

## STRUCTURAL CHANGES AND SPECIALIZATION IN BRAZILIAN INDUSTRY: THE EVOLUTION OF LEADING COMPANIES AND THE M&A PROCESS

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This paper analyzes changes in the Brazilian productive structure and in ownership structures of leading companies during the 1990s. It uses information from balance sheets published in *Gazeta Mercantil* and from the Thomson Financial Securities Data database on M&A. The main findings are: (i) the sectoral distribution of leading companies has remained stable; (ii) there has been a strong change in the ownership structure in Brazil, with an increase in the participation of multinational enterprises (MNEs) in the sample of leading companies; (iii) this increase in participation may be partially, though not integrally, explained by M&A transactions; (iv) though the M&A process has been quite intensive in the period, productive concentration has decreased among the group of leading companies; and (v) acquiring firms have adopted specializing strategies during the period. This trend is even clearer when private national enterprises (PNEs) are examined separately.

### INTRODUCTION

DURING the 1990s, the Brazilian economy went through significant changes. The country liberalized its financial markets and trade, successfully implemented a price stabilization program, and undertook a privatization of state-owned enterprises in infrastructure and commodity industries. These changes had a major impact on the country's institutional framework and changed the behavior of economic agents. Firms changed their conduct in order to take into account new patterns of performance. They had to face a new competitive environment, with greater exposure to international competition, and took new positions in the international division of labor. Economists have recognized these factors as the main causes of the industrial restructuring process in the period.

Nonetheless, economists do not seem to have reached a consensus on the extent

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of industrial change in the period. On the one hand, some economists argue that the increase in competition has eliminated firms and whole sectors that showed low levels of competitiveness. They hold therefore that the new environment has strengthened the country's production sector and that surviving firms and sectors are more capable of facing international competition (Mendonça de Barros and Goldenstein 1997; Franco 1998; Moreira 1999). On the other hand, some economists maintain that the adoption of defensive behavior, mainly based on cost reduction strategies, has made possible the survival of less capable firms. In these cases, in order to survive, firms have reduced their investment, endangering their long-term expansion perspectives (Ferraz, Kupfer, and Haguenuer 1996; Haguenuer, Markwald, and Pourchet 1998; Coutinho 1997; Laplane et al. 2000). Furthermore, the greater level of trade openness and financial liberalization may have deepened asymmetries between national and multinational enterprises (MNEs). Private national enterprises (PNEs) became more vulnerable to takeovers by MNEs. Therefore, not only have domestic enterprises weakened their investment perspectives; they have also become easy targets for acquisition, which may have a negative effect on greenfield investment.

This paper aims to shed some light on this debate, covering three topics:

- (i) the evolution of leading Brazilian companies in regard to their sectoral composition and the origin of their capital (national, state, or foreign);
- (ii) the effects of ownership and production transformations of leading companies on their competitiveness and on market structure; and
- (iii) the direction of the growth of leading companies, focusing on the merger and acquisition (M&A) process.

The paper is divided in three parts. The first focuses on the main methodological features of the paper. The second is dedicated to the analysis of the structural transformations that occurred in the Brazilian production sector during the 1990s, based on a sample covering leading companies. It focuses on a description of the evolution of the industrial structure in respect to sectoral and national composition. The description of these features aims to capture the impacts of institutional changes on business performance. The third part of the paper analyzes the M&A process in Brazil, emphasizing its role in the shaping of the growth directions of leading companies.

## I. METHODOLOGICAL NOTES

The empirical analysis of this paper is based on two data sets. The first uses information published by *Balanço Anual da Gazeta Mercantil* on the biggest Brazilian companies for the years 1991, 1996, and 1999.<sup>1</sup> The choice of these years was made to separate the M&A process into two distinct phases. From 1991 to 1996,

<sup>1</sup> Therefore, "leading companies" here refers to the group of largest companies, that is, the group of companies that hold the largest market shares in the economy.

transactions were concentrated in the manufacturing sector, whereas from 1997 to 1999 transactions in the service sector prevailed. This division also coincides with different moments in the privatization process. In the first period, the government privatized companies in the commodity sector, and the second period is characterized by the privatization of companies in the infrastructure sector.

Company size was measured using sales. This choice was made due to the better quality of the information on sales than on net worth. However, the use of sales as an indicator for size has some shortcomings. Though sales volume seems to be an adequate measure in the manufacturing sectors, it is not adequate for evaluations in the financial sector. This is especially important in the Brazilian case due to the very high levels of inflation in the 1991–93 period. Therefore, the financial sector has been analyzed separately.

Firms were aggregated according to the sectoral classification presented in Table I. The classification was structured into three classes—construction, manufacturing industry, and services. The last two classes were divided into three different sectors. As stated above, most of this paper will analyze the financial sector separately.

The classification of the leading companies into each category was based on the main sector of production. In the case of diversified companies, the ideal procedure would require the allocation of sales to the different sectors of production they belonged to. Available data, however, does not allow such a procedure.

The origin of capital was defined based on the nationality of the headquarters. Companies were classified into three different categories: state-owned enterprises (SOEs), private national enterprises (PNEs), and multinational enterprises (MNEs). In most cases, the information available in the *Balanço Anual* was sufficient for an adequate classification.

In order to build the sample of firms, all companies or business groups<sup>2</sup> with sales above U.S.\$35 million in each of the three periods covered by the database—1991, 1996, and 1999—were selected and included in the database. The sample of leading companies is described in Table II, which shows that there were fluctuations in the number of companies. In 1991, the sample covers 324 companies, in 1996, it covers 396 and, in 1999, 365. Only 190 companies appear in all three years, 140 appear in two of the three years and 160 appear in only one year, leading to a total of 490 companies.<sup>3</sup>

<sup>2</sup> From now on, we will use the term company to describe independent companies and business groups.

<sup>3</sup> Many reasons may explain the fluctuation in the number of firms. Companies may have been extinguished or sold out; they may have shrunk and left the list of leading firms; new entrants may have appeared in the markets; and firms may have grown and entered the list of leading companies. Furthermore, there may be registration failures. The *Balanço Anual* mainly collects information from published balance sheets or from balance sheets that are sent out spontaneously. Only open capital companies are obliged to publicly release their balance sheets. Therefore, in some years, some companies may not send out information, and be left out of the *Balanço Anual*.

TABLE I  
SECTORAL CLASSIFICATION

	Class	Sector	TFSD <sup>a</sup> Sector
Excluding FS	Construction Industry	CC: Construction companies CI: Commodity industries TII: Technology-intensive industries TI: Traditional manufacturing	Construction Stone, clay, glass, and concrete products Metal and metal products Mining Paper and allied products Oil, gas, and petroleum refining Chemicals and allied products Rubber and misc. plastic products Agriculture, forestry, and fishing
	Services	INF: Infrastructure SS: Other services	Electronic and electrical equipment Transportation equipment Drugs Machinery Food and kindred products Printing, publishing, and allied services Textile and apparel products
FS	FS	FS: Financial services	Electricity, gas, and water distribution Transportation and shipping (except air) Telecommunications Wholesale trade Retail trade—food stores Radio and television broadcasting Business services Advertising services
			Commercial banks Insurance Investment firms

<sup>a</sup> Thomson Financial Securities Data.

Special emphasis is placed on the distribution of the market share of each category in the whole sample. Absolute values and variations of market share should be understood in this paper as indicators of competitiveness in a previously defined market. In this framework, the market share expresses the revealed competitiveness at a certain moment, and its evolution in time.

The Herfindahl-Hirschman index (HHI) for each of the seven sectors is used as an indicator of economic concentration, that is, the HHI is the sum of the squares of the market share of each business group or company in a sector of activity. This index is commonly used in the literature as a measure of concentration. It may have some shortcomings, as many different market structures may be compatible with the same HHI value. Furthermore, the database only has information on leading

TABLE II  
NUMBER OF LEADING COMPANIES IN THE SAMPLE BY SECTOR AND ORIGIN OF CAPITAL

Sector	1991				1996				1999			
	SOE	MNE	PNE	Total	SOE	MNE	PNE	Total	SOE	MNE	PNE	Total
CC			15	15	1		12	13		9		9
CI	12	32	45	89	1	40	52	93	2	36	44	82
TII	1	27	22	50		38	28	66	1	42	16	59
TI		12	34	46		21	44	65		17	33	50
INF	40	4	6	50	49	5	10	64	41	13	14	68
SS	3	3	24	30	8	3	29	40	9	7	31	47
FS	13	7	24	44	15	11	29	55	14	16	20	50
Total	69	85	170	324	74	118	204	396	67	131	167	365

Source: GIC/IE/UFRJ, Business Group Database.

- Notes: 1. Sectors: CC = construction companies; CI = commodity industries; TII = technology-intensive industries; TI = traditional manufacturing; INF = infrastructure; SS = other services; FS = financial services.  
 2. Origin of capital: SOE = state-owned enterprise; MNE = multinational enterprise; PNE = private national enterprise.

companies. Therefore, the index is an indication of economic concentration among the leading companies in each sector.

Our analysis of the M&A process relies on information collected from M&A transactions listed in the Thomson Financial Securities Data (TFSD). The TFSD lists 1,149 transactions that took place between 1990 and 1999. Predominantly, they involved acquisitions of companies. Very rarely, there were mergers, only 22 per cent of the transactions involved acquisitions of less than 50 per cent of a company's stock and less than 10 per cent involved participation lower than 25 per cent of a company's stock. The transactions are unevenly distributed across periods and sectors. The 1990–96 period covers 37.9 per cent of all transactions, while the 1997–99 period harbors 62.1 per cent. In the first period, transactions in the manufacturing sector were prevalent, while in the second period the presence of transactions involving service companies was more intensive (see Table III).

The TFSD also provides data on the value of the transactions. However, as Table III shows, in only 49 per cent of the events was the value of the transaction revealed. Furthermore, privatization transactions have a much higher probability of having their values revealed than do transactions between private parties. As a consequence, the use of data on the values of transactions is not reliable. The TFSD also furnishes information on the nationality of the target and the acquiring firm. However, in some cases in which the acquirer was a nationally established subsidiary of a MNE, the TFSD database classified it as a national firm. Further research was done, using Dun and Bradstreet's Who Owns Whom CD-ROM, to classify the

TABLE III  
NUMBER OF M&A TRANSACTIONS AND VALUE OF TRANSACTIONS BY PERIOD AND SECTOR, BRAZIL, 1990-99

Sector of Acquirer	1990-96			1997-99			Total		
	No. of Transactions	No. of Transactions with Value Declared	Total Value	No. of Transactions	No. of Transactions with Value Declared	Total Value	No. of Transactions	No. of Transactions with Value Declared	Total Value
CC	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.3)	0 (0.0)	0 (0.0)	2 (0.2)	0 (0.0)	0 (0.0)
CI	168 (38.6)	96 (48.2)	12,343 (49.3)	136 (19.0)	80 (21.9)	10,435 (11.3)	304 (26.5)	176 (31.2)	22,778 (19.4)
TII	74 (17.0)	24 (12.1)	1,128 (4.5)	95 (13.3)	38 (10.4)	2,611 (2.8)	169 (14.7)	62 (11.0)	3,739 (3.2)
TI	55 (12.6)	18 (9.0)	1,603 (6.4)	76 (10.6)	37 (10.1)	3,586 (3.9)	131 (11.4)	55 (9.7)	5,189 (4.4)
INF	43 (9.9)	24 (12.1)	6,229 (24.9)	150 (21.0)	118 (32.2)	59,728 (64.7)	193 (16.8)	142 (25.1)	65,957 (56.2)
SS	53 (12.2)	14 (7.0)	1,059 (4.2)	169 (23.7)	49 (13.4)	4,927 (5.3)	222 (19.3)	63 (11.2)	5,986 (5.1)
FS	32 (7.4)	17 (8.5)	2,546 (10.2)	60 (8.4)	31 (8.5)	9,197 (10.0)	92 (8.9)	48 (8.5)	11,743 (10.0)
HC	10 (2.3)	6 (3.0)	107 (0.4)	26 (3.6)	13 (3.6)	1,876 (2.0)	36 (3.1)	19 (3.4)	1,983 (1.7)
Total	435 (100.0)	199 (100.0)	25,015 (100.0)	714 (100.0)	366 (100.0)	92,360 (100.0)	1,149 (100.0)	565 (100.0)	117,375 (100.0)

Source: Calculated from TFSI, 1990-99.

Notes: 1. Figures in parentheses are percentages.

2. Sectors: CC = construction companies; CI = commodity industries; TII = technology-intensive industries; TI = traditional manufacturing; INF = infrastructure; SS = other services; FS = financial services; HC = holding companies.

nationality of these subsidiaries according to the country of the parent company. Therefore, as stated above, nationality refers to the firm's headquarters.

Data was organized to cover two different perspectives. The first uses the acquiring firm as the basic unit of analysis. The aim is to address the product diversification or specialization characteristics of the strategy undertaken by the firm. Two indicators were built to cover this first topic:

- (i) the sum of acquisitions of firms in the sector  $r$  of the acquiring firm, divided by total acquisitions by acquiring firms in sector  $r$ . This indicator is 1 when all acquisitions are concentrated in the main sector of production of the acquiring firm, and has value 0 when no acquisitions are made in the sector of the acquiring firm; and
- (ii) the numbers-equivalent index of acquisitions by firms that belong to sector  $r$ , defined as  $NEA = 1/[\sum_{i=1}^n (p_{ir})^2]$ , where  $p_{ir}$  is the share of target firms in sector  $i$  among the total acquisitions of firms that belong to sector  $r$ . This indicator assumes value 1 when firms that belong to sector  $r$  acquire firms from only one sector. The greater the level of diversification of the purchases, the greater  $NEA$  will be.

The second perspective takes target firms as the unit of analysis, allowing the evaluation of the sectoral origin of acquirers of firms in a certain sector. In order to cover this topic, two indicators were formulated:

- (i) the share of acquiring firms of sector  $r$  in total transactions involving target firms in sector  $r$  ( $s_{rr}$ ); and
- (ii) the numbers-equivalent index of the acquirers' level of diversification, expressed by  $NES = 1/[\sum_{i=1}^n s_{ri}^2]$ , where  $s_{ri}$  is the share of sales transactions of firms of sector  $r$  that have acquiring firms from sector  $i$ .<sup>4</sup>

The classification of sectors into broad categories seemed inadequate for the analysis of diversification patterns. Thus, a special sectoral classification provided by TFSD was used. In order to ensure that indicators significantly represented the outcomes of the M&A process, only those sectors that had over ten purchasing and selling transactions were examined. Therefore, from the fifty-six sectors listed in the database, only twenty-seven remained (see Table I for an analysis of the sectoral classification).

## II. STRUCTURAL TRANSFORMATIONS IN THE BRAZILIAN PRODUCTION SECTOR

This section analyzes the structural transformations that took place in the Brazilian

<sup>4</sup> There is an important shortcoming in this analysis. In order to calculate these diversification indicators, a sectoral classification has been used. As emphasized by Teece et al. (1994), the chosen level of aggregation may be too broadly or too narrowly defined. The classification here used was obtained from TFSD. It more or less corresponds to a two-digit ISIC classification. The use of such a classification will normally classify sectors too broadly.

economy during the 1990s. The units of analysis are leading companies in the manufacturing and service sectors. The section describes the evolution of the industrial structure and changes in the sectoral and ownership composition, attempting to gather together elements to examine the impacts of institutional and macroeconomic changes over the production structure.

#### A. *The Evolution of Leading Companies*

Table IV shows the evolution of the sectoral distribution of sales of the leading companies in the database. The only major change is the loss of participation of companies that belong to the construction sector. Their market-share loss seems to have been evenly distributed across the other sectors in Table I. This stable evolution of industries' market shares is in line with the conclusions of other studies (see Kupfer 1998). It can also be seen that companies in service industries experienced a greater increase in market shares during the 1996–99 period, while those in the manufacturing sectors achieved better performance in terms of market share during the 1991–96 period.

However, the distribution of sales across nationalities underwent a major change in the period. The market share of SOEs decreased from 44.6 per cent in 1991 to 24.3 per cent in 1999, that of MNEs increased from 14.8 per cent to 36.4 per cent of the total sales of the firms in the sample, while PNEs maintained a stable share during the period. It is important to note that the 1991–96 and 1996–99 periods

TABLE IV  
EVOLUTION OF THE SECTORAL DISTRIBUTION OF SALES  
(EXCLUDING FINANCIAL SERVICES)

Sector	1991	1996	1999	(%)
CC	12.8	3.6	2.8	
Industry	50.4	58.2	55.2	
CI	24.1	25.4	26.8	
TII	14.5	19.1	18.0	
TI	11.8	13.7	10.4	
Services	36.8	38.2	41.8	
INF	25.8	25.8	29.5	
SS	11.0	12.4	12.3	
Total	100.0	100.0	100.0	

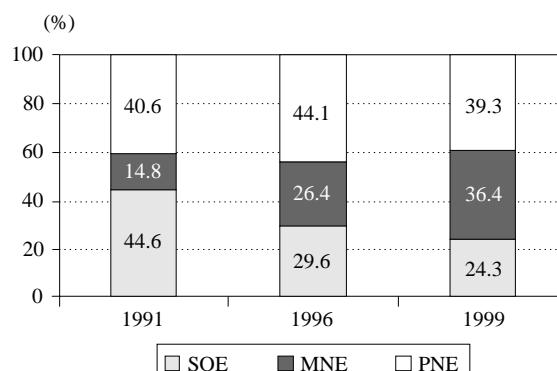
Source: GIC/IE/UFRJ, Business Group Database.

Note: Sectors: CC = construction companies; CI = commodity industries; TII = technology-intensive industries; TI = traditional manufacturing; INF = infrastructure; SS = other services.

show different trends. State-owned enterprises lost most of their market share in the 1991–96 period. In the same period, PNEs increased their market share by 3.5 percentage points. Therefore, the increase of the market share of MNEs in the first period was due almost exclusively to the decrease (privatization) of SOEs. In the second period, the market share of SOEs continued to decrease, though not at the same rate, and that of PNEs shifted from 44.1 per cent to 39.3 per cent. Therefore, the increase in the MNEs' market share was due both to the privatization of SOEs and the decrease of PNEs' sales shares (see Figure 1).

Multinational enterprises seem to have increased their market shares in all sectors analyzed with the sole exception of companies in the construction sector. The causes of this shift seem to differ across sectors and periods of analysis. In the commodity industries, the gains in market share of MNEs were accompanied by a loss in those of SOEs and an increase in those of PNEs. During the 1991–96 period, the main force behind the market share gains of MNEs in the commodity sector seems to have been the privatization of SOEs, for, as can be seen in Table V, the market share of PNEs increased in the period. However, in the 1996–99 period, the increase in the market share of MNEs was due to the transfer of assets from PNEs to MNEs. In technology-intensive industries, the increase in the market share of MNEs confirmed their leading position in Brazil. Their participation in the total sales of the sample rose from 60.3 per cent in 1991 to 86.9 per cent in 1999. This growth implied a decrease in the share of PNEs from 38.8 to 13.1 per cent. In traditional manufacturing industries, where the PNEs were historically dominant, MNEs showed an increase in market share as well.

Fig. 1. Evolution of the Share of Sales of Leading Companies by Origin of Capital (Excluding Financial Services)



Source: GIC/IE/UFRJ, Business Group Database.

Note: Origin of capital: SOE = state-owned enterprise; MNE = multinational enterprise; PNE = private national enterprise.

TABLE V  
SHARE OF SALES BY ORIGIN OF CAPITAL

Sector	Year	SOE	MNE	PNE
CC	1991	0.0	0.0	100.0
	1996	0.0	0.0	100.0
	1999	0.0	0.0	100.0
<hr/>				
Industry:				
CI	1991	42.4	21.2	36.5
	1996	22.6	29.4	47.9
	1999	25.8	33.1	41.1
TII	1991	0.8	60.3	38.8
	1996	0.0	75.6	24.4
	1999	0.0	86.9	13.1
TI	1991	0.0	36.5	63.5
	1996	0.0	44.6	55.4
	1999	0.0	48.5	51.5
Industry total	1991	20.5	36.0	43.5
	1996	9.9	48.2	42.0
	1999	12.5	53.5	34.0
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Services:				
INF	1991	74.1	16.9	9.0
	1996	76.9	12.5	10.6
	1999	42.9	32.2	24.9
SS	1991	1.1	7.8	91.1
	1996	4.4	18.2	77.4
	1999	5.4	27.1	67.5
FS	1991	56.5	8.0	35.5
	1996	39.0	6.4	54.6
	1999	34.3	21.3	44.4
Services total	1991	55.5	9.4	35.1
	1996	46.4	10.5	43.0
	1999	33.0	26.1	40.8

Source: GIC/IE/UFRJ, Business Group Database.

Notes: 1. Sectors: CC = construction companies; CI = commodity industries; TII = technology-intensive industries; TI = traditional manufacturing; INF = infrastructure; SS = other services; FS = financial services.  
 2. Origin of capital: SOE = state-owned enterprise; MNE = multinational enterprise; PNE = private national enterprise.

Services industries show a greater diversity in trends. The analysis of Table V reveals that there was a transfer of market share from SOEs to private enterprises. In the 1991–96 period, the growth of the market share of PNEs was higher than that of MNEs, while in the 1996–99 period, the MNEs grew faster. In the infrastructure sector, SOEs experienced a greater loss of market share. However, the transfer from the state to the private sector was concentrated in the 1996–99 period. Both PNEs

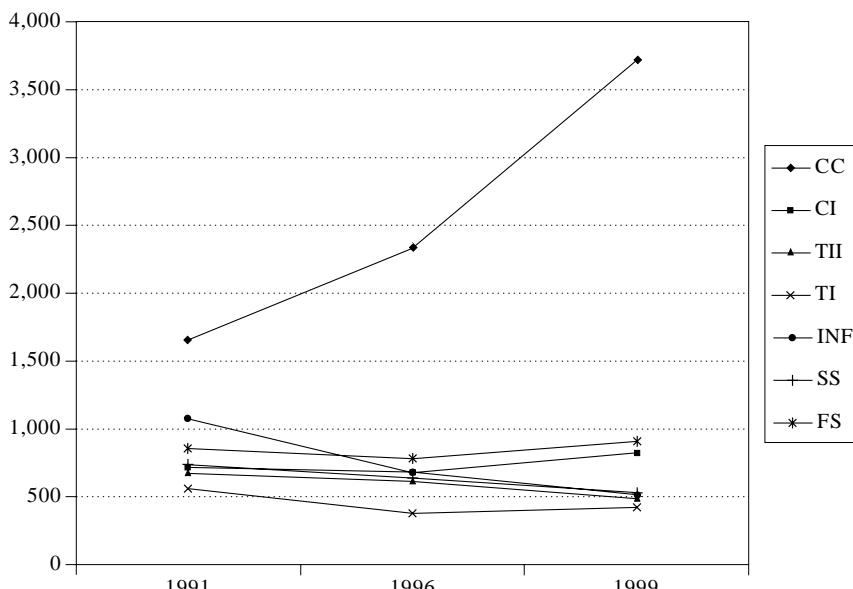
and MNEs saw an increase in their market shares. In the other services sector, PNEs lost market share to MNEs. It is important however to note that other services is the only sector of our analysis where PNEs remain in a clear leading position.

### B. Changes in Concentration

Figure 2 shows the Herfindahl-Hirschmann index (HHI) for the seven sectors in the three years covered by the database. The absolute value of the HHI is not useful due to the high level of aggregation used in the definition of the seven sectors examined. However, their relative values across years may help to demonstrate the impacts of institutional and macroeconomic reforms on industrial structure and the relative weight of leading companies during the 1990s.

During the 1991–96 period, construction was the only sector where concentration increased. All others saw a decrease in concentration levels. In the 1996–99 period, construction companies remained in a trend toward concentration, while the commodity industries, traditional manufacturing, and financial services sector changed their previous trajectory and increased their concentration levels, and tech-

Fig. 2. Herfindahl-Hirschmann Index: Evolution by Sector



Source: GIC/IE/UFRJ, Business Group Database.

Note: Sectors: CC = construction companies; CI = commodity industries; TII = technology-intensive industries; TI = traditional manufacturing; INF = infrastructure; SS = other services; FS = financial services.

nology-intensive industries, infrastructure, and other services maintained a trajectory towards lower levels of concentration.

Two main factors may explain the changes in concentration levels of these sectors:

- (i) differences in the growth rates of firms in a single sector; and
- (ii) changes in the number of firms producing in the same sector.

In the first case, concentration places whenever larger firms show greater rates of growth than small firms; inversely, a lower HHI will appear when small firms exhibit higher growth rates than larger ones. In both cases, changes in HHI show differences in the composition of relative firm size. As firm size become more homogeneous, concentration levels decrease while concentration levels increase as the market shows greater heterogeneity in firm sizes.

Changes in the number of firms may occur due to the entry of new firms, to the exit of existing firms, to M&As, and to the fragmentation of enterprises into different firms. Entries and firm fragmentations result in lower levels of concentration, while exits, M&As of firms lead to higher levels of concentration.

The causes of changes in the concentration index seem to have differed across sector. The commodity industries and the infrastructure sector seem to have been highly influenced by privatizations and by M&A processes. Most SOEs in the commodity industries were privatized during the 1991–96 period. Some of these transactions involved fragmenting former holding companies into different companies, others represented the sale of minority participation in holding companies in some companies in the petrochemical sector. This may be the cause of the decrease in the level of concentration in the commodity sector, as observed in Figure 2. The increase in the concentration index in the commodity industries during 1996–99 may be a consequence of the reselling of recently privatized companies. Some figures for this process may be observed in Table VI. It can be seen that of the total of sixty-nine transactions with privatized companies, twenty-six were post-privatization transactions between private parties. In these cases, most of the purchasing parties were MNEs.

TABLE VI

PRIVATIZATION AND POST-PRIVATIZATION TRANSACTIONS IN COMMODITY INDUSTRIES, ACCORDING TO THE ORIGIN OF CAPITAL OF THE ACQUIRING FIRM, BRAZIL, 1991–99

Origin of Capital	Post-privatization	Privatization	Minority Privatization	Total
Mixed	1	1	0	2
Multinational	11	0	3	14
National	13	16	20	49
Unknown	1	1	2	4
Total	26	18	25	69

Source: Calculated from TFSD.

The decrease in the concentration level of the infrastructure sector was also caused by privatization transactions, mostly in the 1996–99 period. Some of these transactions involved fragmentations of SOEs. However, there was another factor that played a major role in this case. In the telecommunications sector, there were many new entries in mobile phones, fixed phones, and long-distance call services.

It is likely that changes in the concentration in traditional manufacturing can be explained by differences in the rate of growth, mainly in the food industry, and by M&A transactions. During the 1991–96 period, there was a rapid expansion of demand in those industries, providing room for recently established MNEs. Some of the growth of these enterprises took place through the acquisition of smaller enterprises. In this situation, the type of concentration index that we used actually shows a decentralization effect. As explained above, the database deals solely with leading companies. Therefore, though the acquisition of small companies by leading enterprises may have a positive influence on concentration indexes, in the sample used this may result in a decrease in the levels of concentration, for it may result in a more even distribution of sales across leading companies. The slight increase in the concentration index during the 1996–99 period may be due to a slowdown of demand and the consolidation of the market shares of recently established MNEs.

In the technology-intensive industries, the fall in the concentration levels over the whole period seems to be due to the entry of MNEs. This may be especially true in the motor vehicles sector, where there was a large expansion in the number of companies producing in Brazil.

Finally the decrease in the concentration levels of other services may be explained by the emergence of large companies in new dynamic sectors such as information technology.

### III. THE M&A PROCESS

The evidence analyzed above is helpful for assessing the growth perspectives of firms in Brazil. However, it does not say much about the direction of the growth. Nonetheless, the direction of growth is also economically relevant because:

- (i) it may establish the production trajectories followed by firms; and
- (ii) it may open up possible specialization and diversification strategies according to nationality.

The data shows that the M&A process in Brazil was not driven by high levels of diversification among acquiring firms. Only 37 per cent of acquisitions involved targets that did not belong to the acquirer's main sector of production (see column F of Table VII). The number equivalent index for diversification activities (NEA), in Table VII, column D, also indicates a low level of diversification of production activities. Furthermore, it seems that a few sectors are biasing the results upwards. Only seven out of twenty-seven sectors had above average diversification rates

TABLE  
INDICATORS ON THE DIVERSIFICATION OF ACQUISITIONS

Business Group Sector	Sector	No. of Selling Transactions (A)	No. of Acquiring Transactions (B)
CI	Agriculture, forestry, and fishing	20	11
TI	Food and kindred products	88	80
FS	Commercial banks	56	66
CI	Rubber and misc. plastic products	18	21
SS	Wholesale trade (durable goods)	13	12
SS	Wholesale trade (nondurable goods)	26	25
SS	Retail trade-food stores	29	22
INF	Electricity, gas, and water distribution	57	30
TII	Electronic and electrical equipment	27	34
TII	Transportation equipment	54	31
TII	Drugs	13	13
FS	Investment firms	36	284
TI	Printing, publishing, and allied services	15	12
TII	Machinery	44	29
CI	Stone, clay, glass, and concrete products	27	29
CI	Metal and metal products	85	57
CI	Mining	23	24
CI	Paper and allied products	23	17
CI	Oil, gas, and petroleum refining	21	13
SS	Advertising services	18	18
CI	Chemicals and allied products	74	43
SS	Radio and television broadcasting	20	17
FS	Insurance	29	26
SS	Business services	76	57
INF	Telecommunications	68	20
TI	Textile and apparel products	15	11
INF	Transportation and shipping (except air)	41	25
Average		37.6	38.0
Standard deviation		23.5	52.3

Source: Calculated from TFSD, 1990–99.

Note: Sectors: CI = commodity industries; TII = technology-intensive industries; TI =

(NEA), whereas twelve out of twenty-seven sectors had an NEA under two. Thus, the results are biased upward by the presence of three sectors in which most of the diversifying transactions were concentrated: investment firms and the wholesale sector. These sectors seem to have had very good reasons for diversification in M&A activities. Investment firms were major participants in the privatization process. They were sometimes formed as consortia of different firms in order to fulfill requirements for acquisition or to collude to bid in the privatization process.

In addition, it should be noted that PNEs had a lower propensity to adopt diversi-

## VII

## AND DISPERSION OF ACQUIRERS, BRAZIL, 1990–99

Number Equivalent for Acquiring Firm Diversification (NES) (C)	Number Equivalent for Acquisition Product Diversification (NEA) (D)	Share of Acquiring Firms in the Same Sector as Target (E)	Share of Acquired Firms in the Same Sector as Acquiring Firm Sector (F)	Share of Multinationals (G)
5.41	2.28	35.0	63.6	63.6
1.80	1.50	73.9	81.3	73.8
2.06	2.82	67.9	57.6	47.0
3.52	3.90	50.0	42.9	71.4
7.35	6.00	15.4	16.7	75.0
4.28	4.43	38.5	40.0	80.0
1.95	1.20	69.0	90.9	59.1
2.59	2.14	35.1	66.7	73.3
2.18	3.19	66.7	52.9	85.3
4.50	1.91	40.7	71.0	77.4
1.94	1.99	69.2	69.2	92.3
2.34	15.12	61.1	7.7	35.6
2.03	1.41	66.7	83.3	58.3
3.90	2.03	45.5	69.0	72.4
1.94	2.14	70.4	65.5	86.2
3.82	2.93	37.6	56.1	63.2
2.39	2.53	60.9	58.3	79.2
2.99	1.94	52.2	70.6	52.9
5.31	4.12	14.3	23.1	69.2
1.26	1.26	88.9	88.9	83.3
3.57	1.99	40.5	69.8	86.0
1.94	1.44	70.0	82.4	64.7
1.70	1.38	75.9	84.6	65.4
3.67	2.22	50.0	66.7	80.7
2.35	2.13	19.1	65.0	70.0
2.85	1.81	53.3	72.7	36.4
2.50	1.40	51.2	84.0	64.0
3.0	2.9	52.5	63.0	69.1
1.4	2.7	19.2	21.3	14.4

traditional manufacturing; INF = infrastructure; SS = other services; FS = financial services.

fying strategies than did MNEs. When the sample of acquiring firms is split into two, leaving all transactions with PNEs as purchasers on the one side, and all transactions with MNEs on other, PNEs show a lower NEA index. The NEA index's arithmetic average for PNE acquisitions is 2.4, against 3.0 for MNEs. This difference is significant at the 1 per cent level, when a mean difference test is undertaken. Two types of arguments may explain this difference. First, PNEs may have adopted less diversification-oriented strategies due to their lower level of diversification. Compared to MNEs, PNEs are quite small and therefore may be less likely to have

high levels of diversification. Second, these figures may be revealing defensive strategies adopted by PNEs. In the face of external competition, PNEs may have sold their assets in sectors of production where they had little competitive advantage, specializing instead in those sectors where they had competitive advantage or at least where they still found themselves protected.<sup>5</sup>

A second important piece of information in Table VII is related to the sector of origin of acquiring firms in each sector. Whether acquiring firms were from the same sector of production or from a different one may give valuable information on the effect of M&As on market structure. If most acquiring firms came from the same sector as target firms, M&As should have had a concentrating effect on market structure, unless acquirers were new entrants in the markets;<sup>6</sup> if targets and acquirers were in different sectors, then M&As should have had little direct impact on market structure. Column E in Table VII shows the percentage of acquiring firms for each sector that belonged to the same sector as the target firm. The arithmetic average shows that only 52.5 per cent of total acquirers belonged to the same sector. The equivalent number for the diversification for acquiring firms is 3.0 on average. However, it should be stressed that the dispersion is much lower than that for the NEA variable. On average, there were acquiring firms from three different sectors in each sector. Only seven sectors had equivalent numbers for the diversification of acquiring firms under 2.0. No sector had figures over 8.0.

A third feature shown by Table VII is the very high participation by MNEs as acquirers. This may explain the increase in the participation of MNEs in the Brazilian production sector. It should be stressed however that the figures presented in Table VII account for both new entrants into the Brazilian markets and firms that were already producing in the country. The effects on the industrial structure would be quite different. In the former case, acquisitions should have had a neutral effect on concentration rates. In the latter, acquisitions may have had a concentrating effect on market structure.

The three features established above may be considered to be important consequences of the M&A process on market structure. The growth strategies undertaken by firms may be classified as either specializing or diversifying. Specializing

<sup>5</sup> It should be stressed that these figures are based on TFSD's sectoral classification. This classification presents two important shortcomings for our purposes. (i) It is more or less compatible with the two-digit SIC classification. Most international studies are based on less aggregated sectoral classifications (see Ravenscraft and Scherer 1987). This feature may induce a bias towards lower levels of diversification compared to other studies. (ii) It takes into account only the main sector of activity of each firm. Therefore, in some cases, a firm may already be diversified towards some sector, but the TFSD does not give specific knowledge about it. For instance, this was the case with Thyssen. Thyssen was classified by TFSD as a metal products firm. It is, however, also a player in the machinery sector. Whenever Thyssen bought a machinery firm, the transaction was classified as a diversifying transaction.

<sup>6</sup> For instance, MNEs with no previous participation in Brazil.

strategies are achieved when firms buy assets in their main sector of activity, whereas diversifying strategies are achieved when firms buy assets outside their main sector of activity. If strategies are mainly specializing, there should be a tendency towards concentration. There may be one important exception to this concentration effect, however. As stated above, the concentration effect is not present if the acquiring firm is a newcomer to that geographic market, meaning in our case, that the firm is a multinational. Diversifying strategies may be an indication of either great potential of growth of existing firms or of slow growth in a market where firms are established.

New entry through M&As may occur in two modes. Firms may come from different sectors of activity, or they may come from different geographic markets. The direct effect of new entries should not be a concentrating one. In fact, entry may diminish concentration, depending on the characteristic of the acquired firm. If the acquired firm is a one-unit firm, the change of ownership should have no effect on market structure. However, if the target firm was a unit of a greater enterprise that had adopted a strategy of fragmentation of its parts, then, the effect should be a decrease in concentration. This could be quite important in the Brazilian case due to the privatization process that broke up SOEs in the telecommunications, petrochemical, and energy sectors.

The effects of the M&A process on market structure should then vary across sectors, in accordance with their main characteristics such as level of technology, previous state participation, rate of growth, importance of brand names, etc. Table VIII provides us with a taxonomy of sectors, arranged according to the strategy of acquiring firms that belonged to the sector (specializing or diversifying strategies), and the sectoral and national origin of acquiring firms. The classification of sectors into categories was established by comparing the arithmetic averages of each characteristic. If the sector had a specialization index (column F of Table VII) above 63 per cent, it was considered to have implemented a specializing strategy; if the index was under 63 per cent, it was classified as a diversifying strategy sector. Table VIII shows that two-thirds (eighteen out of twenty-seven) of the sectors appear to have firms that pursued a specializing strategy, while in one-third of the sectors, M&A activities seem to reflect the adoption of diversifying strategies by firms.

#### A. *Specializing Strategies*

In those sectors where specializing strategies were prevalent, nine sectors show an intensive entry of acquiring firms from other sectors, and nine a low entry of acquiring firms from other sectors. As stated above, sectors with M&A specializing strategies are more likely to have higher rates of concentration. However, this depends on two important features.

- (i) If firms come from different geographic markets, specialization strategies do not lead to higher concentration indices.

TABLE VIII  
A TAXONOMY OF THE M&A PROCESS IN BRAZIL, 1990–99

Sectoral Location	Nationality of Acquirer	Strategy of Firms in the Sector	
		Specializing	Diversifying
Acquirer from same sector	Multinational	<ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Advertising services</li> <li>• Stone, clay, glass, and concrete products</li> <li>• Drugs</li> </ul>	<ul style="list-style-type: none"> <li>• Mining</li> <li>• Electronic and electrical equipment</li> </ul>
	National	<ul style="list-style-type: none"> <li>• Textile and apparel products</li> <li>• Printing, publishing, and allied services</li> <li>• Retail trade—food stores</li> <li>• Radio and television broadcasting</li> <li>• Insurance</li> </ul>	<ul style="list-style-type: none"> <li>• Investment firms</li> <li>• Commercial banks</li> </ul>
Acquirer from different sector	Multinational	<ul style="list-style-type: none"> <li>• Telecommunications</li> <li>• Machinery</li> <li>• Electricity, gas, and water distribution</li> <li>• Transportation equipment</li> <li>• Business services</li> <li>• Chemicals and allied products</li> </ul>	<ul style="list-style-type: none"> <li>• Oil, gas, and petroleum refining</li> <li>• Rubber and misc. plastic products</li> <li>• Wholesale trade (durable goods)</li> <li>• Wholesale trade (nondurable goods)</li> </ul>
	National	<ul style="list-style-type: none"> <li>• Transportation and shipping (except air)</li> <li>• Paper and allied products</li> <li>• Agriculture, forestry, and fishing</li> </ul>	<ul style="list-style-type: none"> <li>• Metal and metal products</li> </ul>

(ii) If firms from other sectors enter a sector (whether through new investment or acquisitions), concentration does not necessarily rise. A specializing strategy may denote low entry barriers and, sometimes, weak growth potential of firms in comparison with the market's possibilities. Thus, entry by incumbents with specializing strategies may imply that the sector has greater opportunities than the firms in that sector can absorb or supply.<sup>7</sup>

The adoption of specializing strategies can be divided into six categories.

(i) Traditional sectors, with low product differentiation, where firms show low levels of diversification potential and where the sector does not have a high

<sup>7</sup> The following analysis relies on arguments that involve the rates of growth of different sectors. The measurement of sectoral growth in Table VIII is quite difficult, due to problems of aggregation in the main official databases. Therefore, this paper relies on information from secondary sources. Rodrigues (1999), Bonelli and Fonseca (1998), BNDES (2000) are recommended for further information on the subject.

rate of growth. This is the case with: textile and apparel products; printing, publishing, and allied services; and stone, clay, glass, and concrete products.

- (ii) High growth rate sectors, where the entry of MNEs has dominated the M&A process. This is the case with food and kindred goods, advertising services, transportation equipment, and business services.
- (iii) Recently privatized sectors that presented good opportunities for short-term profits. In this case, firms from other sectors and countries entered the market through acquisitions. In a second phase, there was a restructuring of the sectors, with recently privatized firms being resold to firms that belonged to the same sector as the privatized companies. This is the case with: telecommunications; chemicals and allied products; electricity, gas, and water distribution; and transportation and shipping.
- (iv) High technology sectors that attracted foreign acquiring firms due to the opening of the economy.<sup>8</sup> This is the case with transportation equipment and machinery.
- (v) Exporting sectors with very high rates of growth, and which were dominated by PNEs, such as: paper and allied products; and agriculture, forestry, and fishing.
- (vi) Service sectors still protected by legislation, such as radio and television broadcasting; and insurance.

### 1. *Low entry from other sectors*

Nine out of the eighteen sectors that had firms that predominantly adopted specializing strategies showed low entry from other sectors, and the adoption of specializing strategies. These nine sectors included three traditional manufacturing (printing, food, and textile) in our sample, one commodity industries sector (stone, clay, glass, and concrete products), three other services sector (radio and television; advertising; and retail trade-food stores), one technology-intensive sector (drugs), and one financial services sector. With the exception of drugs, all the manufacturing sectors involved have very low levels of technology.

When sectors are divided according to the intensity of participation of MNEs as acquiring firms, a clearer scenario unfolds. Four sectors showed high rates of internationalization: food; stone, clay, glass, and concrete products; advertising; and drugs. With the exception of stone, clay, glass, and concrete products, the other three sectors are either high technology—and therefore the presence of national enterprises came about due to greater international exposure to competition after the institutional reforms—or have a very high growth potential. This should also be true for food (see Rodrigues 1999), due to its very high income elasticity in Brazil,

<sup>8</sup> This process will be explained later.

and also for advertising. The case of the food industry is quite interesting because the entry through acquisition was part of the global competition strategy of some of the MNEs in Brazil.

The five sectors with low rates of internationalization may be divided into two groups. The traditional manufacturing sectors showed very low prospects for growth and shrunk sharply in size during the period. In the case of textiles, the liberalization of imports has had a very strong impact on the sector. The services sector, however, seems quite different. In radio and television broadcasting, there is still severe legislation regulating foreign ownership. The food retail sector had a very strong concentration structure in the period, and had quite high barriers to entry (BNDES 2000). It should nonetheless be stressed that though these sectors have lower internationalization rates, the level of internationalization has increased during the period and the share of MNEs in total acquisitions is quite high (see Table VII).

## *2. High entry from other sectors*

There were nine sectors with high shares of acquiring firms from other sectors: telecommunications; machinery; electricity, gas, and water distribution; transportation equipment; business services; chemicals and allied products; transportation and shipping; paper and allied products; and agriculture, forestry, and fishing.

Three of these nine sectors are commodity industries (chemicals and allied products; paper and allied products; and agriculture, forestry, and fishing), three are classified as infrastructure sectors (transportation and shipping; electricity, gas, and water distribution; and telecommunications), two belong to technology-intensive industries (machinery and transportation equipment), and one is a service sector.

Four out of these nine sectors (chemicals and allied products, and the three infrastructure sectors) were part of the government privatization process. Some acquisitions in infrastructure were made through firm consortia that are here classified in the investment firms sector; others in transportation had former construction firms as acquirers. The opportunities for short-term profits provided by the purchase of SOEs seem to have been an important driving force to explain the diversity of the acquirers in these cases.<sup>9</sup>

The presence of machinery and transportation equipment in this category cannot be separated from the fact that most of the entries have been multinationals. The liberalization of the Brazilian market created a major threat for national high tech firms. These firms, which were accustomed to protected markets, would be facing new competition and were in danger of losing market share. Nonetheless, they had a solid position in the market and owned valuable assets. The entry of MNEs was unavoidable. However, MNE could follow two different paths. They could engage

<sup>9</sup> Graça (2001) finds that acquirers of SOEs earned very high profits immediately after the privatization process.

in greenfield investment and then attempt to displace well-established national firms, or they could acquire some of these firms. The choice would depend on a comparison between two extremes: the present value of national enterprises and the cost of new investment, versus the cost of displacing competition. Any asset price between these two extremes would be advantageous for both parties. Most firms followed the latter option.<sup>10</sup>

The three cases where national acquirers seem to have had a greater presence (transportation and shipping; agriculture, forestry, and fishing; and paper and allied products) seem to have one important thing in common—a great advantage for national enterprises. Some of the transactions in transportation and shipping involved the acquisition of road administration by construction companies. Agriculture, forestry, and fishing; and paper and allied products are amongst Brazil's major exporting sectors, and are dominated by PNEs.

### B. *Diversifying Strategies*

Diversifying strategies could be identified in only nine sectors: mining; electronic and electrical equipment; investment firms; commercial banks; oil, gas, and petroleum refining; rubber and miscellaneous plastic products; wholesale trade (durable goods); wholesale trade (nondurable goods); and metal and metal products. These sectors may be divided into three different groups.

- (i) Financial investment—a category that includes investment firms and commercial banks. Investment in these cases is not directed at increasing the acquiring firm's capacity to affect and decide production in these industries. It rather involves portfolio diversification investments (and are composed of acquisitions of minority shares) or short-term gains, mainly through investment firms buying privatized enterprises.
- (ii) Verticalization of activities—oil, gas, and petroleum refining, rubber and plastics, mining, and the two wholesale sectors fall in this category. The acquisition of firms from other sectors is carried out with aim of verticalizing activities in the same productive chains.
- (iii) Product pervasiveness—this is the case for electrical and electronics and metal and metallurgy. In these cases, acquiring firms are usually more diversified and have their main sector of production located elsewhere.

#### 1. *Low entry from other sectors*

Four sectors (mining, electronic and electrical equipment, investment firms, and

<sup>10</sup> One example of the stylized fact described above may be found in the acquisition of Metal Leve by Mahle of Germany. However, though Metal Leve is classified as a transportation equipment firm, Mahle, due to its diversified multinational structure, is classified as an electronic and electrical firm. The acquisition of Elevadores Sur, a machinery manufacturer, by Thyssen a diversified multinational classified as metal, is another example of this process.

commercial banks) had low entry from firms from other sectors. Two sectors had an intensive presence of MNEs: mining and electronic and electrical equipment. The electronic and electrical equipment sector is a classical case of the acquisition of high tech firms by multinational enterprises, as described above.<sup>11</sup> In this sector, though foreign acquirers were already present in the market in some cases, one should not expect that the M&A process had a great influence on the market structure. Furthermore, as entry is usually achieved through the acquisition of existing assets, it should have little influence in the lowering of concentration.

The commodity and investment firms and commercial bank sector has low entry from other sectors and low participation rates by MNEs. Acquired and acquiring firms in this sector are quite different and should be analyzed separately. Acquirers in this sector are mostly consortia, which play an important role in the privatization process, mainly in the acquisition of infrastructure companies. However, acquired firms from this sector are usually small brokers in the stock market or firms that gather consumers into consortia for the acquisition of durable goods, such as motor vehicles, and which thus may act as tools for long-term financing for the purchase of such goods. Usually there is little interest among major MNEs in the purchase of this type of firm. Therefore, if the M&A process is viewed from the point of view of investment firms as acquirers it should not play an important role in the investment firm sector, but rather in infrastructure. However, if it is viewed from the point of view of acquired firms in the sector, the influence over the concentration rates presented above should not be very important due to the small size of the acquired firms and the small role played by large firms in such acquisitions.

Though the participation of foreign acquirers in transactions involving commercial banks is not as intensive as it is in other sectors, when the value of transactions is analyzed MNEs may play an even more important role. However, it is likely that this sector has a slight concentration in its market structure.

## 2. *High entry from other sectors*

Five sectors show high entry from other sectors: oil, gas, and petroleum refining; rubber and miscellaneous plastic products; wholesale trade (durable goods); wholesale trade (nondurable goods); and metal and metal products. There are four sectors that present a high level of entry, with intensive participation by MNEs: oil, gas, and petroleum refining; rubber and miscellaneous plastic products; wholesale trade (durable goods); and wholesale trade (nondurable goods). The situations in the oil, gas, and petroleum-refining sector may be explained by three important govern-

<sup>11</sup> It seems that in this case, the cost of the acquisition of a national company was lower than the cost of entry through greenfield investment and winning market share. In the case of national companies, the threat of entry by MNEs and the new competition caused by the liberalization of the domestic market created expectations of a devaluation of the firms assets, creating an incentive for owners to sell the firms.

ment policy measures. First, there has been increasing interest in gas, not only a fuel for thermoelectric generation, but also as an input for the petrochemical sector. Second, it should be stressed that the petroleum and gas sector has undergone a deregulation process in recent years, which has attracted the entry of MNEs. Third, the privatization program involved the selling off of some gas transportation and distribution companies that belonged to different federative units (*estados*) in Brazil. The effect on the sector of the deregulation should be a decrease in concentration.

The acquisition of firms belonging to the rubber and miscellaneous plastic products sector by firms from other sectors has a high level of dispersion, as can be demonstrated by the NES indicator in Table VII. Two transactions involved acquirers from the food sector. In this case, the targets were packaging firms, and the transactions seem to reflect the verticalization strategies of the food firms. Other acquirers come from textiles, metals, drugs, oil, and paper sectors. Most transactions (eight out of ten) involving acquirers from the rubber and plastic sector had MNEs as purchasers. Thus, it does not seem that this type of transaction will lead to market concentration.

In the case of the wholesale sectors, no clear strategies can be established from the available data. An analysis of the transactions reveals that there seems to be a prevalence of verticalization strategies. In this case, wholesale firms in the durable goods sector appear to have specialized in the direction of durable goods firms. Therefore, M&A transactions could not be expected to have a strong impact on concentration rates.

The metal and metal products sector has been influenced by two types of events. First, privatization has encouraged purchases by companies from other sectors, due to the already mentioned expectations of short-term gains. Twenty-eight out of the eighty-five transactions involving the sale of metal and metal products firms had investment firms as acquirers. Second, after privatization, the former SOEs had their ownerships restructured, and were taken over by owners interested in long-term profitability. Due to the fact that mostly transactions involved former SOEs, M&As should not have a concentrating effect as well.

## CONCLUSION

Since the beginning of the 1980s the Brazilian industry has been under pressure to change. This pressure may be rooted in the fading power of the import substitution paradigm, which guided national development throughout the postwar period.

The analysis undertaken in this paper suggests that the 1990s cannot be characterized as years of strong transformation in industry structure. Instead, it suggests that the most salient characteristic of the period was the change in the ownership structure of productive assets. In sectoral terms, the only important characteristic

was the loss of importance of the construction sector. Nonetheless, many changes in ownership structure may be identified. Multinational enterprises have come to dominate the whole industrial structure. This strongly contrasts with previous periods, when they were concentrated in parts of the manufacturing sector. Today, their participation has increased in every sector. SOEs have reduced their market share to about half what it once was, while PNEs have roughly maintained their market shares. However, PNEs have been displaced from the manufacturing sector and have concentrated their activities in the service sector.

The decade may also be characterized by a reduction in economic concentration. This finding contradicts a previous work (Willmore 1989) that suggests that an increase in the share of MNEs raised the level of concentration of industrial activity. Some important characteristics of the evolution of the industry may explain the reduction in economic concentration. First, as shown above, the increase in the market share of MNEs was accompanied by a decrease of that of SOEs. As shown by Willmore (1989), SOEs have a positive effect on concentration levels. Furthermore, in the 1990s, the privatization process has been carried out in some cases through the dismemberment of SOEs into parts which were then sold to different private players. Second, in some cases, MNEs have entered the Brazilian market through the acquisition of existing companies. In this case, the entry of an MNE does not necessarily lead to greater levels of concentration. In addition, the short length of time from the date of acquisition to the date of observation of the market structure does not allow for great changes in market structure through efficiency gains. Finally, the results here reported refer to economic concentration and not to concentration in specific markets. The level of aggregation of the analysis is much higher than in Willmore (1989). Further research is still needed in this respect.

The results from our analysis of the M&A process may contribute to the attainment of sharper conclusions. On the one hand, acquiring firms seem to have adopted specializing strategies, mainly acquiring firms in their main sector of production activity. This type of behavior seems to support conclusions favoring the concentration of markets. On the other hand, it is shown that the M&A process has been marked by the entry of MNEs. They have been the main purchasers of assets, and some have used acquisitions as means to enter the market. Therefore, the process does not seem to have led to concentration, due to the presence of new actors in the marketplace.

In addition, PNEs seem to have adopted even less diversified strategies than MNEs. This result seems to support the idea that PNEs have adopted defensive strategies as a reaction to changes in macroeconomic and institutional conditions that took place in the 1990s. Thus, this finding does not seem to support the ideas of those that argue that the institutional changes of the 1990s eliminated weaker companies and sectors and strengthened the Brazilian industrial structure. On the contrary, it suggests that firms were able to survive through the adoption of defensive strategies.

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