiaM00	75,9	74,9	77,1	70,9	70,7	74,5	68,5	70,3					77,1
p10	RomaniaM00	70,0	69,5	72,7	68,8	71,0	71,6	68,5	70,8	68,9				72,7
p11	SouthAfricaM00	71,1	71,7	70,0	66,6	62,4	67,4	61,5	62,5	68,6	62,8			71,7
p12	ThailandM00	72,6	71,6	73,2	70,1	72,9	73,5	70,2	71,4	73,0	67,7	63,2		73,5
p13	TaiwanM0006	69,0	68,6	71,1	70,4	76,7	73,1	68,1	67,8	66,5	66,4	59,7	73,3	76,7
	Maximum	90,0	80,1	82,5	75,7	77,6	74,5	70,2	71,4	73,0	67,7	63,2	73,3	

Source: Own, based on OECD data.

Table 8: Structural Dynamics for developed economies (Mid 1990, Early 2000 and Mid 2000).

	Countries	Mid90// Early00	Early00// Mid00	Mid90// Mid00
1	Norway	91,86	88,87	85,49
2	Australia	90,46	87,10	86,90
3	The Netherlands	94,29	90,95	88,17
4	Ireland	78,60	83,09	75,96
5	United Nations	81,27	91,80	81,20
6	Luxemburg	87,54	86,29	80,57
7	Canada	81,40	85,63	81,07
8	Germany	91,22	94,77	90,81
9	Denmark	90,62	92,63	87,53
10	Finland	88,94	87,23	84,75
11	Austria	91,16	90,68	86,38
12	Sweden	93,35	83,66	82,17
13	Belgium	85,80	88,56	84,85
14	France	88,90	94,80	87,26
15	Spain	88,55	94,13	86,41
16	Japan	92,16	87,91	88,68
17	United Kingdom	89,75	93,37	88,48
18	Italy	93,91	95,36	91,66
19	Greece	84,43	87,62	82,59
20	Slovenia	79,28	88,08	76,65
21	Czech Republic	84,02	86,24	81,52
22	Portugal	86,39	93,72	85,66
23	Slovakia	55,13	83,56	56,34
24	Hungary	86,64	87,06	86,39
25	Poland	72,82	88,35	72,76
26	Estonia	82,79	87,98	79,97
	Average	85,82	89,21	83,09
	Maximum	94,29	95,36	91,66
	Minimum	55,13	83,09	56,34
	Average (without Slovakia)	87,05	89,44	84,16
	Maximum (without Slovakia)	94,29	95,36	91,66
	Minimum (without Slovakia)	72,82	83,09	72,76

Source: Own, based on data OCDE.

Table 9: Structural Dynamics for Chile and its likeness to developed economies.

	Structure	Chile Mid90	Chile Early00	Chile Mid00	Structure	Chile Mid90	Chile Early00	Chile Mid00	
1	ChileM03	90,04			42	FranceM90	75,72	74,98	70,22
2	ChileE10	76,77	77,80		43	FranciaE00	76,35	75,67	69,78
3	NorwayM90	75,06	74,20	69,67	44	FranceM00	75,85	75,37	68,83
4	NorwayE00	74,25	74,34	70,02	45	SpainM90	75,41	73,63	69,52
5	NorwayM00	71,70	71,85	70,49	46	SpainE00	75,09	73,58	68,48
6	AustraliaM9495	78,51	78,18	69,25	47	SpainM00	74,42	73,02	67,66
7	AustraliaE0102	80,15	79,15	69,08	48	JapanM90	72,48	71,11	71,79
8	AustraliaM0405	80,06	79,32	69,95	49	JapanE00	71,88	70,84	70,10
9	NetherlandsM90	75,85	74,08	68,45	50	JapanM00	70,96	70,03	68,97
10	NetherlandsE00	75,47	73,91	67,52	51	United KingdomM90	75,04	74,24	69,14
11	NetherlandsM00	75,65	74,29	67,73	52	United KingdomE00	74,46	74,60	69,74
12	IrelandM90	69,15	68,22	65,71	53	United KingdomM00	74,86	74,62	70,15
13	IrelandE00	72,42	71,84	70,22	54	ItalyM90	74,06	72,89	69,14
14	IrelandM00	69,75	69,71	67,07	55	ItalyE00	74,34	73,53	68,13
15	UnitedStatesM90	75,77	74,80	70,81	56	ItalyM00	73,83	73,25	67,48
16	UnitedStatesE00	76,01	75,13	73,88	57	GreeceM90	74,22	72,45	69,57
17	UnitedStatesM00	72,27	72,22	70,65	58	GreeceE00	75,28	74,16	70,21
18	LuxemburgM90	69,53	68,25	67,98	59	GreeceM00	73,79	73,29	71,45
19	LuxemburgE00	69,79	69,37	66,71	60	SloveniaM90	68,36	67,44	63,22
20	LuxemburgM00	66,06	66,01	62,74	61	SloveniaE00	74,00	72,82	68,12
21	CanadaM90	76,25	74,21	67,68	62	SloveniaM00	74,18	73,31	69,36
22	CanadaE00	77,81	75,50	69,22	63	CzechRepublicM90	73,00	72,72	67,03
23	CanadaM00	78,87	77,19	71,51	64	CzechRepublicE00	74,75	74,54	67,12
24	GermanyM90	76,88	75,91	69,54	65	CzechRepublicM00	71,81	72,35	65,66
25	GermanyE00	76,62	75,63	69,68	66	PortugalM90	75,54	74,68	69,45
26	GermanyM00	76,64	76,03	69,44	67	PortugalE00	76,13	75,35	70,66
27	DenmarkM90	75,70	74,19	69,75	68	PortugalM00	74,62	74,18	68,93
28	DenmarkE00	74,46	72,68	68,36	69	SlovakiaM90	45,21	44,84	41,43
29	DenmarkM00	73,39	72,38	66,67	70	SlovakiaE00	71,20	70,96	65,37
30	FinlandM90	74,32	72,47	68,51	71	SlovakiaM00	72,16	71,78	67,81
31	FinlandE00	74,71	73,54	68,50	72	HungaryM90	73,53	73,20	69,21
32	FinlandM00	76,24	75,57	70,12	73	HungaryE00	72,01	71,93	66,03
33	AustriaM90	77,36	76,34	72,79	74	HungaryM00	70,74	70,66	66,63
34	AustriaE00	76,64	76,62	71,79	75	PolandM90	77,49	77,34	69,53
35	AustriaM00	76,75	77,07	70,47	76	PolandE00	73,47	73,46	69,16
36	SwedenM90	74,88	73,01	68,17	77	PolandM00	74,85	74,57	69,47
37	SwedenE00	74,88	72,85	67,52	78	EstoniaM97	69,95	69,78	64,96
38	SwedenM00	71,25	69,80	68,94	79	EstoniaE00	71,33	71,40	66,05
39	BelgiumM90	72,34	72,84	66,77	80	EstoniaM00	72,49	73,00	68,14
40	BelgiumE00	72,89	73,22	65,80					
41	BelgiumM00	72,99	73,50	66,94					
	Maximum	80,15	79,32	73,88	Maximum	77,49	77,34	71,79	
	Minimum	66,06	66,01	62,74	Minimum	45,21	44,84	41,43	
	Average	74,60	73,73	68,87	Average	72,95	72,35	67,79	

Source: Own, based on data OCDE.

Table 10: Structural Similarity for G1 versus Chile-2003

	Industries	Chile 2003		
		%	Eco	Data
1	C01T05 Agriculture, hunting, forestry and fishing	86,05	Netherlands	M90
2	C10T14 Mining and quarrying	84,48	Austria	E00
3	C15T16 Food products, beverages and tobacco	91,14	France	E00
4	C17T19 Textiles, textile products, leather and footwear	89,65	Poland	M00
5	C20 Wood and products of wood and cork	85,13	Austria	M00
6	C21T22 Pulp, paper, paper products, printing and publishing	89,07	Finland	M00
7	C23 Coke, refined petroleum products and nuclear fuel	89,31	Netherlands	M00
8	C24 Chemicals and chemical products	86,30	Canada	E00
9	C25 Rubber and plastics products	89,29	Canada	M00
10	C26 Other non-metallic mineral products	91,65	Canada	E00
11	C27 Basic metals	85,97	Australia	M00
12	C28 Fabricated metal products except machinery and equipment	87,87	Canada	M00
13	C29 Machinery and equipment n.e.c	86,23	Australia	M00
14	C30 Office, accounting and computing machinery	75,03	Finland	M00
15	C31 Electrical machinery and apparatus n.e.c	62,93	Austria	M90
16	C32 Radio, television and communication equipment	68,38	Finland	E00
17	C33 Medical, precision and optical instruments	61,92	Austria	M90
18	C34 Motor vehicles, trailers and semi-trailers	85,80	Finland	E00
19	C35 Other transport equipment	76,31	Canada	E00
20	C36T37 Manufacturing n.e.c; recycling	84,67	France	E00
21	C40t41 Electricity, gas and water supply	92,57	Austria	M90
22	C45 Construction	86,63	Austria	M00
23	C50T52 Wholesale and retail trade; repairs	84,60	Australia	M90
24	C55 Hotels and restaurants	86,47	Australia	M90
25	C60T63 Transport and storage	86,86	Canada	M00
26	C64 Post and telecommunications	86,99	Austria	M00
27	C65T67 Finance and insurance	93,95	Netherlands	M90
28	C70 Real estate activities	91,03	Germany	M90
29	C71 Renting of machinery and equipment	68,15	Germany	M90
30	C72 Computer and related activities	74,56	Austria	M00
31	C73 Research and development	80,36	Netherlands	E00
32	C74 Other Business Activities	91,72	Canada	E00
33	C75 Public admin. and defence; compulsory social security	87,76	Netherlands	E00
34	C80 Education	93,39	France	M90
35	C85 Health and social work	87,63	Poland	M00
36	C90T93 Other community, social and personal services	88,57	Austria	M90
37	C95 Private households with employed persons	80,46	Poland	M00
	Global Similarity (in %)	84,29	Austria (9)	

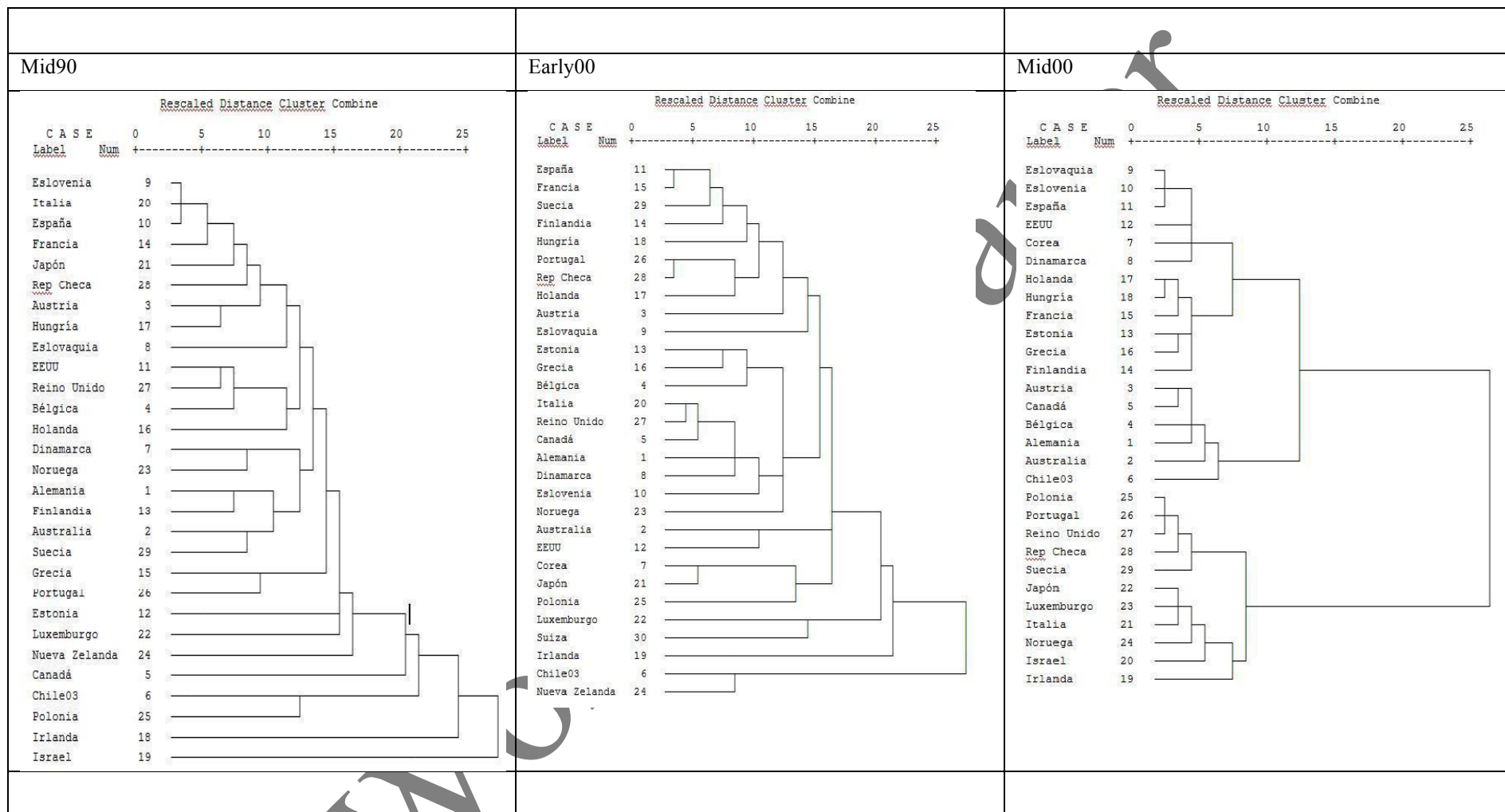
Source: Own, based on input-output tables published in the OECD.

Table 11: Structural similarity for G2 versus Chile-2003.

	Industries	Chile 2003		
		%	Eco	Data
1	C01T05 Agriculture, hunting, forestry and fishing	87,07	United Kingdom	M90
2	C10T14 Mining and quarrying	81,95	United States	E00
3	C15T16 Food products, beverages and tobacco	89,72	Denmark	M00
4	C17T19 Textiles, textile products, leather and footwear	87,75	Norway	M90
5	C20 Wood and products of wood and cork	84,57	Norway	E00
6	C21T22 Pulp, paper, paper products, printing and publishing	87,91	Portugal	M00
7	C23 Coke, refined petroleum products and nuclear fuel	93,38	United Kingdom	M00
8	C24 Chemicals and chemical products	89,79	United Kingdom	E00
9	C25 Rubber and plastics products	88,47	Greece	M90
10	C26 Other non-metallic mineral products	85,76	Portugal	M00
11	C27 Basic metals	71,53	Norway	M90
12	C28 Fabricated metal products except machinery and equipment	91,03	United States	M90
13	C29 Machinery and equipment n.e.c	86,58	Spain	M90
14	C30 Office, accounting and computing machinery	79,20	Portugal	M90
15	C31 Electrical machinery and apparatus n.e.c	63,29	United States	M90
16	C32 Radio, television and communication equipment	68,32	Portugal	M90
17	C33 Medical, precision and optical instruments	61,15	Greece	M90
18	C34 Motor vehicles, trailers and semi-trailers	85,43	Denmark	M90
19	C35 Other transport equipment	60,73	United Kingdom	E00
20	C36T37 Manufacturing n.e.c; recycling	86,61	Norway	M90
21	C40t41 Electricity, gas and water supply	91,12	Portugal	E00
22	C45 Construction	89,70	Greece	E00
23	C50T52 Wholesale and retail trade; repairs	84,92	Denmark	M00
24	C55 Hotels and restaurants	86,48	Portugal	M90
25	C60T63 Transport and storage	87,69	Portugal	M00
26	C64 Post and telecommunications	84,06	Portugal	M00
27	C65T67 Finance and insurance	94,07	Spain	M00
28	C70 Real estate activities	91,02	Portugal	M90
29	C71 Renting of machinery and equipment	53,35	United Kingdom	M00
30	C72 Computer and related activities	62,85	Spain	M00
31	C73 Research and development	58,87	United States	M00
32	C74 Other Business Activities	90,56	Greece	E00
33	C75 Public admin. and defence; compulsory social security	86,42	Greece	M00
34	C80 Education	94,67	Norway	M00
35	C85 Health and social work	89,46	Portugal	M00
36	C90T93 Other community, social and personal services	91,05	Greece	E00
37	C95 Private households with employed persons	78,18	United Kingdom	M90
	Average of Global Similarity (in %)	82,29	Portugal (10)	

Source: Own, based on input-output tables published in OECD.

Table 13: Dendrograms for developed economies according to OECD data (Mid90; Early00 y Mid00) versus Chile-2003.



Source: Own