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The Brazilian economic growth rate increased remarkably in 2007. Data from the quarterly national accounts (System of National Accounts/Brazilian Institute of Geography and Statistics–SCN/IBGE) demonstrate that the growth rate in the GDP accumulated in the last three quarters has been accelerating since the third quarter of 2006, reaching 5.4% at the end of 2007, a level well above that attained in the previous year (3.8%).

Among the key features of this growth, the relevance of industry stands out in the first place. The industrial growth rate reached 4.9%, and that of the manufacturing industry reached 5.1% in 2007, slightly below the agriculture and livestock growth rate (5.3%) and above the growth in services (4.7%).

Physical production data from the Monthly Industrial Survey-Physical Production (Pesquisa Industrial Mensal-Produção Física–PIM-PF/IBGE) confirm this vigorous industrial growth (Table 1). In relation to the same quarter of the previous year, the growth observed in the last quarter of 2007 reached 7.9% in the general industry, 5.9% in the mining industry, and 8.1% in the manufacturing industry. Considering the growth accumulated over the year, the rates are of 6% for the general and manufacturing industries, and of 5.8% for the mining industry.

Table 1 – Industrial Production Growth Rate (1Q/2006 to 4Q/2007)

(In %)

Activities	1Q/2006	2Q/2006	3Q/2006	4Q/2006	1Q/2007	2Q/2007	3Q/2007	4Q/2007
Quarterly growth rate in relation to the same quarter of the previous year								
General Industry	**4.6**	**0.9**	**2.8**	**3.2**	**3.8**	**5.8**	**6.3**	**7.9**
Mining Industry	13.2	4.1	5.7	7.1	5.6	5.8	6.0	5.9
Manufacturing Industry	4.1	0.7	2.6	3.0	3.7	5.8	6.4	8.1
Growth rate accumulated over the last four quarters								
General Industry	**4.6**	**2.6**	**2.7**	**2.8**	**3.8**	**4.8**	**5.4**	**6.0**
Mining Industry	13.2	8.4	7.4	**7.4**	5.6	5.7	5.8	**5.8**
Manufacturing Industry	4.1	2.3	2.4	**2.6**	3.7	4.8	5.3	**6.0**

Source: Monthly Industrial Survey-Physical Production – IBGE.

Another key feature is the active role of domestic demand. This can be observed in the more accelerated growth of family consumption (6.5%), imports (20.7%), and gross fixed capital formation (13.4%) in 2007 (Table 2). As opposed to the brief cycle of growth in 2004, government consumption and especially foreign demand carry a much less significant weight in the current cycle. Considering imports quantum indexes in 2007, it can be observed that the growth rate was of only 5.5% for total exports and of 3.2% for exports of manufactured products (as compared to 19.1% and 25.9%, respectively, in 2004) (Foundation Center for Foreign Trade Studies-FUNCEX).

Table 2 – Components of Demand
(rate accumulated over the last four quarters – 4Q/2004 and 4Q/2007)

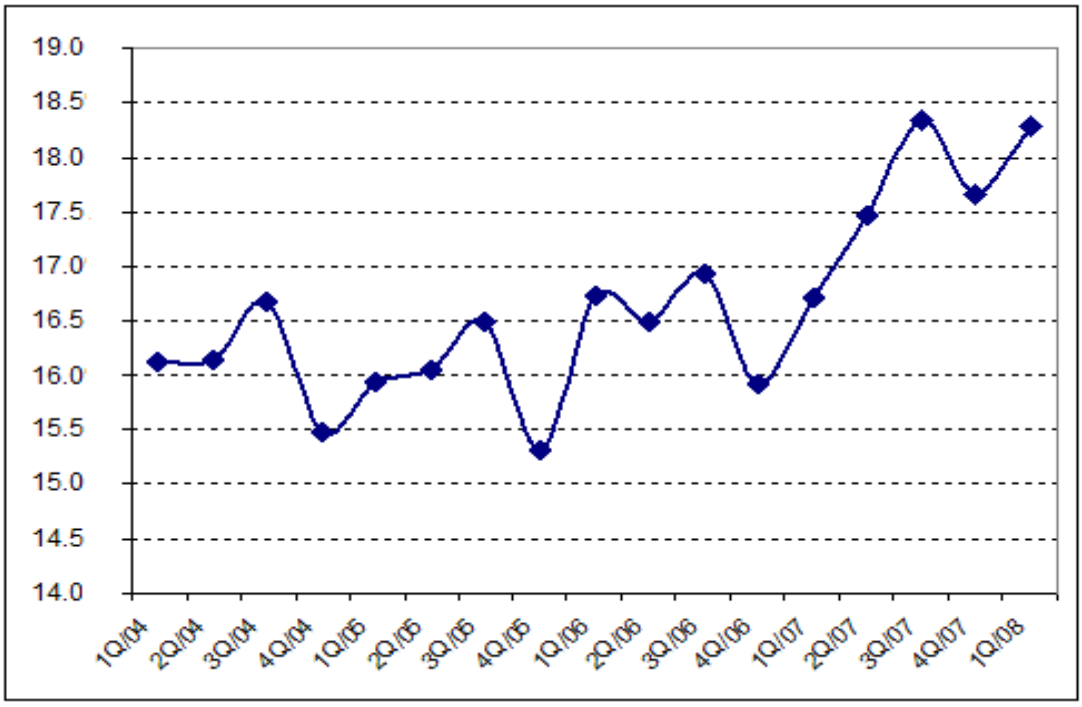
(In %)

Components of Demand	4Q/2004	4Q/2007
GDP at market prices	5.7	5.4
Household final consumption expenditure	3.8	6.5
Government final consumption expenditure	4.1	3.1
Gross fixed capital formation	9.1	13.4
Exports of goods and services	15.3	6.6
Imports of goods and services (-)	13.3	20.7

Source: SCN/IBGE.

The importance of gross fixed capital formation and especially its acceleration constitute the third aspect that deserves attention. Data related to the investment rate show an oscillation of about 16% until the end of 2005 (Chart 1). This rate reached a slightly higher level in 2006 and continued increasing in 2007. Even considering a seasonal decline in the last quarter of 2007, the rate attained (17.7%) was much higher than that obtained in the same period of the previous year (15.9%).

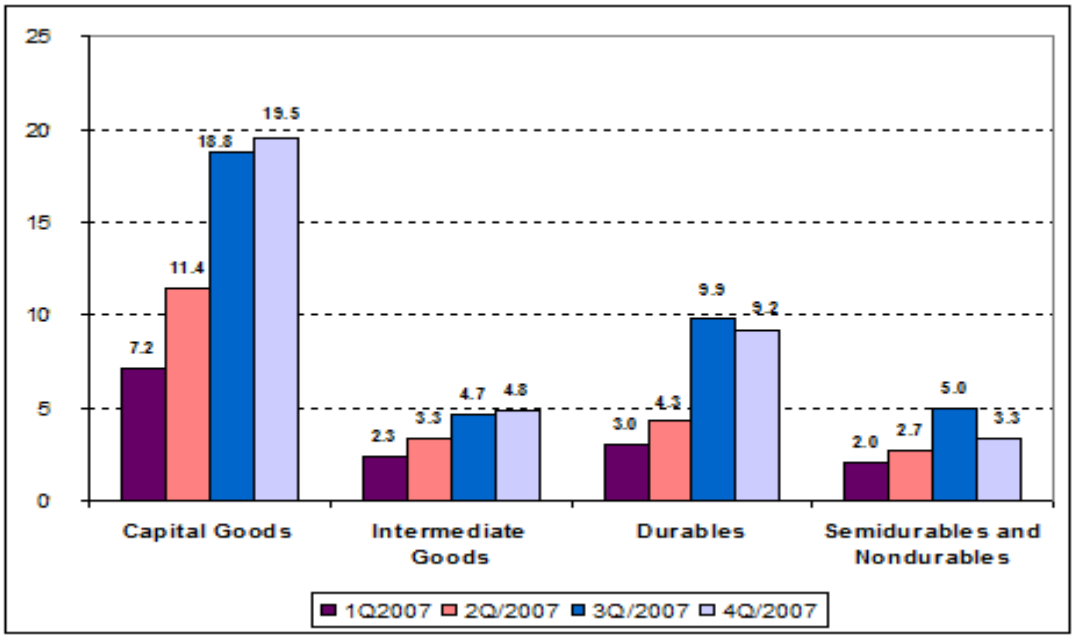
Chart 1 –Investment Rate Evolution (1Q/2004 to 4Q/2007) (In %)



Source: SCN/IBGE.

From the point of view of the industry's physical production, this pattern of growth fuelled by domestic demand, especially by investment, translated into the accelerated growth of the capital goods sector. Its growth rate over the last four quarters raised steadily last year, reaching 19.5% in the last quarter (Chart 2). The production of consumer durables, in spite of a slight decrease in rhythm in the last quarter of the year, also increased considerably, accumulating 9.2% in 2007. Intermediate goods and consumer durables and semidurables also closed the year with growth, although at a lower level (4.8% and 3.3%, respectively), which reveals the generalized industrial growth last year.

Chart 2 –Industrial Production Evolution by Use Category
(rate accumulated in the last four quarters – 1Q/2007 to 4Q/2007) (In %)



Source: Monthly Industrial Survey –Physical Production – IBGE.

This last aspect is precisely the fourth key feature of the recent industrial growth. On analyzing data by sector, it is possible to observe that of the 27 sectors covered by the PIM-PF, 21 have grown. Considering all products covered by PIM-PF, the evolution of the diffusion index[1] shows that, in 2007, the number of products under growth was systematically higher than that observed in 2006 (the index average was 56% in 2006, and 59% in 2007).

From a sectoral point of view, the capital goods sector takes the lead once again, followed by consumer durables, since the five sectors that show the highest growth rates are: machinery and equipment (17.7%); motor vehicles (15.2%); computer and office equipment (14.4%); electrical machinery, equipment and supplies (14%), and other transportation equipment (13.9%). From the perspective of the composition of rate, that is, from the contribution of each sector to growth, the five main sectors are: motor vehicles (21%); machinery and equipment (17.4%); electrical machinery, equipment and supplies (6.4%); other chemicals (6.2%); and basic metallurgy (5.9%). Consequently, the sectors with the highest growth rates last year also carry a significant weight in the composition of this growth.

It is also worth emphasizing that some sectors with a poor performance at the end of 2006 and in the beginning of 2007 started to show a more accelerated growth during 2007. This is the case of the textile, apparel, and rubber and plastics sectors. On the other hand, in some activities, production suffered a visible reduction in 2007, such as in tobacco (-8.1%), wood (-3.2%), footwear (-2.2%), and telecommunications equipment (-1.1%). The latter sector, in spite of having closed 2007 with negative

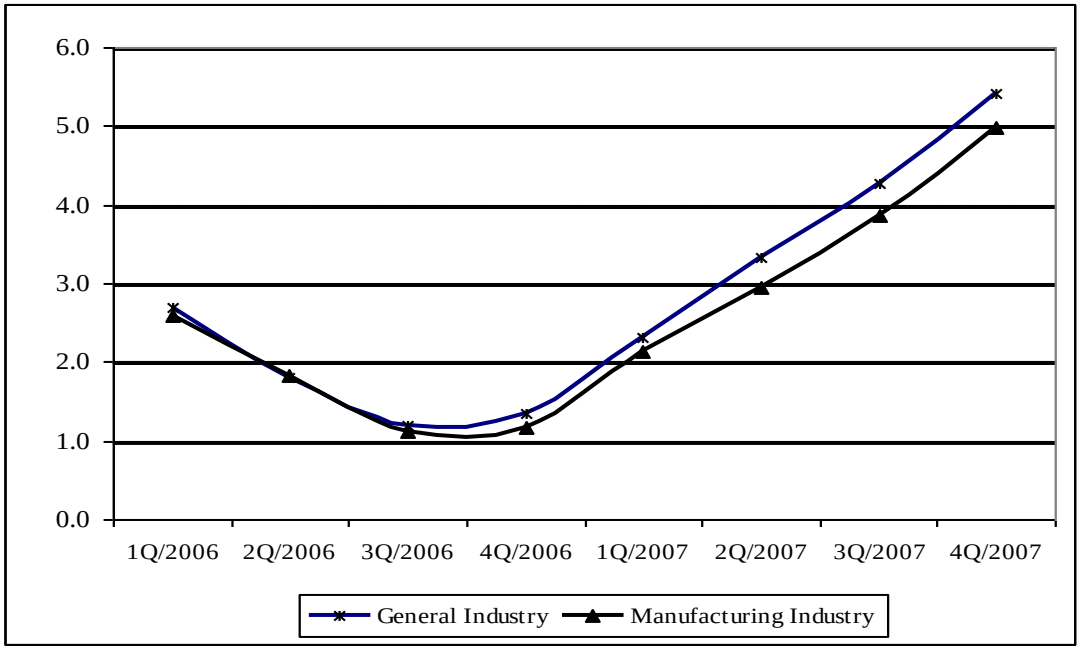
[1] The diffusion index in the PIM-PF shows the percentage of products that followed the general trend in the industry. Therefore, during growth periods, it shows the total of products that have grown in relation to the same period of the previous year.

growth, changed this result in the third quarter and, in the last quarter of 2007, reached a growth of 10% in relation to the same period of the previous year.

The positive performance of production is accelerating employment rates in industry. According to data from the Monthly Survey of Industrial Employment and Wages (Pesquisa Industrial Mensal de Emprego e Salário-PIMES/IBGE), salaried employees in industry increased 2.2% in 2007, contrasting with the stagnation observed in the previous year.

PIMES data also confirm an increase of 5.4% in the real value of industry payroll in 2007, exceeding the growth accumulated in the previous year (1.3%) (Chart 3). It is worth stressing a reverse in the downward trend in 2006 and the steady growth of the mass of real income in industry in 2007. Some sectors led the growth last year: oil refining (12.7%); chemicals (12%); metal products (excluding machinery and equipment) (10%); transportation equipment manufacturing (8.6%); and basic metallurgy (8%).

Chart 3 – Growth Rate of the Real Value of Industry Payroll
(rate accumulated over the last four quarters – 1Q/2006 to 4Q/2007) (In %)



Source: PIMES/IBGE.

According to the General Registry of Employed and Unemployed Individuals (Cadastro Geral de Empregados e Desempregados-CAGED/MTE-Ministry of Labor and Employment)[2], the industry generated approximately 392,000 job vacancies last year (378,000 in the manufacturing industry and 14,000 in the mining industry) (Table 3). It represented an increase of 54.8% in the creation of formal employment in the general industry and of 60.2% in the manufacturing industry in relation to 2006,

[2] As opposed to PIMES/IBGE – which provides sample coverage, including companies with five employees or more –, CAGED/MTE shows results from all companies that hired/dismissed formally employed individuals in the period under study, therefore providing census coverage. In sectors in which small and medium companies prevail, it is possible to find divergent trends in these two sources of data.

whereas the mining industry suffered a reduction in the number of job vacancies created (-17.6%).

Table 3 - Formal Employment Evolution in Industry (2006 and 2007)

	Hired (thousand)		Dismissed (thousand)		Job Vacancies Created (thousand)		
	2006	2007	2006	2007	2006	2007	Var (%)
General Industry	**2,665**	**3,083**	**2,412**	**2,691**	**253**	**392**	**54.9**
Mining Industry	54	55	37	41	17	14	(17.6)
Manufacturing Industry	2,611	3,028	2,375	2,650	236	378	60.2

Source: CAGED/MTE.

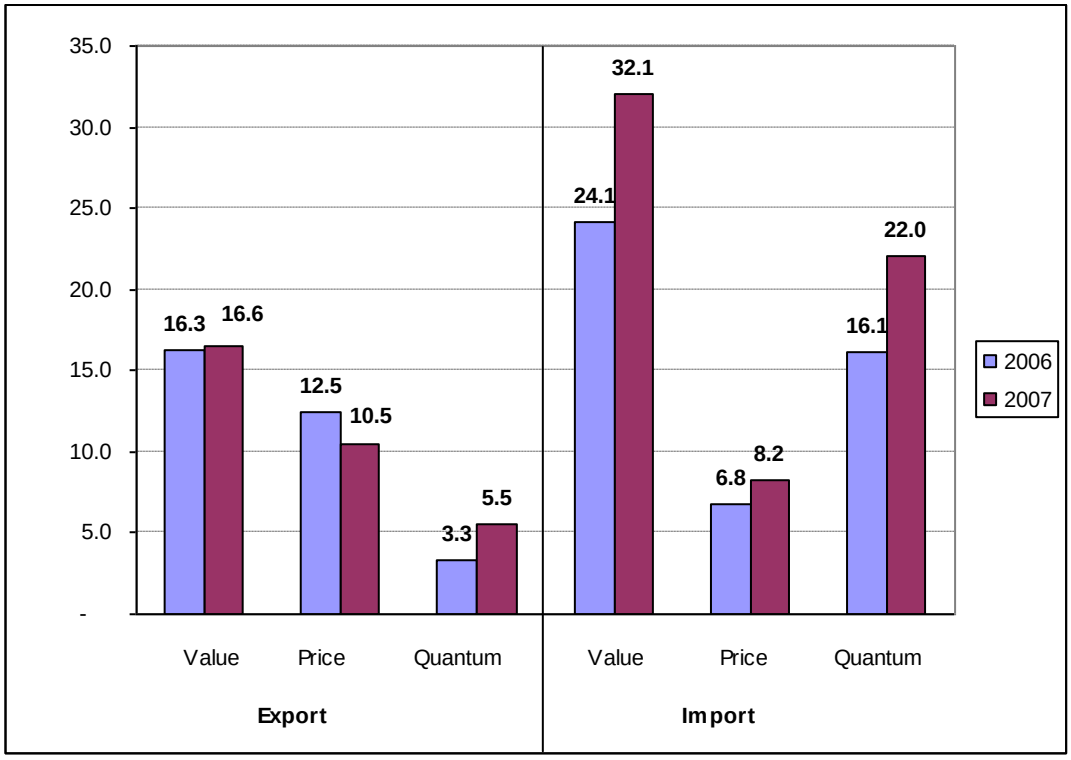
The sectors with the largest shares in the creation of new job vacancies in industry last year were: food (14%), in spite of having suffered a reduction in its share of total vacancies created in relation to the previous year; machinery and equipment, and motor vehicles (11% each); metal products (10%); whereas the apparel sector maintained almost the same share in the last two years (about 9%). It must be remembered that machinery and equipment and vehicles also led the growth of industrial production, representing a large share in its composition, which seems to have affected their positive performance in the formal employment creation in the same period. According to the Annual Social Information Report (Relatório Anual de Informações Sociais-RAIS/MTE), these sectors are also relevant regarding their share in the employment stock, exceeded only by food and apparel, traditionally large employers.

The only industrial sectors that contributed negatively to the creation of job vacancies last year, following a physical production decline, were: tobacco (-4,279 vacancies) and wood (-2,353 vacancies), intensifying the employment contraction already observed in these sectors in the previous year. The footwear sector, in spite of having reduced its production, was able to expand the creation of job vacancies; however, they represented only 2% of the positive balance in 2007.

Concerning foreign trade, the trend remained the same as in 2006: more accelerated growth of imports than of exports, causing commercial balance to drop from US$ 46.4 billions in 2006 to US$ 40 billions in 2007. This result can be explained, as mentioned above, by the rapid growth of domestic demand and production, associated with the exchange rate appreciation.

In relation to 2006, exports value increased 16.6%, of which 10.5% correspond to increase in price and 5.5% in quantum. It is worth emphasizing that this raise in exports was considerably affected by the evolution of basic products, which increased 28.1% in value, 14.5% in price, and 11.8% in quantum. The increase in the exports value of manufactured products was of 11.9%, of which 8.4% in price and only 3.2% in quantum (Chart 4). The increase in the amount of exported manufactured products was well below that observed in the total physical production index of industry, which confirms domestic demand as the main determinant of industry expansion.

Chart 4 – Growth Rate of Exports and Imports – value, price and quantum (2006 and 2007) (In %)



Source: SECEX/MDIC (Department of Foreign Trade/Ministry of Development, Industry and Foreign Trade) and FUNCEX.

Regarding imports, the growth reached 32.1%, of which 8.2% in price and 22% in quantum. Analyzing imports by use category, it can be observed that the sectors with more rapid growth were the same where the domestic production increased more rapidly. Concerning consumer durables, growth in value was of 51.1%, derived almost exclusively from an increase in quantum, given that the increase in price was of only 0.4%. However, it must be remembered that, with regard to weight in the import pattern, consumer durables represented only 4.1% of the total imported in 2007. On their turn, capital goods imports (14% of total imported) increased 35.9%, resulting from a growth of 2.9% in price and of 32.1% in quantum. The evolution of the quantum indexes of intermediate goods (58.4% of total), consumer nondurables (6.6% of total), and fuel (16.9% of total) was of 19.6%, 14.1% and 19.9%, respectively.

From the sectoral perspective, the association of exchange appreciation and heated domestic market resulted not only in an increase in imports, but also in a reduction in the quantum exported by some sectors.

Analyzed together, the production index and the exported and imported quantum index demonstrate that in some sectors, especially consumer nondurables such as textiles, apparel and footwear, this increase in imports has been affecting the domestic production, which grows below the average for the industry (as in textiles and apparel) or declines (as in footwear). At the same time, exporting companies in these sectors have been facing difficulties to increase their volume of exports, redirecting part of the previously exported production to the domestic market. In the case of

footwear, for instance, the imported quantum increased 26.7%, whereas physical production declined 2.2% and exported quantum, 5.9%.

In other sectors, besides redirection to the domestic market, the imported quantum increase also mirrors an increase in the imports of parts and components, as in computer products and electronic and telecommunications supplies. The reduction in exported quantum in these two sectors was of 19.5% and 21.8%, respectively, whereas imports quantum increased 10.9% and 48%.

Therefore, in general, it can be observed that 2007 was an extremely positive year for the industry, not only because of high growth rates, but also because this growth was led by the capital goods sector and by positive impact on employment and income generation. Expectations for 2008 are that this pattern will remain, since the priority projects of the Growth Acceleration Program (Programa de Aceleração do Crescimento-PAC) must step up investment in infrastructure, contributing to a continuous increase in the investment rate and in the growth of the capital goods sector. Moreover, the path to income and credit expansion also creates positive expectations about the consumer goods sector.

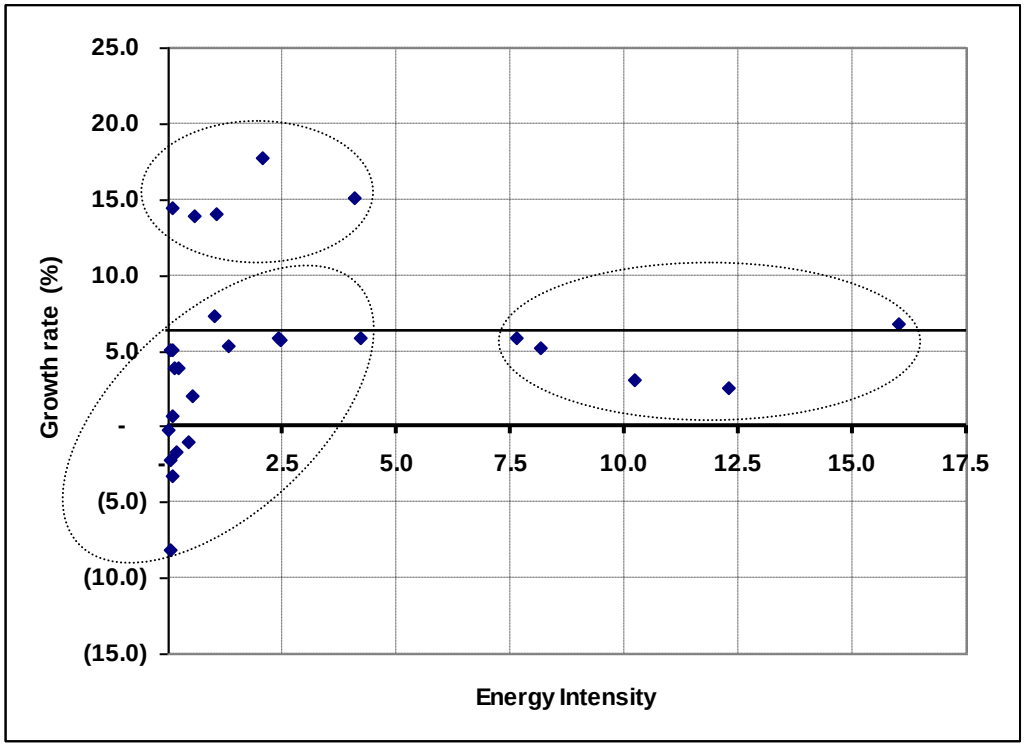
However, attention must be given to some factors that can hinder the continuity of this growth. First, the international scenario is still undefined, as well as the extent of the deceleration in the United States and its effects on other countries. On the one hand, a deeper and lengthier crisis can make the exports expansion even more difficult, which, however, would have a relatively reduced impact, since foreign demand has lost importance as a growth factor. On the other hand, the extent of this crisis can hamper the continuity of credit expansion and the resumption of the interest rate reduction, as well as lead to fiercer competition in the domestic market of imported products. These factors could have negative impacts on domestic demand, the engine of recent growth. The behavior of imports, for that matter, is a second source of concern, since the data analyzed already show that imports are growing at a strong rhythm, raising some difficulties in some sectors and increasing imported content in others.

Finally, the last aspect that deserves attention concerns the consequences of the continuity of growth on the country's energy matrix. The factors that affect energy supply will certainly play a fundamental role, but it is also interesting to observe the behavior of demand. A more detailed analysis of industrial sectors regarding energy intensity allows for advancing in the assessment of the pressure exerted by different industrial sectors – especially the more dynamic in growth – on the country's energy matrix. This becomes relevant in a context in which industry answers for about 38% of the total consumption of energy in the country (National Energy Balance of the Ministry of Mines and Energy-Balanço Energético Nacional do Ministério de Minas e Energia, 2007).

The 27 sectors covered by PIM-PF can be divided into three different groups, formed by crossing the accumulated growth rate in a given year by sector (vertical axis) with an energy intensity indicator associated to each one of them (horizontal axis). Energy intensity measure was based on the expenditure with energy and fuel for each 100 units of value in the manufacturing industry[3] (Chart 5).

[3] To calculate the energy intensity indicator, we have used the ratio between the value of electricity and fuel consumption and the value of industrial transformation multiplied by 100. The values used were the average values for 2004 and 2005, obtained from the Annual Industrial Survey of IBGE.

Chart 5 – Distribution of industrial sectors by industrial production growth rate and energy intensity
(2007)



Source: NEIT/IE/UNICAMP, based on data from PIM-PF and PIA/IBGE..

The first group, composed of the most energy intensive sectors (basic metallurgy, food, oil refining, non-metallic minerals, and mining), represents about 60% of the total industrial consumption of electricity and fuel. In general, these sectors showed growth rates below the average and answered for 21.9% of the industrial growth in 2007. The second group, composed of the sectors that showed the highest growth rates (machinery and equipment, motor vehicles, electrical supplies, computer equipment, and other transportation equipment), can be characterized mostly by lower energy intensity. Only the motor vehicles sector has a little higher energy intensity. This group, which as a whole has a small share in the total industrial consumption of energy (about 9%), answered for a little more than the average of the industrial growth last year. Finally, the third group, composed of the other 17 sectors, in general showed growth rates below the average and, at the same time, relatively low energy intensity, jointly answering for about 30% of the total industrial consumption of energy. These sectors answered for 25.8% of the total industrial growth in 2007. Therefore, it can be observed that, thus far, the growth pattern in the industry seems not to put a significant pressure on energy demand.

The Manufactured Plastics Industry: characterization, recent performance and competitive challenges

Main features and world trends

The industry of manufactured plastic products is called the third generation of the petrochemical chain, comprising companies that transform resins (polymers) into different plastic products.

The products obtained in the manufacturing of plastic resins are destined for different uses and markets, either for intermediate consumption, supplying the production process of other sectors (for instance, auto parts, computers, electroelectronics and household electrical appliances, pharmaceuticals), or for final consumption (such as packaging and containers, toys, household articles, decorative objects, and personal effects). The main features of plastics, such as lightness, strength, and especially versatility, offer many possibilities to make different manufactured products. In addition, when compared to other materials, plastics offer benefits related to acquisition and production costs, use, and flexibility. These advantages make of plastics the substitute products for a growing number of materials.

The structure of the world industry of manufactured plastics is largely heterogeneous, since a high number of small and medium companies coexist with a reduced number of large companies, which in general supply specific markets. More recently, the plastic manufacturing industry has gone thorough a process of concentration in the hands of large groups, as a result of worldwide mergers and acquisitions, following a trend in the industry of plastic resins (supplier of its main raw-material), which is dominated by a group of vertically integrated transnational petrochemical companies.

It must be emphasized that, despite this recent increase in the presence of large companies, the sector remains relatively atomized, especially when compared to raw material suppliers and to some buying industries. This contributes to the existence of a significant pressure on the sector, mainly on smaller companies, which suffer a constant threat of reduction in profitability.

Another trend that has been acquiring more and more importance is the concern with the environmental impacts of production and the use of plastic materials. On the one hand, it reflects on a greater concern with recycling, make it an important link in the plastics chain. The fact that plastics take an extremely long time to degrade has been fostering investments in new recycling technologies, as well as in actions to make people aware of adequate plastics consumption and discard. On the other hand, it has led to important technological changes, such as the development of bioplastics (biodegradable plastics obtained from renewable sources as corn starch or sugar cane starch), or plastics that integrate elements to accelerate their degrading process. Depending on whether the biodegradable resins prove viable on commercial scale, the diversification of origin of polymers will be able to add to the diversity of final products and the variety of processes to transform resins into plastic products.

Recent data on the distribution of world plastics production by regions/countries show a strong contribution from Asia. The world production of plastics (resins and manufactured products) reached an estimate level of 245 million tons in 2006 (Souza and Gorayeb, 2008 – original source: Plastics Europe). Asia alone answered for about 40% of this total (China, 14.5%; Japan, 6%), followed by the whole of European countries (25%), North America (23%), and Latin America (4%) (Brazil, 3%). An

increasing participation of China can be observed in the production not only of resins and manufactured plastics, but also, recently, in the supply of moulds.

The world consumption of plastics *per capita* is still at a reduced level: 30 kg in 2005 (Plastics Europe). North America, Western Europe, and Japan are the largest markets for resins and manufactured plastics. In some of these countries, the consumption of plastics *per capita* reached much higher levels (about 100 kg in the US and Western Europe, and 90 kg in Japan, in 2005). Certainly, there is an enormous potential for growth in the world consumption of plastics, favored by the development of new uses for this material and by its substitution for other materials. The highest potential for growth can be found in the Asian regions that are developing fast, where the consumption *per capita* is low (20 kg in 2005). Brazil can also be included in the group of countries with potential to increase consumption, which is still at a low level: 24.4 kg *per capita* in 2006 (Brazilian Plastic Industry Association-ABIPLAST).

Concerning the foreign trade of plastic products, there is a trend of concentrating exports and imports on a small group of countries. World exports of manufactured plastics reached about US$ 153 billions in 2005, with a significant growth of 68% in the period 2001-2005 (Comtrade). Considering the total of world exports of plastic products in the last year available (2005), it can be observed that the main exporting countries were Germany (14.9%), United States (10.8%), and China (8.9%). The highlight of exports growth was China (144.6%) in the period 2001-2005, whose share in world exports raised from 6.2% in 2001 (ranking fourth) to 8.9% in 2005 (ranking third). In 2005, the main importing countries were the United States, Germany, and France, highlighting imports growth in France (258.3%) and in China (137.7%) (Comtrade).

Characterization and analysis of the recent performance of the Brazilian industry of manufactured plastics

The structure of the Brazilian industry of manufactured plastics is heterogeneous, reproducing a feature of the international industry. Heterogeneity can be seen in capital origin and ownership, in size, in the main technological, productive and administrative features, and in the market power of companies. The presence and leadership of few large – national and transnational – companies that channel their production both to final consumption and to intermediate consumption by companies in different production chains (for instance, footwear, auto parts, plastics plumbing fixtures, and packaging) occur together with the existence of a large mass of small and medium companies that compose a significant part of the industrial structure, concentrated in some Brazilian regions. The State of São Paulo centralizes the largest number of companies and job posts in the sector of manufactured plastics (nearly 50% - Souza and Gorayeb, 2008).

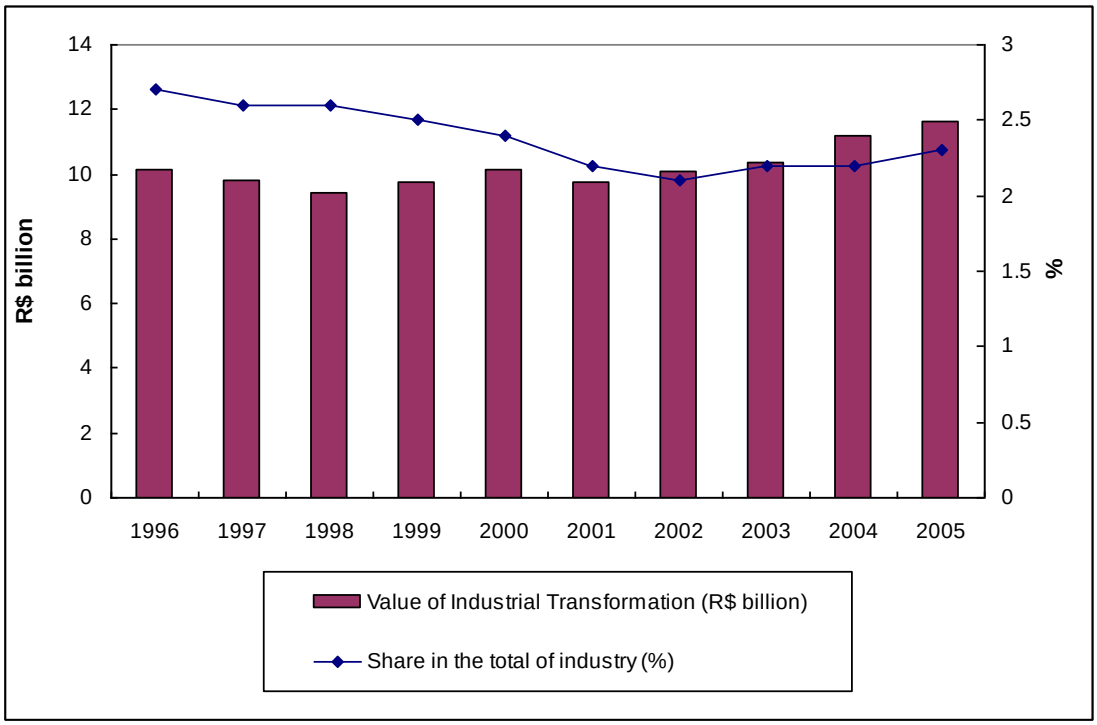
Even considering the obstacles to the existence of smaller companies in the Brazilian industry of manufactured plastics, they certainly did not discourage the establishment of new productive units in the period 2000-2005. Data from the Annual Social Information Report (RAIS/MTE) point to an increase of 26.3% in the total of establishments in this period, from 7,003 units in 2000 to 8,844 in 2005, which reflects small barriers to enter most segments of this industry. The predominance of small companies can be easily observed: companies with up to nine employees represented 50.6% of the total of establishments in 2005. On the other hand, the twelve largest companies of the sector of manufactured plastics concentrated 7.9% of

the employed people in 2005 (Central Register of Companies-Cadastro Central de Empresas-CCE/IBGE). Concentration is greater in the resins supplying sector, where the twelve largest companies answer for 45.2% of the people employed in the same year, which explains the low bargain power of the manufactured plastics sector regarding its main supplier of raw material.

The Brazilian industry of manufactured plastics sold R$ 40 billions in 2006 (ABIPLAST). In real terms, there was a small increase of 1.8% in sales in the first half of the current decade (Souza and Gorayeb, 2008). This performance somewhat reflects the very own characteristic of this sector as a supplier in several segments, either for final consumption or to be used as input in other production chains. The low dynamism of the whole structure of Brazilian industry until 2005 has certainly contributed to the modest performance of the manufactured plastics sector. From the point of view of final demand, the low growth of income has not been able to promote the consumption *per capita* of plastics in the last years either. It increased 0.6% per year in the period 2000-2006 (ABIPLAST). In 2006, the Brazilian consumption *per capita* reached 24.4 kg, lower than the world average, and about a quarter of that observed in the United States.

The poor performance of the sector can also be observed in the Value of Industrial Transformation (Valor da Transformação Industrial-VTI), published in the Annual Industrial Survey (PIA/IBGE). The average growth rate of VTI was of only 1.5% per year in the period 1996-2005, clearly lower than the total in the industry (3.5% per year) (Chart 1). Thus, there was a decline in the share of the added value of manufactured plastics in the total of added value in the industry. Between 1996 and 2002, this decline was continuous, lowering from 2.7% to 2.1% in 2002. In the following years, there was a slight increase that reached 2.3% in 2005.

Chart 1 – Sector of Manufactured Plastics: evolution of the value of industrial transformation and its share in the total of industry (1996-2005)

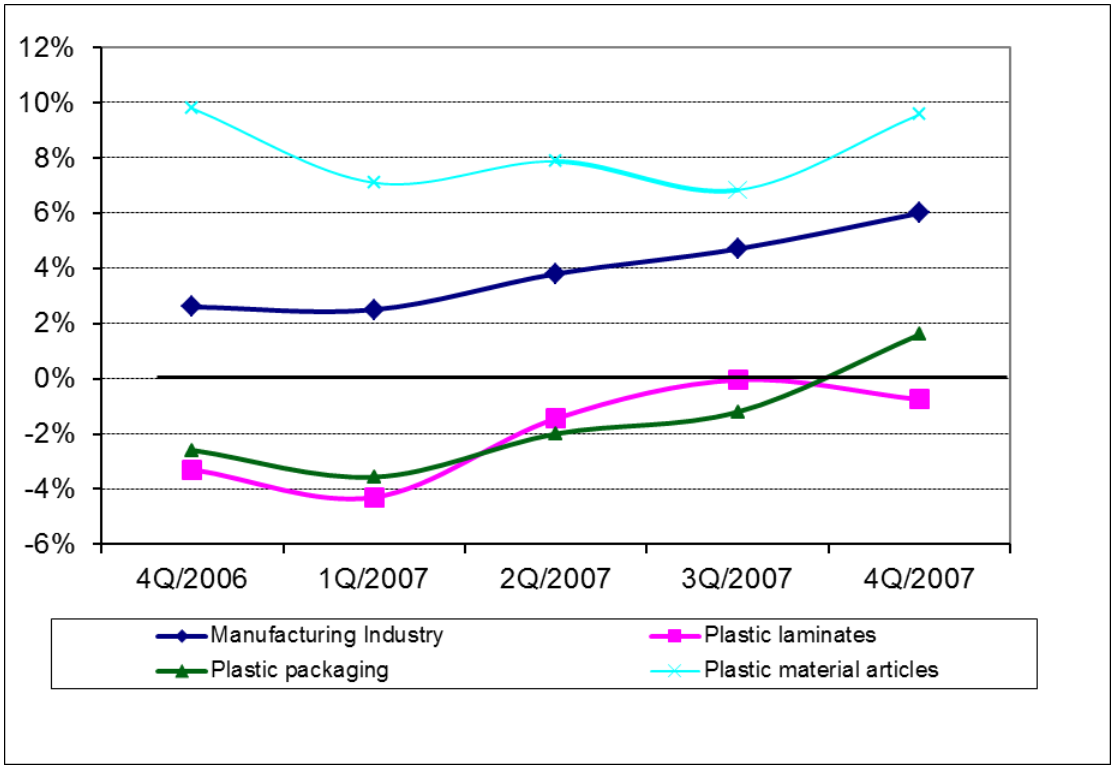


Source: NEIT/IE/UNICAMP, based on data from PIA/IBGE.

Some elements provide explanation for the poor performance of the sector in the period analyzed. The cost of industrial operations had an average increase (6.9% per year) higher than that of the gross value of production (4.6% per year). It means that the cost of inputs in this sector increased more rapidly than the final value of manufactured products, leading to an insignificant increase in its added value in the same period. Certainly, price increase in oil by-products in the period contributed to raise the cost of inputs, together with a relative stagnation in the demanding sectors, which must also have made it difficult passing prices on to later stages of the process.

In the biennial 2006-2007, according to data from the Monthly Industrial Survey-Physical Production (PIM-PF/IBGE), the performance of the physical production of plastic material articles, which correspond to almost 50% of the plastic products under study, was better (9.8% in 2006 and 9.6% in 2007) than the evolution of physical production in the manufacturing industry (2.6% in 2006 and 6% in 2007) (Chart 2). On the other hand, the production of plastic laminates and packaging showed a negative result during the period considered, with a trend to reversion at the end of 2007. In the case of packaging, which corresponds to approximately 35% of the products studied, there was an increase of 1.6% in physical production in 2007, which, in spite of being lower than the manufacturing industry growth, meant a clear reversion of the previous negative behavior.

Chart 2 – Manufacturing Industry and Selected Plastic Products: physical production variation
(accumulated rate in the last four quarters)
(2006-2007) (In %)



Source: NEIT/IE/UNICAMP, based on data from PIM-PF/IBGE.

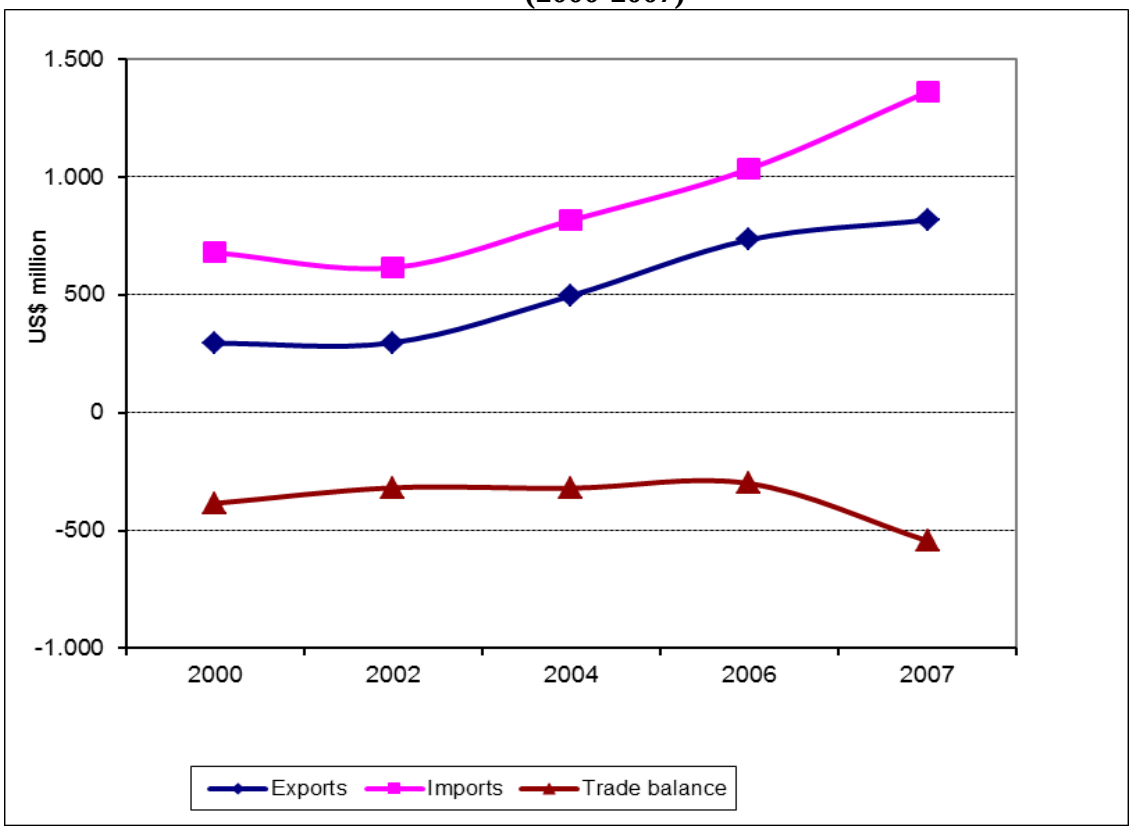
Concerning employment, the sector of manufactured plastics employed 176,500 people in 1996, raising to 248,600 in 2005 (growth of 40.6% in the total in that period - PIA/IBGE). As to the total of Brazilian industry, the increase in people employed was more timid, corresponding to 25.3% in the same period. Thus, the share of the sector of manufactured plastics in the total of industry regarding people employed increased from 3.4% in 1996 to 3.9% in 2005.

In the biennial 2006-2007, data from the General Registry of Employed and Unemployed Persons (Cadastro Geral de Empregados e Desempregados-CAGED/MTE-Ministry of Labor and Employment) show a balance between people hired and dismissed in the sector of manufactured plastics of, respectively, 13,856 and 19,063, revealing a recent increase of 38% in employment creation in the sector. It is also important to observe that the smaller companies are the ones that answer for the highest net hiring in the last two years. Companies with up to nine employees represented 52% of job vacancies creation in 2006, and 44% in 2007.

Therefore, the most recent data point to reheated production in the sector, which reflects significantly on the creation of job vacancies.

Regarding trade flows[4], the sector of manufactured plastics has shown repeated trade deficits (Chart 3). Between 2000 and 2007, there was an increase in the Brazilian trade deficit for plastic products, even though the average annual growth in exports (29.1%) was higher than in imports (19%) in the period analyzed. It happened because imports have been maintained at relatively higher levels. In 2007, the country exported US$ 818 millions, whereas imports added up to US$ 1.362 million, producing a deficit of US$ 544 millions.

Chart 3 –Evolution of Manufactured Plastics Foreign Trade (2000-2007)



Source: NEIT/IE/UNICAMP, based on data from SECEX.

The negative performance of the manufactured plastics foreign trade should be seen as relative, in view of the reduced share of exports and imports in the apparent consumption of plastic articles: respectively, 7.1% and 7.7% of the Brazilian apparent consumption in 2006 (ABIPLAST). It occurs basically as a result of high costs of transportation of manufactured plastic products and of the need to be close to clients. It is worth mentioning that some plastic products are difficult to sell abroad. Medium and large tubes and bottles, for instance, tend to have low commercial value because of their low density (small content taking up large spaces inside containers). Moreover, the plastic products that are part of other products (accessories, parts and packaging) frequently are not imported, because suppliers need to be physically close to their clients (good examples are manufacturing companies that place their productive processes in the client's facilities).

[4] Considering only the plastic products in non-primary form listed in chapter 39 of NCM [Mercosur Common Nomenclature] (3915 to 3926). Therefore, these data do not take into account exports and imports of resins.

In 2007, the main destinations of the Brazilian exports of manufactured plastics were Argentina (23.2%), United States (14.3%), and Chile (8.3%) (SECEX). In the period 2000-2007, these countries remained as the main destinations of exports of manufactured plastics, despite a decline in their joint share from 60.9% in 2000 to 45.5% in 2006, associated to a significant growth in exports to other destinations. Manufactured plastics imports are also concentrated in some countries of origin. In 2007, 78.3% of plastics imports came from only ten countries, mainly from European countries (especially Germany, Italy, and France) and Asian countries (China and Japan). It is important to stress the growth of imports from China, from where came US$ 10.5 millions in plastic products in 2000, and US$ 121.7 millions in 2007, whereas Brazilian exports of plastics to China were of only US$ 8.5 millions in 2007.

In sum, it can be stated that the manufactured plastics sector showed a poor performance in the first half of this decade. On the one hand, it reflected the performance of the economy as a whole, considering that, to a large extent, this sector depends on the evolution both of other sectors's intermediate demand and of final demand. On the other hand, it originated in some competitive weaknesses of the sector. Its recent performance, however, shows some positive signs concerning growth in physical production and employment creation. The prospect of stronger growth in the economy and the still reduced degree of consumption of plastics *per capita* in the country offer the possibility of a favorable performance of the manufactured plastics sector in the future, including even an increase in its share in the total of Brazilian industry regarding different variables. Therefore, this sector faces the great challenge of exploring this possibility by means of finding ways to improve its competitiveness.

Competitive challenges for the Brazilian industry of manufactured plastics

The effective seizure of opportunities opened up by the prospect of a more rapid and sustained growth of the economy depends on surmounting some important obstacles and bottlenecks on the part of the manufactured plastics sector. Among the critical factors for improving competitiveness in the manufactured plastics industry, some can be stressed: (1) capacity for product innovation and differentiation, related to new projects and products, and especially new design; (2) qualification in process management; (3) access to financing and capacity for making investments and updating technology, mainly in machinery and moulds to manufacture plastics; and (4) ability to connect to the other links of the production chain: suppliers of resins, machinery and moulds, as well as distributors and clients.

As to the first aspect, it is important to remember that, in the plastics production chain, innovations tend to concentrate on the initial links, such as the producers of resins, machinery and moulds, while responsibility for design lies primarily with manufacturing companies. Therefore, projects and design of plastic products represent an important area for manufacturers who wish to develop and maintain competitive advantages based on the capacity for product differentiation, which prevents manufacturing companies to compete fiercely only in price, as it is usual. The development of new products and the design, fundamental when the plastics sector seeks differentiation, demand professionals with adequate and specialized technical education or, at least, with a solid basic education, so that lately companies can train them. Public policies are vitally important to support companies in these aspects, especially small businesses, which do not have scale to accommodate such activities. It is worth remembering that there are important clusters of producers, which makes

this sector promising for support policies from the local productive arrangements (arranjos produtivos locais-APL).

With regard to resins, it should be emphasized the research and development in bioplastics and other degradable resins as a way to overcome one of the problems faced by industry: the long degrading time of plastics, which cause harmful effects to the environment. The increasing price of oil and naphtha, largely employed in thermoplastic resins, and the concern with environmental conservation associated with new knowledge in the field of resins can lead to the multiplication of investments in search for new materials, focusing, in the case under study, on the sustainability of plastic products. Likewise, incentive to recycling programs is important to reduce negative environmental impacts.

The capacity for product differentiation is an important aspect of competitiveness in the sector analyzed, but improved skills in productive processes management are also essential, since this is related to productivity increase, cost and price reduction, and improved quality of final products, with relevant impacts on the other links of this chain. Also important in this case are support policies from institutions dedicated to workforce education and qualification in management and organizational practices.

The third critical factor in competitiveness concerns access to capital, capacity for investment and technological innovation, mainly of machinery and moulds used in the manufacturing process. The difficulties of access to financing and its high cost still remain as important restrictions to improve competitiveness in the sector in this country, especially for small companies, making it unfeasible to modernize technology in the park of machines and moulds, which constantly experience incremental innovations.

In spite of certain equivalence in technology and quality between the machinery and moulds used by national manufacturers and those used by manufacturers in the large markets of developed countries, there is still much to be done, especially regarding moulds. The question of moulds is a true bottleneck in the search for competitiveness in this sector, either due to their weight in the total cost of manufactured plastics (cost of mould and its maintenance in proper conditions) or to the difficulty to find suppliers able to develop moulds of the required quality.

Finally, the fourth competitive challenge for the plastics sector is its capacity to negotiate and establish connections between the sector’s companies and with other links of the production chain. Improvement of organization and connection among the many companies of this sector can ease the dissemination of more competitive practices both in terms of product and process. At the same time, it is a necessary condition to restructure the relationship with other links of the chain to increase the negotiation power of the sector and to establish relationships to develop the competitive capacity of the whole chain, favoring improvement in products and possibilities of differentiation, based on new grades of resins, for instance. The search for increased added value along all links of the chain is one of the ways to resolve a permanent conflict and contribute to heighten its competitive level.

An analysis of the presence of critical competitiveness factors in the Brazilian industry of manufactured plastics allows for confirming the existence of a series of more general restrictions to improve this competitiveness, especially those related to difficulties to develop the capacity for product innovation and differentiation; to access financing and to modernize the industrial park; and, finally, difficulties to

connect with suppliers – leading to high-priced resins and moulds, not always of adequate quality – and with clients – who pressure for competitive quality, deadlines and prices. The prospect of a more robust growth in the economy in the next years opens up the opportunity for the sector to overcome its weaknesses and reinforce its competitive capacities. To this end, public policies to support the productive sector in the aspects examined above will be fundamentally important.

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