

## **Multinationals, Employment, and Income Distribution in Brazil\***

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An input-output model is used in this paper to compare the impact of expanded output by domestically-owned private firms and multinational corporations (MNCs) on employment and income distribution. The results reveal that MNCs create less employment per unit of capital and imported inputs than domestic enterprises, and also create fewer high-paying jobs. The impact of MNCs on overall size income distribution differs little, however, from that of domestic firms, as MNCs generate less capital income for upper-income Brazilians. Hence, MNCs cannot be seen as responsible for Brazil's extreme income inequality.

### **I. Introduction**

The appropriate role for foreign capital in the Brazilian economy continues to be an important topic of debate in Brazilian economic and political circles. Brazilian industrialization has relied heavily on multinational corporations (MNCs), which dominate production in important sectors such as automobiles and pharmaceuticals. In the manufacturing sector as a whole, they accounted for 28.5% of output in 1980.<sup>1</sup> Many economists see expanded foreign investment as one of

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<sup>1</sup> This figure is taken from the sample data of Willmore (1987). His sample covered firms responsible for over 95% of industrial output in 1980.

the keys to economic revival in Brazil, especially in light of the limited scope for other forms of foreign financing.<sup>2</sup>

The desirability of the strong presence of MNCs in Brazil has come into sharp question by a number of critics, who have often cited the adverse impact of MNCs on the distribution of income.<sup>3</sup> Since multinationals tend to transfer a capital-intensive technology and consumption package that is largely geared to production of goods for upper-income consumers, these critics claim that MNCs contribute to a growth pattern that primarily benefits the rich, while generating few jobs, especially for low-paid, unskilled labor.

However, for all the claims that MNCs contribute to greater income inequality in Brazil, no research has yet attempted to quantify the impact of MNC production on income distribution and employment and compare it with that of domestically-owned firms. The studies that come closest to dealing with this issue are those assessing the choice of technology of multinationals and domestic firms. These works find that MNCs choose more capital intensive techniques than domestic firms, even when factors such as firm size and industry are taken into account (Morley and Smith, 1977; von Doellinger and Cavalcanti, 1979; Gonçalves, 1982; L. Moreira, 1983; Willmore, 1986). One cannot infer from these studies, however, that MNCs contribute to greater income inequality. Since MNC profits are for the most part remitted abroad or reinvested, the greater capital intensity of MNCs does not translate to the Brazilian rich deriving a bigger share of income under MNC production. Furthermore, an accurate assessment of the distributive and employment consequences of MNCs must take into account not only the direct impact of production by firms, but the indirect, intersectoral effects as well. By indirect effects we mean the generation of employment and income in sectors supplying inputs to these firms. Because earlier studies have not utilized models that capture both direct and indirect effects, they do not provide an accurate picture of the distributive and employment consequences of production by MNCs and domestically-owned firms.<sup>4</sup>

This study fills this lacuna in the literature by assessing the comparative impact of production by MNCs and domestically-owned

<sup>2</sup> For an example of recent work by economists citing the positive impact of an increased presence by MNCs in Brazil, see Fritsch and Franco (1988).

<sup>3</sup> See Baer (1989) for a succinct review of the arguments of those who believe MNCs have had a negative impact on Brazilian economic development.

<sup>4</sup> Recent research on the question of "appropriate technology" has also recognized the need for an input-output approach (Alauddin and Tisdell, 1988).

private firms on employment and income distribution in Brazil, within the context of an input-output model based on 1980 and 1981 data.<sup>5</sup>

This paper is structured as follows. Section II describes the methodology and data employed in the study. Sections III and IV present the empirical results. A summary section concludes the paper.

## II. Methodology and Data

The focus of the model developed in this section is on quantifying the impact of the differing composition of output under MNCs and domestic firms on employment and income distribution. Because the basket of goods produced by MNCs and domestic firms differs, the impact of domestic and foreign enterprises on employment and income is also likely to differ. The scope of our inquiry is markedly different from that utilized in the lion's share of previous research on MNCs in Brazil, which sought to analyze differences in the behavior of MNCs and domestic firms in the same sector. Instead, we attempt to assess the impact of the differences in the allocation of production between sectors on employment and income inequality. An input-output model is ideally suited for this task, as it captures both the direct and indirect effects of the differing structures of production under domestic firms and MNCs. In what follows in this section, an input-output model is constructed to compare the distributive and employment consequences of a unit increase in final demand for the average basket of goods produced by domestic and foreign firms.

Keeping in mind that the dimensions of the vectors equal the number of sectors in the economy unless otherwise indicated, the Leontief balance equation states that the vector of sectoral output,  $x$ , is comprised of final demand by sector,  $f$ , plus intermediate goods demand,  $Ax$ , minus imports,  $m$ :

$$(1) \quad x = Ax + f - m$$

Imports are comprised of intermediate imports,  $M_i$ , and final demand imports,  $m_f$ . The quantity of intermediate imports required in the economy depends on the level of output:

<sup>5</sup> No attempt is made in this paper to assess other aspects of the desirability of foreign investment in Brazil, such as its impact on growth and the balance of payments. While these issues are undoubtedly important, there are outside of the scope of the present work.

$$(2) \quad m_i = A_m x$$

where the typical element in matrix  $A_m$  quantifies the amount of imported intermediate input  $i$  needed per unit of  $j$  produced.

Designating  $(f - m_j)$  as  $e$ , and combining equations (1) and (2) and solving for  $x$ , we have

$$(3) \quad x = (I - A + A_m)^{-1} e$$

The total multiplier effects of an increase in demand for the goods produced by MNCs and Brazilian firms can be simulated by replacing vector  $e$  in equation (3) with vectors representing the average basket of goods (sales) produced by MNCs and Brazilian firms, respectively. For purposes of comparison, a marginal increase of one unit (say one million cruzeiros) of sales is used. The average basket is calculated as a weighted average of the sales of each ownership group, weighted by the sectoral composition of sales.

Employment effects can be addressed by introducing matrix  $A_1$ , whose typical element  $(ij)$  shows the amount of labor class  $i$ 's labor (in person-years) required to produce a unit of  $j$ . Designating the weighted vector of sales as  $s$  and premultiplying the inverted matrix by  $A_1$ , we have

$$(4) \quad l^* = A_1 (I - A + A_m)^{-1} s$$

where  $l^*$  is a vector of employment by labor class, in which each element measures the amount of employment generated for labor class  $i$  per unit increase in  $s$ .

The distributive impact of production by MNCs and domestic firms can be assessed in an analogous manner. Let income and the distribution of income be determined by the amount of factor income (wages and capital income) that go to each income group per unit of output:

$$(5) \quad y = A_y x$$

where  $y$  is a vector of incomes by income group, and  $A_y$  a matrix of distribution coefficients whose typical element  $(nj)$  shows the share of sector  $j$ 's output (per unit) accruing to income group  $n$  as income. Hence, typical element  $(nj)$  shows the percentage of direct income

generated for income group  $n$  per unit produced of sector  $j$ 's output.

The impact of production by MNCs and domestically-owned firms on income groups is thus measured by

$$(6) \quad y^* = Ay(I - A + A_m)^{-1}s$$

where  $y^*$  is the vector of income by income class, in which each element measures the amount of income accruing to income group  $n$  derived from a unit increase in  $s$ .

The model utilized here requires four kinds of data: 1) input-output matrices; 2) data on the distribution of value added or factor payments (wages and capital incomes) by sector to income groups; 3) employment data on labor requirements per unit of output; and 4) data on the sectoral composition of MNC and Brazilian production (sales). The 1980 input-output table compiled by the Instituto Brasileiro de Geografia e Estatística (IBGE) are utilized for matrices  $A$  and  $A_m$  in the model, and for payments by sector to wage labor and capital. Data on the share of sectoral sales of domestic, multinational, and state-owned firms derived primarily from Baer(1983) and Willmore (1987) were used to calculate what share of value added to capital should be distributed to Brazilian income groups. Only the profits of domestic private firms were counted as the income of private citizens. Since the profits of multinational corporations are either reinvested or remitted, they were not distributed to wealthy Brazilian households as capital incomes. Similarly, none of the profits of state enterprises were distributed to private households, as only an exceedingly small share of state equity is provided by private suppliers of capital.

The allocation of capital incomes besides profits, specifically payments to debtholders (debt-servicing costs) deserves some discussion. Utilizing data on debt-servicing costs by sector from Calabi, Reiss, and Levy (1981), we were able to calculate the percentage of capital incomes by sector necessary to service debts. Unfortunately, no precise data exist, on a sectoral level, regarding the division of this debt between foreign and domestic creditors. In the aggregate it was assumed that most comes from financial institutions within Brazil, which act as intermediaries between domestic savers and investors. In light of this, it seemed most reasonable to assume that debt-servicing payments by firms eventually accrued as incomes for Brazilian households.

Information on the distribution of wages and jobs to different income classes by sector was drawn from the *Relação Anual de Infor-*

*mações Sociais* (RAIS) for 1980, which is generally considered the best source of data on wage income in Brazil. Given the weak coverage of the RAIS in agriculture, construction, and some service sectors, however, 1980 demographic census data were used for these sectors. Figures on labor requirements per unit of output were taken from IBGE data that are published with the input-output tables. Data on capital requirements (used to assess capital/labor ratios for MNCs and domestic firms) were drawn from A. Moreira (1989). These data provide information on the incremental capital/output ratio by sector.

The sectoral composition of MNC and Brazilian sales was derived from various sources. No single source could be used, due to differing classification systems used from one data source to the other. The base year chosen was 1981, with data coming primarily from *Visão*'s annual "Quem é Quem na Economia Brasileira," as summarized in Baer (1983). For sectors of the input-output table that did not correspond well with the classification used in "Quem é Quem," 1980 data from Willmore (1987) were utilized. Some 1980 and 1985 *Visão* data were also utilized for some sectors. The weight of each sector in the average basket of sales produced by MNCs and private Brazilian firms is described in Appendix A.

The distributive impact of production by MNCs and domestic firms is assessed in terms of the Gini coefficient, which was derived by distributing the income generated by firms to various income groups, with population weights derived from the 1980 demographic census for the economically active population.<sup>6</sup>

One restrictive aspect of the input-output framework employed here is the assumption of fixed technical and distributional coefficients, as well as the assumption that relative prices do not change in response to changes in output. Constant-cost supply curves are also assumed, implying no capacity constraints. In the face of capacity constraints, increased demand for a sector's output can be reflected in increasing marginal costs and prices, giving rise to the possibility of a

<sup>6</sup> Note that it is appropriate to hold population weights constant for the purposes of our exercise. Distributive performance is then measured by how much income is generated for income groups, with the reference point for poor and rich groups being defined by the share of each income in entire economically active population. Changing population weights would understate the unequalizing impact of high-inequality sectors. For example, if a sector distributes all its income the highest income group, there would be perfect income equality in that sector; yet promoting this sector, instead of those that generated a smaller share of income for the highest income group, would certainly increase aggregate income inequality.

change in relative prices. In view of these qualifications, the results reported in the next section should be seen as rough empirical estimates.

### III. Empirical Results

#### A. Employment Generation

The employment consequences of a one million cruzeiro increase in sales by MNC and private domestic firms is reported in Table 1. The results reveal that domestic firms generate 60% more employment per unit increase in sales than MNC firms. A higher percentage of the jobs generated by domestic enterprises are of the low-paying variety, however. Sixty-five percent of the jobs created by domestic firm production pay two minimum wages or less, while the comparable figure for MNCs is 51%.

While a higher share of MNC jobs pay well, domestic firms still create a somewhat larger absolute number of "good" jobs, defined as

**Table 1**  
EMPLOYMENT GENERATION BY EARNINGS CLASS PER  
MILLION CRUZEIRO INCREASE IN SALES, 1981

Earnings Group	Number of Jobs Created (Person-Years)			
	Brazilian Firms	%	MNCs	%
2 minimum wages or less	1.6072	65.19	.7799	50.56
2-3 MW	.3211	13.02	.2605	16.89
3-5 MW	.2659	10.72	.2389	15.49
5-10 MW	.1680	6.81	.1691	10.96
10-20 MW	.0723	2.93	.0664	4.30
20 or greater	.0310	1.26	.0276	1.79
Total	2.4655	100.00	1.5424	100.00
Total "Good" Jobs Created*	.8582		.7624	

\* Defined as jobs paying more than two times the minimum wage.

those that pay more than two times the minimum wage.<sup>7</sup> As Table 1 demonstrates, for all but one wage class, domestic firms produce more jobs than MNCs. Hence, the results suggest that under the current structure of production in Brazil, domestic firms not only generate more employment than MNCs, but superior potential mobility out of poverty for low-paid workers.

Domestic firms also appear more proficient than MNCs in generating employment per unit of capital and imported inputs (Table 2), as measured by the ratios of employment creation to the capital and to the intermediate imported inputs needed to support a million cruzeiro increase in sales. As Table 2 evidences, domestic firms create almost three times the number of jobs per unit imported intermediate input.

One interesting result in Table 2 is that MNCs appear more effective than domestic firms in generating "good" jobs per unit of capital. This is largely due, however, to the surprisingly high capital/output ratio of the real estate rental sector. Since this sector is dominated by

**Table 2**  
JOB CREATION PER UNIT CAPITAL, IMPORTED INPUT, 1981

	Brazilian Firms	MNCs
Jobs/Capital <sup>a</sup>	1.3765	.5825
Good Jobs/Capital <sup>b</sup>	.2550	.2899
Jobs/Imported Input <sup>c</sup>	20.6612	6.6897
Good Jobs/Imported Input <sup>d</sup>	7.2523	3.3291

<sup>a</sup> defined as the number of jobs created (per million cruzeiro increase in sales) divided by the cruzeiro value of capital (in millions) required to support that output;

<sup>b</sup> number of good jobs (defined as jobs paying more than two times the minimum wage) per million cruzeiros capital;

<sup>c</sup> defined as the number of jobs created (per million cruzeiro increase in sales) divided by the cruzeiro value of imported intermediate inputs (in millions) required to support that output;

<sup>d</sup> number of good jobs (defined as jobs paying more than two times the minimum wage) per million cruzeiros of required imported intermediate inputs.

<sup>7</sup> In 1980, the minimum wage equalled approximately \$43 per month. 67% of the economically active population earned two times or less the minimum wage in 1980.

domestically-owned firms, the higher capital/output ratio of this sector primarily affects the capital/output and good jobs/capital ratio of domestically-owned firms. Outside of the service sector, domestic firms create as many or more good jobs per unit of capital than MNCs. In industry, for example, the good jobs/capital ratio for Brazilian firms is 23 percent higher than in foreign-owned enterprises.

By using average employment coefficients by sector to calculate the job creation attributed to both MNC and domestic firm expansion in Tables 1 and 2, we implicitly assume that the choice of technology of MNCs and local firms producing in the same sector is similar. Using average coefficients also assumes that the product mix within the sector is the same for both ownership groups. It is interesting to note how relaxing this assumption (incorporating intra-sector differences) changes our empirical results. Adjusting matrix A1 in equation (4) with the data available to reflect differences in employment/output ratios for domestic and foreign firms, we find that domestic firms create 2.4909 jobs per million cruzeiro increase in sales, while MNCs generate 1.2183 jobs for a similar increment in receipts.<sup>8</sup> Thus, MNCs generate fewer jobs than indicated in Table 1. Note, however, that the lion's share of the difference in employment generation between MNCs and local firms is due to differences in the sectoral composition of output, rather than to intra-sectoral differences. Of the total difference in employment generation, 72.5% can be attributed to differences in the composition of production, with the remaining 27.5% due to intra-sectoral differences. These results underscore the importance of looking at the composition of sectoral output between MNCs and domestic firms in assessing their comparative performance, and why we can perhaps be forgiven for using a model that ignores intra-sectoral differences between ownership groups. The following section extends the model by looking at how differences in the sectoral composition of output of MNCs and domestic firms affects the distributional impact of these firms.

### *B. Income Distribution*

The distribution of income to income groups that is generated by a one million cruzeiro increase in sales by domestic firms and MNCs is

<sup>8</sup> Our calculations assume that only the direct effects of expansion by domestic and MNC firms are affected by intra-sectoral differences. That is, we assume that direct employment/output coefficients differ between local firms and MNCs, but that the indirect effects are the same for firms in the same sector.

presented in Table 3.<sup>9</sup> Our calculations reveal a remarkably similar impact on income inequality by domestic firms and MNCs, given the nearly similar values for the Gini coefficient. Of interest in Table 3 is the fact that the highest income group (those earning 20 times the minimum wage or more) earns a much larger share of income under domestic firm production (51 percent) than MNC production (46 percent), but this is to be expected, as MNC profits do not accrue to upper-income Brazilian residents, unlike the profits of domestically-owned firms.<sup>10</sup>

The small difference in the distributive impact of MNCs should not obscure the fact, however, that Brazilian firms performs much better in terms of income generation for the poor. Per million cruzeiro increase in production, domestic firms create 94,000 cruzeiros of income for those earning 2 minimum wages or less, while foreign firms generate just 51,300 cruzeiros for this income group. The relatively meager job creation of MNCs for low-paid workers (Table 1) also cor-

**Table 3**  
DISTRIBUTION OF INCOME TO INCOME CLASSES,  
BRAZILIAN AND MULTINATIONAL FIRMS, 1981

Income Group	Income Shares	
	Brazilian Firms	MNCs
2 times minimum wage or less	.1226	.1050
2-3 MW	.0555	.0716
3-5 MW	.0798	.1047
5-10 MW	.1039	.1335
10-20 MW	.1319	.1248
20 or greater	.5063	.4604
Gini coefficient	.7520	.7553

<sup>9</sup> The share of Brazil's economically active population in each size income group in Table 3, according to the 1980 demographic census, is as follows: 2 times the minimum wage (MW) or less, 67.33%; 2-3 MW, 11.68%; 3-5 MW, 10.16%; 5-10 MW, 6.52%; 10-20 MW, 2.90%; more than 20 MW, 1.40%.

<sup>10</sup> Note that MNCs do generate some profits for Brazilian firms in an indirect manner. Since firms supplying inputs to MNCs may be owned by Brazilians, expanded output by MNCs will increase output in supplying sectors, generating profits for Brazilians.

roborates the inability of MNCs to generate substantial income for the poor. Thus, it appears that the similar distributive performance of MNCs and domestic firms is due to the fact that, relative to Brazilian firms, MNCs generate less income for both lower income and upper-income Brazilians. Per million cruzeiro increase in sales, MNCs create just 488,400 cruzeiros of income for Brazilians, as compared with the 766,800 cruzeiros generated by the expansion of domestically-owned firms. The large difference in these figures is indicative of the relatively high share of capital in MNC value added, and the fact that MNCs do not directly generate profits for Brazilian citizens.

It is worth noting that our model results depict greater income inequality (higher Gini coefficients) than that revealed by Brazilian household census or survey data. According to the 1980 demographic census, for example, the Gini coefficient of income inequality is 0.588 (Table 4), compared with the Gini coefficient of 0.7520 and 0.7553 for domestic firms and MNCs, respectively, from Table 3. This difference is not surprising, however, as high income equality sectors (such as public administration) that do not generate capital incomes do not figure in our calculations. In addition, our model distributes all capital incomes earned by Brazilian firms to households, and thus the retained earnings of Brazilian firms are counted as household incomes, which is not necessarily the case in household survey and census data. As a result, the share accruing to the highest income group is larger with our model results than that shown in Table 4. The underreporting of upper income groups in Brazilian income surveys (Lluch, 1982) also accounts

**Table 4**  
SIZE INCOME DISTRIBUTION ACCORDING TO 1980  
DEMOGRAPHIC CENSUS

Income Group	Income Share
2 times minimum wage or less	.234
2-3 MW	.106
3-5 MW	.148
5-10 MW	.173
10-20 MW	.148
20 or more	.191
Gini coefficient	.588

for some of the discrepancy. Finally, our model does not incorporate taxes on profits nor transfers, reinforcing the model's tendency to show higher income inequality than survey or census data.

Since our analysis is basically of a static nature, one might well question how the results would differ if more recent data on the composition of firm sales were utilized. Given the relative stability of the sectoral composition of domestic and MNC sales and the maturity of Brazilian industry, it is unlikely that using more recent data would greatly alter our quantitative results. Figures on the share of MNCs and domestic private firms in sectoral output (based on data from the largest 20 firms in each sector) between 1981 and 1989 are indicative of this point.<sup>11</sup> These data show that in only 5 of the 31 sectors did the MNC share change by more than 15 percentage points. Given that there has undoubtedly been some change in the composition in the sales since the early 1980s, however slight, our results should be interpreted with due caution.

It is interesting to speculate on how our results differ from those that might be expected from a dependency school perspective. It is difficult to pin down a definitive "dependency school" viewpoint on the relative distributive performance of MNCs and domestic firms, given that dependency theory views MNCs as part and parcel of a world economic system that conditions the development of the internal economy.<sup>12</sup> Nevertheless, it is probably fair to say that some dependency theorists see MNCs as contributing to greater income inequality, with MNCs' capital-intensive techniques of production seen as contributing to weak labor demand and consequently an adverse effect on income distribution. As our results have shown, however, the inferior employment performance of MNCs is not associated with greater income inequality, as MNC profits do not accrue to upper income groups. This may be a factor that has been overlooked by dependency theorists in analyzing the impact of MNCs on income inequality in LDCs.<sup>13</sup>

11 These 1981 data are reported in Baer (1983). The original source for these 1981 data is "Os Melhores e Maiores," *Exame*, September 1982. 1989 data are culled from "Os Melhores e Maiores," *Exame*, August 1990.

12 For an overview of dependency theory from the perspective of several different dependency theorists, see Klaren (1986).

13 In a more dynamic context, the weak labor demand by MNCs may influence income distribution by retarding the absorption of surplus labor and the concomitant rise in real wages, which would affect the distributional coefficients utilized in the model. In addition, if domestic firms imitate the capital-intensive techniques used by MNCs, then the adverse distributive effect of MNCs may be more pronounced than indicated by our empirical results.

#### IV. MNCs, Employment, and Distribution: A Disaggregated Approach

Thus far, results have been presented for the aggregate basket of production by domestic and transnational firms, with numerous sectors of the economy utilized to construct an aggregate basket of output for vector  $s$  in equations (4) and (6). Additional insights can be gained through a disaggregation of this average basket into three subsectors: agriculture, industry, and services. The average basket of MNC sales in services, for example, is found by taking a weighted average of MNC sales in the service sectors of the economy. Our focus here is restricted to differences in the composition of output within these sectors; technology and the intra-sectoral product mix are assumed constant in our analysis.

The disaggregated employment results (Table 5) reveal that both domestic and foreign firms are relatively labor intensive in agriculture, both generating nearly 4 jobs per million cruzeiro increase in sales. The similar employment figure for MNCs and domestic firms is due to the fact that the 1980 input-output table contains just one agricultural sector, and that we assume a similar product mix within this sector between domestic firms and MNCs. Nonetheless, agriculture accounts for a larger share of domestic firm sales (10.4%) compared to MNCs (less than 1%), and this explains, to a significant extent, the superior employment creation of the aggregate basket of domestic firm sales (Table 1). It should also be noted that MNCs create less employment than domestic firms operating in industry and services (Table 5). Thus, the inferior aggregate employment performance of MNCs cannot be solely attributed to their relatively low participation in agriculture.

**Table 5**

EMPLOYMENT GENERATION PER MILLION CRUZEIRO INCREASE  
IN SALES, BY DISAGGREGATED SECTOR FOR 1981

	Brazilian Firms	MNCs
Agriculture	3.9565	3.9565
Industry	2.1627	1.5121
Services	2.3909	1.5726

A somewhat different story is evinced for income distribution (Table 6), with MNCs being associated with greater income equality in each sector. Thus, the smaller degree of inequality associated with the aggregate basket of domestic firm sales (relative to the aggregate MNC bundle) depicted in Table 3 must be due to the fact that domestic firms are more heavily concentrated in agriculture, a sector with relatively low income inequality. As with our analysis of the aggregate basket, the similar distributive performance of Brazilian firms and MNCs does not imply that MNCs are equally proficient in generating income for the poor; in fact, domestic firms generate more income for the poor than MNCs in each sector (Table 7), including agriculture, where domestic firms, unlike MNCs, help generate capital incomes for poor farmers.

**Table 6**  
GINI COEFFICIENTS, BRAZILIAN FIRMS  
AND MNCs, BY DISAGGREGATED SECTOR FOR 1981

	Brazilian Firms	MNCs
Agriculture	.5909	.4586
Industry	.7602	.7563
Services	.7870	.7684

**Table 7**  
INCOME GENERATION FOR THE POOR, BRAZILIAN FIRMS  
AND MNCs, BY DISAGGREGATED SECTOR  
(Per Unit Increase in Sales) for 1981

	Brazilian Firms	MNCs
Agriculture	.2092	.1317
Industry	.0815	.0509
Services	.0796	.0469

## V. Conclusion and Policy Implications

Any policy implications drawn from this study must be put in light of the scope and method of this research. No attempt has been made to

assess the impact of foreign investment on economic growth; nor has the relative efficiency of MNCs and local firms been addressed. However, any discussion of the desirability of foreign investment would have to consider the issues raised in this paper. Within the confines of the methodology utilized in this paper, it is clear that MNCs generate significantly less employment than domestic firms; they also create fewer high-paying "good" jobs. MNC production is also relatively intensive in the use of imported intermediate inputs, creating just one third of the jobs of Brazilian firms per unit of imported intermediate input.

Regarding the impact of MNCs on income distribution, a rather complex picture emerges. Our results imply that MNCs cannot be blamed as the culprits for Brazil's extreme income inequality, as MNC production is associated with just a slightly larger degree of aggregate income inequality than production by Brazilian enterprises. The benign impact of MNCs on income distribution is due to the fact that the profits of foreign firms generally accrue to nonresidents, and hence create less income than Brazilian firms for members of the highest income group. MNCs, however, create far fewer jobs for both low paid and high paid workers than their domestic counterparts, suggesting that increased foreign investment (assuming it retains the same sectoral pattern as in the past) is unlikely to significantly ameliorate poverty in Brazil.

One of the most striking results of our analysis is the high degree of income inequality under production by both MNCs and domestically-owned firms. Even those sectors showing relatively good distributive performance (such as agriculture in Table 6) display relatively high Gini coefficients. Under the current policy environment, then, changes in the structure of production cannot be expected to lead to significant short-run improvements in income inequality. Rather, changes in economic policies, property relations, or underlying market forces that alter the share of the poor in income across all sectors of the economy are necessary to significantly affect income inequality.

## Appendix A

## Average Basket of Sales By Ownership Group, 1981

Sector	Private Brazilian	MNC
1. Agriculture	.1038	.0068
2. Metallic Mining	.0022	.0037
3. Non-Metallic Mining	.0025	.0000
4. Petroleum Extraction	.0000	.0000
5. Coal Mining	.0000	.0000
6. Cement	.0049	.0086
7. Cement Structures	.0030	.0061
8. Glass	.0000	.0097
9. Non-metallic Mineral Products	.0067	.0242
10. Steel	.0127	.0195
11. Non-ferrous Metals	.0067	.0242
12. Cast Iron	.0045	.0076
13. Other Metals	.0192	.0325
14. Machines	.0148	.0626
15. Tractors	.0015	.0183
16. Machine Maintenance	.0073	.0089
17. Electrical Energy Equipment	.0012	.0108
18. Electrical Material	.0073	.0089
19. Office Equipment	.0029	.0148
20. Electronic Equipment	.0059	.0165
21. TV Radios	.0036	.0124
22. Automobiles	.0000	.1054
23. Auto Parts	.0129	.0304
24. Shipbuilding	.0015	.0084
25. Fabrication of Trains	.0011	.0000
26. Other Vehicles	.0011	.0035
27. Lumber	.0105	.0044
28. Furniture	.0093	.0000
29. Cellulose	.0022	.0027
30. Paper	.0090	.0112
31. Printing, Graphics	.0096	.0012
32. Rubber	.0023	.0351
33. Chemical Elements	.0024	.0112
34. Alcohol	.0040	.0000
35. Petroleum Refining	.0030	.0767

## Appendix A (Continued)

Sector	Private Brazilian	MNC
36. Petrochemicals	.0047	.0220
37. Resins	.0051	.0242
38. Fertilizer	.0047	.0220
39. Other Chemicals	.0066	.0313
40. Pharmaceuticals	.0016	.0276
41. Cosmetics	.0043	.0031
42. Plastic Forms	.0024	.0044
43. Articles of Plastic	.0061	.0112
44. Natural Textiles	.0140	.0257
45. Synthetic Textiles	.0059	.0108
46. Other Textiles	.0104	.0019
47. Clothing	.0155	.0025
48. Leather	.0022	.0038
49. Footwear	.0067	.0012
50. Coffee	.0076	.0000
51. Rice Processing	.0046	.0000
52. Wheat Milling	.0012	.0023
53. Fruit Juices	.0046	.0000
54. Other Vegetable Processing	.0043	.0000
55. Tobacco	.0000	.0196
56. Meat Slaughtering	.0174	.0083
57. Poultry Slaughtering	.0029	.0014
58. Dairy Products	.0087	.0064
59. Sugar	.0091	.0000
60. Unrefined Vegetable Oil	.0087	.0117
61. Refined Vegetable Oil	.0031	.0041
62. Animal Feed	.0053	.0131
63. Other Food Products	.0078	.0212
64. Beverages	.0057	.0033
65. Miscellaneous Industrial Products	.0062	.0149
66. Electrical Energy	.0000	.0000
67. Public Utilities	.0000	.0000
68. Construction	.1102	.0468
69. Wholesale & Retail Trade	.1062	.0273
70. Highway Transportation	.0344	.0000
71. Train Transportation	.0000	.0000
72. Boat Transportation	.0048	.0031

## Appendix A (Continued)

Sector	Private Brazilian	MNC
73. Air Transportation	.0049	.0000
74. Communications	.0040	.0000
75. Insurance	.0039	.0069
76. Finance	.0296	.0153
77. Hotels & Restaurants	.0240	.0000
78. Repair Services	.0228	.0000
79. Family Services	.0113	.0000
80. Health Care-Private Sector	.0143	.0000
81. Education-Private Sector	.0074	.0000
82. Services to Firms	.0312	.0000
83. Equipment Rental	.0041	.0000
84. Real Estate Rentals	.0580	.0000
85. Public Administration	.0000	.0000
86. Health Care-Public Sector	.0000	.0000
87. Education-Public Sector	.0000	.0000
88. Domestic Servants	.0107	.0000
Total	1.0000	1.0000

Source: see text.

## Appendix B

## Share of Ownership Groups in Sales, 1981\*

Sector	Private Brazilian	MNC
1. Agriculture	.964	.011
2. Metallic Mining	.249	.074
3. Non-Metallic Mining	.821	.129
4. Petroleum Extraction	.000	.000
5. Coal Mining	.821	.129
6. Cement	.765	.235
7. Cement Structures	.737	.264

## Appendix B (Continued)

Sector	Private Brazilian	MNC
8. Glass	.369	.631
9. Non-metallic Mineral Products	.613	.387
10. Steel	.340	.091
11. Non-ferrous Metals	.505	.495
12. Cast Iron	.771	.227
13. Other Metals	.771	.227
14. Machines	.561	.413
15. Tractors	.318	.682
16. Machine Maintenance	1.000	.000
17. Electrical Energy Equipment	.398	.602
18. Electrical Material	.825	.175
19. Office Equipment	.530	.470
20. Electronic Equipment	.673	.327
21. TV Radios	.666	.334
22. Automobiles	.026	.974
23. Auto Parts	.709	.291
24. Shipbuilding	.502	.498
25. Fabrication of Trains	.732	.023
26. Other Vehicles	.349	.202
27. Lumber	.932	.068
28. Furniture	1.000	.000
29. Cellulose	.778	.167
30. Paper	.778	.167
31. Printing, Graphics	.942	.021
32. Rubber	.275	.725
33. Chemical Elements	.457	.375
34. Alcohol	.981	.000
35. Petroleum Refining	.071	.317
36. Petrochemicals	.457	.375
37. Resins	.457	.375
38. Fertilizer	.457	.375
39. Other Chemicals	.457	.375
40. Pharmaceuticals	.241	.724
41. Cosmetics	.888	.112
42. Plastic Forms	.758	.242
43. Articles of Plastic	.758	.242
44. Natural Textiles	.755	.241

## Appendix B (Continued)

Sector	Private Brazilian	MNC
45. Synthetic Textiles	.755	.241
46. Other Textiles	.969	.031
47. Clothing	.973	.027
48. Leather	.769	.231
49. Footwear	.970	.030
50. Coffee	.810	.190
51. Rice Processing	1.000	.000
52. Wheat Milling	.745	.255
53. Fruit Juices	1.000	.000
54. Other Vegetable Processing	.973	.027
55. Tobacco	.059	.941
56. Meat Slaughtering	.915	.076
57. Poultry Slaughtering	.915	.076
58. Dairy Products	.859	.110
59. Sugar	.981	.000
60. Unrefined Vegetable Oil	.810	.189
61. Refined Vegetable Oil	.810	.189
62. Animal Feed	.699	.301
63. Other Food Products	.679	.321
64. Beverages	.908	.092
65. Miscellaneous Industrial Products	.700	.290
66. Electrical Energy	.006	.000
67. Public Utilities	.000	.000
68. Construction	.907	.067
69. Wholesale & Retail Trade	.894	.040
70. Highway Transportation	.870	.000
71. Train Transportation	.000	.000
72. Boat Transportation	.479	.054
73. Air Transportation	.840	.000
74. Communications	.500	.000
75. Insurance	.695	.217
76. Finance	.457	.041
77. Hotels & Restaurants	.998	.002
78. Repair Services	1.000	.000
79. Family Services	1.000	.000
80. Health Care-Private Sector	1.000	.000
81. Education-Private Sector	1.000	.000

## Appendix B (Continued)

Sector	Private Brazilian	MNC
82. Services to Firms	.950	.000
83. Equipment Rental	1.000	.000
84. Real Estate Rentals	1.000	.000
85. Public Administration	.000	.000
86. Health Care-Public Sector	.000	.000
87. Education-Public Sector	.000	.000
88. Domestic Servants	1.000	.000

\* The total of the MNC and Brazilian share may not total 1.000, due to the presence of state firms in that sector.

Source: see text.

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