

MACRO/MICRO INTERACTIONS: ECONOMIC AND INSTITUTIONAL UNCERTAINTIES AND STRUCTURAL CHANGE IN THE BRAZILIAN INDUSTRY

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1. Introduction

The objective of this paper is to associate structural changes in industry to a long period of persistent economic and institutional uncertainties in Brazil. The analysis of adaptation strategies, capabilities and performance of firms is taken up in search for common features of those capable of developing adequate response to uncertainty. The evolution of indicators related to sector of origin, size and ownership of firms, among others, are taken into account in order to stylise emerging trends in morphological and structural features of industry. This retrospective analysis, covering the period 1982-97, will provide the basis for an exploratory assessment on how the future evolution of the Brazilian economy may be influenced by observed changes in its microeconomic structure.²

This is an exploratory and empirical analysis on the implications of macro to micro interactions for industrial development, drawing from different sets of data, from traditional economic indicators to literature review and interviews with firms. It is hoped that this exercise may contribute to the further understanding of the behaviour of economic agents under economic and institutional related uncertainty. The works of Katz (1996), among others, who search for links between economic and institutional changes and the recent transformation of Latin American industrial structures inspired this analysis.

The paper is organised as follows. Section 2 develops the main concepts and arguments used in the article. Section 3 describes, briefly, the nature and extent of changing economic and institutional conditions in Brazil, according to a periodisation defined in terms of main economic and political events. This periodisation anchors the analysis of macro to micro interactions, the subject of the next sections. In the final section main conclusions are summarised and prospective and policy implications are drawn.

1. Macro/micro interactions

Macro to micro interactions are widely recognised as one of the most relevant and complex economic phenomena. They are relevant because economic and institutional changes define, to a great extent, the degrees of freedom allowed for private decision-making on investment, production and distribution. They are complex due to the multiplicity of interaction channels and directions of causal relationships. Relevance and complexity place enormous theoretical and analytical difficulties for an adequate comprehension of how firms react to external uncertainties, especially if high intensity and persistence of changes are involved. If an incipient level of understanding prevails on the macro/micro direction, the field is even more arid on the opposite direction: how a microeconomic structure and its functioning may influence macroeconomic aggregates.

Nature, direction and duration of economic and institutional changes define levels of uncertainty and

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² Earlier versions of this paper were presented at the 1997 Brazilian Economic Studies Association Annual Meeting and at the University of Oxford Centre for Brazilian Studies, Oxford, in July 1998; Jorge Katz provided constructive criticism on central aspects of our arguments. Bernardo Kosacoff, Jorge Garay and other researchers involved in a Latin American comparative study sponsored by the Colombian Departamento de Planeación were active discussants of the issues at stake. At IE-UFRJ, Lia Haguener, our long standing partner, sharpened our arguments and guided us through the maze of Brazilian industrial statistics.

confidence prevailing among economic agents. In this paper two types of uncertainties were considered: a macro uncertainty pertaining to the domain of the general evolution of an economy and its governing rules, and a micro uncertainty linked to the regime of incentives and regulation governing sectoral competition. Correspondingly, macro confidence is associated with how foreseeable investment decisions are, in terms of time horizon; micro confidence is associated with how foreseeable the number and types of competitors operating in specific markets are. A direct but incomplete indicator of macro confidence would be the level of inflation; likewise, the openness of a trade regime influences micro confidence.

Conventional wisdom establishes that firms react homogeneously and predictably to economic and institutional changes. Undoubtedly, the nature and direction of the evolution of macroeconomic aggregates or policy directives define generic constraints for private businesses. But, as Nelson (1996) has convincingly argued, firms do differ. It is argued in this paper that morphological and structural features like size, ownership and sector of origin do influence response capabilities. At the same time these features are changed as adaptive strategies by firms are pursued. More important, from a temporal perspective, successful strategies have to be adequate to the prevailing type of economic and institutional uncertainty and they are cumulatively carried out as learning processes consolidate and further periods of change unfold.

The departing assumption is that firms are not passive and they actively search ways to adapt to economic and institutional changes, with more or less success, depending on their capacity to respond. To a large extent success is associated, at the level of the firms, with existing entrepreneurial capabilities and prevailing market power in specific industrial structures, when processes of external change start to unfold. Strategies, capabilities and performance in sales, finance, production and investment, among others business functions, have to be adapted to new economic and institutional conditions. Future expectations on the state of the economy are also important as well as firms or sets of firms' political leverage and random factors, which can be better summarised as "being in the right place at the right time".

But firms are also bound to morphological features and these may influence their capacity to respond to external challenges.³ As strategies are implemented, some firms grow while others perish. The accumulated result may imply long lasting modifications in the relative distribution of size, sector and ownership patterns of an industrial structure. Once uncertainties abate and a new economic and institutional regime emerges, the resulting industrial morphology, in its turn, may or may not be conducive to a production base strong enough to sustain and foster that same regime.

Under macro and micro uncertainties and constrained by structural features, it is argued, firms try to implement flexible strategies, either to change positions quickly or to be able to choose future directions among the widest possible range of possible alternatives of behaviour⁴. That is, ideally firms should try to keep positions that enabled the quickest possible reversion of decision-making processes. These microeconomic flexibilities are thus associated with firms' adaptive strategies that, once implemented will build the capacity of firms to perform under uncertainty.

The concept of 'flexibility' is usually associated with preference for liquidity as opposed to the allocation of resources in 'locked-in' irreversible fixed capital assets Hicks (1974). Fanelli & Frenkel (1996) recently suggested that, under persistent macroeconomic instability, firms in Argentina

³ Corporate strategies and behaviour are not completely guided by the external environment. The logic of competition in each sector exerts strong influences on firms. This separation was not undertaken in this paper; for those readers interested in the subject should refer to Katz (1996:111-124)

⁴In industrial, technology and labour studies, flexibility is a concept extensively used to denote the capacity of firms to quickly introduce and take advantage of the latest innovation. Thus, flexibility is a positive attribute. More recently the concept of flexibility has been also used in association to labour and other market regulations, implying more degrees of freedom of contracts. The advantages and disadvantages of these types of flexibilities is, still, a much debated issue. The meaning of flexibility in this article is strongly associated with changes in decision-making. Its positive or negative implications can only be appreciated a posteriori.

developed financial flexibilities, implying, on one hand, an “economic premia” and, on the other, a negative propensity to invest in fixed capital. Through the investment channel, this type of macro/micro/macro interaction would represent, definitely, a development constraint.

However, such polarisation may enclose an oversimplification of a much richer economic phenomenon. From an analytical perspective it is possible to argue that firms may develop flexibilities in many other dimensions, a point also suggested by Vercelli (1991). In the analytical part of this paper those business functions mentioned above -sales, finance, production, investment- will be examined. Sales flexibility could give firms the advantage of balancing the direction of the output, depending on the level of demand prevailing in external versus internal markets. As widely known, finance flexibility is related to liquidity and debt levels. Production flexibility is associated with how a firm manages its variable costs, shifting positions according to relative prices of inputs and labour. Finally, investment flexibility is related to how a firm disposes of its capital stock. Optimisation of capital stock can take the form of investment in localised modernisation of existing facilities, in new production capacity, in acquiring businesses, etc. Meanings and implications of these microeconomic flexibilities constitute the primary conceptual concern of this paper.

The Brazilian case is particularly relevant for an exploratory analysis along these lines because of the volatile economic and institutional environment prevailing between 1982 and 1997. The period examined in this paper departs from an established inward regime, covers up most of a long transition period and ends up when deregulation and economic liberalisation is in full swing.⁵

The nature of interactions between macroeconomic signals and firm behaviour and their implications is presently at the centre of the debate on the resumption of industrial development. Some authors argue that Brazilian firms will eventually resume investment and growth, under and because of a macroeconomic context of stable prices and exchange rate, within a trade regime open to foreign competition Franco (1996). Others, more cautious, emphasise how a wide dispersion of firms’ reactions to similar macroeconomic signals may pose problems for the recovery of investment levels and the consequent diffusion of technical progress Castro (1996). This paper tries to contribute to this debate, stressing that any simplistic posture overshadows both, negative and positive outcomes of structural changes, relegating to a secondary plan the possibility of pre-emptive and pro-active actions towards strengthening the productive base of the country.

2. Economic and institutional changes and confidence levels

In the period 1980-94 nine major stabilisation plans, 15 different wage indexation policies, 19 changes in the rules governing changes of the exchange rate, 22 different proposals to deal with the external debt and 20 proposals for the fiscal adjustment of the State were promoted by different governments (Miranda 1996). Nevertheless, until the 1994 “Plano Real”, the Brazilian economy co-lived with an inflationary process persistently threatened by hyperinflationary pressures. The profusion of policy directives indicate clearly the high economic and institutional instability reigning in the country, placing private decision-makers under permanent uncertainty. Instability implied generalised losses: per capita income froze at around US\$ 3,000 and in 1995 the ratio of investment to GDP was almost 8 percentage points below the 1980 level (Table 1).

⁵ In this paper deregulation and economic liberalisation imply higher degrees of freedom in the allocation of resources for the private sector.

Table 1
Brazil: evolution of economic aggregates (1993 prices)

Year	GDP (US\$ billions)	Growth Rate (%)	GDP per capita (US\$)	Investment/GDP (%)
1980	375	9.2	3,157	22.8
1985	394	7.9	3,019	16.3
1990	433	-4.4	3,017	15.8
1991	438	1.2	2,993	15.1
1992	435	-0.7	2,912	14.5
1993	456	4.8	2,999	15.0
1994	482	5.8	3,512	15.0
1995	502	4.2	3,609	15.4

Source: GDP and GDP per capita: Banco Central do Brasil, annual reports. Investment: IPEA -a government research institute- according to methodology defined by IBGE -the country's statistical office-.

Changing internal and external conditions, associated with policy directives are summarised in Table 2.⁶ For the purposes of this paper the 1982-97 history of the country can be described along three sub-periods and against three different sets of economic and institutional determinants - international context, internal context and policy directives:

- 1982-1989, when **price instability with protectionism** prevailed; macro uncertainties were high while micro confidence levels remained unchanged; it was triggered by the debt crisis;
- 1990-1993, when **instability and trade liberalisation** prevailed, defining high levels of macro and micro uncertainties; it started by the time of the inauguration of the Collor government, although some steps towards trade liberalisation were initially taken in 1998 and,
- 1994-1997, **when price stability with economic liberalisation** prevailed; micro related uncertainties were dominant; long lived macro uncertainties remained although in the price domain confidence levels built up; the Plano Real is the turning factor.

Table 2
Economic and institutional change and confidence levels

Period	Economic and institutional change			Macro and micro confidence levels
	International context	Internal context	Policy directives	
1982-89	Mexican crisis, interruption of capital flows	Foreign exchange constraint, price instability with spells of inflation control	Generation of foreign exchange, import barriers, contractionist monetary policies, IMF agreements, Plano Cruzado	Low macro confidence, unchanged high micro confidence
1990-93	Loan conditionality, Plan Brady, increasing international liquidity	Continuing instability, recession	Plano Collor, trade liberalisation, privatisation of industry	Low macro and micro confidence
1994-97	Debt agreement, international liquidity directed to Brazil	Monetary stabilisation, stop-go growth, trade deficits	Plano Real, overvalued exchange rates, privatisation of infrastructure	Low micro confidence, increasing macro confidence

The process of economic and institutional change was inaugurated by the interruption -and even reversal- of international capital inflows to the region, after the 1982 Mexican default. Concurrently, for some authors, by this time the prevailing development strategy was running out of steam, damaged

⁶ While these are well established, self-explanatory factors, dispensing further explanations, the causal interrelationships among them is less so. External determinants are intertwined and it is not the intention of this article to determine a definite hierarchy of causal relationship for the country's microeconomic performance.

by “macroeconomic mismanagement” which placed a heavy burden on public finances, weakening the State, until then the patron of the development process (Dornbush and Edwards 1990).⁷

Along the years an important process of institutional change, from one type of policy paradigm to another was unfolding. Up to 1982, incentives and regulations focused the nationalisation of production. Until 1990 changes were intense but lacked a trajectory. Then the direction of change became clearer, with Brazil following what Edwards (1995) calls “a new Latin American consensus”. In 1994, the Plano Real tackled inflation successfully, breaking a deeply established indexed economic system. Absolute priority to macroeconomic fundamentals, associated with deregulation, trade liberalisation and privatisation; the internationalisation of the internal market coupled with a open concern with economic efficiency, and production led by the private sector, specially foreign investment, constitute the pillars of such emerging regime of incentives and regulation, yet to be consolidated.

Notwithstanding, during the period of institutional transition in Brazil, amidst a context of low dynamism, relevant transformations in the pattern of behaviour of firms and in the economic structure of industry were taking place. Table 3 provides evidence on one of the most relevant changes observed in industry: significant increases in efficiency levels.

Table 3
Evolution of industrial productivity:
1985-1996, 1990=100

Year	Productivity ¹	Annual rate of change (%) ²	Average annual rate of change per period (%) ³
1985	102,4	-	Period 85-89 0,34
1986	102,3	-0,1	
1987	102,0	-0,3	
1988	103,0	1,0	
1989	103,8	0,8	
1990	100,0	-3,7	Period 90-93 5,32
1991	110,8	10,8	
1992	114,3	3,2	
1993	127,7	11,7	
1994	140,6	10,1	Period 94-96 8,90
1995	145,4	3,4	
1996	164,9	13,4	

Sources: 1: Feijó and Carvalho (1997); 2 e 3: calculated from column 1

It is commonly believed, in Brazil, that two main reasons are behind these changes: increasing economic liberalisation and price stabilisation. In this paper an effort will be done to show that determinants and resultants are more complex. From a ‘macro’ perspective, uncertainty has never gone definitely out of the scenes. From a macro to micro’ perspective, it is suggested, high and permanent levels of uncertainty implied low levels of confidence, inducing firms to follow conservative and defensive business strategies, often along paths of least resistance to change. Firms learned to endure the hostile environment by developing capabilities to quickly change, sequentially, market, financial, cost and asset-related decisions. These flexible adaptive strategies will be the concern of the next 3 sections; each dedicated to one of the sub-periods mentioned above.

3. Foreign exchange constraints, macroeconomic instability and protectionism: market and financial flexibilities between 1982 and 1989

⁷ The issue of institutional transition is clearly an open area for research, urgently in need for appropriate analysis.

3.1 Export adjustment and market flexibility

The debt crisis and the interruption of capital inflows, common to most Latin American countries, had particular effects on the Brazilian economy, given two “heritages” from the recent past: generalised monetary indexation of economic contracts and a productive structure recently expanded.

Price indexation was associated with a crawling-peg exchange rate regime with frequent mini-devaluations. These continuous nominal devaluations of the currency facilitated the indexing of interest rates on government bonds. From there it spread to most financial contracts. However, the debt crisis demanded and forced the introduction of periodic "maxi-devaluations", on top of the crawling peg, in order to ease foreign exchange scarcity. Those maxi-devaluations accelerated even more inflation. Paradoxically, the prevailing complex system of indexed contracts led inflation rates to increase persistently but it also prevented the disorganisation of the economy as it happens under open uncontrolled hyperinflation.

A second unique feature of the Brazilian economy was its renovated production base. This was a result of a recent investment drive, under the 2nd National Development Plan -II PND-, strongly oriented towards a significant expansion of production capacity in industrial commodities sectors and infrastructure services (Castro and Pires de Souza 1985). Under the II PND industrial policies were very active: selective and attractive investment financing, channelled by the State was facilitated by extensively available foreign funds, recycled from petrodollars, while import selectiveness was used to induce the nationalisation of production.

After the debt crisis, besides the use of maxi-devaluations of the currency, other policy measures were implemented with the objective of ensuring the generation of a positive trade balance. For imports, existing non-tariff and tariffs barriers were used. For promoting exports, an active trade policy was put into use including fiscal and credit subsidies. Long term export agreements -known as Befiex-associated with tariff exemptions for capital goods imports were introduced. Import repression with export expansion was promoted with significant results, as shown in Table 4. For industrial products, while in 1985 trade balance represented 67% of the volume of resources necessary to finance the deficit in services, in 1989 it reached 91.9% (Bielshowsky and Stumpo 1996).

Table 4
Brazilian trade balance: 1980-1997, in US\$ millions

Year	Exports	Imports	Balance
1982	20.175	19.395	780
1983	21.899	15.429	6.470
1984	27.005	13.916	13.089
1985	25.639	13.153	12.486
1986	22.349	14.044	8.305
1987	26.224	15.052	11.172
1988	33.789	14.605	19.184
1989	34.383	18.263	16.120
1990	31.414	20.661	10.753
1991	31.620	21.041	10.579
1992	35.793	20.554	15.239
1993	38.555	25.256	13.299
1994	43.545	33.079	10.466
1995	46.506	49.663	-3.157
1996	47.747	53.286	-5.539
1997	52.986	61.358	-8.372

Source: SISCOMEX

In the second half of the 1980s the export drive diminished intensity. Fiscal and financial incentives were gradually cancelled as new macroeconomic objectives took primacy, especially under an increasing concern with balancing public finances, as part of the negotiation process on foreign debt.

By 1988 a tariff reform was initiated, signalling a gradual trade liberalisation which was then accelerated with the inauguration of the Collor government, in 1990. The exchange rate evolved less favourably to exporters as mini-devaluations failed to impede trends towards the valorisation of the local currency, every time inflationary surges and control attempts took place. Entering the 1990s, as it will be seen later on, the pattern of international trade integration changed: decreasing rates of export growth and expansion of imports took place, initially very slowly and, by 1995, with great speed and force.

Firms turned to exports as a form of protecting themselves against the falling internal demand and to benefit from currency devaluations. That is, they searched for **market flexibility**, a strategy to shift the direction of sales depending on the conditions of prices and quantities in the internal versus the external market. But specific types of firms were more capable than others in implementing such strategy.

Particular success was obtained by industrial activities targeted under the II PND and by firms capable of inserting themselves within the pro-export trade policy: foreign associated firms in the car industry and auto-parts, as well as segments of capital goods industries, producing standardised machinery and some traditional industries producing goods like shoes and poultry. According to Baumann (1990), Befiex's share of total manufactured exports rose from 9% in 1974 to 17% in 1979. In that year the automobile industry accounted for 87% of the Befiex program.

Table 5 shows that sectors producing processed food and industrial commodities constituted the pillars of the country's export performance. That is, Brazilian international trade position was stronger in natural resource or energy intensive activities, like pulp, concentrated orange juice, processed soy or semi-processed minerals. In these sectors competitiveness depends on access to natural resources, the existence of transport and energy infrastructure and on management of updated process technology. Nevertheless, such export specialisation, while positive for exploring consolidated national advantages, is very sensitive to the evolution of the world economy. Products have low unit value and low-income elasticity of demand and firms are not capable of influencing price evolution, usually defined in international commodity markets. As a result, the country's share in world trade gradually fell from 1.5% in mid-1980s to 0.9% in 1990 (Kupfer et al 1998).

Table 5
Trade balance in selected sectors and years (US\$ billions)

Selected sectors	1980	1985	1989	1992	1993	1994
Processed food	4.9	4.7	5.0	4.2	4.1	4.6
Other traditional goods	1.5	2.5	2.1	2.3	3.1	3.2
Industrial commodities	-2.9	2.7	5.4	4.8	4.2	4.5
Mechanical engineering and electrical-electronics	-2.2	1.2	1.1	0.5	-1.5	-5.9
Total industry	1.3	11.1	13.6	11.8	9.9	6.5

Source: Ministério da Fazenda, in Bielschowsky and Stumpo (1996)

In summary, export adjustment was an immediate response to the external debt crisis and later to the continuation of macroeconomic instability, which forestalled local demand. Such market flexibility allowed firms to enjoy the advantages of double market affiliation, enabling them to shift sales to internal or external markets, depending on demand prospects. When foreign exchange scarcity decreased, the expansion of Brazilian exports lost intensity, while imports gained force. In industrial commodities this is due to the low-income elasticity nature of production and the evolution of the world economy. In other sectors, like mechanical engineering the lack of sustainability of international competitiveness, coupled with a resurgence of local demand is revealed. For both cases though, market flexibility was of great relevance for the physical survival of industrial activities in the country and for the successive stages of the adjustment process engaged by industry.

3.2 Balance sheet adjustment and financial flexibility

To provide a cushion for the over-indebted private sector, in the early 1980s the Brazilian government facilitated a currency swap of the external debt incurred by companies. These measures increased the liability of the public sector from 78.8 % of total debt, in 1984, to 90.1% in 1990 (Ferraz, Rush and Miles 1992). Such policy reveals, firstly, a high degree of political leverage enjoyed by the private sector in Brazil and, secondly, a defensive move towards low debt levels by firms facing uncertainty. But these type of measures, coupled with the vicious circle of exchange rate shocks and inflation acceleration had destructive effects upon public finances.

In the macroeconomic context, progressively the only means of financing an increasing deficit still available was the emission of fully indexed public bonds, with very short maturity and guaranteed full liquidity. In practice these bonds became the country's indexed currency. Capital flight and open hyperinflationary explosion were avoided but at a high cost for the State, not only financially, but also in terms of governments' ability to implement and control macroeconomic policies.

Given the peculiar Brazilian process of currency substitution from fiat money to short-term indexed bonds it became increasingly difficult to distinguish and separate monetary from fiscal policies as the public deficit, financed by fully liquid indexed bonds, generated virtually as much liquidity as if it was financed by printing currency. The need to guarantee liquidity for government bonds in practice implied an endogenous and virtually uncontrolled currency supply. The only tool still available for avoiding open hyperinflation was the management of internal interest rates.

However, the exclusive reliance on interest rates implied two consequences. First, it reinforced the financial component of the public deficit, paradoxically increasing the supply of indexed currency. Second, it led to the acceleration of inflation. That is, as the maturity of most contracts fell drastically, the increase in the very short term interest rates on government bonds pushed upwards the minimum opportunity cost for capital, leading to increases in mark-ups and, hence, to the supply prices for most sectors of the economy.

The stage was set for a continuously reproduced ascendant spiral in most prices: increases in interest rates to avoid hyperinflation at one point in time led to the worsening of the inflation process in subsequent periods. This process was temporarily interrupted by a series of inflation control plans, based on the stabilisation of nominal exchange rates and wages, which included, in some of them, price controls.⁸

Financial flexibility became the favoured strategy for economic agents. Table 6 shows the resulting financial behaviour of the 1,000 largest industrial firms along the 1980s. In the immediate aftermath of the Mexican crisis a pronounced cut in debt exposure and an increase in liquidity levels were pursued. Average debt to equity ratios fell from 55.6% in 1980 to 41.4% in 1983, reaching a minimum of 34.1% in 1988. Liquidity increased from a 1.2 index in 1982 to 1.6 in 1985. Following such strategy firms were able to maintain a positive leverage against the financial sector and, ultimately, the government while benefiting from increases in interest rates to obtain non-operational, financial profits.

⁸ The most spectacular of these was the 1986 Plano Cruzado which included a comprehensive price freeze and deindexing measures. A faster than expected recovery in activity levels, mainly due to the expansion of credit, together with foreign exchange and import constraints and an over extension of price freeze for electioneering reasons, led to increasing inflationary speculation particularly in regard to the then frozen nominal exchange rate. The latter was kept mainly by widespread postponing and over-invoicing of exports and anticipating and under-invoicing of imports. In a context of extreme fragility in the balance of payments these speculative attempts succeeded and inflation quickly returned to its accelerating path, as soon as price controls were lifted.

Table 6
Financial behaviour of the 1,000 largest industrial firms

Year	Debt to equity ratio	Current liquidity
1980	55.6	1.2
1981	54.4	1.2
1982	54.6	1.2
1983	41.4	1.4
1984	49.9	1.5
1985	37.9	1.6
1986	38.1	1.5
1987	35.4	1.6
1988	34.1	1.5
1989	34.7	1.4

Source: Ferraz, Rush and Miles (1992)

Notes: Debt to equity: the share of debt to total equity of a firm; Current liquidity: the capacity to pay back short term obligations, calculated as a ratio between current assets and current liabilities

The Brazilian experience showed that Keynesian precautionary motives could be hardly distinguished from speculative attitudes, both constituting inseparable determinants impelling economic agents' towards liquidity (Runde 1994). As economic agents increasingly accumulated knowledge to behave under uncertainty, their capacity to live with and profit from such context increased. In time this preference for liquidity became anchored in very sophisticated indexation instruments, beating government attempts to diffuse them in order to bring permanent price stability. That is, the development of an 'inflationary culture', based upon 'learning by living' past experience and built-in expectations over the future, carried important microeconomic consequences, often implying benefits for specific groups of firms.

Permanent price instability and institutional distortions created by the various and ill-fated attempts to curb down inflation affected demand negatively and shortened decision horizons: short term investments were better valued over long term ones; rapid and secure returns prevailed over slower and more uncertain ones. Productive investment plans were put aside and replaced by an inflation-hedging behaviour.

In the political-administrative structure of firms, financial management prevailed. Maximisation of cash flow and price setting with high-risk margins became standard behaviours, while production matters moved to the bottom of strategic priorities. Compliance costs with changing government regulations increased steadily. Firms, suppliers and clients spent lengthy efforts in negotiating or renegotiating terms of contracts, particularly in the aftermath of abrupt changes in regulations, brought about by economic packages. By the late 1980s, Brazilian machine tool producers used up to 26% of total manager's time for these activities; for garment producers it involved 5% of employees' total time, compared to 0.4% for Chilean producers (Shepherd and Holden 1993).

For price-makers, the increasing lack of transparency and confidence in markets facilitated the transfer of costs (including inefficiency costs!) along their commercial chain. Facing unstable relative prices, it became very difficult for price takers to establish acceptable parameters for their purchasing or selling actions. In any negotiation, economic agents capable of imposing economic terms in contracts eventually would find loopholes in government regulations, allowing readjustments in prices or wages, not only to cover past losses but, increasingly, to build up insulation against future public measures. For taxes and public prices, Shepherd and Holden (1993:11) suggest that, 'uncertainties caused by macroeconomic instability create (d) excellent conditions for opportunistic behaviour and erosion of the rule of law in the economic sphere. There is (was) substantial room for negotiating with government officials, on the size and timing of tax payments notably...There are (were) substantial incentives for tax evasion and for partial or full informality to avoid taxes or other regulations'.

Non-operational earnings and those derived from the ability to negotiate price adjustments overshadowed other potential sources of economic gains in a way that overdeveloped inflationary

culture became permissive to inefficiency. Under instability, short-term interest rates were the only available lighthouse for decision-making, becoming the minimum acceptable level for the nominal mark-ups. That became known as 'combat' margins retro-fed back into inflation, contributing to the continuation of instability.

Runde (1994:136) suggests that decision-making under uncertainty depends on, first, 'the extent of information the decision-maker may have about factors that might influence possible outcomes. Second, they may differ in terms of the scope different options permit for responding to information that may be acquired once they have been taken'. In the Brazilian context, for the first case, a group of firms was well placed to hold relevant information. Export oriented firms could partially hedge their operations as the country's need for foreign exchange implied repeated currency devaluation, at least at the level of inflation rates. Also multinationals or large local private firms and the financial sector clearly had more 'information gathering and manipulation' capabilities relative to local and/or small firms. Brazilian state owned firms provide an excellent evidence for Runde's second alternative. Even export oriented state firms -that is, better informed agents-, had a limited capacity to choose their course of actions, specially in relation to price readjustment. As they became integral part of government policies to control macroeconomic aggregates, along the years, their prices were systematically readjusted below inflation rates.

From this discussion three conclusions can be drawn. First, firms chose a financially biased behaviour, acting defensively. Second, the decade was not 'lost' for all. Sector leaders, foreign affiliates, price makers and large firms were better placed to develop the skills and means to protect themselves against inflation. Third, macroeconomic implications are also relevant. As pointed out by Fanelli and Frenkel (1994), economic agents' reactions to uncertainty -financial flexibility- reinforced existing trends: slow down in investment and growth rates, over-development of finance related activities and permanent tension in relative prices.

4. Macro and micro instability: cost adjustment and sourcing flexibility between 1990 and 1993

Along the eighties the Brazilian economy gradually drifted to a state of financial regression, due to the short maturity of most financial contracts - maturity of more than one month was usually classified as long term contracts- and the virtual non-existence of feasible interest rates to compensate the risks of borrowers and lenders over a longer time span. The credit system collapsed under steep and permanent fall in both the demand and the supply for funds at all levels. The only remaining borrower was the State and the financial system became extremely efficient in the intermediation of indexed government bonds.

The lack of credit, together with the effects of inflation on wage earners, led to a relative stagnation of consumption expenditure and residential investment. Firms invested as little as possible, slowing down equipment renovation which, together with the difficult access to imported capital-goods, implied growing industrial obsolescence. Public expenditure decreased sharply and the only dynamic component of final demand was the export sector, but it could not sustain growth given the other negative trends in aggregate demand.

1988 can be seen as the year when important changes in Brazilian international trade pattern start to unfold. Trade surplus reached US\$ 19 billions and, from that year onwards, imports started to grow at increasing rates. Two associated facts induced the growth of imports in the years to come. First, from 1988 onwards a trade reform was being implemented, involving partial removal of non-tariff barriers and reductions in the average manufacturing tariff, within a context of foreign debt renegotiations.⁹ As shown in Table 7, from 1990 onwards, trade liberalisation was accelerated, including the removal of

⁹By then loan conditionality -granting loans against formal compromises to deregulation- was widely practised by those few international agencies, IMF and World Bank- still extending loans for developing countries. (Edwards 1995)

most non-trade barriers and anticipations in the established calendar of tariff reductions. Second, in the early 1990s, international lending constraints improved and financial inflows increased drastically -attracted by rates of returns similar to other newly 'emerging' markets-, helping to finance the import bill.¹⁰

Table 7
Evolution of import tariffs (in %)

DATES	AVERAGE	MEDIAN	INTERVAL	STANDARD DEVIATION
1990	32,2	30	0 - 105	19,6
FEB/ 1991	25,3	25	0 - 85	17,4
JAN/ 1992	21,2	20	0 - 65	14,2
OCT/ 1992	16,5	20	0 - 55	10,7
JUL/ 1993	14,9	20	0 - 40	8,2
DEC/ 1994	11,2	9,8	0 - 24	5,9
DEC/ 1995	13,9	12,8	0 - 55	9,5

Source: until July 1993, Pinheiro (1996); December 1994 and 1995, Kume (1996)

The Collor government in 1990, just after inauguration, attempted a rather drastic but short lived plan to control and dismantle indexation mechanisms, which included the seizure of a large portion of private liquid assets and its compulsory transformation into a 18 month loan to the government. However financial authorities could not change rules concerning the liquidity of new public bonds and, in less than a month, they start to allow the restoration of liquidity, through a number of formal and informal channels. Soon pressures to devalue the currency to service the external debt, to increase local interest rates avoiding capital flight and to re-index economy proved irresistible. High and accelerating inflation quickly returned, accompanied by a strong recession, which, in 1990, plunged the country into a negative growth of 4.4%.

Thus, persistent macroeconomic instability, marked by deep recession and very high inflation, together with increasing trade liberalisation and micro level uncertainties, became the context within which Brazilian industry had to operate in the beginning of the 1990's.

These constraints narrowed down the degrees of freedom in decision-making, driving the search for further flexibility to the firms' internal environment. Thus, after decades of operating under the 'nationalisation at any cost' paradigm, a growing number of firms initiated efforts to 'produce at minimum cost'. Such cost reduction drive, initially impelled by macro and micro uncertainties and later on in a context of price stabilisation, was to be praised, in many quarters, as an unequivocal sign of the beginning of a new era for Brazilian industry. In reality existing evidence reveals a more complex process of change. Generalised uncertainty implied **sourcing flexibility**, a strategy to adjust productive structures to changing conditions in variable costs, and to adapt production levels to changing conditions in demand, without compromising significant and irreversible capital expenditures.

This strategy implied spectacular gains in productivity (Tables 3 and 8). Firms were able to extract higher production levels without expanding employment or the work journey. More important, growth in real wages remained below changes in productivity levels, indicating that benefits of higher efficiency were privately appropriated.

¹⁰ Later on, under the Plano Real, an overvalued local currency and a sudden increase in local final demand provoked the expansion of imports. After the 1994 Mexican crisis the government took reactive and localised measures, aiming at decreasing the growth rates of imports by placing selective import restrictions, specially for durable goods.

Table 8
Industrial evolution 1986-1994 (previous year = 100)

Year	Physical production	Employment	Work journey	Productivity	Average real wage
1986	110.9	111.0	101.9	98.1	112.5
1987	100.9	101.2	100.7	99.3	93.6
1988	96.8	96.1	100.2	100.6	100.9
1989	102.9	101.8	95.1	105.8	94.1
1990	91.1	94.6	98.5	98.0	87.2
1991	97.4	89.8	100.2	108.0	99.7
1992	96.3	91.2	99.9	106.1	111.6
1993	107.5	97.4	100.1	110.1	106.8
1994	107.5	98.0	99.5	110.4	105.7

Source: IBGE

According to Coutinho and Ferraz (1996) the efficiency drive evolved along stages of less to more technical complexity. Rationalisation started in non-essential, unskilled administrative activities, such as security and cleaning, which were sub-contracted to external suppliers. From there it evolved to the reduction of hierarchical levels and the promotion of labour polyvalence, in the sense of using labour's idle time for other productive activities. The reduction of production times constituted a step further and, when the 1990-92 recession came, concurrently with an acceleration of trade liberalisation, firms moved on to increase productivity levels by curbing down organisational and other sources of inefficiency.

Cost reductions were also facilitated by the introduction of generic innovations, like microelectronic-based industrial automation and new organisational techniques. Efforts to improve productive efficiency spread and many analysts concluded that, in the early 1990s, a generalised process was in motion, inaugurating new prospects for Brazilian industrial development (Gonzaga 1996, Amadeo and Soares 1996, Bonelli 1996).

Firm level evidence reveals, however, that by then industrial modernisation was at an infant stage. As Table 9 shows, firms of a selected panel started to update operations around the turn of the decade but a long improvement trajectory was still ahead of them. In 1992, at least 2/3 of this panel declared to use industrial automation and new organisational techniques at low levels of intensity.¹¹

Table 9
Intensity in the use of **Industrial Automation** and **Statistical Quality Control** in a selected panel
(% of respondents)

Innovation/ Industrial sectors	Intensity of use (*)								n
	1987-89				1992				
	low	medium	high	n	low	medium	high		
Total sample									
Automation	84%	13%	3%	566	74%	19%	7%	583	
Quality Control	82%	11%	8%	543	69%	18%	14%	553	
By type of industry									
Equipment producers									
Automation	70%	23%	7%	90	62%	28%	10%	90	
Quality Control	80%	15%	5%	85	67%	19%	14%	86	
Industrial commodities									
Automation	64%	27%	8%	59	51%	29%	20%	59	

¹¹ To evaluate modernisation levels is a complex task. Recently it became fashionable to rely on crude measures, such as the use of ISO 9,000. However, adequate indicators of modernisation should be also able to express the intensity in the use of different techniques.

Quality Control	81%	12%	7%	59	60%	28%	12%	58
Durable goods								
Automation	81%	19%	0%	47	58%	36%	6%	53
Quality Control	69%	20%	12%	51	27%	42%	31%	52
Traditional goods								
Automation	93%	6%	1%	324	86%	11%	4%	333
Quality Control	85%	8%	8%	306	78%	11%	11%	315

(*) Intensity of use:

Low intensity = up to 10% - medium intensity = between 11 and 50% - high intensity = above 50%

Automation = % operations controlled by microelectronics based equipment

Quality Control = % labour force working with statistical process quality control methods

Source: Fieldwork, Estudo da Competitividade da Indústria Brasileira, Coutinho and Ferraz 1994.

More important, the rhythm of introduction of these generic innovations, their determinants and consequences differed substantially across industries. The producers of industrial commodities were more advanced in the use of industrial automation, followed by producers of durable goods, equipment and traditional goods. Durable goods industries led the use of organisational techniques, followed by industrial commodities while the other two types of industries lagged behind.

Firms in industrial commodities pioneered cost adjustment efforts. In the mid-1980s, leading firms already had accumulated technical capabilities to optimise production processes, as these activities have low tolerance to production inefficiency. Given the importance of price competition in these sectors and the early 1980s export drive, there were additional inducements for their pioneer search for productive efficiency. Their preference for industrial automation relatively to organisational techniques can be explained by the flow nature of their production process. Furthermore, large firms predominate in industrial commodities sectors and these firms have the resources to invest in automation.

The cost reduction drive by producers of durable goods was triggered by trade liberalisation and further boosted by the prospects of an expanding internal demand, after 1993. These firms moved more rapidly in the use of organisational techniques, as these are better suited for assembly rather than flow production processes. Also, as in industrial commodities, large firms prevail in durable goods sectors, facilitating the access to resources and to the relevant information for change. The dominant presence of foreign firms provided an additional advantage: local affiliates benefited from the accumulated experience of their parents firms, resulting in faster learning processes in the use of these techniques.

Producers of equipment and traditional goods lagged behind in the use of automation and quality techniques. As will be shown below, equipment producers were subject to intense substitution for imports. In traditional goods rationalisation was circumscribed to larger firms or those dedicated to market niches -local or foreign- which demanded lower tolerance to inefficiencies.

Two implications can be drawn. First, a specific group of firms were better placed to undertake one of the most important transformations in the production sphere of Brazilian industry: large, foreign associated, durable goods as well as intermediate producers. Second, sourcing flexibility implied optimisation of installed capacity. In the political-administrative sphere of firms, the status of production managers began to increase relatively to financial managers. But, more important, sourcing flexibility strengthened firms' abilities to serve an increasing demand, when stabilisation proceeded, while, at the same time, serving to cool down decisions on expansion oriented investments.

5. Return of capital inflows, increasing price stability and continuing micro uncertainty: capital adjustment and productive capacity flexibility between 1994 and 1997

In the 1990s external conditions improved. Foreign debt negotiations were finally settled, under the Plan Brady initiative, and economic liberalisation was slowly gathering momentum in the country. Correspondingly, as international capital liquidity and mobility increased, foreign funds returned to Brazil. As a result, foreign reserves expanded steadily, from US\$ 8.5 billions in 1991 to above US\$ 50 billions, 5 years later.

In 1994, Fernando Henrique Cardoso implemented the successful price stabilisation “Plano Real” during Itamar Franco’s administration, facilitating his task of conquering the next presidency. The plan was successful in bringing inflation down. In June 1994 monthly inflation had reached 47.7%. On July first a monetary reform was introduced and inflation dropped to 17.9% for the whole second half of 1994, and to 10.6% and 7.6% for the first and second semesters of 1995, respectively. By 1997 the annualised levels attained were only comparable to those prevailing 40 years before. As in other similar programmes, in the short run the Plano Real provoked demand expansion. The Brazilian economy, which had grown 4.8% in 1993, expanded 5.8% in 1994. The corresponding import expansion forced the government to slow down the economy (through credit controls and record high real interest rates) further ahead, and growth slowed down to 4.2% in 1995 and to around 3% in the next 2 years.

The Plano Real represented an important departure from the past. In time it became clear that the objective function of public authorities was to ensure the greatest possible stability of the nominal exchange rate, in order to control inflation and prevent the return of indexation. That stability also seemed necessary for the strategy of financing growing trade and current account deficits, through short-term capital inflows.

During the 1994-97 period, macro level confidence increased. Price stabilisation reduced the number of short-term scenarios, widening the temporal horizon of economic calculations by firms. The income effect and the return of credit lines, especially for consumption purposes, expanded demand levels. At the regulatory front, trade liberalisation, privatisation of the infrastructure and deregulation widened the space for the private sector. Among others, Kupfer et al (1998) indicated the following measures lowered barriers to entry for foreign investors:

- Extinction of restrictions to entry in informatics: 1991
- Elimination of limits to participation in privatisation: 1993
- Elimination of differentiation’s between local and foreign capital, opening access to official loans and subsidies: 1994
- Income tax exemption for profit and dividend remittance
- Liberalisation of restrictions to patenting in high technology areas, especially in biochemical: 1995
- Lifting of prohibitions for intrafirm remittance of royalties for trade marks and patents

However, developments in two basic pillars of the stabilisation plan, acted in the opposite direction, conditioning the willingness of business to lock-in resources in fixed investment: overvalued exchange rates and high interest rates. These, in turn, contributed to microeconomic uncertainty which was reinforced by the above mentioned anticipation on the cronogram of tariff reform. In the initial months of the Plano Real tariff reductions were used as a combat instrument against local price-makers; only in 1995, after the Mexican crisis, public authorities reduced their impetus, changing tariffs upwards, but in an ad-hoc fashion, for specific sectors -automobile, electronic equipment, toys, shoes- (Kume 1996, 1997).

At the microeconomic level, previous adaptive, rationalisation strategies continued to be enforced: downsizing, production modernisation and substitution for imports. Following such trajectory, producers of durable and non-durable goods were also active in modernising products and processes through technology imports. (Kupfer et al 1998) As shown in Table 10, technology imports expanded strongly between the 1990-93 and 1994-96 periods; during the latter, payments increased at a 50% rate, even with a significant expansion of sales abroad between 1995 and 1996.

Table 10
Brazil: technology balance of payments (US\$ current millions)

Year	Payments	Sales	Balance	Payments/ income
1990	209	132	-77	1,58
1991	173	125	-48	1,38
1992	158	214	56	0,74
1993	227	151	-75	1,50
1994	373	222	-150	1,68
1995	683	309	-374	2,21
1996	990	550	-439	1,80

Source: Hasenclever and Cassiolato (1998)

This last issue is a relevant source of concern. According to Hasenclever and Cassiolato (1998), while technology imports increased, its counterpart stagnated. In average Brazilian firms spend 0.7% of sales in R&D and this level did not changed during the 1990s. Thus, there are no strong signs of an effective inclination, among Brazilian industrial firms, to invest locally in the adaptation or development of new products and processes.

In foreign trade, previous trends started to consolidate (Table 11). In absolute terms, between 1990/91 and 1996/97 industrial international trade more than doubles but the rate of growth of imports is much more pronounced. More interesting though, while the sectoral distribution of exports is relatively stable, there is a pronounced change in the import profile, with higher value added gaining ground over commodities associated sectors.

Table 11
Foreign trade by type of industry: biannual averages US\$ 10⁶ and %

Type of industry	1990/1991				1996/1997			
	X	%	M	%	X	%	M	%
Commodities	18,664	62.2	7,527	45.9	27,576	58.4	18,638	36.0
Durable goods	3,789	12.6	1,713	10.5	6,529	13.8	8,023	15.5
Capital goods	1,830	6.1	3,980	24.3	3,787	8.1	14,304	27.5
Traditional goods	5,717	19.1	3,167	19.3	9,296	19.7	10,874	21.0
Total	29,999	100	16,382	100	47,188	100	51,839	100

Source: Elaborated from Kupfer et al (1998)

Parallel to the further implementation of strategies designed to increase sourcing flexibilities, a more complex set of business behaviour was emerging: strategies aimed at increasing capital productivity¹² and economies of scale and scope. They included: spatial relocation, mergers and take-overs, localised equipment renovation. For successful firms these strategies implied **productive capacity flexibility** or the ability to adjust product lines and production levels to attend changing demand patterns.¹³

Industrial relocation is taking two different forms. First, in traditional industries, especially textile and shoe producers, firms are moving to the Northeast, thanks, primarily, to state-level fiscal incentives and labour costs differentials from southern states. Such move was accelerated by the inflow of goods from other developing countries. The reaction of industrialists -to search for cheaper production basis-, however, is Brazil-specific given the prevailing wide income differentials among different regions. These firms are moving towards multiplant operations, within the country, keeping some operations in

¹² Pioneering work by Bielschowsky (1997) demonstrated clear trends towards these increases in capital productivity, as a result of localised investment.

¹³ As these are recent trends, reliable and systematic information is still unavailable. Therefore, the analysis made in this section must be taken as a preliminary assessment.

their home base and opening new factories in the Northeast, dividing production lines according to best price/quality relations.

Second, specially in the automobile industry, established firms and new entrants are actively setting up new production facilities, most of them away from the São Paulo state, also attracted by generous and competing state fiscal incentives. The amount of committed investment is significant -around US\$ 10 billions up to 2,002- making the sector a leader (and the exception!) in fixed investment. Such investment drive should place Brazil as an important international production pole, especially in the South American region. In a context of open economy these investments incorporate the latest production and product technologies, taking full advantage of sourcing flexibilities. In the wake of assemblers' expansion, associated international suppliers are moving into the country, taking over local concerns rather than opening up new operations, revealing what is to become the most important economic phenomenon of this last phase: mergers and take-overs.

Mergers and take-overs are spreading throughout most sectors, including services and infrastructure. As shown in Table 12, between 1992 and the end of the first semester of 1997, a total number of 374 mergers and take-overs in industry was recorded in published press. The rate of growth was quite impressive; 21 transactions in 1992, 50 in 1994, 120 in 1996 and 61 in the first half of 1997. The total recorded value is around US\$ 33 billions, divided between national transactions (US\$ 13 billions) and those involving foreign companies (US\$ 20 billions). Such international pre-eminence is strengthened as years passed. Another interesting evidence is related to sectors involved: while in the early 1990s most transactions were related to traditional industries, later on most mergers took place in high value added industries.¹⁴

Table 12
Mergers and acquisitions in industry: number by sector and nationality - 1992-1997 - n° operations

Sectors	1992			1993			1994			1995			1996			1997*			Total		
	F	N	Total	F	N	Total	F	N	Total												
Traditional goods																					
Food, drink and tobacco	0	8	8	0	14	14	9	9	18	11	8	19	24	14	38	5	10	15	49	63	112
Pharmaceutical	0	0	0	0	1	1	1	1	2	4	1	5	9	1	10	2	1	3	16	5	21
Commodities																					
Chemicals	0	8	8	0	15	15	4	9	13	11	8	19	8	10	18	6	3	9	29	53	82
Metallurgy	0	4	4	0	7	7	2	6	8	1	6	8	3	14	17	5	3	8	12	40	52
Durable goods																					
Electronics	0	0	0	0	5	5	4	1	5	6	4	10	11	4	15	9	1	10	30	15	45
Auto-parts	0	1	1	0	1	1	1	1	2	5	5	10	10	1	11	7	3	10	23	12	35
Capital goods																					
Computers	0	0	0	3	0	3	1	1	2	4	1	5	6	5	11	6	0	6	20	7	27
Total	0	21	21	3	43	46	22	28	50	43	33	76	71	49	120	40	21	61	179	195	374

*1° semester 1997; F - by foreign firms; N by local firms

Source: KPMG in Gazeta Mercantil

Transactions usually involved sector leaders or firms with interesting market prospects, acquired by those willing to enter or expand market share in Brazil.¹⁵ Focusing primarily the local market, tow potential resultants are economically significant. First, take-overs facilitate the diversification of product portfolios; second, it increases operational scales and rationalises the use of productive resources thus generating significant cost savings not only at production levels but also in areas of

¹⁴ The banking industry and sectors related to the privatisation of the country's infrastructure process: telecommunication have gained pre-eminence in the late 1990s.

¹⁵ Its is necessary to bear in mind that mergers and take-overs among multinationals may be a reflection of similar processes occurring internationally.

sales, distribution and technical assistance. Mergers and take-overs then imply optimisation of a firm's capital stock and not necessarily the addition of new production capacity to the economy.

Differences between Brazilian and foreign-led mergers and take-overs are clearly shown in Table 12; Brazilian buyers are especially prevalent in industrial commodities, where local capital is particularly strong. Foreign buyers are more active in technology intensive sectors: electronics, computers, pharmaceuticals, and areas where they have had always a dominant position.

Foreign capital led mergers and take-overs are strengthening a peculiar structural feature of the Brazilian economy: its high level of internationalisation of ownership. In 1997, the stock of foreign capital in the country was estimated at US\$ 65 billions; two years before it stood at US\$ 42 billions. Among the 500 largest firms, foreign firms expanded their share from 31 to 36.3%, between 1990 and 1997 and foreign dominated activities (more than 20% of production by foreign firms) include most durable and capital goods (CEPAL 1998). The expansion of foreign direct investment is a particular feature of this period; growing from US\$ 1.9 billion in 1994, to US\$ 2.9 billions in 1995, to US\$ 6.1 in 1996 and US\$ 16 billions in 1996. The privatisation process in infrastructure, especially electricity and telecommunications, can explain the expansion observed in these last 2 years. (Kupfer et al 1998) Among industrialised countries probably Brazil presents the lowest rate of local to foreign capital ownership ratio, a feature -and its implications- yet to be correctly understood by analysts and policy-makers.

In terms of localised equipment renovation and/or investments in capacity expansion, even after three years of the Plano Real, aggregated fixed capital formation was still at very low levels, similar to those prevailing along the 1980s -around 15% of GDP- and much below historical trends. Table 13 shows that investments specifically geared towards industry have not changed much, although there are signs of improvements after 1995.

Table 13
Industrial investment, 1980 prices

Period	% of GDP
1972-80	4.6
1981-88	3.4
1992-93	2.8
1995-97 (estimate)	3.0 to 3.5

Source: Fonseca, R. - Relações Capital-Produto. BNDES-PNUD. Mimeo, 1997, in CNI-CEPAL 1997

These figures do not provide information on the nature, determinants and agents of fixed investment presently being carried out in the country. According to CNI-CEPAL (1997), based on a sample of 730 firms, representing 14% of total 1993 industrial employment (4.8 millions), by 1997 a slow resumption of fixed capital investment could be observed with an emphasis on modernisation and cost reduction by means of localised equipment renovation. The main feature of these investments was their high rate of return, implying substantial increases in physical capital productivity. Firms were taking advantages of local market growth, low inflation and international interest rates, as well as labour costs and low import tariff for capital equipment. However these investment efforts are implying limited direct employment generation and are mostly concentrated in sectors directly affected by the income effect produced by the Plano Real. Transport, food, electronic and electrical durable goods, plastics and pharmaceuticals together with their most important industrial supplier, the steel industry, performed above the industry's average (Bielshowsky 1997).

A balance of the recent period indicates interesting changes in industry. Besides the above-mentioned greater reliance on foreign trade, technology and capital, two other features are starting to emerge. First, the average size of firms is increasing. As shown in Table 14, sectors where very large firms predominate increased their share in total production from 36.2% to 42.8%, much to the expense of sectors where large firms prevail. Second, as shown in Table 15, the share of sectors associated to final consumption in total value of production increased, as indicated by the change in the share of

traditional goods' sectors from 41.9% to 44%, between 1993 and 1997. Most probably these trends are associated with the two important phenomenon already commented: mergers and take-overs aimed at leading local firms and the income effect led demand expansion in the post-Plano Real period.

Table 14
Evolution of the Brazilian industry by size of firms (share in value of production - %)

Type of sectors	1985	1986/89	1990/92	1993/96	1997
Sectors where very large firms predominate (L above 1,000)	36.2	36.2	38.1	41.4	42.8
Sectors where large firms predominate (L between 450 & 999)	28.8	28.1	26.7	25.3	23.7
Sectors where middle size firms predominate (L between 100 & 449)	20.5	20.6	19.7	18.5	19.0
Sectors where small firms predominate (L up to 99)	14.4	15.1	15.5	14.9	14.5
Total	100	100	100	100	100

* L = employment. Sectors were classified in these 4 groups, based on 1994 employment data. Their share in value of production for the various years were then calculated

Source: Kupfer et al 1998

Table 15
Share in industrial value of production by type of industry (%)

Type of industry	1985	1989	1993	1997
Commodities	40.6	32.5	36.8	34.4
Durable goods	11.5	13.0	13.5	14.9
Capital goods	8.0	11.5	7.8	6.7
Traditional goods	39.9	42.9	41.9	44.0
Total	100	100	100	100

Source: elaborated from Kupfer et al (1998)

In summary, continuation and deepening of previous strategies -sourcing flexibility- and the incorporation of new strategies aimed at increasing production capacity flexibility became the main features of industrial change in this period. Well placed to implement these strategies were foreign associated and or large firms, operating in sectors associated with the expansion of the final demand.

Up to the end of 1997, these trends suggested positive perspectives for further industrial expansion. But external determinants came to fore, impeding developments along this line: turbulence in international financial markets emerged and capital inflows receded. Correspondingly, external trade and public finance constraints worsened. Interest rates soared and pressures on the overvalued exchange rates mounted, unbalancing the opportunity costs for fixed investments and postponing the development a long term credit system, necessary for supporting expansion plans. As a consequence, flexibilities accumulated in market, financial, sourcing and, now, productive fronts, provided successful firms with an extraordinary capacity to adjust production for a wide range of demand scenarios, implying strong resistance to irreversible capital spending. The persistence of low confidence levels in the long term, even within a regime of price stability, is turning to be the most negative heritage of the instability years and the real conditions for the resolution of this dilemma are still unknown.

5. Uncertainty and change: concluding remarks

5.1 From macro to micro: the emerging industrial structure

Along the 1980s and 90s, Brazilian firms were forced to adapt to the influence of internal and external

economic and institutional changes. Two inter-linked sources of change prevailed. Firstly, the longevity of uncertainty, besides blocking the possibilities for internal market expansion, implied more acute competition for shares in a shrinking market. The external market proved to be only a partial solution, incapable of pulling the economic growth of a country with continental dimensions. Secondly, liberalisation prevailing in international markets, the increasing weakness of the Brazilian State and the inherent problems of the regime of nationalisation of production gradually led to local policies oriented at privatisation, deregulation, trade liberalisation and, above all, the pre-eminence of controlling macroeconomic fundamentals as the objective function of public management.

Table 16 summarises macro to micro interactions, highlighting determinants, firms' confidence levels and associated strategies, capabilities and performance.

Table 16
Brazil, 1982-97: macro to micro interactions

Period	Determinants	Confidence	Strategy	Capacity	Performance
1982/ 1988	Foreign exchange scarcity, import barriers, and price instability	Low macro confidence, unchanged high micro confidence	Market flexibility, Financial flexibility	Sales effort, balance sheet adjustment	Expansion of exports, high liquidity, low debt-equity ratios
1988/ 1994	Increasing instability, recession, trade liberalisation	Low macro and micro confidence	Sourcing flexibility	Rationalisation techniques, import of components	Cost reduction, downsizing, production efficiency
1994/ 1997	Price stability, capital inflow, trade deficit, stop-go growth	Low micro confidence, increasing macro confidence	Productive capacity flexibility	Localised equipment renovation, mergers, take-overs	Increase in capital productivity, economies of scale and scope

Firms capable of embarking in market, financial, sourcing and productive capacity adjustments were better placed to operate adequately to prevailing types of uncertainties, during specific sub-periods, facilitating the exploitation of existing market opportunities. For successful firms, accumulated capabilities were carried on to the following years. Initially, in the beginning of the 1980s, an export drive provided 'market flexibility' or the capacity to shift sales according to changes in the conditions of demand. The next move was a sharp reduction of indebtedness levels, as firms changed from a debtor to a creditor position. Such preference for liquidity gave firms the necessary 'financial flexibility' to face the inflationary acceleration of the mid-80s and changing interest rates and financial regulations. By the late 1980s, facing growing economic instability, recession and a new threat -trade liberalisation-, a cost rationalisation drive was implemented, implying 'sourcing flexibility' or the capacity to adapt variable costs and operate in constantly changing conditions in relative prices. Finally, in the middle of the 1990s, as monetary stabilisation and economic liberalisation unfolded, "productive capacity flexibility" was pursued, implying mergers and take-overs, spatial relocation and limited and punctual investments in new production capacity.

Successful strategies were not followed by all; e.g. not all-Brazilian firms turned to the export markets in the middle of the eighties or engaged in merger and acquisition processes in the nineties. From a 17-year perspective, the cumulative consequences of microeconomic flexibilities implied changes in the morphology of industry, as shown in Table 17, where an attempt was made to stylise the location of firms with better and lower response capabilities. In this sense, larger firms and multinationals were better equipped to face changes, relatively to smaller or state and locally private-owned firms. Sector-wise, firms producing industrial commodities and durable goods performed better than producers of traditional goods and capital goods did. Finally, firms engaged in imports and exports, simultaneously, profited better relatively to importers or exporters

Table 17
Changes in industrial morphology

Location of firms	Lower response capabilities	Higher response capabilities
sector	capital goods, traditional goods	industrial commodities, durable goods
size	small, medium & large	very large
ownership	state & private nationals	transnationals
direction of sales	only internal market and/or only external market	Intra-industry trade

Completing the stylised emerging structural features of Brazilian industry, the following consequences can also be depicted. Firstly, efficiency levels are increasing, as firms rely upon imports of technology capital goods and components, localised equipment renovation, introduction of new organisational techniques and downsizing. Secondly, market structures are becoming more internationalised and concentrated. Thirdly attitude towards fixed investment or R&D expenditures remain cautious. The country's export profile -reliance on low unit value products, usually associated with industrial commodities- remained unchanged.

In short, along the different types of adjustments, the complexity of the tasks facing firms increased and a decreasing number of firms was able to engage in sequential adjustments, conforming a potentially excluding process. Undoubtedly, concentration of economic power is a result of competition. But, as this paper showed, in Brazil, this process was mediated by specific macroeconomic conditions which, partially were caused by external and internal determinants and partially by government policies. While external determinants and even internal conditions are, to a certain extent, beyond the influencing capacity of public authorities, policy determinants are not. Policy determinants involved choices, a lack of co-ordinated efforts to promote industry prevailed, and these did matter in explaining the emerging industrial structure.

5.2 From micro to macro: micro flexibilities and macro rigidities

Four important features of this emerging industrial structure have direct implications on the macroeconomic context, including the possibilities for the continuation of price stability and the resumption of economic growth. They are related to efficiency, international trade, market concentration and investment prospects. These final comments also highlight areas for further research.

First, the efficiency drive is still in an infant stage, especially in traditional industries, closely associated with the final demand. Moreover, even for firms at a more advanced stage, the continuation of their improvement trajectory implies investments in technological development, which is stagnant, by all accounts. Long-term consequences are not favourable if decisive action by government is not taken up.

Second, given structural differences in the composition of Brazil's international trade, reflected in wide differences in income elasticity of demand of imports and exports, tensions in the country's trade balance are likely to remain. The implications for the macroeconomic management is quite clear: public authorities are likely to maintain an active policy to attract foreign capital, which is a sensitive issue for public finances -if interest rates are kept high- and exchange rate policies. Trade tensions can only be altered in the long run, with the entry of new products in exports' portfolio. Potentially exporting firms are well placed to receive support from government in the future ahead. Alternatively, government could intervene in the import sector. However, there are upper and lower limits to such intervention. Import repression is likely to raise the ceilings for local prices; import expansion is likely to affect the level of foreign currency reserves and public finances.

Third, increasing levels of market concentration are associated, on one hand, to economies of scale, which can impact positively the price/performance of products. On the other hand, firms also enjoy greater market power; in negotiations with clients and suppliers they have disproportionate conditions to set contract terms. A concentrated industrial configuration carry serious policy implications, not only for competition policy but also in other spheres of economic regulation like consumer rights, environment, property rights, etc. It is also worth mentioning their price-making capabilities, which, if exerted fully, may affect inflation rates, negatively. In terms of ownership, the growing importance of multinationals in industry facilitates the incorporation of new technologies, especially in a context of a relatively open trade regime. But, at the same time, such ownership structure may lead to a partial loss of policy enforcement capabilities by government over economic agents, if firms play bcational determinants in negotiations over new investments.

Finally, the implication over investment trends. After conquering and ensuring price stability, the great task ahead of government is, undoubtedly, the resumption of sustained economic growth, behind which lies investments in capacity expansion. So far three trends are in motion and they do not justify a ‘belief’ that investment growth is setting place.

First, privatisation of the infrastructure is raising positive expectations and bringing new actors, to a much-needed area. This process is just starting and there is the formal compromise, by new entrants, to invest in improving and expanding infrastructure services. The extent of benefits to industry will be directly related to the level and intensity of local procurement of capital equipment, which remains to be seen. But a more preoccupying issue is at stake: in some privatised sectors the resulting ownership structure is unstable and original acquisition partners are bound to change. Paula (1998) relates such instability to the methods of privatisation used in the country: bids by consortiums. While ownership is not settled, it is very unlikely that concerted investments in new capacity are likely to occur.

Second, where sectoral investments occurred in a significant way, the role of regional fiscal incentives was important. A significant part of costs involved in creating new production capacity fell on state level economies, mostly under the argument of job creation. However, opportunity costs of such pattern of job creation remains to be calculated.

Third and most important, the analysis in this paper indicates that the accumulation of microeconomic flexibilities enabled firms to stand uncertainty and avoid or postpone irreversible decisions on capital expenditures. Such feature cannot be underestimated: macro and micro confidence levels will only increase and justify investment if demand perspectives remain positive for a substantial period of type. Building up and sustaining credibility in an era of open economic regimes, as Brazil is experiencing, is certainly a difficult task.

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