Spatial Interdependence of Brazilian Exports: Impacts on the Regional Labor Markets

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ABSTRACT

This paper analyzes the interdependence among Brazilian states associated with employment generation by the export sector. Using a unique database — an interstate input-output table for 1996 — employment multipliers are calculated for six different skill groups. Multiplier decomposition techniques are also used in order to reveal intrastate and interstate patterns of dependence. The analysis of the regional impacts of state exports on employment suggests a concentration of skilled labor content in the states in the Southeastern and Southern regions. More developed states benefit to a great extent from Brazilian exports, responding directly and indirectly to the demand for skilled workers.

1. Introduction

Despite the significant advances achieved during the 1990s, Brazil remains a country with a small degree of trade openness relative to the rest of the world. The Brazilian openness coefficient, measured by the sum of imports and exports, is half that of countries with similar levels of national income. While not exclusively responsible, this factor has been one of the most serious constraints on economic growth and the generation of new jobs, since it contributes to a high current account deficit on the balance of payments, of the order of 4% of GDP in 2002, a figure equivalent to 40% of Brazilian export volumes. Despite the encouraging recent performance of the export sector, there is still strong upwards pressure on domestic interest rates, limiting productive investments that promote the absorption of labor [see Bruno(1987)]. In the case of exports, there appears to be a consensus that their importance is not merely restricted to the positive effects that they can bring to bear in reducing the trade deficit, but also, and principally, in generating employment. By boosting national output, exports generate direct jobs in these sectors, and indirect ones resulting from the links in the productive chain. In addition, the net inflow of foreign currency promotes the so-called income effect, i.e. an effect on production and employment arising from the consumption of economic agents who receive income generated by export activity.

The increase in employment arising from exports is a well-known phenomenon, but this relationship is not restricted to this quantitative dimension. In order to participate in the international market by exporting goods and services, companies must develop the capacity to deal with a much more competitive environment, raising productivity, reducing production costs and increasing efficiency. Zockun (2002), analyzing data for the São Paulo economy showed that if principal variables are controlled, companies that export tend to generate greater value added, pay better salaries and have a productivity differential that is 72% greater than companies that do not export.

Hence, in this case, it may be inferred that exports affect the labor market not only through by generating employment, but also because they are associated with the level of qualification of labor, given that there is a well-defined relationship between this quality and productivity levels. That is to say, the export-employment pair also has a clear qualitative dimension. This is because, on the one hand, exporting companies need skilled staff to increase their productivity with a view to promoting their competitive insertion in a globalized economy, and on the other, because they tend to have an important impact on the labor market, to the degree that their demand tends to be concentrated among workers with a higher level of educational attainment, who are supposedly of higher quality.

In this way, the stimulus given to exports is reflected in the labor market not only through the increase in the number of jobs generated both directly and indirectly, as a result of the growth in production along the whole of the productive chain, but also due to the effects of such exports on the relative demand for labor according to level of qualification.[1] In this

[1] For an analysis of spatially aggregated impact, see Domingues, Leon and Haddad (2001).

sense, exporting companies, since they use more modern technology, tend to employ workers with a higher level of educational attainment, with the geographical concentration of the same exporting companies also having an impact on the profile of labor that will be used.

Comparative advantage is a concept that is repeatedly used as a factor for explaining the level of trade in a region. In summary, Ricardo's theory explains comparative advantage in terms of cost differentials (supply) that arise from technology and endowments of specific resources among the regions involved in the exchange process [Bowen, Hollander and Videne (1998)]. The Brazilian economy is not internally homogeneous, showing sharp variations between regions and sectors. Upon analyzing the structure of international trade among states, it is important to remember the particular characteristics of each state; e.g. its productive structure, the availability of natural resources, government incentives, tax structure, inherent costs of transport and ease of access to foreign markets. These factors are determinants of the pattern of trade in each state. Allied to these factors, we may also highlight the presence of tariff and non-tariff barriers, of agreements and systems of preferential trade between countries that constrain the exploitation of the comparative advantages of states for trade in specific products. This paper will focus on relative endowments of the labor factor in Brazilian states, considering its qualitative dimension. Could the theoretical literature on international trade, which finds in the neoclassical model an undisputable reference to the explanation of the nature of such trade flows, explain to some extent, the pattern of exports by Brazilian states?

In summary, among other results, the methodological development and the empirical evidence that follows is an attempt to show that in regions and states with a higher concentration of export volumes, there is an even greater accumulation of skilled labor, for the simple reason that exporting companies hire this kind of labor as one of the prerequisites for achieving high productivity and maintaining competitiveness in international markets.

This study is divided into four sections, in addition to this introduction. In Section 2, a brief description is given of the sectoral/regional profile of level of educational attainment of the Brazilian workforce. In Section 3, we present the methodology for calculation using an import-export matrix. The results are presented and analyzed in Section 4. In Section 5, we present our final conclusions.

2 The level of educational attainment of the Brazilian workforce IN 1996

2.1 Educational structure of the workforce: by sector

According to data from the *Pesquisa Nacional por Amostra de Domicílios* [Brazilian Households Survey] (PNAD) And the input-output matrix, there were some 64.8 million workers, employed both formally with a signed *carteira assinada* [official work card] or in some other form of occupation, classed generically as informal. The highest levels of

employment were in the service sector (services in general and trade), followed by agriculture and industry (transformation and construction).

Table 1 clarifies the occupational dimension of each branch of activity. By means of it, we may verify that in 1996, the sum of sectors composing the service sector (other services,[2] commerce and financial institutions) accounted for around 53.0% of all current employment in the country, agriculture for 22.0%, while the total for industry was 19.1 %.

Table 1. Sectoral Distribution of Employment by Category of Educational Achievement: Brazil, 1996

	G1	*G2*	*G3*	*G4*	*G5*	*G6*	*Total*
Agriculture	0.557	0.399	0.195	0.065	0.027	0.015	0.220
Transformation Industry	0.062	0.092	0.156	0.182	0.135	0.093	0.129
Public Utility Services	0.015	0.011	0.010	0.010	0.014	0.016	0.012
Construction	0.069	0.093	0.082	0.043	0.019	0.018	0.062
Commerce	0.085	0.129	0.186	0.259	0.243	0.103	0.178
Financial Institutions	0.007	0.010	0.018	0.042	0.077	0.137	0.036
Public sector	0.018	0.021	0.027	0.057	0.100	0.129	0.048
Other services	0.186	0.246	0.325	0.341	0.386	0.488	0.316
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: IBGE (PNAD and Input-Output Matrix)
G1 – <1 year of schooling; G2 – 1 - 3 years; G3 – 4 - 7 years;
G4 – 8 - 10 years; G5 – 11 - 14 years; G6 – ≥15 years

The main interest of this survey is to quantify the component relating to the educational attainment content of labor in state exports, not only directly but also in the interactions existing in the productive chain of Brazilian sectors and states. As a result of this, it becomes important in this presentation of Brazil's occupational structure to verify the distribution of employment by the level of educational attainment provided by the PNAD, namely: *a*) individuals with no schooling and less than a year of completed study (G1); *b*) from 1 to 3 years of study (G2); *c*) from 4 to 7 years of study (G3); *d*) from 8 to 10 years of study (G4); *e*) from 11 to 14 years of study (G5); *f*) 15 or more years of study (G6). In rough terms, we may identify groups G1 and G2 as unskilled labor, groups G3 and G4 as intermediate and groups G5 and G6 as skilled workers.[3]

[2] Other services include: transport, communications, services to families, services to companies, real estate rentals and non-mercantile private services.

[3] We recognize that this is an incomplete classification, principally because one part of the group of intermediate attainment may be classified as unskilled labor and the other part as skilled labor. This aspect does not interfere. However, in future results, since we shall work with each group in isolation.
[3] Reconhecemos que se trata de uma classificação incompleta, principalmente pelo fato de que parte do grupo de qualificação intermediária poderia ser enquadrada como mão-de-obra não-qualificada e outra parte como pessoal qualificado. Este aspecto, contudo, não interfere nos resultados futuros, uma vez que trabalharemos com cada um dos grupos isoladamente.

We may also verify a number of results in Table 1 that deserve highlighting, in terms of comparisons between sectors and with regard to level of educational attainment. The greatest concentration of unskilled labor is in agriculture, which absorbs almost half of the workers who have attended school for less than a year. This absorption is also significant in the branch of 'other services', probably due to the existence of informal and precarious work. At the other extreme is the 'other services' branch, which employs some 48.8% of the workers in group G6. If we add to this branch the figure obtained for the financial sector, another branch of services, as well as that for commerce, around 63% of the service sector absorbs the most highly skilled workers in group G6.

Considering the distribution by educational attainment group in each sector that is presented in Table 2, it may be confirmed that agriculture includes a high component of unskilled workers: around 65% of those employed by the sector have completed less than 3 years of study. As is known, construction also employs unskilled labor, in so far as 40% of workers are in groups G1 and G2. At the same time, financial institutions (59.2%) and public administration (51.5%) represent the sectors with the highest level of skilled workers in groups G5 and G6. Groups G3 and G4, which represent an intermediate level of educational attainment, occur more frequently in industry (transformation and construction) and the service sector (commerce and other services).

Table 2. Distribution by Educational Attainment Group of Employment by Sector: Brazil, 1996

	G1	*G2*	*G3*	*G4*	*G5*	*G6*	*Total*
Agriculture	0.351	0.295	0.285	0.044	0.020	0.004	1.000
Transformation Industry	0.067	0.116	0.389	0.211	0.173	0.045	1.000
Public Utility Services	0.173	0.150	0.275	0.123	0.193	0.087	1.000
Construction	0.156	0.244	0.428	0.104	0.050	0.019	1.000
Commerce	0.066	0.118	0.337	0.218	0.225	0.036	1.000
Financial.	0.027	0.043	0.162	0.174	0.353	0.239	1.000
Public Administration	0.052	0.071	0.184	0.179	0.345	0.170	1.000
Other Services	0.082	0.127	0.332	0.161	0.201	0.097	1.000
Total	0.139	0.163	0.322	0.149	0.165	0.063	1.000

Source: IBGE (PNAD and Input-Output Matrix)
G1 – <1 year of schooling; G2 – 1 - 3 years; G3 – 4 - 7 years;
G4 – 8 - 10 years; G5 – 11 - 14 years; G6 – ≥15 years

2.2 Structure of employment by educational attainment: Brazilian states

São Paulo, Minas Gerais, Rio de Janeiro, Bahia and Rio Grande do Sul are the states with the highest employment levels considering absolute total numbers of total jobs, with these 5

states accounting for 53.4% of all employment, as shown in Table 3. Also in Table 3, it may be noted that the states of the Northeast, especially Bahia, Ceará, Maranhão and Pernambuco, include the least skilled workers (groups G1 and G2), while workers with intermediate levels of educational attainment, in groups G3 and G4, and workers considered as skilled, in Groups G5 and G6, are more frequent in the states that are the greatest absorbers of labor: São Paulo, Minas Gerais, Rio de Janeiro, Paraná and Rio Grande do Sul.

The distribution of workers by level of educational attainment in each state may be observed in Table 4. Among its principal results, we may see that the states of the Northeast are those that absorbed the least skilled labor (groups G1 and G2). The fact that Bahia, Ceará, Maranhão, Alagoas, Paraíba and Piauí have a labor force in which over half of all workers have less than three years of schooling is little less than dramatic, with over 40% of workers in Pernambuco, Sergipe and Rio Grande do Norte at the same level of educational attainment.

On the other hand, the states that absorb more skilled labor (G5 and G6) are in the South and Southeast, especially São Paulo (29.2%), Rio de Janeiro (34.3%), Paraná (20.5%), Santa Catarina (21.1%) and Rio Grande do Sul (23.2%). Outside this axis, the Federal District of Brasília has the highest percentage absorption of skilled labor (53.2%), a result that is undoubtedly due to the high concentration there of public sector employees of the three branches of government (Executive, Legislature and Judiciary), who tend to have a high level of educational attainment.

It is also interesting to note from Table 4 that ‘frontier’ states, such as Amapá, Roraima, Tocantins, Acre, Mato Grosso, Goiás, and Mato Grosso do Sul, where there has been a greater expansion in both formal and informal employment [see Chahad and Macedo (2002)], reveal a less concentrated educational distribution of labor, with the predominance of employed workers at an intermediate level of educational attainment.

Table 3. Distribution by State of Employment by Educational Attainment Group:Brazil, 1996

	G1	*G2*	*G3*	*G4*	*G5*	*G6*	*Total*
AC	0.002	0.002	0.001	0.001	0.003	0.002	0.002
AP	0.002	0.001	0.001	0.002	0.002	0.001	0.002
AM	0.010	0.006	0.009	0.010	0.015	0.006	0.010
PA	0.015	0.022	0.016	0.020	0.016	0.011	0.017
RO	0.004	0.004	0.005	0.007	0.006	0.005	0.005
RR	0.001	0.001	0.001	0.002	0.001	0.000	0.001
TO	0.009	0.009	0.005	0.005	0.005	0.002	0.006
AL	0.037	0.014	0.009	0.008	0.013	0.012	0.014
BA	0.151	0.115	0.055	0.043	0.060	0.035	0.076
CE	0.090	0.054	0.030	0.026	0.028	0.020	0.041
MA	0.098	0.054	0.021	0.020	0.023	0.007	0.036
PB	0.048	0.030	0.015	0.014	0.014	0.017	0.022
PE	0.071	0.056	0.040	0.034	0.036	0.040	0.045
PI	0.040	0.025	0.011	0.010	0.013	0.005	0.017
RN	0.026	0.019	0.012	0.011	0.016	0.011	0.015
SE	0.021	0.013	0.008	0.008	0.007	0.007	0.011
ES	0.015	0.018	0.023	0.021	0.019	0.014	0.019
MG	0.089	0.123	0.130	0.099	0.094	0.089	0.110
RJ	0.041	0.055	0.076	0.112	0.120	0.150	0.085
SP	0.094	0.155	0.243	0.297	0.276	0.336	0.228
PR	0.040	0.072	0.071	0.066	0.056	0.058	0.063
SC	0.012	0.030	0.048	0.042	0.035	0.029	0.036
RS	0.027	0.053	0.097	0.073	0.070	0.080	0.071
DF	0.006	0.005	0.008	0.013	0.020	0.023	0.011
GO	0.025	0.033	0.032	0.029	0.026	0.018	0.029
MT	0.013	0.019	0.019	0.015	0.012	0.010	0.016
MS	0.012	0.013	0.013	0.013	0.013	0.013	0.013
Brazil	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: IBGE (PNAD and Input-Output Matrix)

G1 – <1 year of schooling; G2 – 1 - 3 years; G3 – 4 - 7 years; G4 – 8 - 10 years; G5 – 11 - 14 years; G6 – ≥15 years

Table 4. Distribution by Educational Attainment Group of Employed Workers, by State: Brazil, 1996

	G1	*G2*	*G3*	*G4*	*G5*	*G6*	*Total*
AC	0.164	0.160	0.218	0.116	0.260	0.081	1.000
AP	0.157	0.122	0.291	0.165	0.217	0.047	1.000
AM	0.148	0.100	0.293	0.157	0.266	0.036	1.000
PA	0.125	0.205	0.300	0.176	0.154	0.040	1.000
RO	0.110	0.135	0.310	0.189	0.192	0.064	1.000
RR	0.089	0.145	0.322	0.243	0.182	0.019	1.000
TO	0.202	0.237	0.274	0.130	0.132	0.024	1.000
AL	0.362	0.160	0.200	0.080	0.147	0.051	1.000
BA	0.276	0.246	0.234	0.085	0.130	0.029	1.000
CE	0.308	0.217	0.235	0.095	0.114	0.031	1.000
MA	0.372	0.242	0.190	0.082	0.103	0.011	1.000
PB	0.307	0.223	0.222	0.093	0.106	0.048	1.000
PE	0.218	0.201	0.284	0.111	0.131	0.055	1.000
PI	0.325	0.234	0.217	0.086	0.121	0.018	1.000
RN	0.231	0.201	0.252	0.104	0.167	0.045	1.000
SE	0.271	0.206	0.257	0.112	0.113	0.042	1.000
ES	0.107	0.149	0.376	0.163	0.161	0.045	1.000
MG	0.113	0.182	0.380	0.135	0.141	0.051	1.000
RJ	0.067	0.105	0.289	0.196	0.233	0.110	1.000
SP	0.058	0.111	0.344	0.195	0.200	0.092	1.000
PR	0.089	0.185	0.364	0.157	0.147	0.058	1.000
SC	0.047	0.134	0.431	0.176	0.160	0.051	1.000
RS	0.053	0.122	0.439	0.153	0.162	0.070	1.000
DF	0.075	0.074	0.240	0.178	0.304	0.128	1.000
GO	0.121	0.186	0.354	0.150	0.150	0.039	1.000
MT	0.118	0.194	0.380	0.144	0.126	0.039	1.000
MS	0.129	0.163	0.328	0.149	0.168	0.063	1.000
Brazil	0.139	0.163	0.322	0.149	0.165	0.063	1.000

Source: IBGE (PNAD and Input-Output Matrix)

G1 – <1 year of schooling; G2 – 1 - 3 years; G3 – 4 - 7 years; G4 – 8 - 10 years; G5 – 11 - 14 years; G6 – ≥15 years

3. Methodology

3.1. Interstate input-output matrix

The basic methodology used in this study is based on an interregional analysis of input-output. The interregional input-output matrix provides a complete description of the intra- and interregional relations between a given location together with its productive sectors and the other locations comprising the matrix.

There has recently been a proliferation of studies on the Brazilian economy that use this instrument. In general, this analysis has focused on the interdependence of Brazilian macroregions [Guilhoto, Hewings and Sonis (2002); Guilhoto *et al.* (2001); Haddad (1999), Haddad and Hewings (2000), and Crocomo and Guilhoto (1998)] and its evolution in time [Guilhoto *et al.* (2001)], or the insertion of specific regional economies in the context of an integrated interregional system [Domingues (2002), Duarte-Filho and Chiari (2002)]. Having said this, studies that explicitly consider the intersectoral relations between Brazilian states are still in their infancy.

In this sense, the analysis to be developed may be considered to be original and innovative in a Brazilian context, given the unique character of the data-base.

A simplified scheme of the direct production requirements identified in the interregional matrix is given by the matrix A:[4]

$$A = \begin{bmatrix} A^{LL} & A^{LM} \\ A^{ML} & A^{MM} \end{bmatrix} \qquad (1)$$

In this, the simplest case with two regions, L and M, the terms A^{LL} and A^{MM} indicate the regional input coefficients for the regions L and M, respectively. The cross terms, A^{LM} and A^{ML}, respectively show the interregional trade coefficients for the regions L and M.

In this study, we shall use the interstate input-output matrix for the year 1996, developed by researchers at the Fundação Instituto de Pesquisas Econômicas (FIPE) [see Haddad *et al.* (2002)].[5] This matrix contains the interstate relationships for the 27 Brazilian states, disaggregated into 8 economic sectors.[6] A representative scheme for the direct interstate production requirements has the following form:

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[4] For more details, see, for example, Miller and Blair (1985).
[4] Para maiores detalhes, ver, por exemplo, Miller e Blair (1985).

[5] This is the first data-base of its kind for the Brazilian economy. Data and methodological text may be downloaded from the site www.econ.fea.usp.br/nereus

[6] The eight sectors studied are: Agriculture, Transformation Industry, Public Utility Services, Construction, Commerce, Financial Institutions, Public Sector Administration, Other Services.

$$A = \begin{bmatrix} A^{11} & A^{12} & \cdots & A^{127} \\ A^{21} & A^{22} & \cdots & A^{227} \\ \vdots & \vdots & \ddots & \vdots \\ A^{271} & A^{272} & \cdots & A^{2727} \end{bmatrix} \quad (2)$$

A number of observations regarding this matrix should be made. Firstly, it should be noted that each entry, A^{LM}, L and M = 1,..., 27, is composed of an 8 x 8 submatrix, corresponding to the 8 economic sectors. Hence, matrix A is a 216 x 216 matrix, corresponding to the productive structure of the 27 Brazilian states, in which we consider eight productive sectors. It should also be noted that the principal diagonal of A gives us 27 matrices with state input coefficients. In a similar way, entries outside the principal diagonal give us the interstate trade coefficients relating to interstate relations.

From matrix A, we obtain the Leontief inverse matrix, B:

$$B = (I-A)^{-1} \quad (3)$$

Whose structure is similar to that described for matrix A, i.e.

$$B = \begin{bmatrix} B^{11} & B^{12} & \cdots & B^{127} \\ B^{21} & B^{22} & \cdots & B^{227} \\ \vdots & \vdots & \ddots & \vdots \\ B^{271} & B^{272} & \cdots & B^{2727} \end{bmatrix} \quad (4)$$

The inverse Leontief matrix provides us with the direct and indirect requirements for intra- and interstate production.

3.2 Employment generation potential

This study presents a measure of employment generation potential, or more precisely, a measure of the employment content in state exports to the rest of the world. To this end, six vectors of employment coefficients by level of educational attainment were constructed by sector and by region. Each element of a vector relative to qualification q may be represented by the following equation:

$$e_{iq}^{L} = \frac{E_{iq}^{\ L}}{VP_i^L} \quad (5)$$

which is simply the ratio between the number of employees with level of educational attainment q, q = 1, ..., 6, of sector i in region L, and the total value of production of sector i

in the same region. Performing this operation for each sector of the 27 states, we obtain the vectors of employment coefficients by sector and by level of qualification, E_q.

The next step is to obtain the matrix for the generation of interstate employment, for each level of qualification/educational attainment. This matrix is derived from a transformation of the inverse Leontief matrix, in which each element is weighted by the corresponding employment coefficient of vector E_q. In this way, we obtain the six matrices of employment impact:

$$B(E)_q = \hat{E}_q B \tag{6}$$

where $\hat{E}_q$ is the diagonal matrix constructed from vector E_q. Each matrix resulting from this transformation indicates the sectoral capacity for generating employment with qualification *q*, per additional unit of final demand.

The structure of the matrix $B(E)_q$, termed the matrix of interstate multipliers of employment by qualification, is similar to the one described for matrices *A* and *B*. In this way, for each sector *i*, of each state *L*, the sum of the elements of the corresponding column in $B(E)_q$ gives us the employment multiplier for qualification *q* in sector *i*. The component of the sum that refers to the elements of the same state provides us with the intrastate employment multiplier, while the sum of the other elements of the column gives us the interstate employment multiplier.

3.3 Employment content of exports

The generation of employment in the Brazilian economy will be analyzed on the basis of its component that is associated with exports from states to the rest of the world. In order to evaluate the capacity of individual states for generating employment through exports by level of qualification, a standard unit of state exports (UPE) was defined that provides a description of the sectoral distribution of a monetary unit exported by state *L*. This unit is defined as:

$$UPE^L = \frac{X_i^L}{\sum_{i=1}^{8} X_i^L} \tag{7}$$

where X_i^L is the value exported by sector *i* of state *L* and $\sum_{i=1}^{8} X_i^L$ is the total value exported by state *L*.

Repeating this operation for each of the 27 units of the federation, we may generate 27 vectors, $X(UPE)^L$, of dimension 216, representing the respective UPEs.

$$XE^1 = \begin{bmatrix} UPE^1 \\ 0 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \quad XE^2 = \begin{bmatrix} 0 \\ UPE^2 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \quad \ldots \quad XE^{27} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ \vdots \\ UPE^{27} \end{bmatrix} \tag{8}$$

Pre-multiplying the vector $X(UPE)^L$ by the matrix of interstate multipliers of employment by qualification, $B(E)_q$, we derive the vector of employment by level of qualification for each UPE, $P(E)_q$:

$$P(E)_q = B(E)_q \, X(UPE)^L \tag{9}$$

The vector $P(E)_q$ has a dimension of 216, with each entry representing the impact on employment of group q for each of the eight sectors in each state due to a UPE exported by region L. It follows that the sum of the elements of the vector $P(E)_q$ gives the global impact in terms of employment q, for each UPE exported by the corresponding Brazilian state. Once again, this impact may be decomposed into intrastate and interstate impacts.

The capacity of a state for generating employment through exports may also be evaluated with regard to total Brazilian exports. This is the objective that is sought starting from the definition of the standard unit of Brazilian exports (UPBR), which provides a description of the distribution by sector/state of a monetary unit exported by the country. In this way, we define:

$$UPBR = \frac{X_i^L}{\sum_{L=1}^{27} \sum_{i=1}^{8} X_i^L} \tag{10}$$

where X_i^L is the value exported by sector i of state L and $\sum_{L=1}^{27} \sum_{i=1}^{8} X_i^L$ is the total value of national exports.

The analytical procedure is thus the same as that adopted in the case of UPEs to obtain the vectors, $P(E)_q$. The interstate impacts, in terms of employment, generated by the UPBR will be explored in the next section for comparative purposes.

It should be noted that part of the employment generated by exports is due to the direct initial requirements for the production of the final good that is exported, i.e. it refers to the employment generated in the export production units. Discounting initial employment, we may isolate the net employment generated in the productive chain of state exports, associated with intersectoral and interstate productive relations.

The initial effect is calculated as a fixed relationship with the UPE. The weighting factor applied to the UPE (or to the UPBR) refers to the coefficient, e_{iq}^{L}, defined above. The interstate vector of initial employment generation effects, q associated with an UPE, $E(I)_q$, is defined by:

$$E(I)_q = \hat{E}_q X (UPE)^L \tag{11}$$

It follows that the vector of net interstate impacts, $E(L)_q$, will be given by subtracting the interstate initial effects vector, $E(I)_q$, from the vector of employment generation potential by level of qualification for each UPE, $P(E)_q$:

$$E(L)_q = P(E)_q - E(I)_q \tag{12}$$

Like the vector $P(E)_q$, the vector $E(L)q$ has a dimension of 216, with each entry carrying the net impact on employment, q, of the eight sectors of each state, associated with a UPE exported by state L. It follows that the sum of all of the elements of $E(L)_q$ gives us the net impact, in terms of employment q, for each UPE^L. This impact may be decomposed into net intrastate impacts and net interstate impacts.

4. Results

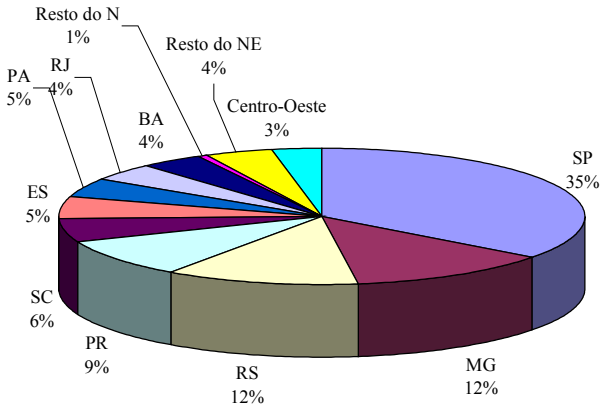
Brazilian exports are highly concentrated in the South and Southeast regions, which together account for around 83% of total national exports. Table 5 and Graph 1 show the distribution of exports by selected regions and states. In addition to the states of the South and Southeast, Bahia and Maranhão in the Northeast, Pará in the North, and Mato Grosso in the Center-West region have a notably higher share of exports.

Table 5. State Exports: Brazil, 1996

	Exports (R$ '000)	*Share*
AC	2,838	0.0001
AP	117,838	0.0022
AM	167,102	0.0031
PA	2,457,610	0.0452
RO	32,217	0.0006
RR	8,260	0.0002
TO	1,644	0.0000
AL	335,696	0.0062
BA	2,142,978	0.0394
CE	441,605	0.0081
MA	791,035	0.0145
PB	120,019	0.0022
PE	395,837	0.0073
PI	72,466	0.0013
RN	110,131	0.0020
SE	64,940	0.0012
ES	2,848,891	0.0523
MG	6,721,447	0.1235
RJ	2,187,304	0.0402
SP	19,240,513	0.3535
PR	4,928,624	0.0905
SC	3,061,373	0.0562
RS	6,574,324	0.1208
DF	35,838	0.0007
GO	449,236	0.0083
MT	765,321	0.0141
MS	355,040	0.0065
Brazil	54,430,127	1.0000

Source: FIPE and Aliceweb (Interstate Input-Output Matrix)

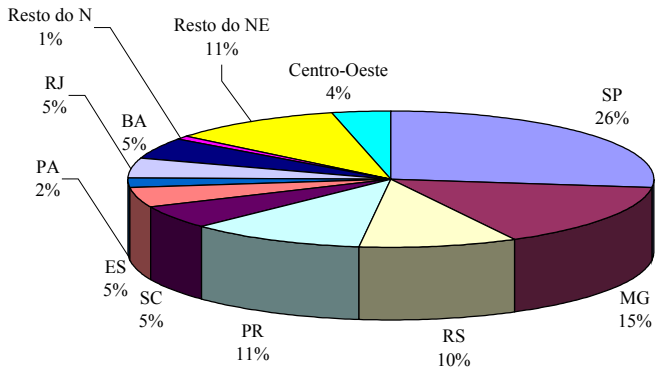
Figure 1. State/Regional Share of Brazilian Exports: 1996



++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 2 presents the spatial distribution of the total content of employment in Brazilian exports. The general result shows that there is a greater concentration is less favored regions, i.e., whose exports are relatively more labor-intensive. In this way, the Northeast region, which accounts for some 8% of Brazilian exports, employs 16% of all labor involved directly and indirectly in the national export chain. The state of São Paulo, which in turn represents 35% of national exports, is responsible for the generation of only 25% of jobs associated with exports.

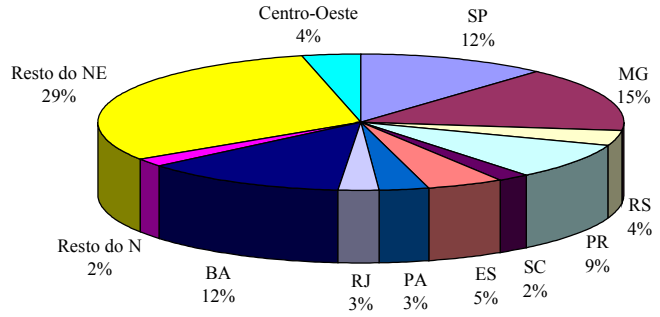
Figure 2. Share by State/Region of the Generation of Total Employment through Exports: 1996



++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

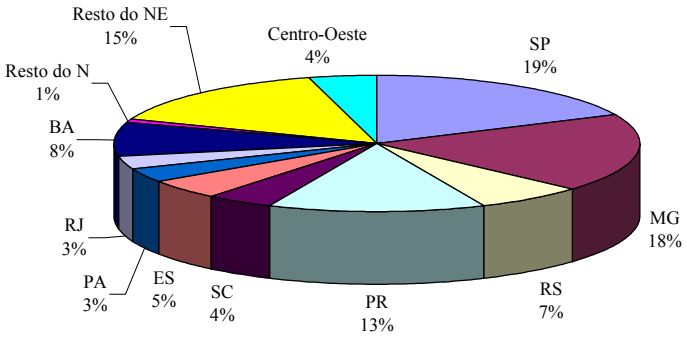
A more detailed analysis of the results, considering the different levels of qualification of labor, is highly revealing. Graphs 3 to 8 present the results for the six groups of workers considered in this study. It should be noted that the share of less developed regions in the generation of employment through exports is higher among less skilled workers. In the case of the Northeast, for example, its share varies from 41% to 23% for the least skilled categories, from 9% to 7% for the intermediate categories and from 9% to 6% for the most highly skilled categories. The case of São Paulo also deserves mention: the state accounts for only 12% of total employment in group G1, increasing its share progressively as the level of qualification increases: 19% (G2); 27% (G3); 36% (G4); 36% (G5); 45% (G6).

Figure 3. Share by State/Region of G1 Employment Generation through Exports: 1996



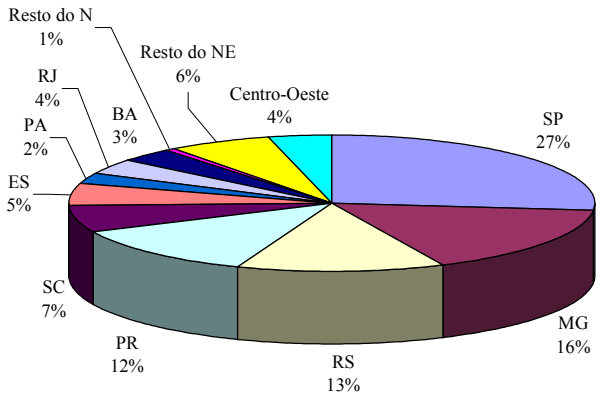
++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 4. Share by State/Region of G2 Employment Generation through Exports: 1996



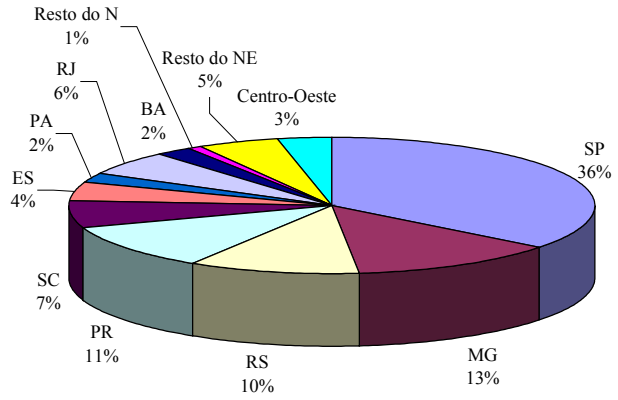
++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 5. Share by State/Region of G3 Employment Generation through Exports: 1996



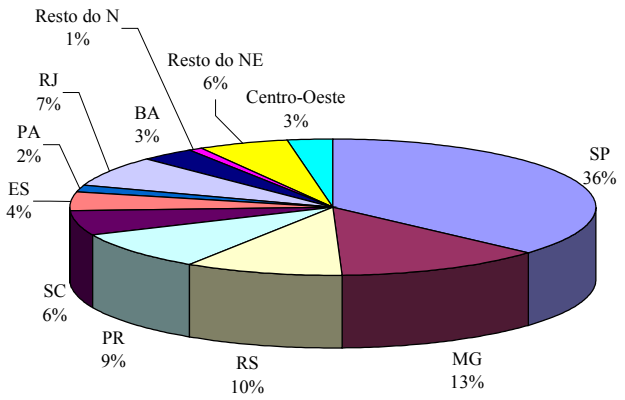
++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 6. Share by State/Region of G4 Employment Generation through Exports: 1996



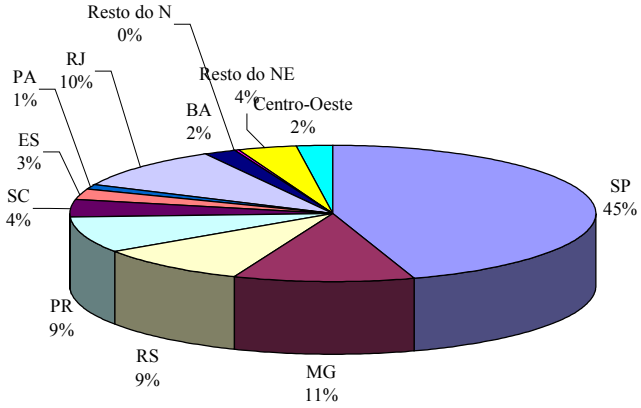
++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 7. Share by State/Region of G5 Employment Generation through Exports: 1996



++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Figure 8. Share by State/Region of G6 Employment Generation through Exports: 1996



++Resto do N – Rest of N++
++Resto do NE – Rest of NE++
++Centro-Oeste – Center-West++

Another relevant indicator is the simple employment multiplier for state exports, obtained directly from the vectors $P(E)_q$. Table 6 presents these results, which consider the total employment associated with R$ 1 million of exports by each state, distributed by qualification group.

The results point to a greater relative intensity of the labor factor in exports from the North and Northeast regions, followed by the Center-West, as well as to a relative concentration of the generation of jobs with low qualifications in the Northeast and intermediate qualifications in the North and Center-West.

States in the South and Southeast show a consistently low relative labor factor content in their exports, which are associated with higher levels of qualifications.

Thus, by way of illustration, we may take the examples of Ceará and São Paulo. In the case of Ceará, an average of 302 jobs are created for each R$ 1 million exported by the state. Of these, 72% may be considered to be jobs with low levels, 23% with intermediate levels and only 5% with high levels of qualification. São Paulo's exports (R$ 1 million) generate only 57 jobs, distributed in the following way: 21% with low levels, 54% with intermediate levels and 25% with high levels of qualification.

Table 6. Simple Employment Multiplier for State Exports (Jobs per R$ 1,000,000 of state exports)

	G1	*G2*	*G3*	*G4*	*G5*	*G6*	*Total*
AC	14.6	18.3	27.0	9.8	8.8	2.3	80.8
AP	18.1	14.4	27.5	10.2	8.6	2.4	81.3
AM	8.8	7.6	16.7	7.6	11.7	2.4	54.9
PA	7.7	10.7	18.3	7.4	5.6	1.4	51.3
RO	18.2	14.5	38.1	20.0	14.1	3.4	108.2
RR	49.8	7.7	37.9	84.9	17.1	1.8	199.3
TO	67.1	75.2	79.4	23.3	24.7	5.0	274.8
AL	36.2	20.0	29.7	11.3	12.9	5.3	115.4
BA	28.4	25.2	26.2	9.4	11.5	2.9	103.7
CE	138.4	79.0	54.1	15.2	12.7	3.0	302.5
MA	62.8	42.5	41.9	15.8	16.8	2.0	181.8
PB	19.9	18.6	27.9	12.0	11.4	4.0	93.8
PE	24.8	22.2	34.0	12.6	12.4	4.7	110.6
PI	44.5	41.0	49.4	21.1	19.8	3.4	179.2
RN	113.1	68.4	65.5	15.0	16.2	3.1	281.4
SE	27.9	19.1	28.8	10.3	9.1	2.5	97.7
ES	8.3	10.4	26.5	9.6	9.0	2.2	66.0
MG	10.3	16.2	32.9	11.4	10.4	3.1	84.3
RJ	5.0	7.8	22.2	15.1	17.1	7.9	75.1
SP	4.8	7.5	20.3	10.8	9.9	4.1	57.3
PR	9.0	17.4	34.9	13.7	11.0	3.5	89.5
SC	3.0	8.7	29.2	12.9	10.7	2.6	67.2
RS	2.9	6.7	27.3	9.7	8.2	2.9	57.7
DF	19.5	19.7	43.7	16.5	20.7	7.4	127.6
GO	12.9	19.7	43.4	17.0	14.8	3.2	111.0
MT	13.3	19.9	40.4	15.4	10.3	3.0	102.3
MS	9.9	12.9	26.9	12.3	10.1	3.6	75.8
Brazil	9.7	12.3	26.5	11.3	10.3	3.5	73.5

G1 – <1 year of schooling; G2 – 1 - 3 years; G3 – 4 - 7 years; G4 – 8 - 10 years; G5 – 11 - 14 years; G6 – ≥15 years

4.1. Spatial Decomposition

Where are jobs generated? Are states capable of internalizing the multiplier effects of employment generation by exports or is there significant leakage? In order to reply to such questions, we proceed with the decomposition of multipliers associated with the vectors $E(L)_q$. We consider the spatial distribution of the net effects of employment multipliers, that is, only the effects outside the exporting productive units. These results are presented in Tables 7 to 13.

In general terms, we may identify the effects of substantial leakage from the economies of the North, Northeast and Center-West to the economies of the South and Southeast, with São Paulo taking on a dominant role. The polarization of the Center-South of the country becomes notable when we observe only the spatial distribution of the net effects.

At the same time, an interesting phenomenon emerges when we focus on different skill groups. The less developed states with a higher concentration of less skilled workers succeed in absorbing internally a large part of the net effect of export employment generation among lower levels of qualification. To the degree that the need for qualifications increases, the dependency on other regions with a larger stock of skilled workers also increases.

If we again take the case of Ceará as an example, considering the spatial decomposition of the net effects of employment multipliers by level of qualification, we may observe that for the lowest levels of qualification, G1 and G2 (Table 7 and 8), the state succeeds in absorbing 92% and 85% respectively of the indirect needs of workers. In the case of the most highly skilled workers in classes G5 and G6 (Tables 11 and 12), the rate of internal absorption is far lower: 63% and 52% respectively. It should be highlighted that in the case of more skilled labor, part of the effects of exports from Ceará 'leaks' to the Center-South, principally benefiting the state of São Paulo, which meets 14% (G5) and 21% (G6) of the indirect needs of skilled labor associated with exports of products from Ceará.

On the other hand, the opposite phenomenon may be observed in exports from São Paulo, albeit not to such an intense degree, since São Paulo absorbs only 49% of G1 and 65% of G2 category labor associated with exports from the state. States outside the Center-South, such as Bahia and Ceará, also benefit from indirect effects, contributing to the content of labor with a low degree of qualification in São Paulo products. Having said this, the content of highly skilled labor is almost entirely provided by workers in São Paulo: 96% (G5) and 97% (G6) of the total for each group.

In summary, it may be said that Ceará exports skilled labor to São Paulo, and that São Paulo exports unskilled labor to Ceará.

5. Final considerations

The analysis of regional impacts on the generation of employment by state exports points to a concentration in the use of skilled labor in the states of the South and the Southeast. As has been seen, this factor is relatively more abundant in these regions, generating elements for the empirical verification of the Heckscher-Ohlin theorem in the subnational space of Brazil, principally with regard to the theoretical aspects associated with the expected characteristics of state exports.[7] These results call attention to a phenomenon that has dominated the debate on the regional question: the role of foreign trade as a motor of growth and employment generation. There are various theories that advocate a positive vision which equates trade and economic growth, emphasizing the direct gains deriving from international specialization, as well as the additional impacts for the development of a country through a series of multiplier effects that are internalized by the domestic economy.

This study has shown that the most developed states also benefit from the exports of states on the periphery, meeting, both directly and indirectly, demand for more highly skilled workers linked to the export sector. Are the other states of the federation condemned to an archaic trade structure, founded on the exporting of low value-added products with a low content of highly skilled labor, as well as to the indirect export of unskilled labor?

In our view, the answer to this question is a negative one. We should consider the current trend towards the expansion of trade agreements involving Brazil that are capable of leveraging Brazilian exports, with the aim of achieving a gradual reduction in commercial restrictions over ever more extensive geographical areas, as a complex and dynamic general equilibrium phenomenon whose effects extend to the long-term. The process of regional integration involves questions that relate growth to technology, training, externalities, political economy and political agreements, the repercussions of which in a subnational space may be redirected by public policies. At the current stage of development of the Brazilian economy, the action of market forces tends to concentrate economic activity in the Center-South, although there is still scope for government intervention to attenuate this situation. It is nevertheless necessary to establish regional planning directives with a view to the efficient use of the potentialities of peripheral regions.

The creation of comparative advantages over time will arise through the formation of a solid economic infrastructure in a region, characterized by efficient transport, energy and communications systems, as well as a broad policy for training local labor. The emphasis on economic rather than financial incentives increases the degree of liberty for the formulators of regional policy, promoting the creation and consolidation of comparative dynamic advantages in the regions.

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[7] The objective of this article is not to implement empirical tests of the neoclassical model in the manner of Heckscher-Ohlin. At the same time, by measuring the component relating to the skill content of labor in state exports, we obtain an important element in the characterization of foreign trade flows arising from individual states, that casts light on the interpretation of that trade model in the context of a subnational space.

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Table 7. Spatial Decomposition of the Net Effects of Multipliers on G1 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,427	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,001	0,000	0,000
AP	0,000	0,669	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,009	0,007	0,340	0,010	0,011	0,017	0,002	0,002	0,003	0,002	0,001	0,003	0,003	0,005	0,001	0,001	0,002	0,001	0,017	0,082	0,004	0,002	0,002	0,011	0,004	0,019	0,013	0,020
PA	0,000	0,000	0,000	0,474	0,000	0,000	0,002	0,001	0,001	0,001	0,003	0,001	0,001	0,014	0,001	0,000	0,000	0,000	0,001	0,001	0,001	0,001	0,000	0,002	0,001	0,001	0,000	0,011
RO	0,000	0,000	0,000	0,001	0,572	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,001	0,000	0,000	0,000	0,015	0,002	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,031	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,011	0,000	0,000	0,835	0,000	0,000	0,001	0,000	0,001	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,001	0,000	0,001	0,001	0,000	0,001
AL	0,003	0,006	0,047	0,011	0,002	0,004	0,001	0,789	0,009	0,002	0,003	0,011	0,014	0,009	0,003	0,011	0,000	0,000	0,011	0,009	0,001	0,004	0,000	0,003	0,001	0,003	0,002	0,026
BA	0,027	0,026	0,070	0,041	0,014	0,149	0,010	0,051	0,903	0,012	0,006	0,030	0,042	0,061	0,022	0,035	0,014	0,004	0,045	0,087	0,007	0,006	0,003	0,038	0,008	0,019	0,015	0,156
CE	0,026	0,060	0,072	0,057	0,015	0,067	0,008	0,012	0,008	0,920	0,018	0,045	0,021	0,246	0,096	0,005	0,002	0,001	0,021	0,027	0,003	0,005	0,002	0,029	0,005	0,012	0,008	0,039
MA	0,001	0,001	0,001	0,064	0,001	0,002	0,000	0,003	0,003	0,005	0,929	0,006	0,004	0,002	0,000	0,001	0,001	0,001	0,003	0,006	0,001	0,002	0,002	0,001	0,001	0,009	0,001	0,087
PB	0,008	0,005	0,008	0,010	0,002	0,010	0,001	0,015	0,002	0,004	0,002	0,709	0,013	0,008	0,023	0,003	0,001	0,000	0,003	0,004	0,001	0,003	0,001	0,007	0,001	0,002	0,002	0,006
PE	0,033	0,023	0,056	0,030	0,009	0,032	0,002	0,061	0,010	0,013	0,007	0,109	0,833	0,043	0,051	0,011	0,001	0,001	0,008	0,017	0,001	0,001	0,001	0,034	0,002	0,005	0,003	0,023
PI	0,001	0,001	0,000	0,030	0,001	0,001	0,000	0,000	0,001	0,004	0,000	0,001	0,002	0,490	0,000	0,000	0,000	0,000	0,001	0,004	0,000	0,000	0,000	0,001	0,000	0,002	0,001	0,003
RN	0,002	0,002	0,001	0,005	0,002	0,003	0,000	0,002	0,003	0,007	0,000	0,018	0,006	0,003	0,760	0,001	0,001	0,000	0,004	0,011	0,001	0,002	0,000	0,002	0,001	0,005	0,004	0,012
SE	0,002	0,006	0,007	0,006	0,002	0,004	0,001	0,018	0,007	0,002	0,001	0,003	0,003	0,007	0,002	0,905	0,001	0,000	0,003	0,006	0,006	0,001	0,000	0,004	0,001	0,002	0,002	0,008
ES	0,009	0,010	0,010	0,011	0,010	0,017	0,002	0,008	0,004	0,002	0,001	0,004	0,003	0,006	0,003	0,001	0,909	0,003	0,028	0,032	0,004	0,002	0,002	0,032	0,004	0,012	0,010	0,066
MG	0,187	0,060	0,037	0,080	0,062	0,195	0,048	0,014	0,017	0,008	0,011	0,018	0,018	0,038	0,012	0,006	0,043	0,965	0,091	0,110	0,014	0,011	0,009	0,227	0,041	0,080	0,050	0,207
RJ	0,017	0,011	0,043	0,014	0,014	0,053	0,003	0,003	0,005	0,002	0,002	0,004	0,004	0,007	0,004	0,002	0,006	0,003	0,640	0,056	0,004	0,009	0,004	0,076	0,005	0,013	0,012	0,025
SP	0,100	0,057	0,244	0,078	0,083	0,184	0,018	0,014	0,015	0,010	0,009	0,022	0,019	0,036	0,012	0,008	0,012	0,011	0,086	0,487	0,025	0,028	0,027	0,202	0,025	0,092	0,088	0,119
PR	0,039	0,015	0,013	0,025	0,085	0,129	0,006	0,004	0,004	0,002	0,002	0,006	0,005	0,010	0,005	0,006	0,003	0,003	0,018	0,029	0,903	0,033	0,010	0,045	0,011	0,126	0,068	0,099
SC	0,010	0,009	0,011	0,006	0,009	0,026	0,002	0,001	0,001	0,001	0,001	0,002	0,002	0,004	0,001	0,001	0,001	0,001	0,005	0,007	0,006	0,868	0,007	0,011	0,002	0,012	0,007	0,021
RS	0,017	0,011	0,011	0,010	0,012	0,034	0,003	0,002	0,002	0,002	0,001	0,003	0,002	0,005	0,001	0,001	0,001	0,001	0,007	0,010	0,005	0,014	0,925	0,013	0,003	0,013	0,009	0,040
DF	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,002	0,000	0,000	0,000	0,165	0,002	0,001	0,001	0,001
GO	0,031	0,015	0,005	0,023	0,018	0,020	0,052	0,001	0,002	0,001	0,002	0,002	0,002	0,006	0,002	0,001	0,001	0,002	0,003	0,006	0,002	0,001	0,001	0,090	0,860	0,050	0,010	0,014
MT	0,039	0,002	0,022	0,003	0,065	0,017	0,002	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,001	0,001	0,001	0,004	0,006	0,003	0,001	0,006	0,021	0,489	0,019	0,009
MS	0,010	0,002	0,003	0,001	0,009	0,005	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,003	0,003	0,002	0,001	0,003	0,001	0,017	0,671	0,006

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 8. Spatial Decomposition of the Net Effects of Multipliers on G2 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,275	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000
AP	0,000	0,446	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,004	0,004	0,200	0,003	0,004	0,005	0,001	0,002	0,001	0,002	0,001	0,002	0,002	0,002	0,001	0,001	0,001	0,000	0,005	0,025	0,001	0,000	0,001	0,004	0,001	0,006	0,004	0,007
PA	0,000	0,001	0,000	0,524	0,000	0,000	0,003	0,002	0,001	0,002	0,006	0,003	0,001	0,021	0,001	0,001	0,000	0,000	0,001	0,001	0,001	0,000	0,000	0,002	0,001	0,000	0,000	0,013
RO	0,000	0,000	0,000	0,000	0,486	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,007	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,046	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,012	0,000	0,000	0,780	0,000	0,000	0,002	0,000	0,001	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,001
AL	0,001	0,003	0,016	0,004	0,001	0,001	0,000	0,582	0,005	0,002	0,002	0,007	0,008	0,004	0,002	0,009	0,000	0,000	0,003	0,002	0,000	0,001	0,000	0,001	0,000	0,001	0,000	0,008
BA	0,018	0,026	0,052	0,025	0,008	0,080	0,007	0,082	0,854	0,016	0,008	0,033	0,043	0,054	0,025	0,053	0,010	0,002	0,023	0,045	0,003	0,002	0,001	0,022	0,004	0,010	0,009	0,095
CE	0,015	0,059	0,038	0,034	0,009	0,029	0,005	0,017	0,007	0,852	0,022	0,046	0,020	0,211	0,087	0,006	0,001	0,001	0,008	0,010	0,001	0,002	0,001	0,012	0,003	0,005	0,004	0,018
MA	0,001	0,001	0,000	0,034	0,001	0,001	0,000	0,003	0,002	0,006	0,869	0,006	0,003	0,002	0,000	0,001	0,000	0,000	0,001	0,002	0,000	0,001	0,001	0,000	0,001	0,004	0,001	0,043
PB	0,005	0,005	0,005	0,006	0,001	0,005	0,000	0,025	0,002	0,005	0,002	0,609	0,014	0,007	0,024	0,004	0,000	0,000	0,002	0,002	0,000	0,001	0,000	0,003	0,000	0,001	0,001	0,003
PE	0,023	0,026	0,040	0,020	0,006	0,017	0,001	0,106	0,011	0,018	0,009	0,130	0,780	0,041	0,058	0,019	0,001	0,000	0,004	0,008	0,001	0,001	0,000	0,019	0,001	0,002	0,002	0,014
PI	0,000	0,001	0,000	0,023	0,000	0,000	0,000	0,001	0,001	0,006	0,000	0,001	0,002	0,443	0,000	0,000	0,000	0,000	0,001	0,002	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,002
RN	0,001	0,001	0,001	0,003	0,001	0,001	0,000	0,003	0,003	0,009	0,000	0,019	0,006	0,002	0,703	0,002	0,001	0,000	0,001	0,004	0,001	0,001	0,000	0,001	0,001	0,003	0,002	0,006
SE	0,001	0,005	0,004	0,003	0,001	0,002	0,001	0,022	0,006	0,002	0,001	0,002	0,003	0,005	0,002	0,831	0,000	0,000	0,001	0,002	0,003	0,000	0,000	0,002	0,001	0,001	0,001	0,004
ES	0,009	0,015	0,011	0,009	0,009	0,014	0,002	0,020	0,006	0,003	0,003	0,006	0,005	0,008	0,005	0,003	0,888	0,003	0,021	0,023	0,003	0,001	0,001	0,026	0,003	0,009	0,009	0,059
MG	0,239	0,112	0,051	0,088	0,069	0,196	0,065	0,040	0,032	0,019	0,025	0,035	0,033	0,060	0,026	0,015	0,056	0,964	0,086	0,104	0,011	0,007	0,006	0,241	0,044	0,077	0,055	0,232
RJ	0,018	0,017	0,047	0,013	0,014	0,043	0,004	0,008	0,008	0,004	0,004	0,007	0,006	0,010	0,007	0,004	0,007	0,003	0,690	0,042	0,003	0,005	0,003	0,065	0,004	0,011	0,011	0,025
SP	0,163	0,140	0,411	0,107	0,122	0,238	0,032	0,053	0,035	0,030	0,027	0,053	0,044	0,073	0,032	0,022	0,020	0,014	0,102	0,649	0,027	0,019	0,022	0,269	0,035	0,115	0,130	0,172
PR	0,065	0,036	0,023	0,035	0,127	0,173	0,011	0,014	0,010	0,008	0,007	0,015	0,012	0,020	0,015	0,019	0,006	0,004	0,023	0,037	0,921	0,027	0,010	0,063	0,016	0,161	0,100	0,147
SC	0,026	0,034	0,033	0,013	0,021	0,053	0,005	0,007	0,005	0,005	0,003	0,008	0,006	0,012	0,005	0,004	0,002	0,001	0,011	0,013	0,009	0,915	0,009	0,024	0,004	0,022	0,015	0,048
RS	0,034	0,031	0,022	0,015	0,020	0,052	0,006	0,007	0,005	0,006	0,004	0,009	0,006	0,011	0,004	0,004	0,002	0,001	0,011	0,015	0,006	0,011	0,940	0,022	0,004	0,018	0,016	0,069
DF	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,000	0,000	0,123	0,001	0,000	0,000	0,000
GO	0,039	0,029	0,006	0,025	0,021	0,020	0,072	0,003	0,003	0,003	0,005	0,004	0,003	0,009	0,003	0,003	0,002	0,003	0,003	0,005	0,002	0,001	0,001	0,091	0,853	0,050	0,012	0,015
MT	0,051	0,004	0,034	0,003	0,071	0,017	0,002	0,001	0,001	0,001	0,001	0,001	0,001	0,002	0,001	0,000	0,001	0,001	0,001	0,004	0,005	0,002	0,001	0,006	0,021	0,480	0,021	0,011
MS	0,011	0,002	0,004	0,001	0,008	0,004	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,002	0,002	0,001	0,000	0,002	0,001	0,014	0,604	0,006

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 9. Spatial Decomposition of the Net Effects of Multipliers on G3 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,195	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
AP	0,000	0,489	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,002	0,002	0,251	0,003	0,002	0,003	0,001	0,003	0,003	0,003	0,001	0,003	0,003	0,002	0,001	0,001	0,000	0,000	0,002	0,011	0,001	0,000	0,000	0,002	0,001	0,006	0,003	0,004
PA	0,000	0,000	0,000	0,404	0,000	0,000	0,004	0,003	0,002	0,003	0,010	0,003	0,002	0,023	0,002	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,009
RO	0,000	0,000	0,000	0,001	0,469	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,009	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,047	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,015	0,000	0,000	0,571	0,001	0,001	0,004	0,000	0,002	0,002	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,001
AL	0,001	0,002	0,007	0,003	0,000	0,001	0,000	0,445	0,007	0,003	0,003	0,007	0,008	0,004	0,002	0,012	0,000	0,000	0,001	0,001	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,004
BA	0,006	0,008	0,017	0,013	0,002	0,026	0,005	0,053	0,648	0,014	0,008	0,023	0,030	0,033	0,016	0,054	0,004	0,001	0,005	0,010	0,001	0,001	0,001	0,006	0,002	0,003	0,002	0,034
CE	0,007	0,027	0,013	0,024	0,004	0,012	0,005	0,014	0,008	0,690	0,029	0,043	0,018	0,169	0,068	0,007	0,001	0,000	0,002	0,002	0,001	0,001	0,000	0,004	0,001	0,002	0,002	0,008
MA	0,000	0,000	0,000	0,023	0,000	0,000	0,000	0,003	0,003	0,006	0,691	0,005	0,003	0,001	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,016
PB	0,003	0,003	0,002	0,005	0,001	0,002	0,000	0,024	0,003	0,007	0,004	0,435	0,014	0,007	0,021	0,005	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,002
PE	0,015	0,017	0,019	0,019	0,003	0,010	0,001	0,127	0,019	0,031	0,017	0,169	0,668	0,046	0,061	0,029	0,001	0,000	0,001	0,002	0,000	0,000	0,000	0,009	0,001	0,001	0,001	0,009
PI	0,000	0,000	0,000	0,016	0,000	0,000	0,000	0,001	0,002	0,007	0,000	0,001	0,002	0,341	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
RN	0,000	0,001	0,000	0,002	0,000	0,001	0,000	0,003	0,004	0,012	0,000	0,018	0,006	0,002	0,633	0,003	0,000	0,000	0,001	0,002	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,003
SE	0,001	0,003	0,002	0,003	0,000	0,001	0,001	0,023	0,009	0,003	0,002	0,003	0,003	0,005	0,002	0,718	0,000	0,000	0,000	0,001	0,002	0,000	0,000	0,001	0,000	0,001	0,000	0,002
ES	0,011	0,014	0,012	0,013	0,009	0,015	0,005	0,037	0,015	0,008	0,007	0,011	0,008	0,013	0,009	0,007	0,884	0,004	0,017	0,020	0,003	0,001	0,001	0,029	0,004	0,010	0,010	0,066
MG	0,219	0,086	0,036	0,104	0,055	0,157	0,111	0,058	0,066	0,037	0,057	0,054	0,050	0,080	0,039	0,029	0,055	0,943	0,044	0,049	0,012	0,007	0,005	0,174	0,044	0,071	0,045	0,192
RJ	0,017	0,017	0,033	0,018	0,014	0,036	0,007	0,015	0,023	0,011	0,011	0,013	0,012	0,017	0,012	0,008	0,009	0,005	0,801	0,019	0,004	0,006	0,002	0,047	0,005	0,011	0,010	0,028
SP	0,238	0,176	0,460	0,196	0,165	0,312	0,086	0,124	0,116	0,096	0,096	0,129	0,110	0,157	0,076	0,060	0,028	0,027	0,081	0,818	0,046	0,023	0,020	0,307	0,055	0,173	0,188	0,252
PR	0,066	0,029	0,021	0,041	0,112	0,159	0,019	0,022	0,020	0,016	0,016	0,023	0,019	0,027	0,025	0,035	0,005	0,004	0,014	0,023	0,886	0,022	0,007	0,054	0,016	0,160	0,095	0,136
SC	0,043	0,045	0,050	0,024	0,030	0,081	0,015	0,017	0,018	0,015	0,012	0,020	0,015	0,027	0,013	0,011	0,004	0,003	0,012	0,015	0,017	0,918	0,008	0,034	0,006	0,036	0,023	0,074
RS	0,066	0,049	0,038	0,034	0,034	0,096	0,020	0,021	0,023	0,023	0,020	0,026	0,018	0,029	0,013	0,012	0,004	0,003	0,013	0,019	0,013	0,014	0,952	0,037	0,008	0,035	0,029	0,126
DF	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,201	0,003	0,001	0,001	0,001
GO	0,044	0,026	0,006	0,033	0,020	0,021	0,142	0,005	0,008	0,006	0,014	0,008	0,005	0,014	0,006	0,005	0,002	0,004	0,002	0,003	0,003	0,001	0,000	0,084	0,825	0,055	0,012	0,015
MT	0,054	0,004	0,030	0,004	0,070	0,016	0,005	0,001	0,002	0,002	0,002	0,002	0,001	0,002	0,001	0,001	0,001	0,001	0,001	0,002	0,006	0,002	0,001	0,006	0,024	0,406	0,022	0,010
MS	0,012	0,002	0,004	0,001	0,007	0,004	0,001	0,000	0,001	0,001	0,000	0,001	0,001	0,001	0,000	0,000	0,000	0,000	0,001	0,001	0,003	0,001	0,000	0,002	0,001	0,014	0,554	0,006

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 10. Spatial Decomposition of the Net Effects of Multipliers on G4 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,201	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
AP	0,000	0,399	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,001	0,001	0,311	0,002	0,001	0,001	0,000	0,003	0,004	0,004	0,000	0,003	0,003	0,001	0,001	0,002	0,000	0,001	0,001	0,002	0,001	0,001	0,001	0,001	0,001	0,007	0,002	0,002
PA	0,000	0,000	0,000	0,452	0,000	0,000	0,004	0,003	0,002	0,004	0,012	0,004	0,002	0,023	0,003	0,002	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,013
RO	0,001	0,000	0,000	0,001	0,524	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,001	0,000	0,000	0,000	0,012	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,082	0,000	0,000	0,001	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000
TO	0,000	0,000	0,000	0,011	0,000	0,000	0,546	0,001	0,001	0,004	0,000	0,002	0,002	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,001
AL	0,000	0,002	0,005	0,002	0,000	0,000	0,000	0,377	0,008	0,003	0,003	0,007	0,009	0,003	0,002	0,014	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,003
BA	0,004	0,006	0,009	0,009	0,001	0,015	0,004	0,045	0,526	0,012	0,006	0,019	0,028	0,024	0,015	0,057	0,004	0,001	0,002	0,003	0,001	0,001	0,001	0,003	0,001	0,002	0,001	0,024
CE	0,006	0,028	0,009	0,019	0,003	0,009	0,005	0,015	0,010	0,623	0,028	0,041	0,021	0,148	0,076	0,009	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,003	0,001	0,002	0,001	0,007
MA	0,000	0,000	0,000	0,021	0,000	0,000	0,000	0,003	0,003	0,007	0,657	0,005	0,003	0,001	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,000	0,002	0,000	0,016
PB	0,003	0,003	0,002	0,005	0,001	0,002	0,000	0,028	0,004	0,009	0,004	0,412	0,018	0,007	0,026	0,006	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,002
PE	0,012	0,016	0,011	0,015	0,002	0,007	0,001	0,126	0,021	0,032	0,016	0,157	0,568	0,038	0,063	0,034	0,001	0,001	0,000	0,000	0,000	0,000	0,000	0,005	0,001	0,001	0,000	0,007
PI	0,000	0,000	0,000	0,017	0,000	0,000	0,000	0,001	0,002	0,009	0,000	0,001	0,003	0,371	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
RN	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,003	0,005	0,013	0,000	0,018	0,007	0,001	0,544	0,003	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,001	0,001	0,002
SE	0,001	0,002	0,001	0,002	0,000	0,001	0,001	0,020	0,008	0,003	0,001	0,002	0,003	0,004	0,002	0,648	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,001	0,000	0,000	0,000	0,002
ES	0,008	0,012	0,009	0,009	0,006	0,011	0,004	0,036	0,017	0,008	0,006	0,010	0,009	0,010	0,010	0,008	0,842	0,006	0,007	0,009	0,003	0,002	0,002	0,019	0,003	0,009	0,007	0,054
MG	0,165	0,073	0,022	0,072	0,035	0,109	0,093	0,051	0,064	0,033	0,047	0,043	0,048	0,059	0,038	0,029	0,059	0,900	0,016	0,016	0,011	0,008	0,006	0,106	0,036	0,058	0,030	0,144
RJ	0,023	0,028	0,033	0,024	0,018	0,047	0,012	0,027	0,046	0,020	0,019	0,021	0,023	0,024	0,021	0,015	0,020	0,012	0,902	0,011	0,006	0,010	0,005	0,049	0,008	0,017	0,013	0,043
SP	0,311	0,266	0,472	0,224	0,187	0,393	0,125	0,191	0,194	0,150	0,137	0,176	0,182	0,197	0,127	0,092	0,050	0,053	0,050	0,928	0,072	0,036	0,036	0,323	0,079	0,249	0,232	0,349
PR	0,061	0,029	0,017	0,034	0,089	0,139	0,019	0,023	0,023	0,017	0,016	0,023	0,022	0,024	0,030	0,044	0,007	0,006	0,007	0,010	0,849	0,033	0,011	0,041	0,016	0,164	0,082	0,127
SC	0,043	0,053	0,042	0,022	0,026	0,076	0,017	0,020	0,024	0,018	0,013	0,022	0,020	0,027	0,017	0,015	0,005	0,004	0,006	0,007	0,023	0,881	0,015	0,026	0,007	0,040	0,021	0,071
RS	0,051	0,044	0,023	0,024	0,023	0,069	0,018	0,019	0,023	0,022	0,017	0,022	0,018	0,022	0,013	0,013	0,004	0,004	0,005	0,007	0,013	0,017	0,918	0,022	0,007	0,030	0,020	0,097
DF	0,000	0,000	0,000	0,002	0,000	0,000	0,001	0,001	0,001	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,320	0,006	0,001	0,001	0,001
GO	0,042	0,028	0,005	0,028	0,016	0,019	0,144	0,005	0,010	0,007	0,014	0,008	0,006	0,012	0,008	0,007	0,002	0,005	0,001	0,002	0,003	0,001	0,001	0,072	0,804	0,055	0,010	0,015
MT	0,053	0,004	0,024	0,004	0,062	0,015	0,005	0,001	0,002	0,002	0,003	0,002	0,002	0,002	0,001	0,001	0,002	0,001	0,000	0,001	0,007	0,003	0,001	0,004	0,027	0,328	0,020	0,009
MS	0,014	0,003	0,005	0,001	0,007	0,004	0,001	0,001	0,001	0,001	0,000	0,001	0,001	0,001	0,000	0,001	0,001	0,000	0,000	0,001	0,004	0,001	0,001	0,002	0,001	0,018	0,553	0,007

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 11. Spatial Decomposition of the Net Effects of Multipliers on G5 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,323	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000
AP	0,000	0,548	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,001	0,001	0,436	0,004	0,001	0,001	0,001	0,004	0,007	0,007	0,000	0,005	0,006	0,001	0,001	0,004	0,001	0,001	0,001	0,002	0,002	0,002	0,003	0,000	0,001	0,015	0,003	0,003
PA	0,000	0,000	0,000	0,421	0,000	0,000	0,003	0,002	0,001	0,003	0,008	0,003	0,001	0,016	0,002	0,002	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,013
RO	0,000	0,000	0,000	0,001	0,537	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,001	0,000	0,000	0,000	0,011	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,056	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,015	0,000	0,000	0,538	0,001	0,001	0,005	0,000	0,002	0,003	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,001	0,000	0,001
AL	0,001	0,002	0,006	0,004	0,000	0,001	0,000	0,473	0,011	0,004	0,004	0,011	0,014	0,005	0,002	0,031	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,001	0,000	0,005
BA	0,005	0,007	0,010	0,014	0,001	0,021	0,005	0,053	0,590	0,017	0,008	0,027	0,039	0,031	0,016	0,104	0,009	0,002	0,001	0,002	0,002	0,003	0,002	0,003	0,001	0,003	0,001	0,034
CE	0,005	0,020	0,008	0,020	0,003	0,009	0,005	0,012	0,008	0,628	0,024	0,038	0,019	0,126	0,059	0,011	0,001	0,001	0,001	0,000	0,001	0,002	0,001	0,002	0,001	0,002	0,001	0,007
MA	0,000	0,000	0,000	0,029	0,000	0,000	0,000	0,003	0,004	0,009	0,709	0,006	0,004	0,001	0,001	0,002	0,000	0,001	0,000	0,000	0,000	0,001	0,001	0,000	0,000	0,003	0,000	0,021
PB	0,002	0,002	0,001	0,005	0,001	0,002	0,000	0,021	0,003	0,008	0,003	0,432	0,016	0,006	0,021	0,007	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,002
PE	0,011	0,013	0,011	0,017	0,003	0,008	0,001	0,106	0,019	0,032	0,015	0,153	0,579	0,035	0,054	0,043	0,001	0,001	0,000	0,000	0,000	0,001	0,000	0,004	0,001	0,001	0,000	0,008
PI	0,000	0,000	0,000	0,019	0,000	0,000	0,000	0,001	0,002	0,009	0,000	0,001	0,003	0,453	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
RN	0,000	0,001	0,000	0,002	0,000	0,001	0,000	0,004	0,007	0,018	0,001	0,025	0,010	0,002	0,638	0,006	0,001	0,000	0,000	0,000	0,001	0,001	0,000	0,000	0,000	0,002	0,001	0,003
SE	0,000	0,002	0,001	0,002	0,000	0,001	0,001	0,019	0,008	0,003	0,001	0,002	0,003	0,003	0,002	0,528	0,001	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,000	0,001	0,000	0,002
ES	0,007	0,010	0,006	0,010	0,006	0,010	0,004	0,032	0,016	0,008	0,005	0,010	0,009	0,009	0,008	0,012	0,784	0,009	0,004	0,003	0,004	0,003	0,003	0,011	0,003	0,010	0,006	0,044
MG	0,147	0,056	0,019	0,074	0,036	0,117	0,098	0,042	0,055	0,031	0,040	0,040	0,045	0,051	0,030	0,035	0,080	0,885	0,012	0,012	0,013	0,012	0,009	0,086	0,036	0,064	0,030	0,146
RJ	0,022	0,025	0,027	0,028	0,021	0,056	0,014	0,025	0,046	0,021	0,018	0,022	0,025	0,024	0,018	0,019	0,031	0,015	0,931	0,007	0,009	0,016	0,007	0,042	0,009	0,021	0,014	0,052
SP	0,272	0,200	0,385	0,224	0,193	0,418	0,131	0,150	0,157	0,139	0,114	0,157	0,164	0,167	0,098	0,102	0,063	0,057	0,038	0,955	0,083	0,050	0,048	0,264	0,078	0,270	0,228	0,357
PR	0,048	0,020	0,013	0,031	0,082	0,129	0,017	0,017	0,018	0,014	0,012	0,019	0,018	0,018	0,021	0,050	0,008	0,007	0,004	0,006	0,825	0,047	0,015	0,029	0,014	0,161	0,071	0,113
SC	0,033	0,036	0,027	0,021	0,025	0,068	0,016	0,015	0,018	0,016	0,010	0,018	0,017	0,021	0,011	0,018	0,007	0,005	0,003	0,003	0,025	0,820	0,021	0,016	0,006	0,040	0,018	0,059
RS	0,042	0,031	0,020	0,024	0,023	0,067	0,017	0,015	0,019	0,020	0,014	0,020	0,016	0,018	0,010	0,017	0,006	0,005	0,003	0,004	0,015	0,029	0,885	0,016	0,006	0,032	0,019	0,093
DF	0,000	0,000	0,000	0,002	0,000	0,000	0,001	0,001	0,001	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,000	0,000	0,458	0,006	0,001	0,001	0,001
GO	0,036	0,020	0,005	0,028	0,016	0,020	0,142	0,004	0,008	0,006	0,011	0,007	0,005	0,010	0,006	0,007	0,003	0,006	0,001	0,002	0,003	0,001	0,001	0,060	0,814	0,058	0,010	0,016
MT	0,032	0,002	0,020	0,003	0,043	0,011	0,004	0,001	0,001	0,002	0,002	0,001	0,001	0,001	0,001	0,001	0,002	0,001	0,000	0,001	0,006	0,003	0,001	0,003	0,017	0,282	0,012	0,007
MS	0,012	0,002	0,004	0,001	0,008	0,005	0,001	0,000	0,001	0,001	0,000	0,001	0,001	0,001	0,000	0,001	0,001	0,001	0,000	0,001	0,005	0,002	0,001	0,002	0,001	0,019	0,581	0,007

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 12. Spatial Decomposition of the Net Effects of Multipliers on G6 Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,273	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
AP	0,000	0,409	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,000	0,000	0,168	0,002	0,000	0,000	0,000	0,002	0,003	0,003	0,000	0,002	0,002	0,001	0,000	0,002	0,001	0,001	0,000	0,000	0,001	0,001	0,001	0,000	0,001	0,006	0,001	0,001
PA	0,000	0,000	0,000	0,297	0,000	0,000	0,004	0,002	0,002	0,003	0,011	0,002	0,001	0,017	0,002	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,007
RO	0,001	0,000	0,000	0,001	0,501	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,002	0,001	0,000	0,000	0,000	0,010	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,071	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,008	0,000	0,000	0,382	0,000	0,001	0,003	0,000	0,001	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,000
AL	0,001	0,003	0,007	0,005	0,000	0,001	0,001	0,440	0,015	0,006	0,008	0,009	0,014	0,007	0,003	0,028	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,001	0,000	0,005
BA	0,003	0,006	0,009	0,011	0,001	0,014	0,006	0,038	0,418	0,015	0,010	0,016	0,027	0,030	0,014	0,078	0,010	0,002	0,001	0,001	0,001	0,003	0,001	0,002	0,001	0,002	0,001	0,020
CE	0,003	0,016	0,007	0,017	0,002	0,005	0,005	0,008	0,007	0,517	0,030	0,022	0,012	0,116	0,046	0,009	0,001	0,001	0,000	0,000	0,001	0,002	0,001	0,001	0,001	0,002	0,001	0,005
MA	0,000	0,000	0,000	0,011	0,000	0,000	0,000	0,001	0,001	0,003	0,414	0,002	0,001	0,001	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,006
PB	0,004	0,005	0,004	0,010	0,001	0,003	0,001	0,039	0,008	0,016	0,011	0,471	0,030	0,014	0,042	0,015	0,001	0,001	0,000	0,000	0,001	0,003	0,001	0,001	0,001	0,001	0,001	0,003
PE	0,014	0,020	0,017	0,025	0,003	0,009	0,003	0,127	0,031	0,049	0,035	0,165	0,586	0,063	0,083	0,061	0,002	0,001	0,000	0,000	0,001	0,001	0,001	0,004	0,001	0,001	0,001	0,010
PI	0,000	0,000	0,000	0,010	0,000	0,000	0,000	0,000	0,002	0,005	0,000	0,000	0,001	0,219	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
RN	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,002	0,005	0,013	0,001	0,013	0,005	0,002	0,512	0,004	0,001	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,001	0,001	0,002
SE	0,001	0,002	0,002	0,003	0,000	0,001	0,001	0,017	0,011	0,003	0,002	0,002	0,003	0,004	0,002	0,461	0,001	0,000	0,000	0,000	0,002	0,001	0,000	0,000	0,000	0,001	0,000	0,002
ES	0,006	0,010	0,007	0,010	0,005	0,008	0,005	0,027	0,020	0,008	0,009	0,008	0,007	0,012	0,008	0,013	0,658	0,011	0,001	0,001	0,004	0,004	0,003	0,006	0,003	0,008	0,004	0,030
MG	0,138	0,064	0,024	0,085	0,034	0,100	0,128	0,039	0,068	0,037	0,072	0,034	0,040	0,071	0,037	0,039	0,113	0,843	0,007	0,009	0,012	0,015	0,011	0,064	0,043	0,061	0,024	0,129
RJ	0,031	0,042	0,049	0,044	0,029	0,072	0,027	0,033	0,080	0,036	0,047	0,026	0,031	0,048	0,032	0,028	0,060	0,025	0,957	0,009	0,012	0,027	0,012	0,047	0,017	0,029	0,017	0,072
SP	0,328	0,292	0,581	0,330	0,230	0,451	0,219	0,172	0,240	0,209	0,260	0,168	0,181	0,295	0,152	0,142	0,108	0,082	0,027	0,967	0,099	0,086	0,075	0,254	0,121	0,325	0,239	0,422
PR	0,049	0,025	0,016	0,040	0,084	0,117	0,025	0,017	0,024	0,018	0,024	0,017	0,018	0,028	0,028	0,060	0,012	0,008	0,002	0,004	0,806	0,070	0,021	0,023	0,019	0,165	0,063	0,110
SC	0,029	0,038	0,041	0,024	0,023	0,053	0,019	0,014	0,024	0,017	0,018	0,016	0,016	0,029	0,014	0,023	0,011	0,007	0,001	0,001	0,025	0,720	0,032	0,010	0,007	0,036	0,012	0,047
RS	0,047	0,042	0,032	0,034	0,026	0,066	0,026	0,017	0,029	0,028	0,029	0,020	0,017	0,030	0,015	0,024	0,010	0,007	0,002	0,003	0,017	0,052	0,834	0,013	0,009	0,036	0,017	0,098
DF	0,000	0,000	0,000	0,001	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,538	0,004	0,001	0,001	0,001
GO	0,026	0,017	0,005	0,024	0,012	0,013	0,141	0,003	0,008	0,005	0,016	0,004	0,004	0,011	0,006	0,007	0,003	0,005	0,000	0,001	0,002	0,002	0,001	0,033	0,748	0,042	0,006	0,011
MT	0,028	0,002	0,024	0,003	0,037	0,009	0,004	0,001	0,002	0,002	0,003	0,001	0,001	0,002	0,001	0,001	0,003	0,001	0,000	0,000	0,006	0,004	0,001	0,002	0,019	0,246	0,009	0,006
MS	0,016	0,003	0,007	0,002	0,011	0,006	0,002	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,002	0,001	0,000	0,001	0,007	0,004	0,001	0,002	0,002	0,026	0,602	0,008

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++

Table 13. Spatial Decomposition of the Net Effects of Multipliers on Total Employment (via UPE/UPBR)

Estado Impactado \ Origem das Exportações	AC	AP	AM	PA	RO	RR	TO	AL	BA	CE	MA	PB	PE	PI	RN	SE	ES	MG	RJ	SP	PR	SC	RS	DF	GO	MT	MS	Brasil
AC	0,268	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000
AP	0,000	0,508	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
AM	0,003	0,003	0,288	0,004	0,003	0,004	0,001	0,003	0,003	0,003	0,001	0,003	0,003	0,002	0,001	0,001	0,001	0,001	0,003	0,018	0,001	0,001	0,001	0,003	0,001	0,009	0,004	0,006
PA	0,000	0,000	0,000	0,440	0,000	0,000	0,003	0,002	0,001	0,002	0,006	0,003	0,001	0,020	0,001	0,001	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,001	0,000	0,000	0,000	0,011
RO	0,000	0,000	0,000	0,001	0,506	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,010	0,001	0,001
RR	0,000	0,000	0,000	0,000	0,000	0,052	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TO	0,000	0,000	0,000	0,013	0,000	0,000	0,669	0,000	0,000	0,002	0,000	0,002	0,002	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,001	0,000	0,001
AL	0,001	0,003	0,015	0,004	0,001	0,001	0,000	0,586	0,008	0,003	0,003	0,009	0,011	0,005	0,002	0,014	0,000	0,000	0,002	0,002	0,000	0,001	0,000	0,001	0,000	0,001	0,000	0,008
BA	0,011	0,013	0,031	0,018	0,004	0,049	0,006	0,056	0,753	0,014	0,007	0,027	0,036	0,041	0,020	0,054	0,007	0,002	0,009	0,021	0,002	0,002	0,001	0,012	0,003	0,006	0,004	0,061
CE	0,011	0,035	0,027	0,028	0,005	0,021	0,006	0,013	0,008	0,794	0,023	0,042	0,020	0,181	0,080	0,007	0,001	0,001	0,004	0,005	0,001	0,002	0,001	0,008	0,002	0,004	0,003	0,014
MA	0,000	0,000	0,000	0,030	0,000	0,001	0,000	0,003	0,003	0,006	0,810	0,006	0,003	0,001	0,000	0,001	0,000	0,000	0,001	0,001	0,000	0,001	0,001	0,000	0,000	0,003	0,000	0,031
PB	0,004	0,004	0,004	0,006	0,001	0,004	0,000	0,022	0,003	0,006	0,003	0,536	0,015	0,007	0,023	0,005	0,000	0,000	0,001	0,001	0,000	0,001	0,000	0,002	0,000	0,001	0,001	0,003
PE	0,018	0,018	0,027	0,020	0,004	0,013	0,001	0,098	0,015	0,022	0,012	0,143	0,713	0,043	0,057	0,024	0,001	0,001	0,002	0,004	0,001	0,001	0,000	0,012	0,001	0,002	0,001	0,011
PI	0,000	0,000	0,000	0,019	0,000	0,000	0,000	0,001	0,001	0,006	0,000	0,001	0,002	0,407	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001
RN	0,001	0,001	0,000	0,002	0,001	0,001	0,000	0,003	0,004	0,010	0,000	0,019	0,007	0,002	0,680	0,003	0,000	0,000	0,001	0,003	0,001	0,001	0,000	0,001	0,000	0,002	0,001	0,005
SE	0,001	0,004	0,003	0,003	0,001	0,002	0,001	0,020	0,007	0,002	0,001	0,002	0,003	0,005	0,002	0,766	0,000	0,000	0,001	0,001	0,003	0,000	0,000	0,001	0,001	0,001	0,001	0,003
ES	0,009	0,012	0,010	0,011	0,008	0,013	0,003	0,023	0,010	0,005	0,004	0,008	0,006	0,010	0,006	0,005	0,865	0,005	0,012	0,016	0,003	0,002	0,002	0,023	0,003	0,010	0,008	0,059
MG	0,196	0,077	0,034	0,087	0,050	0,154	0,083	0,036	0,042	0,022	0,031	0,037	0,037	0,061	0,026	0,020	0,058	0,936	0,038	0,051	0,012	0,008	0,006	0,163	0,041	0,070	0,042	0,186
RJ	0,019	0,020	0,037	0,021	0,017	0,045	0,007	0,013	0,020	0,008	0,008	0,013	0,012	0,017	0,010	0,007	0,014	0,007	0,835	0,023	0,005	0,009	0,004	0,053	0,006	0,014	0,012	0,034
SP	0,223	0,172	0,408	0,180	0,162	0,314	0,070	0,084	0,080	0,061	0,058	0,098	0,088	0,129	0,053	0,046	0,034	0,030	0,064	0,803	0,051	0,031	0,030	0,280	0,057	0,184	0,183	0,254
PR	0,057	0,026	0,018	0,035	0,101	0,149	0,014	0,014	0,013	0,009	0,009	0,016	0,014	0,021	0,017	0,026	0,006	0,005	0,011	0,020	0,879	0,031	0,010	0,047	0,015	0,157	0,085	0,127
SC	0,033	0,037	0,035	0,019	0,024	0,065	0,010	0,009	0,010	0,008	0,006	0,013	0,011	0,019	0,007	0,008	0,004	0,003	0,007	0,010	0,016	0,887	0,012	0,024	0,005	0,032	0,018	0,058
RS	0,046	0,036	0,026	0,024	0,025	0,071	0,013	0,011	0,012	0,011	0,009	0,015	0,011	0,018	0,007	0,008	0,003	0,003	0,008	0,012	0,011	0,018	0,929	0,025	0,006	0,028	0,021	0,094
DF	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,000	0,000	0,000	0,259	0,003	0,001	0,001	0,001
GO	0,039	0,024	0,006	0,028	0,018	0,020	0,105	0,003	0,005	0,004	0,008	0,005	0,004	0,010	0,004	0,004	0,002	0,004	0,002	0,003	0,003	0,001	0,001	0,078	0,827	0,053	0,011	0,015
MT	0,047	0,003	0,027	0,004	0,062	0,015	0,003	0,001	0,001	0,001	0,001	0,002	0,001	0,002	0,001	0,001	0,002	0,001	0,001	0,002	0,006	0,002	0,001	0,005	0,022	0,394	0,019	0,010
MS	0,012	0,002	0,004	0,001	0,008	0,004	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,002	0,003	0,001	0,001	0,002	0,001	0,016	0,583	0,006

++Origem das Exportações - Origin of Exports++

++Estado Impactado - Impacted State++