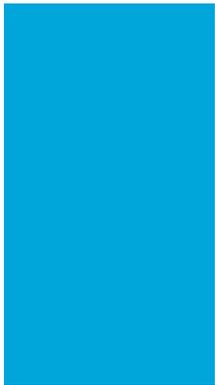


Center for Latin American Studies  
University of California, Berkeley



Innovative Firms in Three  
Emerging Economies:  
Comparing the Brazilian, Mexican, and  
Argentinean Industrial Elite

Glauco Arbix\*  
Professor of Sociology  
Universidade de São Paulo

October 2008  
Paper No. 22

W  
O  
R  
K  
I  
N  
G  
  
P  
A  
P  
E  
R  
S

clas.berkeley.edu  
2334 Bowditch Street  
Berkeley, CA 94720

\* Glauco Arbix is Professor of Sociology at the Universidade de São Paulo and a Visiting Scholar at the Center for Latin American Studies and the Department of Sociology of the University of California, Berkeley. The author is grateful to Professors Harley Shaiken and Peter Evans and to the CLAS researchers and staff for their warm reception and assistance. The author thanks CAPES for its financial support. This paper draws on the seminal survey on innovation conducted by the Directorate of Studies on Production, Technology and Innovation at the Instituto de Pesquisa Econômica Aplicada (Institute for Applied Economic Research, IPEA).

Copyright © 2008, the Regents of the University of California. All rights reserved by the Regents of the University of California. No part of this publication may be reproduced or transmitted in any form or by any means without prior permission in writing from the publisher. ISSN #1552-7611.

## CONTENTS

1. Introduction .....	1
2. Characteristics of Brazilian Firms .....	1
3. The Impact of Innovation .....	4
4. Brazil, Argentina, and Mexico .....	10
5. Signs of a New Entrepreneurial Wave in Brazil .....	15
Bibliography .....	19



## 1. INTRODUCTION

The remarkable and unmatched growth rates of the advanced, free-market economies are what distinguish them most from all other economic systems. In no other system, past or present, has the average income of the general public risen as quickly as it has in Western Europe, the United States and Japan. The secret of this success is an economic puzzle that is undoubtedly critical to our future prosperity and one that the world's latecomer and poorer Latin American countries are anxious to learn.

In attempts to explain these achievements, the terms innovation and entrepreneur invariably recur, and yet in mainstream economic writings, these two words are scarcely found.

For the purposes of this article, entrepreneurship can be defined as the ability to transform an idea into a market reality by means of a firm. Entrepreneurial behavior refers to the ability to develop new business via the creation or structural remodeling of companies. Entrepreneurs promote corporate strategy building, founded on knowledge-intensive activities.

This article argues that the entrepreneurial activities of industries and firms drive the success of the free-market machine by promoting innovation which in turn leads to the longterm expansion of firms in both internal and external markets.

The three sections of this article describe the current characteristics and growth performance of Brazilian business firms; examine the way in which innovation occurs and impacts Brazilian industrial firms; and compare innovation and the performance of firms in Brazil, Mexico, and Argentina.

## 2. CHARACTERISTICS OF BRAZILIAN FIRMS

The consequences of the widespread opening of the Brazilian economy, which began in the 1980s and expanded from 1990 onward, have already been examined from different perspectives. In general, these studies have emphasized economic and societal changes.

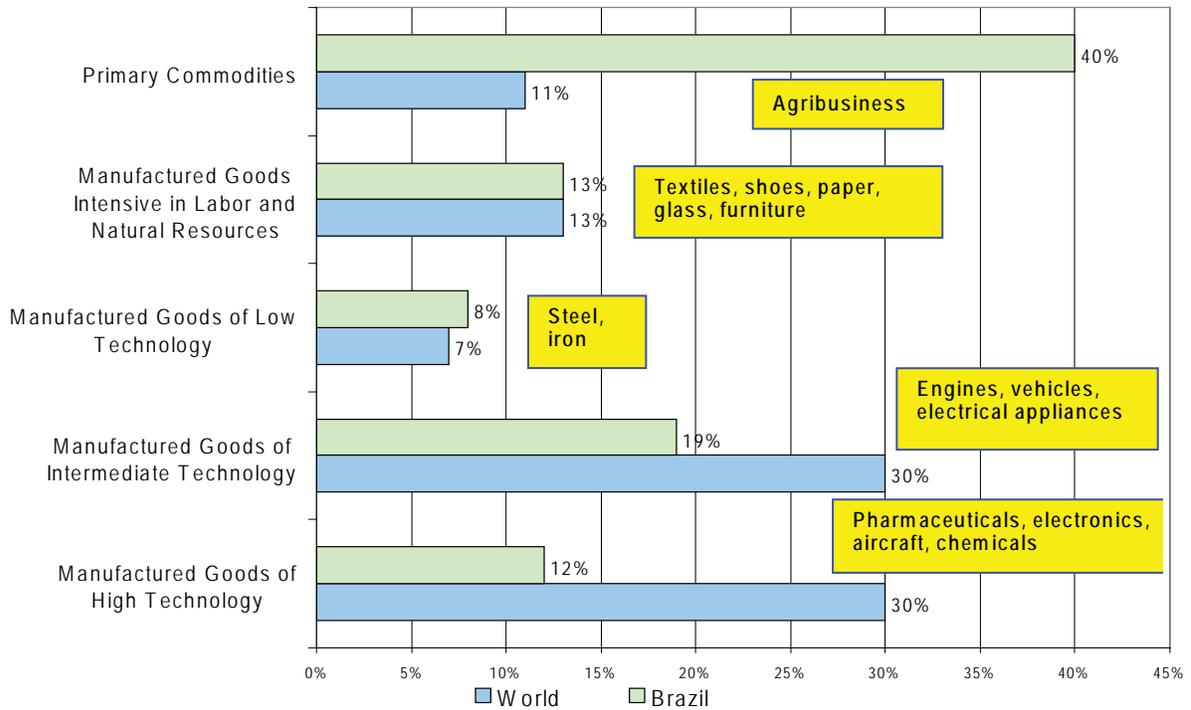
In contrast, this article emphasizes microeconomic realities based on the evolution of Brazilian firms. Brazil has abandoned at least part of its protectionist past and become much more open to the transformative influence of global trade. The economic openness coefficient (trade as a percentage of GDP) reached 25 percent in 2006, the highest level since the 1950s, and increased by 17 percent in 2006, reaching the highest level of exports to almost US\$140 billion, triple the level observed ten years ago. Brazil's commodities are responsible for a significant part of this progression, but in 2006, around 54 percent of Brazilian exports were manufactured goods, not just commodities. Likewise, over 40 percent of Brazil's industrial exports in 2006 had a reasonable degree of technological sophistication. Leading examples of medium- and high-tech exports include aircraft and aerospace equipment, specialty chemicals, automobiles, and communication equipment.

Although serious research has included some outstanding contributions to the understanding of this new Brazilian reality, they have offered few suggestions regarding the features of business behavior and decision-making that could account for these changes. Indeed, when analyzing the appreciation of the Brazilian currency, these studies predicted that Brazilian companies would face great difficulties in switching from an inward to an outward strategy, which clearly has not been the case.

In the early 1980s, conventional analysis was pessimistic regarding the ability of Brazilian industry to gather the impetus needed to participate significantly and compete in international markets, due to the country's protectionist habits and relatively small size, compared to international counterparts.

Indeed, Brazilian exports are strongly concentrated in primary commodities, which represent about 50 percent of the total. However, the mix of Brazilian and world export products are significantly different. On average, 60 percent of the products exported in the world are of high and intermediate technological intensity, while the share of commodities is only 13 percent (see chart below). Data confirm that Brazil remains competitive in exports of labor- and natural-resource-intensive goods.

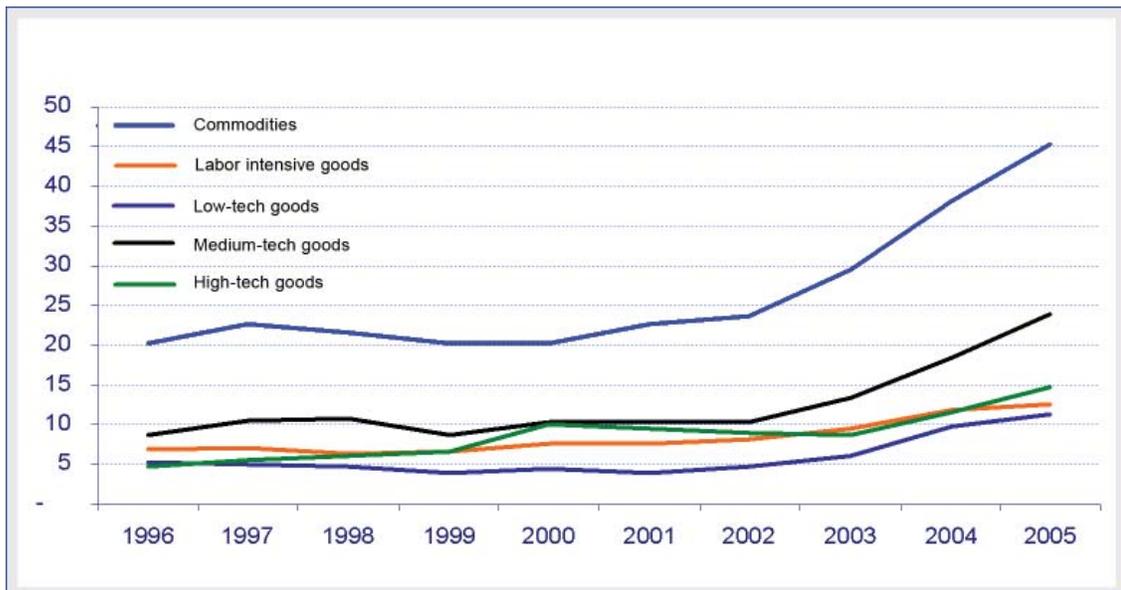
**Chart 1 – Structure of Brazilian (2003) and International Exports (2002)  
By types of products classified by technological intensity (in %)**

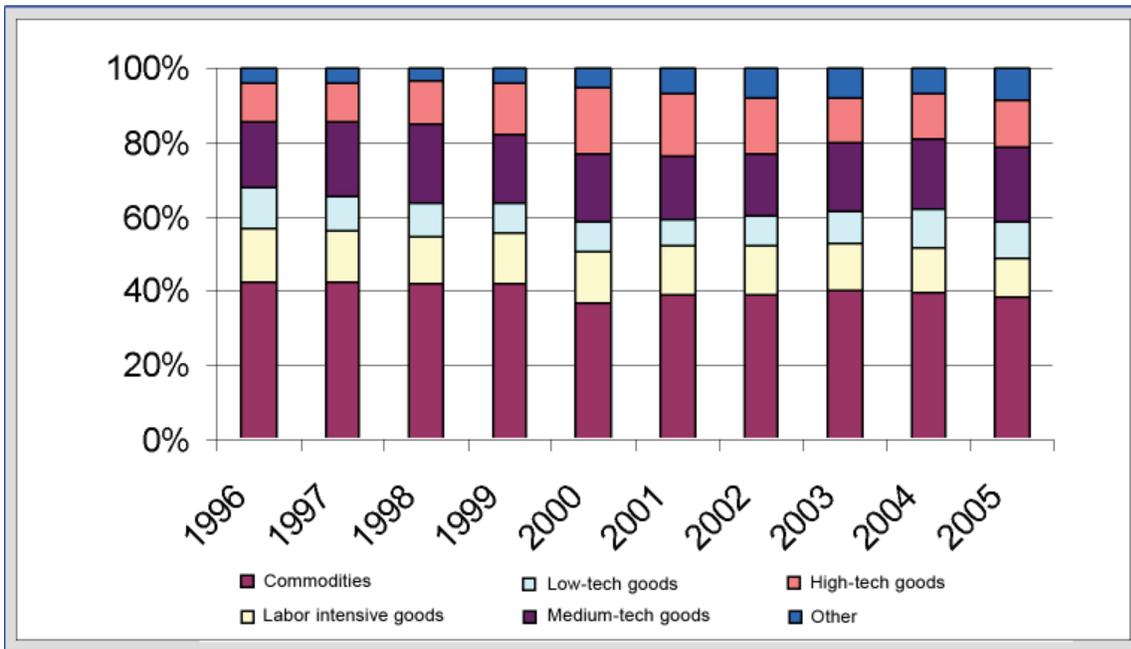


Source: IPEA 2005, 2006; IBGE/Pintec 2000. Products by technological Intensity according to UNCTAD methodology.

Nonetheless, recent Brazilian exports show an unusual competitiveness in segments with medium and high technological content (Charts 2 and 3), which calls for explanation.

**Chart 2 – Brazilian Exports by Technological Intensity 1996-2005 (US\$ bln)**



**Chart 3 – Brazilian Exports by Technological Intensity 1996-2005 (US\$ bln)**

What are the reasons for this unexpected performance? How are Brazilian industrial companies able to export to such demanding North American and European markets, exhibiting relevant levels of competitiveness? Certainly, the answer must take into consideration the economic pressures that affected Brazilian firms during the 1990s, but it is reasonable to delve further into this issue

### 3. THE IMPACT OF INNOVATION

A group of Brazilian firms are behaving differently from the past and assuming new corporate strategies towards exports and employment based on more permanent processes of innovation.

A survey conducted in 2005 and 2006 by the Instituto de Pesquisa Econômica Aplicada (Institute for Applied Economic Research, IPEA), the Brazilian government's most important think-tank, revealed that this new group of Brazilian firms share several characteristics: they obtain a premium price in the international market when compared to other Brazilian exporters; are more productive; invest more in R&D; pay better salaries to their employees; invest more in training and capacity building; and grow faster than other Brazilian companies.

In 2003, the IPEA started researching this new group of companies, using a new methodological approach.<sup>1</sup> The IPEA defined a unique taxonomy to categorize industrial firms according to their competitive strategies, producing a detailed and precise industrial diagnosis for the period between 1998 and 2004.

The IPEA sorted industrial firms by their corporate policy for strategic competition in terms of product differentiation that enables companies to obtain a premium price in the markets. This product differentiation strategy, based on innovation, is quite different from the spurious competition that had predominated in emerging countries for decades. As the competition is no longer based on lower wages and extended working hours, this strategy better rewards companies and society.

The IPEA first distinguished Brazilian firms from foreign firms based on ownership (at least 50 percent of Brazilian firms' capital is national) and then divided strategic competition into three groups:

1. **A Firms:** Companies that innovate and differentiate products. Firms in this group introduced some sort of innovation to the market and obtained a price-premium equivalent to 30 percent in exported goods when compared to other Brazilian exporters of the same product. Group A emphasizes R&D, marketing, quality, and brand management.
2. **B Firms:** Companies that specialize in standard products and employ a competitive strategy based on cost-cutting activities, rather than generating value added, as in the previous category. This group includes exporting firms not listed in the previous category and non-exporting firms with the same or better efficiency than the exporting ones. Group B firms stress operational manufacturing, management, control and logistics, and cost reduction.

---

1. IPEA (2006) used data collected by the Instituto Brasileiro de Geografia e Estatística (IBGE)/Industrial Research on Innovation Technology (PINTEC) and Industrial Research (PIA); RAIS/MtB; SECEX/MDIC; Censo do Capital Estrangeiro/Central Bank; Registro of Capitais Brasileiros no Exterior/Central Bank; Compras Governamentais/Ministry of Planning.

3. C Firms: Companies that do not differentiate and have lower productivity, as well as firms that do not fit into the previous groups. C firms are non-exporting companies that are able to perform better in less-dynamic markets by means of low prices or low salaries.

A survey conducted by IPEA in 2005 with 70,000 Brazilian-owned firms confirmed that the vast majority could not really be classified as innovative in terms of launching new products or new processes into the global or internal market. Nonetheless, the IPEA survey brought to light interesting information regarding the higher performance of the roughly 1,200 Brazilian-owned companies that truly do innovate (see Table 1).

**Table 1 – Brazilian Industrial Firms’ Competitive Strategy**

Competitive Strategy	Number of Firms	Share in Wages (%)	Share in Employment (%)
Innovative Firms (A)	1,199 (1.7%)	25.9%	13.2%
Standard Products (B)	15,311 (21.3%)	62.6%	48.7%
Lower Productivity (C)	55,495 (77.1%)	11.5%	38.2%
Total	72,005 (100%)	100%	100%

*Source: IPEA (2005, 2006), based on IBGE (Pintec 2000) and PIA/IBGE, Secex/MDIC, CBE and CEB/Bacen, MPOG, and Rais/MTE.*

Although these firms represent only 1.7 percent of all industrial companies, they account for more than 25 percent of total industrial sales in Brazil and 14 percent of total employment in industry. These companies are much larger than most other Brazilian industrial firms. They also are more efficient and demonstrate higher productivity and leadership capacity (Table 2).

**Table 2 – Size, Efficiency, and Leadership in Brazilian Industrial Firms<sup>2</sup>**

Competitive Strategy	Average # of Employees	Total Sales (R\$ million)	Efficiency		Productivity per Worker R\$1.00)	Market Share Leadership
			Scale Efficiency (index)	Technical Efficiency (index)		
A Firms	545.9	135.5	0.77	0.30	74.1	0.02
B Firms	158.1	25.7	0.70	0.18	44.3	0.004
C Firms	34.2	1.3	0.48	0.11	10.0	0.00028

*Source: IPEA (2005, 2006), based on IBGE (Pintec 2000), and PIA/IBGE, Secex/MDIC, CBE and CEB/Bacen, MPOG and Rais/MTE; DeNegri et al., 2006.*

2. Technical and scale efficiency refer to the firms’ productivity relative to the most productive scale within the industry. Market share leadership refers to the market share of each firm within its industrial sector.

Table 3 shows the average difference in wages per employee among A firms (R\$1,254.64), B firms (R\$749.02), and C firms (R\$431.15). It is clear that the performance of A-type firms is correlated with higher wages and more-educated workers than their counterparts. On average, workers in A-type firms have 9.13 years of education and remain with the same company for 54.09 months.

**Table 3 – Salaries, Schooling, and Premium Wages in Brazilian Industrial Firms**

Competitive Strategy	Wage Average (R\$/month)	Schooling (years)	Tenure (months)	Wage Premium (%)
A Firms	1,254.64	9.13	54.09	23
B Firms	749.02	7.64	43.90	11
C Firms	431.15	6.89	35.41	0

*Source: IPEA (2005, 2006), based on IBGE (Pintec 2000), and PIA/IBGE, Secex/MDIC, CBE and CEB/Bacen, MPOG and Rais/MTE.a Bahia and Arbache (2005).*

Schooling and effective time on the job are especially relevant variables in analyzing firms' competitive strategies. These indicators are frequently associated with technological learning processes that tend to require better-trained and more-educated workers.

To better understand these attributes, Bahia and Arbache (2005) reduced the effect of more than 200 variables<sup>3</sup> to isolate and focus only on innovation. They established the parameters of the wage-innovation-differential: A-type firms pay 23 percent more than C-type firms and 11 percent more than B-type firms. The authors' findings indicated that innovation exerts a positive impact on salaries and raises the quality of work performance.

In addition, the IPEA's survey (2005) revealed that innovative firms are more likely to participate in international trade. According to the survey, of 1,611 foreign companies in the Brazilian industry, 1,215 (75.4 percent) do not fit the description of innovative companies, suggesting a continuity of foreign companies' preference for the Brazilian internal market, natural resources, and relatively cheaper labor.<sup>4</sup>

3. Such as firms' earnings, sectors, geographic localization, employees, scale, tenure, turnover, export and import coefficients, and so on.

4. Multinational companies in Brazil seem to concentrate innovation processes in their headquarters. Their strategy in developing countries like Brazil remains oriented towards the domestic market.

Araújo (2004) carried out a firm-by-firm evaluation of innovative efforts (internal R&D expenses in relation to sales) and found that Brazilian A-type companies spend around 3 percent of sales on research activities. This amount is 80.8 percent higher than the R&D spending of foreign multinational subsidiaries in Brazil during 1998 through 2000. Araújo reported that innovative foreign multinational subsidiaries in Brazil purchase more R&D abroad than national A-type firms: foreign firms spent 0.21 percent of their total sales on external acquisitions and 0.80 on internal acquisitions, while national firms spent 0.14 percent and 0.26 percent, respectively, which suggests that subsidiary R&D spending is basically aimed at adapting products and processes coming from their headquarters.

De Negri and Freitas (2004) showed that technological innovation is the main determinant in fostering firms' exports: an innovative Brazilian firm is 16 percent more likely to become an exporter than a Brazilian firm that does not carry out any technological innovation. Fernanda de Negri (2005) found that Brazilian firms are capable of exporting products with higher technological intensity to competitive markets (such as the U.S. and Europe) and that there is a strong association between these exports and the innovation processes carried out by these firms. Moreover, the Brazilian case seems to be different from other Latin American economies because the Brazilian firms manage to export high-tech products associated with imported machines, components, and equipment. Such a pattern is comparable to traditional multinational companies.

The growing internationalization of a group of Brazilian firms is also revealed by the IPEA's survey. According to the Brazilian Central Bank, in 2003 US\$82.7 billion of Brazilian capital was located in foreign countries. Brazilian foreign direct investment (FDI) was calculated at US\$54.9 billion. Of this total, Brazilian industrial firms were responsible for US\$13.7 billion in FDI.

The internationalization process developed by some Brazilian firms improves their export performance, according to research by Arbix, Salerno, and De Negri (2004). These authors suggest that firms' external performance is due to innovation based on new information or

technology from abroad. Likewise, Arbache (2005) pointed out that technological innovation is positively connected to firms' growth. Firms that invest abroad, via FDI, show a larger expansion and growth potential.<sup>5</sup>

Arbix, Salerno, and De Negri (2005) confirmed the significant association between technological innovation, internationalization of Brazilian industrial firms, and price premiums in exports. The authors found innovation to be strongly correlated to efforts of internationalization, as firms tend to broaden their knowledge and R&D network in an effort to sustain their position in the markets. Brazilian companies with FDI in North American and European markets are respectively 17.40 percent and 14.01 percent more likely to export to these markets than non-internationalized Brazilian firms. These results suggest that competition strengthens Brazilian firms' abilities to innovate and export.

Arbix, Salerno, and De Negri (2004b) also brought to light the differences in external sources that support innovation processes. For specific markets, like the United States and Europe, information for innovation comes from suppliers as well as clients and is positively correlated with the search for price premiums. In less-demanding markets, such as in Latin America, Brazilian firms look for additional information only occasionally.

Brazilian firms are inclined to form cooperative alliances and partnerships to access technological innovation. However, in-house engineering and R&D remain the main sources of information for Brazilian companies (see Table 4).

**Table 4 – Brazilian Firms and Innovation Sources**

Competitive Strategy	Internal Sources	Other Companies of the Same Group	Machine Suppliers	Clients and Customers	Competitors
A Firms	60.7	28.1	29.9	49.6	19.9
B Firms	53.2	9.5	40.8	37.9	22.1
C Firms	44.1	1.1	35.7	34.3	22.5

*Source: IPEA (2005, 2006), based on IBGE (Pintec 2000), and PIA/IBGE, Secex/MDIC, CBE and CEB/Bacen, MPOG, and Rais/MTE.*

5. Brazilian firms with FDI are present in almost all industrial sectors, such as textile, cellulose, metallurgics, and steel.

A-type firms consider internal sources, information from other companies of the same group, and clients and consumers as highly important for their corporate strategies. In comparison, B- and C-type firms rely heavily on machine suppliers and competitors, which is consistent with cost-reduction-driven strategies or imitation processes.

Particularly relevant to the improvement of firms' competitiveness is their capacity to promote structural and organizational change. There is no simple causal relationship between such change and technological innovation: technological innovation simultaneously stimulates and is stimulated by change. Nonetheless, based on information from the companies themselves, A-type firms have experienced more profound organizational and managerial changes than B- and C-type firms (see Table 5).

**Table 5 – Innovation and Competitive Processes**

Competitive Strategy	Product		Market		
	Quality Programs	Product Offering #	Stable Market Share	Increasing Market Share	Success in New Markets
A Firms	61.2	46.8	55.8	47.5	34.9
B Firms	57.1	28.7	50.6	39.9	23.7
C Firms	55.6	24.0	47.7	34.6	21.0
Competitive Strategy	Process				
	Increasing Productive Capacity	Reducing Environmental Impact	Reducing Labor Costs	Reducing Raw Materials	Energy Reduction
A Firms	34.1	28.8	23.7	10.6	8.8
B Firms	42.5	27.4	24.2	9.2	9.0
C Firms	43.6	22.2	22.3	7.2	8.3

*Source: IPEA (2005, 2006), based on IBGE (Pintec 2000), and PIA/IBGE, Secex/MDIC, CBE and CEB/Bacen, MPOG, and Rais/MTE.*

#### 4. BRAZIL, ARGENTINA AND MEXICO

In all of the Latin American countries, standard-product-oriented firms have the largest share of exports, employment, and sales. However, in the shadow of the commodity boom, Brazil's adaptable private sector is responding to a competitive global marketplace through innovation and technology.

**Table 6 – Brazil, Argentina, and Mexico: Firm Profiles According to Competitive Strategies<sup>6</sup>**

Competitive Strategy	Total # of Firms	% of Total Firms	% of Total Employees	% of Country's Total Sales	% of Country's Exports (average)
<b>Brazil</b>					
A Firms	721	4.58%	17.64%	25.19%	33.16%
B Firms	6,066	38.55%	52.35%	64.19%	66.83%
C Firms	8,949	56.87%	30.00%	9.80%	--
Total	15,737	100%	100% (3,776,499)	100%	100%
<b>Argentina</b>					
A Firms	242	6.06%	9.48%	12.71%	12.75%
B Firms	2,064	56.34%	64.67%	80.11%	87.25%
C Firms	1,357	37.04%	25.85%	7.61%	--
Total	3,663	100%	100% (639,984)	100%	100%
<b>Mexico</b>					
A Firms	263	3.23%	5.29%	5.30%	3.48%
B Firms	4,179	51.29%	62.75%	82.70%	96.52%
C Firms	3,705	45.48%	31.96%	11.99%	--
Total	8,147	100%	100% (1,918,942)	100%	100%

*Source: De Negri, 2006.<sup>7</sup>*

In terms of innovation and R&D efforts, Brazilian A-type firms compare favorably with their counterpart domestic companies in Argentina and even Mexico, where domestic B-type firms are producing more standardized products for sale on the U.S. market. Innovative A-type firms in Brazil have a larger share of employment, sales, and manufacturing than in Mexico and Argentina.

Mexican B-type firms, which are standard-product-oriented, are stronger than those in Brazil and Argentina and are more productive than Mexican firms that invest in innovation as a competitive strategy.

6. The data for Tables 6 and 7 was drawn from three different databases and had to be adapted to avoid inconsistencies between them. For this reason, the data sample for Brazil was drawn from a smaller group than the Brazil-only studies cited previously. Because of the smaller sample size, some of the findings are different.

7. The Mexican survey did not interview maquila firms.

In all three countries, R&D investment remains very low (Table 7).

**Table 7 – Brazil, Argentina, and Mexico: R&D Efforts**

Competitive Strategies	R&D as a % of Total Sales	R&D Employees (Average #)	% of Total Staff
<b>Brazil</b>			
A Firms	1.40%	30.6	3.31%
B Firms	0.36%	3.6	1.10%
C Firms	0.36%	0.9	0.76%
Industry Total	0.61%	3.3	1.39%
<b>Argentina</b>			
A Firms	1.08%	7.9	3.29%
B Firms	0.08%	3.0	1.59%
C Firms	0.15%	1.4	1.20%
Industry Total	0.21%	2.7	1.65%
<b>Mexico</b>			
A Firms	0.81%	7.1	1.79%
B Firms	0.04%	1.1	0.41%
C Firms	0.06%	0.4	0.26%
Industry Total	0.08%	1.0	0.44%

*Source: De Negri (2006); INDEC (2003, 2005)*

For purposes of comparison with another region (taking into account that the information available has serious methodological differences), the R&D/industrial sales indicator is 2.7 percent in Germany and 2.5 percent in France (OECD 2004).

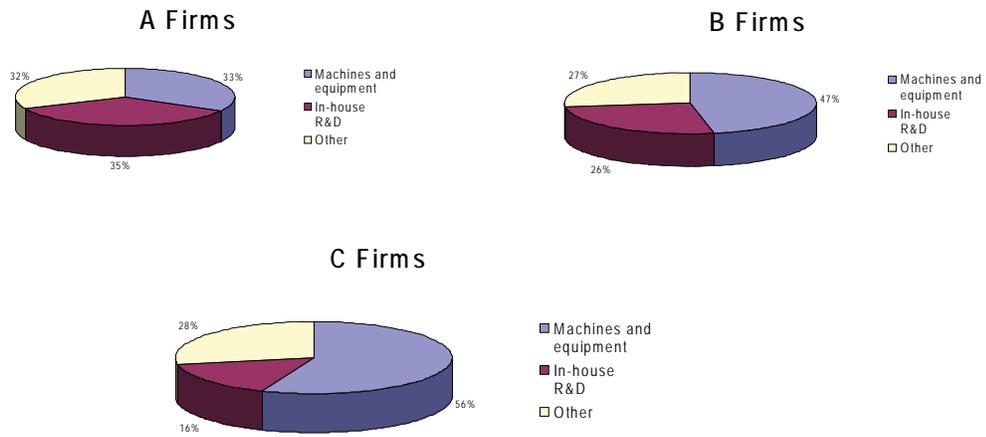
According to Table 7, there are more people employed in R&D in each type of firm in Brazil. However, because of the larger scale of the Brazilian companies, the percentage of total R&D employees as a proportion of total employees is not very different from the case of Argentina.

In Mexico, the R&D/industrial sales indicator reaches the lowest value, only 0.08 percent. As the Mexican survey did not interview maquila firms, the most logical explanation is that Mexican A-type firms' competitive strategy is not emphasizing innovation.

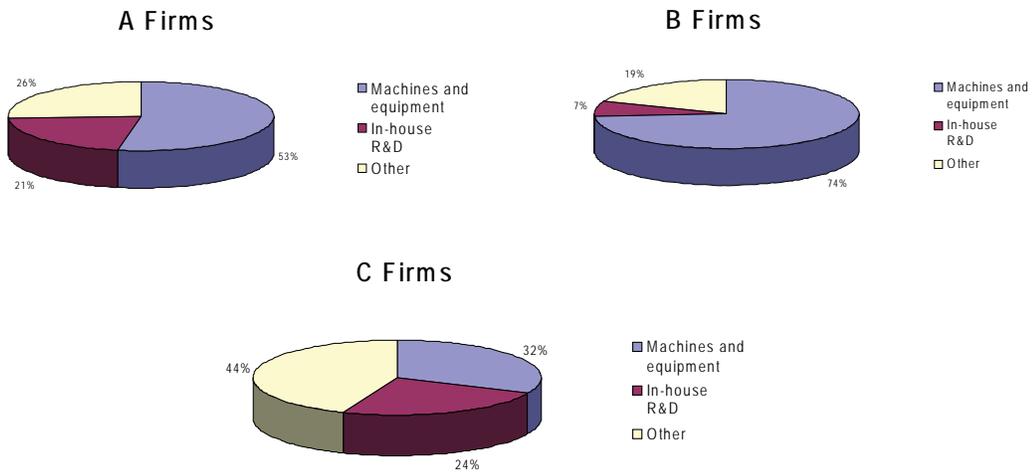
The series of charts that follow show the distribution of innovation expenditures in Brazil, Argentina, and Mexico (Charts 4, 5, and 6).<sup>8</sup>

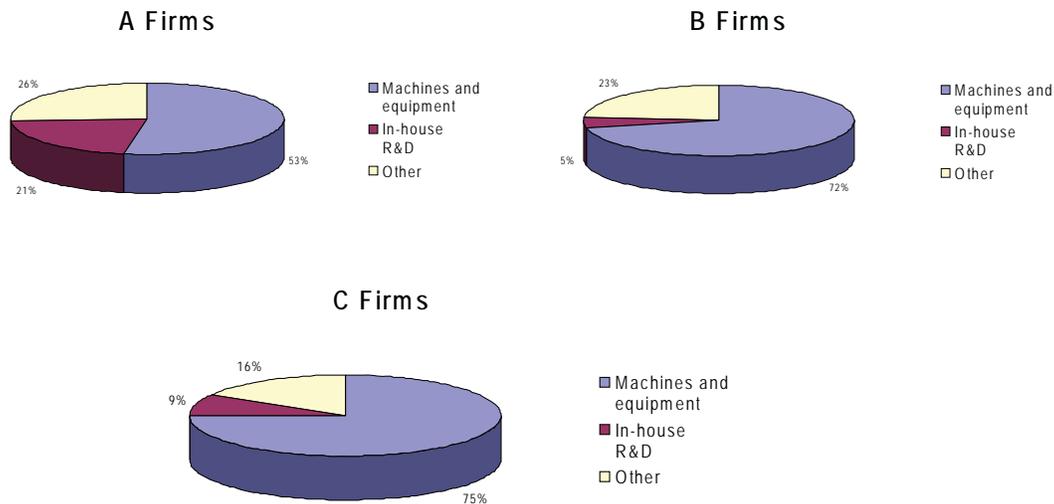
8. Based on De Negri (2006).

**Chart 4 – Brazil: Distribution of Innovation Expenditures**



**Chart 5 – Argentina: Distribution of Innovation Expenditures**



**Chart 6 – Mexico: Distribution of Innovation Expenditures**

In all three Latin American countries, innovative efforts are biased towards the acquisition of machines and other equipment. However, this pattern is much stronger in Mexico than in Argentina and Brazil, another sign of Mexico's standard-led technological and competitive strategy.

Although Brazil is recognized for its competitiveness in more standardized agricultural and industrial goods, there is a significant group of Brazilian companies (A-type firms) in which R&D expenditures represent 35 percent of the total invested in innovation processes. This quantity stands in stark contrast to the 21 percent spent by Mexico and Argentina respectively.

To summarize, the IPEA's survey uncovered several striking new realities involving Brazilian industrial firms:

1. Innovation has been confirmed as the key element which explains the successful performance in external markets by a small but significant emerging elite of Brazilian industrial companies.
2. Innovation is positively correlated to exports, productivity, quality, market share, and environmental concerns.

3. Compared to past experience, this highly competitive industrial cluster is growing faster than its counterparts and generating spillover in terms of wages and productivity, based on a new outward-oriented strategy.
4. To carry out this strategy, this group of highly innovative Brazilian companies has changed its business strategies in the last twenty years in response to international conditions and broadened its knowledge networks to capture new trends and absorb new technologies, processes, and management expertise.
5. These firms pay higher wages and hire much more educated workers than their B- and C-type counterparts.
6. These Brazilian companies also appear to compare favorably with the international competition in the key category of R&D, spending about 3 percent of sales on research activities. This amount is higher than the average spent in most of Europe and far in excess of the R&D spending of foreign multinational subsidiaries in Brazil.
7. Elite industrial firms in Brazil are not only exporting to a greater extent than ever before, but they are also becoming transnational to an extent unprecedented in Brazilian history. In fact, for the first time, direct investment abroad by Brazilian firms in 2006 was higher than inward flows.
8. This group of Brazilian industrial companies draws attention to the singularity of the Brazilian case when compared to Mexico and Argentina, countries that underwent a similar Import Substitution Industrialization (ISI) process and, until recently, had a very analogous industrial structure. While the strategy of Brazilian A-type firms has incorporated innovation efforts and a clearly outward orientation, domestic companies in Argentina and in Mexico are more standard product oriented.

## 5. SIGNS OF A NEW ENTREPRENEURIAL WAVE IN BRAZIL

Innovative firms represent 25.9 percent of Brazilian industry sales, and 39 percent of these firms have changed their strategies over the past fifteen years. All the innovative Brazilian firms have

drawn from information abroad to carry out technological innovation, and 23.1 percent of these firms have changed their internal processes and adjusted themselves to international norms and standards, becoming more technology and export oriented.

The economic relevance of these companies indicates that in reaction to the new business environment—a result of the end of National Developmentalism and the opening of the economy—part of the Brazilian industrial elite developed new strategies based on innovation to make up for lost time and opportunities. In the past, the Brazilian state had served as a kind of substitute for the lack of business entrepreneurship.<sup>9</sup> After privatization, structural changes began to be made in Brazil, and these changes impacted very subtle economic mechanisms. This newly competitive environment encouraged a period of structural transition for important economic segments, such as services, industry, and agriculture.

This scenario was by no means unique. From the 1970s to the 1980s, Brazilian industry's transition already had enjoyed an historic opportunity to correct its course by reducing protectionism, incorporating new information and communication technologies, and seeking international involvement in advanced markets. Unfortunately, a long macroeconomic crisis and consequent instability kept industry stagnant throughout the 1980s. With the additional burden of directionless government policy, Brazilian industry could not overcome these obstacles and renovate the industrialization process.

The opening of the economy and trade liberalization in the early 1990s offered a second chance to recovering industries but under conditions in which they had to confront international competitors both in domestic and foreign markets.

More than fifteen years later, while most of Brazilian industry finds itself even further behind technologically, there is an emergent small group of companies better equipped for innovative activities. Their competitiveness is based on increasing productivity and efficiency. They improve their standing through product differentiation, not by cutting costs or downsizing salaries.

---

9. Gerschenkron elaborated on this subject in his article "The modernization of Entrepreneurship," in *Entrepreneurship: The Social Science View*, R. Swedberg, ed. (New York: Oxford University Press, 2000).

In this new wave of entrepreneurship, companies are embracing innovation to foster competitiveness, seeking new alliances with domestic and foreign firms, investing overseas, and searching for new knowledge abroad. These companies buy, absorb, or generate knowledge and technology as their main tool to innovate, transform, and expand. New alliances with foreign and domestic firms contribute to improving their export performance through access to new trade chains, adapting products to specific markets, accessing cheaper financial resources, and appropriating new technology.<sup>10</sup>

The 1990s set the stage for greater economic transformation and opened up new possibilities for industry, yet all attempts to implement policies to foster competitiveness failed during the Collor Plan. The new Industrial and Foreign Trade Policy (Política Industrial e de Comércio Exterior, PICE), defined by the government in 1991, has only supported foreign trade liberalization.

Nevertheless, profound institutional changes have had an impact on Brazilian economic and social institutions—as have macroeconomic stability, privatization, regulatory agencies, and the Brazilian competition defense system—forcing companies to improve productivity in order to survive. There have been losses and trauma, but nothing like the deindustrialization foretold by some analysts.<sup>11</sup>

The significant increase in Brazilian exports after 2000 was accompanied by an increased ability of Brazilian firms to succeed in more technological markets. De Negri (2005) tested and confirmed the hypothesis that productivity gains acquired during the 1990s contributed to the increased efficiency of these firms, with clearly positive consequences for their international competitiveness.

---

10. Burt (1992) has shown how entrepreneurs' chances of success are determined by the structure of their networks.

11. Trade and financial opening combined with low inflation based on high real interest rates and overvalued currency were supposed to distort competitiveness in Brazilian industry. In this scenario, companies supported by labor- and natural resource-intensive production would be able to compete internationally, weakening higher value-added sectors and spawning regressive specialization (Coutinho 1997, Kupfer 1998).

In the international arena, various surveys and authors (c.f. Reynolds 2000, Audretsch and Thurik 2001) have demonstrated that entrepreneurship, based on the creation of new businesses and the growth of existing firms, makes innovation processes more dynamic. The special ability of entrepreneurship to promote growth is emphasized by Audretsch and Thurik, who also present further empirical evidence regarding the relationship between the level of GDP growth and the founding and expansion of businesses (2001).

Facing risk, investing, and trading in the global world are closely linked to the form in which knowledge is created, disseminated, and transformed by entrepreneurial firms into market goods. The ability to innovate is closely associated with the capacity to develop new business, expand to new markets, find niches in international trade, and control the effects of price volatility of the products traded by the country.

The new manner in which a group of Brazilian industrial companies are becoming transnational is stimulating a virtuous circle of innovation, investment, and growth of firms. This course of action represents a step forward for Brazilian industry, away from the old protectionism and towards a more impressive integration into international markets.

## BIBLIOGRAPHY

- Araujo, R.D. 2005. Esforço tecnológico das firmas transnacionais e domésticas. In *Inovação, padrões tecnológicos e desempenho das firmas brasileiras*, edited by J. De Negri and M. Salerno. Brasilia: IPEA.
- Arbache, J. 2005. Inovações tecnológicas e exportações afetam o tamanho e a produtividade das firmas manufatureiras? Evidencias para o Brasil. In *Inovação, padrões tecnológicos e desempenho das firmas industriais brasileiras*, edited by J. De Negri and M. Salerno. Brasilia: IPEA.
- Arbix, G., Salerno, M., and De Negri, J. 2004. Internacionalização com foco na inovação tecnológica e seu impacto sobre as exportações das firmas brasileiras. *Dados - Revista de Ciências Sociais* (32):71-102.
- Arbix, G., Salerno, M., and De Negri, J. 2005. Internacionalização gera emprego de qualidade e melhora a competitividade das firmas brasileiras. In *Inovação, padrões tecnológicos e desempenho das firmas brasileiras*, edited by J. De Negri and M. Salerno. Brasilia: IPEA.
- Audretsch, D.B., Audretsch, D., Grimm, H., and Wessner, C.W. 2005. The Emergence of Entrepreneurship Policy. In *Local Heroes in the Global Village: Globalization and the New Entrepreneurship Policies*. New York: Springer.
- Bahia, L.D. and Arbache, J. 2005. Diferenciação salarial segundo critérios de desempenho das firmas brasileiras. In *Inovacoes, Padrões Tecnológicos e Desempenho das Firmas Industriais Brasileiras*, edited by J. De Negri and M. Salerno. Brasilia: IPEA.
- Baumol, W. 2002a. *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*. Princeton, New Jersey: Princeton University Press.
- Baumol, W.J. 2002b. Towards microeconomics of innovation: Growth engine hallmark of market economics. *Atlantic Economic Journal* 30(1):1-12.
- Burt, R.S. 1992. *Structural Holes: The Social Structure of Competition*. Cambridge: Harvard University Press.
- Cohen, W.M. and Levinthal, D.A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly* 35(1):128-152.

- Coutinho, L. 1996. O Brasil e o Viés Antiindustrializante. *Rumos do Desenvolvimento* 21:26-30.
- De Negri, F. 2005. Padrões tecnológicos e de comércio exterior das firmas brasileiras. In *Inovação, padrões tecnológicos e desempenho das firmas brasileiras*, edited by J. De Negri and M. Salerno. Brasília: IPEA.
- De Negri, J., F. De Negri and F. Freitas. 2006. Does Technological Innovation Lead to Exports in Brazil and Argentina? Brasília, mimeo.
- De Negri, J. and Freitas, F. 2006. A influência das estratégias competitivas das empresas sobre os salários. In *Tecnologia, exportação e emprego*, Vol. 1, edited by J. De Negri, F. De Negri, and D. Coelho) Brasília: IPEA.
- Gerschenkron, A. 2000. The Modernization of Entrepreneurship. In *Entrepreneurship*, Vol. 1, edited by R. Swedberg. New York: Oxford University Press.
- IPEA. 2005. Pesquisa sobre Inovações, Padrões Tecnológicos e Desempenho das Firms Industriais Brasileiras. Brasília: IPEA.
- IPEA. 2006. Tecnologia, exportação e emprego. Brasília: IPEA.
- INDEC. 2003. Segunda Encuesta Nacional de Innovación y conducta tecnológica de las empresas argentinas. 1998-2001. Serie Estudios N° 38. Buenos Aires.
- INDEC. 2005. Encuesta Nacional a Empresas sobre Innovación, Investigación y Desarrollo y Tecnologías de la Información en Comunicaciones; año 2004. Mimeo. Buenos Aires.
- Kupfer, D. 1998. Trajetórias de reestruturação da indústria brasileira após a abertura e a estabilização: temas para debate. *Boletim de Conjuntura* 18(2):30-40.
- OECD. 2005. Science, Technology and Industry: Scoreboard 2005. Paris: OECD.
- Reynolds, P.D., Westhead, P., and Wright, M. 2000. Sociology and Entrepreneurship: Concepts and Contributions. In *Advances in Entrepreneurship*. Cheltenham, U.K.: Elgar.
- Shane, S.A. and Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*. 25(1):217-226.

## TITLES IN THE CLAS WORKING PAPER SERIES

- No. 1: Vilmar Faria and Eduardo Graeff, *Progressive Governance for the 21st Century: The Brazilian Experience*, 2001.
- No. 2: Vinod K. Aggarwal and Ralph H. Espach, *Diverging Trade Strategies in Latin America: An Analytical Framework*, 2003.
- No. 3: Juan Gabriel Tokatlian, *The United States and Illegal Crops in Colombia: The Tragic Mistake of Futile Fumigation*, 2003.
- No. 4: Alcides Costa Vaz, *Trade Strategies in the Context of Economic Regionalism: The Case of Mercosur*, 2003.
- No. 5: Paulo Paiva and Ricardo Gazel, *MERCOSUR Economic Issues: Successes, Failures and Unfinished Business*, 2003.
- No. 6: Peter Smith, *Cycles of Electoral Democracy in Latin America, 1900-2000*, 2004.
- No. 7: Harley Shaiken, *Work, Development and Globalization*, 2004.
- No. 8: Gabriela Delamata, *The Organizations of Unemployed Workers in Greater Buenos Aires*, 2004.
- No. 9: Kirsten Sehnbruch, *From the Quantity to the Quality of Employment: An Application of the Capability Approach to the Chilean Labor Market*, 2004.
- No. 10: Jorge Arrate, *La evolución política de Chile (1988–2003)*, 2004.
- No. 11: Jorge Wilhelm, *Urban Planning: Innovations From Brazil*, 2004.
- No. 12: Kirsten Sehnbruch, *Privatized Unemployment Insurance*, 2004.
- No. 13: Kevin P. Gallagher, *Economic Integration and the Environment in Mexico*, 2005.
- No. 14: Kevin P. Gallagher, *FDI as a Sustainable Development Strategy: Evidence from Mexican Manufacturing*, 2005.
- No. 15: Anna Zalik, *Re-Regulating the Mexican Gulf*, 2006.
- No. 17: Jenny Martinez and Aryeh Neier, *Torture, Human Rights, and Terrorism*, 2007.
- No. 18: Thomas W. Laqueur and Francine Masiello, *Art and Violence*, 2007.
- No. 19: Wendy Muse Sinek, *Coalitional Choices and Strategic Challenges: The Landless Movement in Brazil, 1970–2005*, 2007.
- No. 20: Kevin P. Gallagher and Roberto Porzecanski, *Climbing Up the Technology Ladder? High-Technology Exports in China and Latin America*, 2008.

No. 21: James Holston, *Dangerous Spaces of Citizenship: Gang Talk, Rights Talk, and Rule of Law in Brazil*, 2008.

No. 22: Glauco Arbix, *Innovative Firms in Three Emerging Economies: A Comparison Between the Brazilian, Mexican, and Argentinean Industrial Elite*, 2008.

No. 23: Rene Davids, *Mythical Terrain and the Building of Mexico's UNAM*, 2008.

#### TITLES IN THE CLAS POLICY PAPER SERIES

No. 1: Mary E. Kelly and Alberto Székely, *Modernizing the International Boundary and Water Commission*, 2004.

No. 2: Gilbert Cedillo, *A Social, Public Safety, and Security Argument for Licensing Undocumented Drivers*, 2004.

No. 3: Mariclaire Acosta, *The Women of Ciudad Juárez*, 2005.

No. 4: David Shields, *Pemex: Problems and Policy Options*, 2006.

No. 5: Micah Lang, et al., *Meeting the Need for Safe Drinking Water in Rural Mexico through Point-of-Use Treatment*

No. 6: David R. Ayón, *Long Road to the *Voto Postal*: Mexican Policy and People of Mexican Origin in the U.S.*

No. 7: Philip Martin, *Global and U.S. Immigration: Patterns, Issues, and Outlook*, 2008.

No. 8: David Shields, *Mexico's Deteriorating Oil Outlook: Implications and Energy Options for the Future*, 2008.

#### ORDERING INFORMATION

To order papers from the CLAS Working Papers or Policy Papers series, send a check or money order for US \$5.00 made out to the UC Regents along with the title and/or serial number to:

Working Papers Series  
Center for Latin American Studies  
2334 Bowditch Street  
Berkeley, CA 94720

[WWW.CLAS.BERKELEY.EDU](http://WWW.CLAS.BERKELEY.EDU)