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# Comparative Analysis of Brazil's National and Regional Economic Structure, 1985, 1990, 1995\*

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## Introduction

The changes that are taking place recently in the Brazilian economy raise some questions about its future. The goal of this paper is to analyze the differences in the productive structure in the Brazilian economy and five macro regions for the years of 1985, 1990, and 1995, using some established and recent contributions to linkage analysis applied to input-output tables. The main sources of data are interregional and intersectoral input-output matrices constructed by the authors for the years of 1985, 1990, and 1995 for the five Brazilian macro regions (North, Northeast, Central West, Southeast, and South).

The next section will present an overview of the Brazilian economy in the 1980s and 1990s; in the third section, a brief discussion about the regional differences in Brazil will be made, while the methodology will be presented in the forth section. The results follow in the fifth section and some concluding comments complete the paper.

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### **A Brief Overview of the Brazilian Economy in the 1980s and 1990s**

In the 1980s, the Brazilian economy experienced a very low growth rate especially when compared to its long run history. In the 1980s, the national GDP grew at yearly average rate of only 1.56 % (Bonelli and Gonçalves, 1998). The 1990s can be divided into two periods. From 1990 to 1993, the economy went through a period of recession, with the GDP growing at a yearly average rate of 1.6 %; industry and the agriculture grew at yearly rates of 0.3% and 2.3%. In the second period, from 1993 to 1997, the yearly average GDP growth rate was of 4.4%, while industry, agriculture, and services grew, respectively, 3.8%, 6%, and 3.1% (Bonelli and Gonçalves, 1998).

In 1994, investment accounted for 16.3% of Brazilian GDP; in 1995 this share grew to 19.2% (Baer, 1996 and Conjuntura Econômica, 1997). The quality of the investment also improved and at the same time there was a growth in the share of imported capital goods. This contributed to an increase in productivity; with a consequent increase in wages (5.7% in 1993, and 6.2% in 1995) there was also a decrease in the unemployment rates from 5.3% in 1993 to 4.6% in 1995 (IBGE, 1997a and Conjuntura Econômica, 1997).

The strong performance of the industrial sector in the 1990 was followed by the growth in importance of the service sector, mainly due to increased subcontracting by the industrial sector after the economy was opened up, a process that started in 1990 (Bonelli and Gonçalves, 1998). While the 1980s are characterized by a closed economy, the 1990s can be said to be a decade of openness and modernization in Brazil.

Finally, we should stress the tendencies and the sectoral progress in the Brazilian economy in the last decade. The share of the industrial sector in the economy declined from 48% in 1985 to 42% in 1990 and to 34% in 1995, while the service sector's shares grew respectively from 40%, to 47% and to 54%. The shares of the agricultural sector were maintained, 12% for 1985, 11% for 1990, and 12% for 1995 (Melo *et al.*, 1998)

### **The Brazilian Macro Regions**

Using the IBGE classification, the Brazilian Economy can be divided into 5 macro regions (figure 1) North (7 States); Northeast (9 States); Central West (3 States and the Federal District); Southeast (4 States); and South (3 States). The overall size of the Brazilian territory is 8.5m km<sup>2</sup> of which 45.3% belongs to the North region, 18.3% to the Northeast, 18.9% to the

Central West, 10.9% to the Southeast, and 6.8% to the South. However, the economic and population distribution do not follow the geographical distribution, as can be seen in table 1.

Having 45.3% of the Brazilian territory, the North region has only 7.2% of the Brazilian population and the smallest number of people living per km<sup>2</sup>, it also has the smallest share of population living in cities (62.4%) and the smallest share in the Brazilian GDP (4.6% in 1995). The most developed regions in Brazil are the Southeast and the South region. The Southeast region had a share of 58.7% (1995) of the Brazilian GDP with 42.7% (1996) of its population and 10.9% of the territory, while the South region had a share of 17.9% (1995) in the Brazilian GDP with 6.8% of the territory and 15.0% (1996) of the population. The Southeast region is the most industrialized region in Brazil, while the South region is the one more closed to the Mercosur countries and potentially the region that stands to gain most from Mercosur integration.



**Figure 1 Map of Brazil and Its Five Macro Regions**

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The Central West region has been an important region for Brazil in terms of agriculture, mainly because of the favorable type of land that this region has, and it has a reflex in its share in the population, 6.69% in 1996, and GDP, 5.98% in 1995, of Brazil. The Northeast region has serious problems of drought and in the beginning of the formation of the Brazilian State it used to be its most important region. This region has 18.3% of the Brazilian territory, 28.5% (1996) of its population and 12.8% (1995) of its GDP; recently oil extraction and processing has been one of the most rapidly growing sectors in the region and with the openness of the Brazilian economy, a number of industries have been installing their production units in the region (in part due to the fiscal incentives provided by the various levels of state government).

**Table 1**                      **Main Economical and Geographical Indicators of the Brazilian Macro Regions**

Regions	Size		Population (1996)			GDP Shares		
	km <sup>2</sup>	Share %	Number 1,000	Share %	Urban Share %	1985 %	1990 %	1995 %
North	3,851,560	45.25	11,288	7.19	62.36	3.84	4.94	4.64
Northeast	1,556,001	18.28	44,767	28.50	65.21	14.10	12.86	12.78
Central West	1,604,852	18.85	10,501	6.69	84.42	4.81	5.16	5.98
Southeast	924,266	10.85	67,001	42.66	89.29	60.15	58.83	58.72
South	575,316	6.76	23,514	14.97	77.22	17.10	18.21	17.89
Brazil	8,511,996	100.00	157,070	100.00	78.36	100.00	100.00	100.00

Source: IBGE (1997a, 1997b, and 1999)

### Theoretical Background

In this section, the theory used to analyze the differences in productive structure of the Brazilian macro regions will be described. It is based on some well-known indices associated with the work of Hirschman and Rasmussen and some recent modifications that are referred to as pure linkages approaches.

#### *The Hirschman/Rasmussen Approach*

The work of Rasmussen (1956) and Hirschman (1958) established the development of indices of linkages that have now become part of the

generally accepted procedures for identifying key sectors in the economy. Define  $b_{ij}$  as a typical element of the Leontief inverse matrix,  $B$ ;  $B^*$  as the average value of all elements of  $B$ , and if  $B_{\bullet j}$  and  $B_{i\bullet}$  are the associated typical column and row sums, then the indices may be developed as follows:

*Backward linkage index (power of dispersion):*

$$U_j = [B_{\bullet j} / n] / B^* \quad (1)$$

*Forward linkage index (sensitivity of dispersion):*

$$U_i = [B_{i\bullet} / n] / B^* \quad (2)$$

One of the criticisms of the above indices is that they do not take into consideration the different levels of production in each sector of the economy; this is accommodated in the pure linkage approach presented in the next section.

### ***The Pure Linkage Approach***

As presented by Guilhoto *et al.* (1996, 1997), the pure linkage approach can be used to measure the importance of the sectors in terms of production generation in the economy. Consider a two-region input-output system represented by the following block matrix,  $A$ , of direct inputs:

$$A = \begin{pmatrix} A_{jj} & A_{jr} \\ A_{rj} & A_{rr} \end{pmatrix} \quad (3)$$

where  $A_{jj}$  and  $A_{rr}$  are the quadrat matrices of direct inputs within the first and second region,  $A_{rj}$  and  $A_{jr}$  are the rectangular matrices showing the direct inputs purchased by the first region from the second region and vice versa.

From (3), one can generate the following expression:

$$B = (I - A)^{-1} = \begin{pmatrix} B_{jj} & B_{jr} \\ B_{rj} & B_{rr} \end{pmatrix} = \begin{pmatrix} \Delta_{jj} & 0 \\ 0 & \Delta_{rr} \end{pmatrix} \begin{pmatrix} \Delta_j & 0 \\ 0 & \Delta_r \end{pmatrix} \begin{pmatrix} I & A_{jr}\Delta_r \\ A_{rj}\Delta_j & I \end{pmatrix} \quad (4)$$

where:

$$\Delta_j = (I - A_{jj})^{-1} \quad (5)$$

$$\Delta_r = (I - A_{rr})^{-1} \quad (6)$$

$$\Delta_{jj} = (I - \Delta_j A_{jr} \Delta_r A_{rj})^{-1} \quad (7)$$

$$\Delta_{rr} = (I - \Delta_r A_{rj} \Delta_j A_{jr})^{-1} \quad (8)$$

By utilizing this decomposition (equation 4), it is possible to reveal the process of production in an economy as well as derive a set of multipliers/linkages.

From the Leontief formulation:

$$X = (I - A)^{-1} Y \quad (9)$$

and using the information contained in equations (4) through (8), one can derive a set of indexes that can be used to rank the regions in terms of its importance in the economy, and to see how the production process occurs in the economy.

From equations (4) and (9), one obtains:

$$\begin{pmatrix} X_j \\ X_r \end{pmatrix} = \begin{pmatrix} \Delta_{jj} & 0 \\ 0 & \Delta_{rr} \end{pmatrix} \begin{pmatrix} \Delta_j & 0 \\ 0 & \Delta_r \end{pmatrix} \begin{pmatrix} I & A_{jr} \Delta_r \\ A_{rj} \Delta_j & I \end{pmatrix} \begin{pmatrix} Y_j \\ Y_r \end{pmatrix} \quad (10)$$

which leads to the definitions for the Pure Backward Linkage (PBL) and for the Pure Forward Linkage (PFL), i.e.,

$$\begin{aligned} PBL &= \Delta_r A_{rj} \Delta_j Y_j \\ PFL &= \Delta_j A_{jr} \Delta_r Y_r \end{aligned} \quad (11)$$

where the PBL will yield the pure impact on the rest of the economy of the value of the total production in region  $j$ ,  $(\Delta_j Y_j)$ : i.e., the impact that is free from the demand inputs that region  $j$  makes from region  $j$ , and the feedbacks from the rest of the economy to region  $j$  and vice-versa. The PFL will give the pure impact on region  $j$  of the total production in the rest of the economy  $(\Delta_r Y_r)$ .

As the PBL and PFL are shown in current values, the pure total linkage (PTL) can be obtained by adding the two previous indices, i.e.,

$$PTL = PBL + PFL \quad (12)$$

The pure linkage indices can also be normalized by the average value of the sectors in the economy such that the normalized indices show how many times a sector is larger or smaller than the average sector in the economy.

In such a way, it is possible to use these indices for a direct comparison of the productive structure of economies of different sizes and even with different currencies. In the same way, the methods allow for a temporal comparison in economies that have experienced significant inflation or that have changed their currency.

### **The Productive Structure of Brazil and Its 5 Macro Regions**

In analyzing the productive structure of Brazil and its five regions, through the eyes of the Hirschman/Rasmussen and pure linkage approaches, this section is divided into three parts. First, an analysis is provided to reveal the set of key sectors. Secondly, a cross-section analysis is made, comparing the productive structure of the national economy with those of the macro regions. Finally, in the last part, a temporal comparison is made using the productive structure in the year of 1985 as a base period.

#### ***Key-Sectors***

The determination of key sectors in a economy is not an easy task, since not every sector will be able to fulfill all the desirable characteristics, namely, having strong backward and forward linkages, generating a high level of production, employment and income, a better distribution of income, a low level of pollution, and so forth.<sup>5</sup> In this section, we will use two measures to determine which sector is a key sector; first one is based on the Hirschman/Rasmussen backward and forward linkages that take into consideration only how the sectors relate with each other based on their technical coefficients, and the second measure that is based in the pure linkage approach. In addition to considering the productive structure, it also accounts for the importance of a sector in generating production value in the economy.

For the Hirschman/Rasmussen approach, we define key sectors, following McGilvray (1977), as those whose backward and forward linkages are greater than one. For the pure linkage approach, if a sector presents a value greater than one for the normalized pure total linkage it is considered a key sector for the economy.<sup>6</sup> The complete set of results for these two approaches are shown in summary form in tables 2 and 3. For

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<sup>5</sup> A good discussion of what is a key sector can be found in McGilvray (1977).

<sup>6</sup> It should be stressed here that the definition of key sector is in a certain sense dependent on how the sectors are aggregated in the input-output matrices, as so, different aggregations could result into different definition of key sectors for a given economy.



the Brazilian economy as a whole (table 2) the key sectors are: Agriculture; Metallurgy; Chemicals; Textiles; Food Products; Construction; Trade; Transportation (only for the year of 1985); and Services. For the North region (table 2) the key sectors are: Agriculture; Machinery (for 1985 and 1990); Wood & Wood Products (for 1985 and 1990); Chemicals (for 1990 and 1995); Textiles; Food Products; Public Utilities; Construction; Trade; Transportation (only for the year of 1985); and Services. In the Northeast region (table 2) the key sectors are: Agriculture; Metallurgy; Paper Products & Printing; Chemicals; Textiles; Food Products; Public Utilities; Construction; Trade; and Services while for the Central West region (table 3) the key sectors are: Agriculture; Non-Metallic Minerals (only in 1985); Chemicals (in 1990 and 1995); Textiles; Food Products; Public Utilities (only in 1985); Construction; Trade; Transportation; and Services.

**Table 2 Consolidated Key-Sectors, Hirschman/Rasmussen and Pure Linkages, for the Brazilian Economy and for the North and Northeast Regions, 1985, 1990, and 1995**

Sectors	Brazil			North			Northeast		
	1985	1990	1995	1985	1990	1995	1985	1990	1995
1. Agriculture	0	0	0	0	0	0	0	0	0
2. Mining									
3. Non-Metallic Minerals									
4. Metallurgy	⊕	⊕	⊕	+	+		+	+	+
5. Machinery									
6. Electrical Equipment									
7. Transport Equipment									
8. Wood & Wood Prod.				0	0				
9. Paper Prod. & Printing							+	+	+
10. Rubber Industry									
11. Chemicals	0	⊕	⊕		0	0	⊕	⊕	⊕
12. Pharmaceutical									
13. Plastics									
14. Textiles	+	+	+	+	+	+	+	+	+
15. Clothing and Footwear									
16. Food Products	0	0	0	0	0	0	0	0	0
17. Miscellaneous Indust.									
18. Public Utilities				⊕	0	0	⊕	0	0
19. Construction	0	0	0	0	0	0	0	0	0
20. Trade	0	0	0	0	0	0	0	0	0
21. Transportation	0			0					
22. Services	0	0	0	0	0	0	0	0	0
+ Key sector by the Hirschman/Rasmussen approach (forward and backward linkages greater than 1.0)									
0 Key sector by the pure linkage approach (normalized pure total linkage greater than 1.0)									
⊕ Key sector by both approaches, Hirschman/Rasmussen and pure linkage									

For the Southeast region (table 3), the key sectors are: Agriculture; Metallurgy; Machinery (in 1985 and 1990); Transport Equipment; Paper Products & Printing (only in 1990); Chemicals; Textiles; Food Products;

Construction; Trade; Transportation; and Services and for the South region (table 3), the key sectors are: Agriculture; Metallurgy; Paper Products & Printing; Chemicals (in 1985 and 1990); Textiles; Clothing and Footwear (in 1985 and 1990); Food Products; Construction (in 1985 and 1990); Trade; Transportation; and Services.

From the above presentation of the key sectors in the economy, it is possible to explore some similarities and differences in the results. The following sectors are defined as key sectors exclusively by the Hirschman/Rasmussen criteria: Non-Metallic Minerals; Machinery; Paper Products & Printing; and Textiles, whereas according to the pure linkage criterion, the following sectors are considered key ones: Transport Equipment; Clothing and Footwear; Construction; Trade; Transportation; and Services. From the use of either approach in different regions and/or periods of time, the following sectors are considered key sectors: Agriculture; Metallurgy; Chemicals; Food Products; and Public Utilities.

**Table 3** Consolidated Key-Sectors, Hirschman/Rasmussen and Pure Linkages, for the Central West, Southeast, and South Regions, 1985, 1990, and 1995

Sectors	Central West			Southeast			South		
	1985	1990	1995	1985	1990	1995	1985	1990	1995
1. Agriculture	⊕	0	⊕	0	0	0	0	0	0
2. Mining									
3. Non-Metallic Minerals	+								
4. Metallurgy				⊕	⊕	⊕	+	+	+
5. Machinery				+	+				
6. Electrical Equipment									
7. Transport Equipment				0	0	0			
8. Wood & Wood Prod.									
9. Paper Prod. & Printing					+		+	+	+
10. Rubber Industry									
11. Chemicals		0	0	0	0	0	0	0	
12. Pharmaceutical									
13. Plastics									
14. Textiles	+	+	+	+	+	+	+	+	+
15. Clothing and Footwear							0	0	
16. Food Products	0	0	0	0	0	0	0	0	⊕
17. Miscellaneous Indust.									
18. Public Utilities	+								
19. Construction	0	0	0	0	0	0		0	0
20. Trade	0	0	0	0	0	0	0	0	0
21. Transportation	0	0	0	0	0	0	0	0	0
22. Services	0	0	0	0	0	0	0	0	0

+ Key sector by the Hirschman/Rasmussen approach (forward and backward linkages greater than 1.0)

0 Key sector by the pure linkage approach (normalized pure total linkage greater than 1.0)

⊕ Key sector by both approaches, Hirschman/Rasmussen and pure linkage

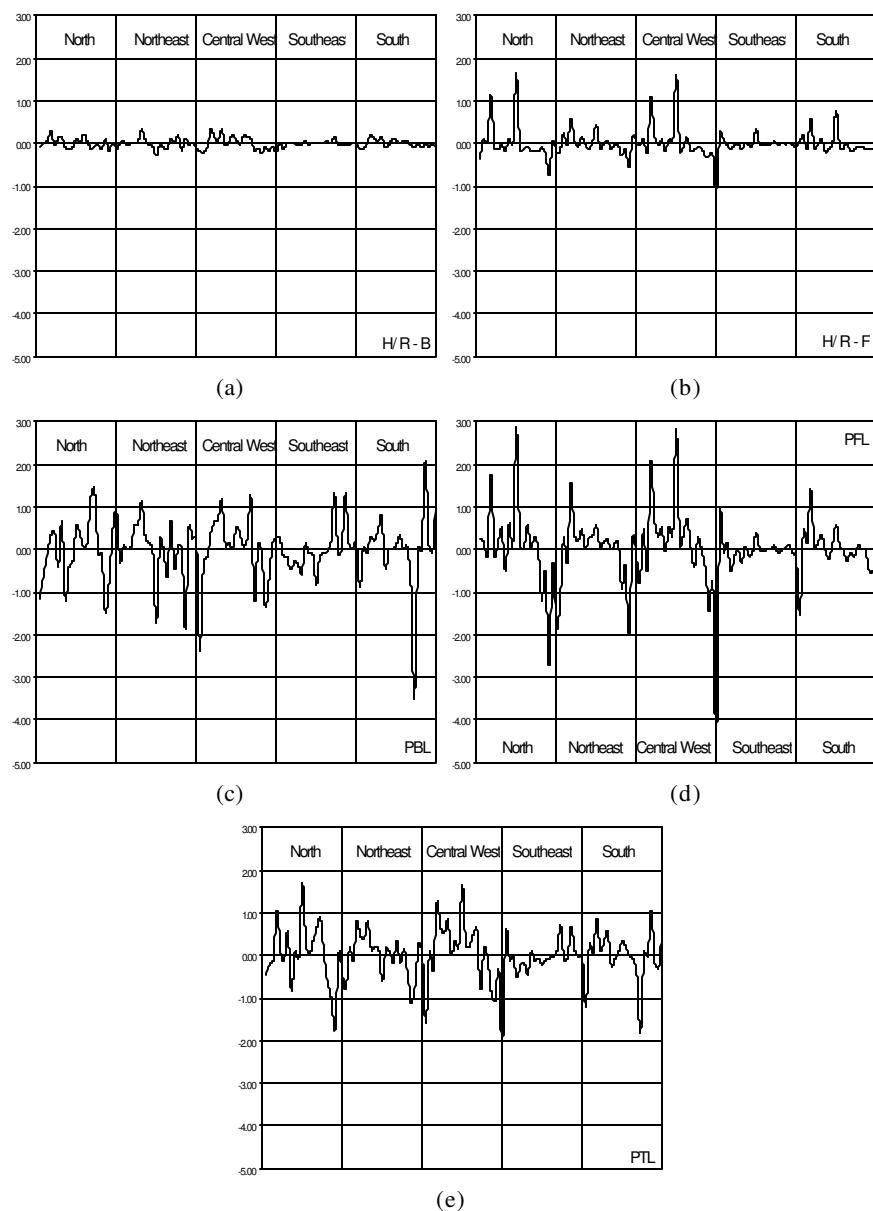
Notwithstanding the similarities among the regions, there are some important differences. For example, one can note, as examples, the importance of the Paper Products & Printing sector in the Northeast and South regions, Transport Equipment in the Southeast region, Public Utilities in the North and Northeast regions, Agriculture sector under both approaches in the Central West region, Chemical sector also under both approaches for the Northeast region..

As revealed in the derivation of the above indices, there is a difference in one sector being a key sector in one or the other definition. Defined as a key sector in the Hirschman/Rasmussen approach means being an important sector in terms of the productive structure, while designation as a key sector in the pure linkage approach means being a key sector in the process of generating production. As such, it may be claimed that a sector that is defined as key in both definitions is certainly a sector that is a very important one for the region. This may be the type of sector to which careful attention would need to be paid when considering any form of economic development policy.

### ***Productive Structure in Space***

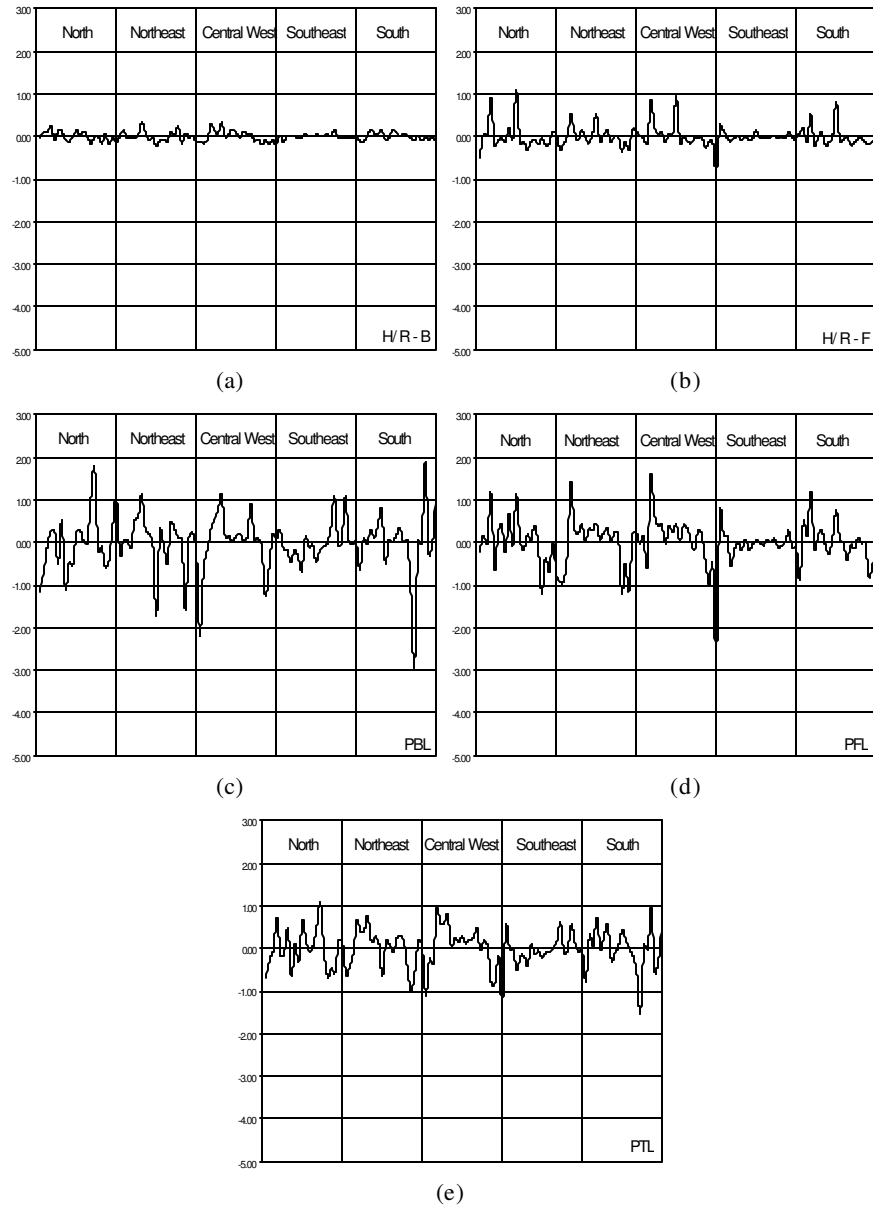
Using the results of the Hirschman/Rasmussen and the pure linkage approaches for Brazil as a “numeraire,” it is possible to study how the results for the macro regions differ from the ones for the Brazilian economy. The general idea is that the closer the results for the regions are to the results for the Brazilian economy, the more similar the productive structures. Figure 2 for the year of 1985, figure 3 for the year of 1990, and figure 4 for the year of 1995 provide the comparative analyses.

These figures do resemble and are based in the idea of the electroencephalograms in medicine that measure the differences from a given standard, as such we call them as the Electroconograms of the Productive Structure (EPS). The higher the amplitude of the waves in the figures, the more different are the productive structures. For 1985, the greatest amplitudes in the EPS are in the pure linkages, showing the difference in importance of the sectors in generating production value in the regions. Further, the forward linkages do reveal larger waves than the backward linkages. The same patterns repeat in 1990 and 1995.

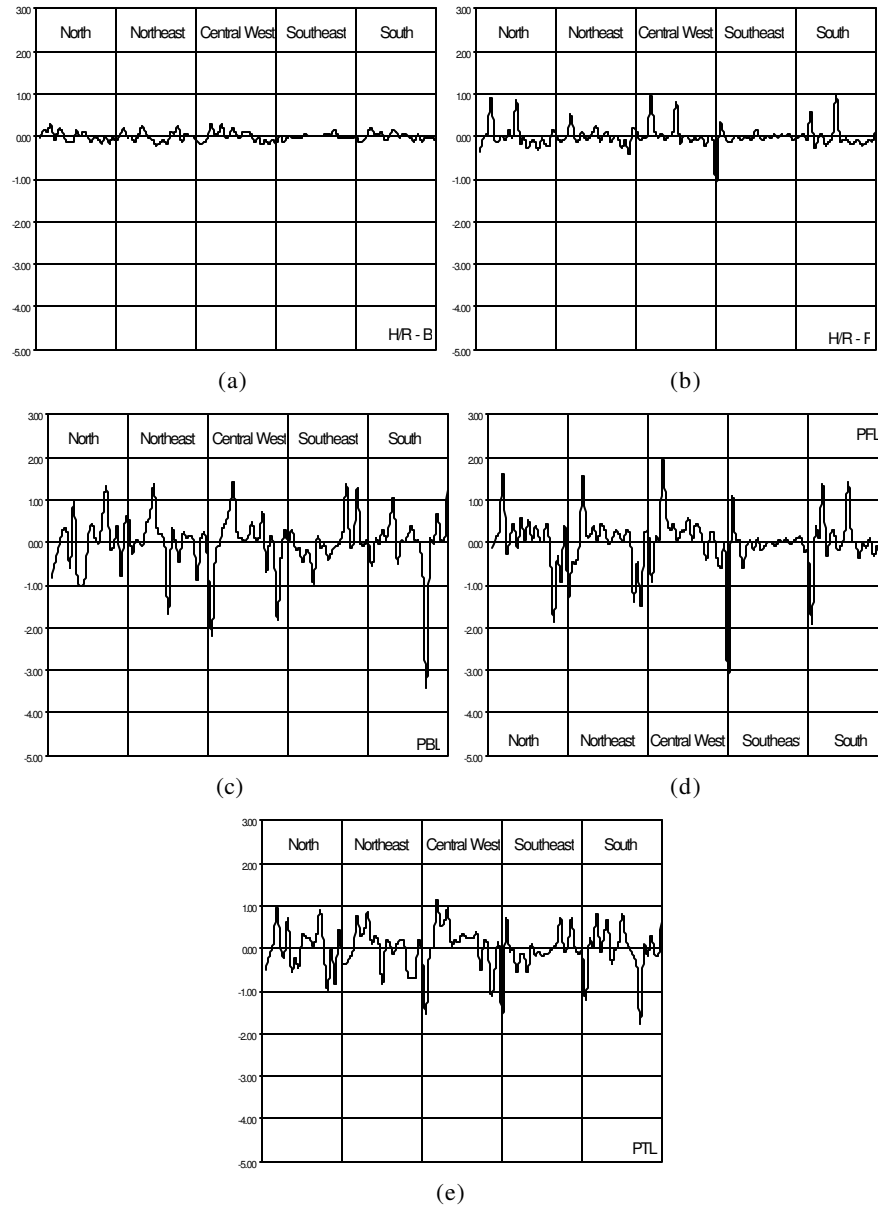


**Figure 2** Electroconogram of Linkages for the Brazilian Macro Regions – 1985  
**(a) Hirschman/Rasmussen Backward (b) Hirschman/Rasmussen Forward (c) Normalized Pure Backward Linkage (d) Normalized Pure Forward Linkage (e) Normalized Pure Total Linkage**

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**Figure 3** Electroconogram of Linkages for the Brazilian Macro Regions – 1990  
**(a) Hirschman/Rasmussen Backward (b) Hirschman/Rasmussen Forward (c) Normalized Pure Backward Linkage (d) Normalized Pure Forward Linkage (e) Normalized Pure Total Linkage**



**Figure 4** Electroconogram of Linkages for the Brazilian Macro Regions – 1995  
**(a) Hirschman/Rasmussen Backward (b) Hirschman/Rasmussen Forward (c) Normalized Pure Backward Linkage (d) Normalized Pure Forward Linkage (e) Normalized Pure Total Linkage**

For the Hirschman/Rasmussen indices, from the EPS for all the years of the analysis it can be seen that for the backward linkages, the results show that the Southeast and the South regions are closer to the productive structure of the Brazilian economy, while the other regions present greater differences. For the forward linkages, the closest region to the productive structure of the Brazilian economy is the Southeast region, followed by the Northeast and the South regions, while the North and the Central West regions the more different.

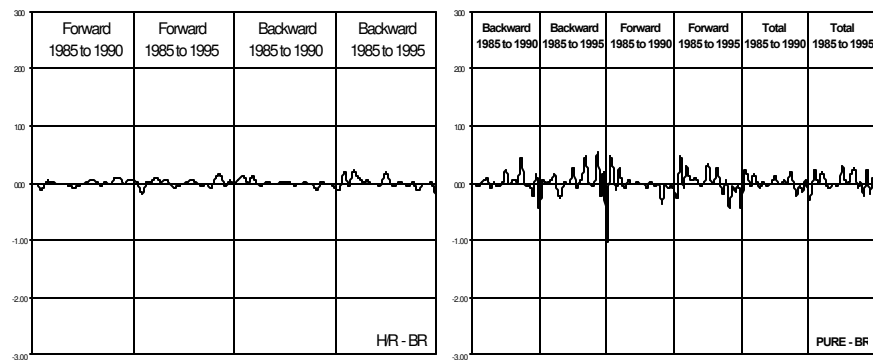
Looking at the pure linkages approach, from the EPS, for all the years of the analysis one finds that the smallest waves are in the pure total linkages, implying that there is an averaging effect of the differences revealed in the backward and forward linkages. The closest productive structure to the Brazilian economy is the one of the Southeast region, the other four regions do present differences from the Brazilian economy as a whole and the patterns of differences are not similar among region, indicating that every region has a particular pattern of production. The amplitude of the waves in the EPS show that, from 1985 to 1990, the differences of the regions to the Brazilian economy as a whole decreased, increasing again from 1990 to 1995. However, considering the whole period, from 1985 to 1995, the differences tended to decrease.

Guilhoto (1999), using the same interregional system for 1995 as the one used in this paper, was able to estimate the *dependence* among the productive structure of the regions. The results showed that the North region has practically no relation with the Northeast region and vice-versa; while the South region has some impact on the production of the North region while the reverse is not true. Although the demands from the Central West region have some impact on the production of the other regions, the production in the Central West region has its relations concentrated with the Southeast and South regions. From this analysis, we can suggest that the South and Southeast regions are the most important regions in the system.

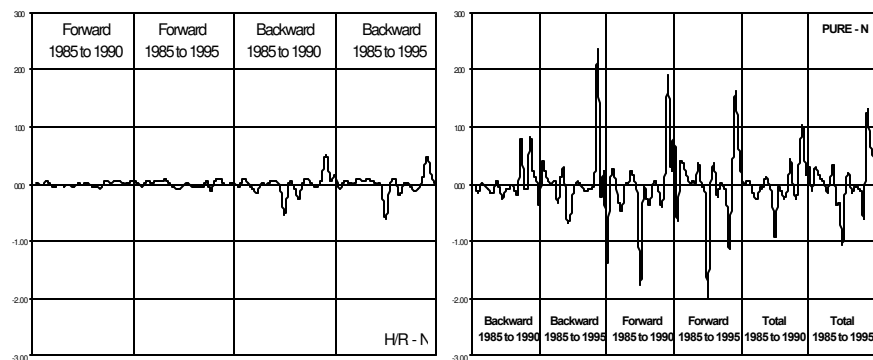
### ***Productive Structure in Time***

In similar fashion to the approach adopted in the previous section, using the results of the Hirschman/Rasmussen and the pure linkages approaches for the year of 1985 as a "numeraire," it is possible to explore how the results for the economies of Brazil and of its five macro regions have changed through time. The general idea is that the smaller the changes that did occur, the closer the results to those for the base year; the findings are summarized in figures 5 to 10. These figures adopt the same convention as

figures 2 to 4 and thus can be also called the Electroekonograms of the Productive Structure (EPS). However, the difference is that they now show changes through time and not through space but the interpretations are similar – larger differences in amplitude indicating more changes occurred in the productive structures through the time period of analysis.



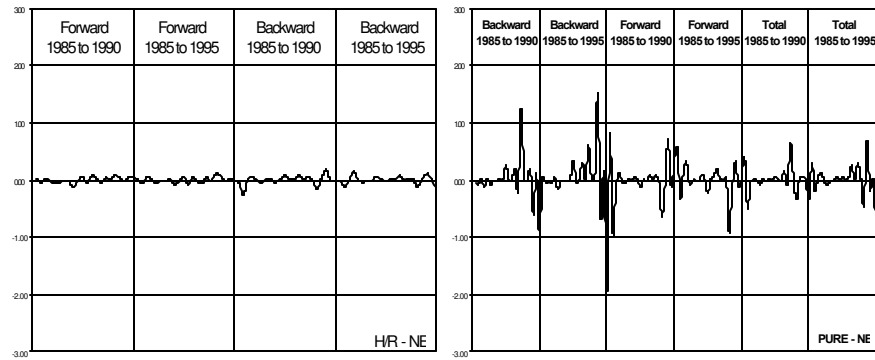
**Figure 5** Electroekonogram of the Changes in the Hirschman/Rasmussen and Normalized Pure Linkages for Brazil - 1985 to 1995



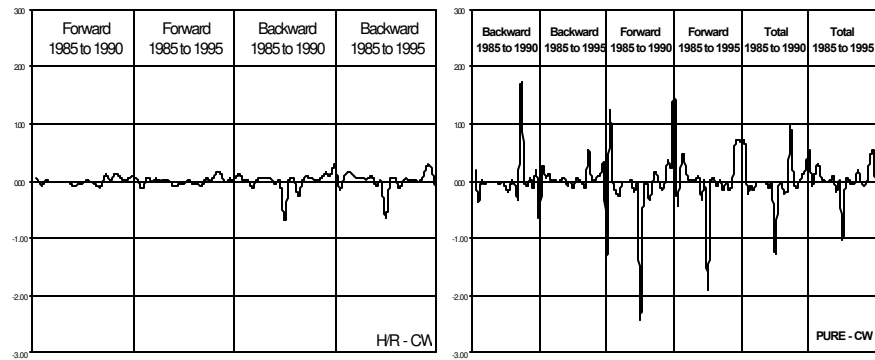
**Figure 6** Electroekonogram of the Changes in the Hirschman/Rasmussen and Normalized Pure Linkages for the North Region - 1985 to 1995



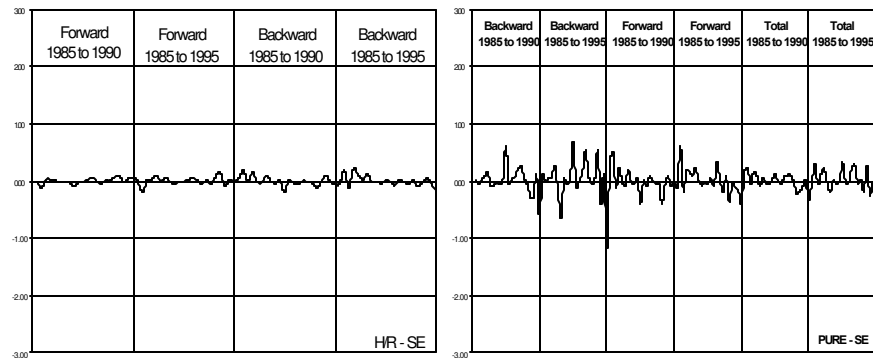
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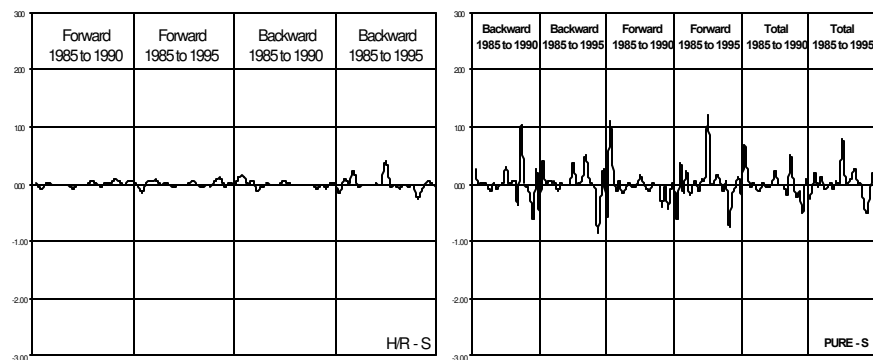
**Figure 7** Electroconogram of the Changes in the Hirschman/Rasmussen and Normalized Pure Linkages for the Northeast Region - 1985 to 1995



**Figure 8** Electroconogram of the Changes in the Hirschman/Rasmussen Linkages and Normalized Pure for the Central West Region - 1985 to 1995



**Figure 9** Electroconogram of the Changes in the Hirschman/Rasmussen and Normalized Pure Linkages for the Southeast Region - 1985 to 1995



**Figure 10** Electroconogram of the Changes in the Hirschman/Rasmussen Linkages and Normalized Pure for the South Region - 1985 to 1995

In general, the changes reported in the Hirschman/Rasmussen approach are smaller than the changes that occurred in the pure linkages approach. Also, the waves in general are larger for the 1985 to 1995 period than from the 1985 to 1990 period, showing that changes are taking place in the economy through time. For the Hirschman/Rasmussen indices, the larger waves are found in the forward linkages – indicating changes in the sales linkages. For the Pure Linkages indices, the larger waves are found either

in the backward linkages (Brazil, Northeast and Southeast) or in the forward linkages (North, Central West, and South); as a general rule for all the regions being analyzed, the changes in the pure total linkages are smaller than the ones found in the backward and forward linkages.

The regions that show the largest waves, i.e., the economies that have undergone a lot of changes in the time period, are the North and Central West regions. The Northeast occupies a middle position with modest change while the South regions are the ones with the smallest waves. The results for the Brazilian economy as a whole reveal the smallest waves of the whole system. Hence, while the economies of some regions experienced some evident change in their structure, this was not reflected in the national experience where the changes were modest. Also, there is a greater similarity in the patterns of change in the Brazilian economy with the ones found for the Southeast Region; this is not surprising given the dominant role that this region plays in the Brazilian economy.

### **Final Comments**

The analysis began with an identification of the key sectors in the Brazilian economy and in five macro regions. Attention was then directed to a comparative analysis, first between the regions and the Brazilian economy as a whole and then in terms of change that had occurred over time. The key sector indices associated with Hirschman/Rasmussen and the Pure Linkage methodology was adopted and an innovation in presentation was proposed, the idea of an Electroconogram that allows measurement of the differences in space and time of the productive structure of the economies.

The results in general show that the productive structure of the economies of the Brazilian regions are different one from another and also differ from the Brazilian economy as a whole. The patterns of change through time show that the evolution of the productive structure of the regions are also different one from another, however, maybe due to the greater share that the Southeast region has in the Brazilian economy, the patterns of changes in the Southeast region are very similar to the ones for Brazil as a whole.

While this analysis has suggested some new insights into ways of comparing the productive structure of the regions, there still some question that need to be answered. What are the causes for the differences in productive structure among regions? How do the economic relations (trading patterns) among the regions affect their productive structure? Are the differences in productive structure an indication merely of different

sectoral mixes or do they reflect differences in the competitive advantage of different regions?

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