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**Evolution and Challenges of Recent Industrial Policy in
Brazil**

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Resumo:

Abstract

This paper investigates the main strands of Brazilian industrial policy between 2003 and 2014. After a decade of neoliberal experiences, industrial policy returned to the agenda, increasing the interest about its capacity to promote positive results. The first part looks at aspects related to the 'why' and 'how' of the industrial policy, drawing upon theories and other experiences to construct a benchmark to analyse the Brazilian case. The article finds that despite specific advances and its prioritisation by different administrations, industrial policy failed to produce more favourable and consistent results. The main reasons include the excessive number of sectors contemplated; the lack of an appropriate coordination structure; the incapacity to centre the policy on clear productivity and competitiveness targets; the lack of consistent mechanisms of evaluation and the inability to achieve an encompassing process of negotiation with the business class.

Key words: industrial policy; state capacity; industrial development

Evolution and challenges of the recent industrial policy in Brazil

Introduction

The objective of this paper is to provide a reflection on the present stage of industrial policy in Brazil. Industrial policy was a key component in the Brazilian process of industrial development from the 1930s to the 1970s. In the 1980s, a serious macroeconomic crisis marked the abandonment of the previous strategy. In the 1990s, liberal policies put industrial policy in second place, but in 2003, the victory of the Partido dos Trabalhadores (PT) resulted in the revival of industrial policy. The objective is to investigate the main lines of industrial policy since then, addressing how the effort was undertaken and how it can be improved.

Before that, previous issues are addressed. Firstly, I intend to summarise arguments related to why industrial policy is necessary, how it should be implemented and how to avoid the mistakes which marked previous experiences. Industrial policy tends to be a very controversial topic. This is in part explained because it touches on a key issue which has marked economic science since its foundation: the division of attributions between the state and the market. Secondly, the controversy is related to methodological issues: a lot of economists are trained in deductive and quantitative methods and tend to base significant parts of their arguments on mathematical models. Another group tends to rely largely on historical and institutional approaches. This divergence tends to hinder the achievement of a certain degree of agreement. Thirdly, the industrial policy debate is very influenced by ideology and by the fact that different policies have distinct political impacts. Monetary, regulatory and exchange rates policies affect distinct economic groups very differently. For all these reasons, industrial policies have a strong political economy dimension, which is critical to understand not only the capacity to successfully adopt development strategies, but also different national trajectories.

Divergence is paramount in the history of economic development discipline, a field of studies which emerged in the post Second World War. Since then, many strategies to promote industrialization have been attempted, but only a few are considered cases of success. In general, neoclassical economists are reluctant in accepting that developmental policies played a key role in increasing productivity or for the success of the strategy. These economists argue that industrial policies were applied everywhere and in most countries had been conducted to negative results. In the few cases of success, factors such as human capital and correct macroeconomic policies are claimed to be the responsible for success.

By contrast, structuralist development economists undertake analyses of the successful cases and argue that state guidance and industrial policies were a key part of the process.¹ According to structuralist economists, states played a key role in encouraging investments in new sectors, in nurturing competitive enterprises and in strengthening technological capacity. A key variable is the state's capacity to coordinate the strategy and induce the private sector action.² In this sense, not only the policies matter, but also the capacity to design and implement them.

It is important to emphasise that controversy is also nurtured by the nature of the object. The transmission mechanisms of industrial policy are complex and hard to understand. In addition, it is hard to separate the effects of industrial policy from other effects and there is also the question of endogeneity in addressing causality³. For this reason, it is impossible to find incontestable evidence. As the sceptics argue, the fact that successful countries adopted selective industrial policies is not evidence that it works. For the supporters, it is also impossible to find evidence that, if well implemented, it does not work; in addition, countries should not avoid industrial policy only because neoclassical theory argues to do so.⁴ An argument in favour of the second group is that among the countries which recently caught up, most adopted systematic programs of intervention in order to upgrade industrial structure⁵.

In the 1980s and 1990s, the neoliberal ideology became prominent in the development debate. Failure in great parts of the developing world was attributed to excessive state intervention. Liberalisation of market forces was viewed as a requisite to wake up the entrepreneurial forces, to attract foreign capital and to produce balanced strategies of development. In Latin America, this strategy was embraced by most countries. Despite achieving stabilization and improving macroeconomic variables, the results were disappointing. Increase in exports and in foreign direct investment was not able to aggregate value and to stimulate other economic sectors. Impacts on employment were limited, productivity did not increase and most of the countries were marked by reprimarisation of

¹ Alice H. Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, 2015); Ha-Joon Chang, *The East Asian Development Experience: the Miracle, the Crisis and the Future* (Penang: Third World Network, 2006).

² Peter Evans, *Embedded Autonomy: States and Industrial Transformation* (Princeton: Princeton University Press, 1995).

³ Robert Devlin and Graciela Mogullansky, *Breeding Latin American tigers: Operational Principles for Rehabilitating Industrial Policies*. United Nations Economic Commission for Latin American and Caribbean (Santiago/Washington DC: ECLAC/World Bank, 2011).

⁴ Ibid.

⁵ Helen Shapiro. 'Industrial Policy and Growth', in Ocampo, K.S Jomo and Rob Vos (eds.), *Growth Divergences: Explaining Differences in Economic Performance* (London and New York: ZED books, 2007), pp. 148-171.

exports and by precocious processes of deindustrialization⁶. As a consequence, the frustrating results of neoliberal policies brought to power opposition governments which proposed strategies marked by the return of industrial policy.

The objective of the present article is to construct an analysis about the stages of recent industrial policy in Brazil and the steps necessary for its success. I believe that by bringing the contributions of the recent literature and the lessons from recent cases, it is possible to establish certain propositions which tend to be shared by a large group of economists and policy makers. I believe that it is possible to agree on a range of issues related to procedures, institutional building and instruments which, if adopted, tend to increase the chances of success.

The next section explores basic general issues related to why industrial policy is necessary. In section 3, I bring factors and procedures which contribute to successful implementation of industrial policy, bringing examples and successful experiences. Sections 4 to 6 explore different stages of the recent evolution of industrial policy in Brazil. Section 7 concludes, highlighting several directions for improving the effectiveness of industrial policy.

Industrial Policy: why it is necessary

Industrial policy has, in general, a very broad definition, including a diverse range of measures aimed at promoting industrial growth, strengthening industrial structure and increasing productivity, competitiveness and employment, among other objectives. Horizontal policies, including investments in infrastructure, education, training and research and development (R&D), tend to be considered necessary; divergence emerges when the issue is selective intervention aimed at promoting specific sectors. Neoclassical economists tend to oppose these measures on the grounds that bureaucrats are not better positioned than businessmen to know the best sectors to be promoted.⁷

A key issue is if development prospects are affected by the types of goods which a country produces: does it make any difference to produce complex and elaborated goods rather than basic and simple products? According to mainstream economists, what matters is the capacity to produce in a competitive way.⁸ This justifies the decision to focus on products in

⁶ Ibid; J.G. Palma. 'Why has productivity growth stagnated in most Latin American countries since the neoliberal reforms?' *Cambridge Working Papers in Economics 1030*, 2011. Available at <http://www.econ.cam.ac.uk/dae/repec/cam/pdf/cwpe1030.pdf>

⁷ In addition, costs of opportunity are invoked to defend the concentration of resources on education and infrastructure, while selective policies are criticized for facilitating the capture of the state by private groups. See Chang, *The East Asian Development Experience*.

⁸ Sergio Lazzarini, Marcos Jank and Carlos Inoque. 'Commodities in Brasil: maldição ou bênção?', in Edmar Bacha and Mônica de Bolle (eds.), *O futuro da indústria no Brasil: desindustrialização em debate* (Rio de Janeiro: Civilização Brasileira, 2013), pp. 201-226.

which the country has comparative advantage, the attempts to depart from this rule being the main cause of industrial policies failure⁹.

By contrast, structuralist authors argue that there are important reasons to diversify and to produce more elaborated goods. The first was given by Albert Hirschman: it is necessary to stimulate goods whose linkage effects push the development of other sectors.¹⁰ This is what development is about: a process able to create tensions and unbalances, demanding responses and transformation in other parts of the economy. The problem with concentrating on primary goods is that these products have little capacity to induce transformation. A second reason is related to the lower income elasticity of demand for primary products. As recent research has reinforced, complex and elaborated goods have more capacity to capture demand of developed countries, besides being less vulnerable to international crises. Thirdly, elaborated products increase the chances of differentiation and of obtaining higher profit margins. Fourthly, when a country advances along the stages of development, wages tend to rise and it tends to suffer competition from poorer countries, demanding the development of other sources of competitiveness.¹¹

An original contribution is given by Hausmann and Rodrik.¹² The argument is based on the notion of sectoral capabilities: when a country produces certain goods, it accumulates capabilities which increase the chances of successful diversification to adjacent activities. A key point is the identification of affinities and contiguity in the productive chain, compared by the authors to a forest. For a respective country, it is easy to jump (diversify) to neighbouring trees, i.e., to sectors which share technical and productive requisites. The risks are much higher when a country attempts to jump to very distant sectors: “to jump from garments to electronics may be too big a step”. In an analysis supported very much by empirical data, Hausmann and Rodrik show how some sectors tend geographically to develop together. They argue that the capacity to export certain goods is a very good predictor of the sectors in which a country tends to advance in the future.

⁹ Justin Lin and Célestin Monga. ‘Comparative Advantage: the Silver Bullet of Industrial Policy’, in Joseph Stiglitz and Justin Lin (eds.), *The industrial policy revolution I: the role of government beyond ideology* (New York: Palgrave Macmillan, 2013), pp. 19-38.

¹⁰ Albert Hirschman. *The Strategy of Economic Development* (New Haven: Yale University Press, 1958).

¹¹ Historical and empirical data shows that countries which significantly improved percapita income tended to advance towards a higher degree of diversification (Shapiro, ‘Industrial Policy and Growth’).

¹² Ricardo Hausmann and Dani Rodrik, *Doomed to Choose: Industrial Policy as Predicament* (Harvard University: Jonh F. Kennedy School of Government, 2006). Available at http://www.hks.harvard.edu/content/download/69495/1250790/version/1/file/hausmann_doomed_0609.pdf

A key point is that the property rights which matter in this case are those specific to sectors.¹³ When a country does not have the requirements (inputs) for certain economic activity, they need to be provided or accumulated, creating conditions to make productive activities attractive to the private sector. The worst situation is faced by countries with a very simple and restricted productive structure, which faces hard difficulties to produce the necessary requisites.

There are important implications in terms of policies. The first is that there are opportunities for diversification in contiguous sectors, a key role of industrial policy being to provide cooperation with the business sector in the identification of viable niches. The other is that the promotion of capabilities in other sectors tends to increase the chances of future diversification. Although the development of “distant” sectors may involve challenges, its success tends to strengthen the opportunities to diversify the industrial structure.

Another reason to diversify production and upgrade industrial structure is related to the fact that certain goods are intensive in learning, knowledge and innovation and tend to have spillover effects on the economy. Innovation is one of the main sources of productivity, competitiveness and economic growth, opening new opportunities to be explored. Although the advance towards knowledge intensive goods involves significant efforts, it is a central objective to be pursued by a strategy of industrial development.

In face of those arguments, a clear direction for developing countries is to aggregate value in goods in which they already have comparative advantages. However, this does not exclude the possibility of strategies which, feasible, well designed and having the necessary support, tend to produce linkage effects and stimulate diversification in the future. A key point is that a country should not accept the argument that the best strategy is to concentrate on the production of a few elementary goods and wait for the advantages of trade specialization.

Productive diversification and the advance in Research and Development (R&D) imply risks and the costs inherent to the learning process, requiring policies and incentives. Two concepts are critical: market failures and externalities. In activities which involve risk, the expected return of private investment may be lower than social return. As a consequence, investments with potential to bring positive effects to society may not be undertaken; firms may opt for less risk and less productive strategies. One important example is the “first mover externalities”: when moving to a new sector, a firm may suffer high losses in cases of failure, while in cases of success it may face difficulties in curbing copy and in retaining the fruits of innovation. A second case involves complementary investments, in which

¹³ It is necessary to abandon the idea that there are plenty of opportunities to be explored, waiting only for the provision of favorable property rights. The possibility of diversification requires capacities which are specific to the sectors, a requisite to make investments viable.

investments, although not very attractive if undertaken in isolation, may be very lucrative if undertaken together. In this case, governments can provide the incentives to the simultaneous realization of the investments.¹⁴

Nevertheless, externalities are not the only reason to justify state intervention. Economic development is a dynamic process in which learning, capabilities accumulation and innovation play an essential role.¹⁵ Innovation is an interactive and not linear process, benefitting from interactions among enterprises, universities, suppliers, clients, public R&D institutes and other actors. The government tends to play an important role in building research and development framework, stimulating interaction and promoting the strengthening of enterprises' capacities. This involves efforts to socialize R&D costs and results, create laboratories, undertake research in public institutions and stimulate public-private consortiums.

Mazzucato¹⁶ shows very convincingly how a government's role in spurring innovation is much wider than usually accepted. A government's investments, undertaken on a large scale, were the engine behind the development of many technologies which became critical for future cycles of investment, including the internet, genetic sequence, the pharmaceutical industry and biotechnology. Governments went much further than funding innovation, approximating science and technology and supporting commercialization. They opened windows, detected opportunities and engaged in very uncertain research activities. Anything more than support or correct markets, the governments create them.

Implementing a successful industrial policy

Once accepted that governments should adopt policies aimed at moving up the production ladder, it is necessary to better understand the factors responsible for successful industrial policies. As Devlin and Moguillansky¹⁷ emphasize, the literature has not fully understood the "how" of industrial policy in terms of process organization, internal organization of the government and implementation. Nevertheless, important lessons are learned from previous experiences. The notion of embedded autonomy, developed in Peter Evans' authoritative

¹⁴ Hausmann and Rodrik, 'Doomed to Choose', in Ricardo Hausmann, Dani Rodrik and Charles Sabel. *Reconfiguring Industrial Policy: a Framework with an application to South Africa* (Center for International Development of Harvard University: CID Working Paper n. 168, 2008). Available at www.hks.harvard.edu/content/download/69285/1249950/version/1/file/168.pdf

¹⁵ Mariana Mazzucato, *Entrepreneurial State* (London: Demos, 2011); Mario Cimoli, Giovanni Dosi and Joseph Stiglitz. 'The future of industrial policies in the new millennium: toward a knowledge centered development agenda', in Mario Cimoli, Giovanni Dosi and Joseph Stiglitz (eds.). *Industrial Policy and Development: the Political Economy of Capabilities Accumulation*. (Oxford: Oxford University Press, 2009b), pp. 541-560.

¹⁶ Mazzucato, *Entrepreneurial State*.

¹⁷ Devlin and Moguillansky, *Breeding Latin American Tigers*.

work, captures important requisites to the success of industrial policies.¹⁸ A critical challenge is how to develop embedded autonomy in democratic contexts and in countries in which state-society relations are different from the paradigmatic Asian cases.

A recent and very original contribution is given by Mushtaq Khan.¹⁹ According to Khan, a key challenge for developing countries is to acquire the capacity to produce, in a competitive way, goods which technology has already made available to world markets. The process involves a huge effort of learning, given that a large part of the knowledge is tacit, inherent to the routines of the productive process. A team has to be trained and abilities have to be achieved in many stages, including the setup of the factory, the employment of machines, the establishment of quality control systems and the provision of post sales services.

Success at this stage requires certain capacities and requisites, such as managerial capacity, work force ability and access to the necessary inputs and services at competitive prices. However, it also involves a huge effort and commitment by the enterprises to the learning process. The process is uncertain and involves risks, as the enterprise tends to produce at higher costs than the main competitors. Incentives and policies are thus necessary.

Once policies are adopted and rents conceded, a key point is to guarantee that they are in fact conducting an engagement in the learning effort, and are not accommodating and/or lobbying to make the incentives permanent. In most of the previous industrial policies experiences, firms failed to succeed in the learning process. According to Khan²⁰, a key reason was governments' incapacity to compel firms to engage in the necessary effort. The result was low productivity, incapacity to compete and dependence on incentives.

In the successful cases of South Korea and Taiwan, states were strong, bureaucracies autonomous and there was little interest in protecting losers. The government was thus successful in making credible the commitment that incentives would be removed in case of failure. However, state-society relations are very different in most of the developing countries, where policies failed to increase competitiveness in many sectors. Business

¹⁸ Peter Evans. *Embedded Autonomy*. The concept of embedded autonomy implies the conciliation of a certain degree of autonomy, achieved through a well prepared and meritocratic bureaucracy, and the development of links and channels with the business sectors, necessary to have access to information and to implement the policies.

¹⁹ Mushtaq Khan, 'Governance, Economic Growth and Development since the 1960s', in José Antonio Ocampo, K.S Jomo and Rob Vos (eds.), *Growth Divergences: Explaining Differences in Economic Performance* (London and New York: ZED books, 2007), pp. 285-323; Mushtaq Khan. 'Technology Policies and Learning with Imperfect Governance', in Joseph Stiglitz and Jultin Lin (eds.), *The Industrial Policy Revolution I: the Role of Government Beyond Ideology* (New York: Palgrave Macmillan, 2013), pp. 79-115.

²⁰ Mushtaq Khan, 'The Role of Industrial Policy: Lessons from Asia', in David Bailey, Keith Cowling and Philip Tomlinson (eds.), *New Perspectives on Industrial Policy for a Modern Britain* (Oxford: Oxford University Press, 2015), pp. 79-98.

groups were able to shape alliances inside the state apparatus and to guarantee the preservation of the incentives. The high costs were paid by consumers and taxpayers.

Khan's analyses significantly add by opening the industrial policy process and providing insights into understanding why it failed in most of the cases. Examples are given of how to create mechanisms to improve the chances of success in countries with imperfect governance. A good example is India's agreement with the Japanese firm Suzuki in the 1980s. Suzuki was invited to form a joint venture with national producers, and were committed to producing, in a five year period, a high quality model with a domestic components content of 60%. In the case of success, the prize would be free access to the Indian market. The arrangement provided an ex-post rent, which gave the company the incentive to increase productivity and to collaborate with the Indian partners. The experiment was revealed very successful indeed, creating organizational and competitiveness capacities and being applied later with other companies. As a consequence, Indian automobile industry significantly advanced and was successfully inserted into international markets.²¹

Another important contribution comes from Hausmann, Rodrik and Sabel²². According to the authors, the key issue in development policy is the successful concretization of new activities and the consequent accumulation of new sectoral capabilities. As emphasized, contiguities in the productive structure tend to indicate paths of diversification. The process involves a close partnership between the government and the enterprises, in order to identify niches and the obstacles to be tackled. The departure point is the institutionalization of cooperation with the business sector.

A second requisite is to provide the industrial agency with the financial resources and instruments which enable them to respond to the opportunities which emerge during the consultation process. The industrial policy apparatus should have a source of independent financial resources, a pre-condition to respond with agility. The incapacity to respond tends to discourage business participation. Another principle is that actions should be centred on increasing productivity and capabilities and not on protecting sectors with low productivity. The purpose is to pursue a more focused action, to provide transparency and to facilitate evaluation. Therefore, actions aimed at protecting sectors or regions in difficulties, although relevant, must be the object of other agencies and policies. It is also important to establish ex ante criteria of success, facilitating the identification of underperformed firms and providing the corrections. The government should make clear that the incentives are temporary.

²¹ Khan, 'The Role of Industrial Policy: Lessons from Asia'.

²² Hausmann, Rodrik and Sabel, *Reconfiguring Industrial Policy*.

An important and related requisite is the capacity of permanently monitoring and evaluating the process, detecting the factors responsible for the non-achievement of the objectives. Promotion of auto discovery is uncertain and mistakes are inherent. Therefore, permanent evaluation, undertaken by people with different expertise and including external evaluation, is a critical part of the process. Permanent evaluation is also a precondition to achieve transparency and legitimacy. Industrial policy tends to be favoured when it is made clear which are the main instruments and how they are employed for the achievement of the objectives. They should be presented as a matter of national interest, a precondition to giving the policy the support and time necessary to produce the expected results.

Another important contribution for the “how” of industrial policy is given by Devlin and Moguillansky.²³ Their analysis is centred on summarizing the policies and the organization of the industrial policy apparatus in ten of the fifteen countries which, from 1960, were successful in closing the per capita income gap with the United States by 10 per cent points or more. Devlin and Moguillansky argue that among the 15 countries, only Hong Kong adopted a strategy close to the neoliberal precepts. Most countries adopted systematic proactive policies aimed at removing obstacles and creating comparative advantages.²⁴ Promotion of specific branches and activities were part of a strategy also marked by balanced macroeconomic policies and actions aimed at strengthening secondary and higher education and advancing other horizontal industrial policies. Most of the countries adopted strategies of industrial diversification and exports upgrade and in several of them long term strategies were accompanied by multiyear plans to allocate resources.

As Devlin and Moguillansky argue, success in industrial policies requires institutionalization of embedded autonomy, including an institutional design able to organise public-private cooperation. A key part is the constitution of well prepared and meritocratic bureaucratic agencies. The consolidation of an *esprit de corps* plays an important part in integrating the bureaucracy, achieving certain consensus and providing informal forms of coordination. A certain degree of institutionalization in state-business relations is also critical to reduce the risks of capture. When the channels of communication are informal and the mechanisms of control are weak, the risks are high, but they tend to be significantly reduced in an arrangement in which the objectives are clearly established, monitored and evaluated. A good example is Singapore, which shares a bureaucracy with a high *esprit de corps*, a strong culture of accountability and an independent and powerful anti-corruption agency.

²³ Devlin and Moguillansky, *Breeding Latin American tigers*.

²⁴ These countries include Australia, Ireland, Finland, New Zealand, Sweden, Spain, South Korea, Malaysia, Singapore and Czech Republic.

Another key requisite is the organization of councils which, joining representatives of government, business, labour and civil society, act as key spaces for exchange of information and consensus achievement. The experiences show that successful councils tend to be marked by the adoption of clear and transparent rules of recruitment and by the inclusion of members who enjoy a high reputation in their respective groups. Another key component is the existence of clear mandates and the support from top political authorities. In order to facilitate the achievement of consensus, the councils should adopt a forward looking approach, avoid current disputes and focus on negotiation and compromise. The support of experts contributes to settling a common ground on which to address the main challenges. A very good example is the Irish National Economic and Social Council (NESC), which played an important role in the 1980s in landing the foundations for a wide social pact. Later, it turned to issues related to industrial policy, competitiveness and innovation and was considered a key agent for the successful strategy of economic development.

Another critical point is the capacity to achieve coordination among ministries and agencies, very important in a political process marked by intra-bureaucratic conflicts and the overlapping of attributions. In the face of conflicting objectives, industrial policy tends to be favoured when it is an attribute of a powerful industrial agency, as well illustrated by the developmental state paradigmatic cases, in which the presence of powerful pilot agencies was critical to the preservation of strategies which, although under attack, were later revealed to be very important.

Another component of the successful industrial strategies summarized by Devlin and Mogueillansky was long term thinking aimed at forecasting tendencies and future events, a step towards creating consensus about future possibilities. Forecasting practices tend to be more effective when undertaken in panels joining experts in the industry and researchers with multi-disciplinary knowledge. Another critical issue is the capacity of evaluation and assessment. Devlin and Mogueillansky show that although only a few of the twelve countries investigated had undertaken impact assessment, most of them had increased their concern with the forms to assess the policies. The point is that assessment is not a trivial process and a rigorous assessment centred on empirical evidence is very difficult to undergo. An alternative is to combine methodologies, including creation of control groups, econometric exercises and contrafactual subjective evaluations.

Finally, a key factor is the political dimension of state capacity. Political support is essential to the adoption of certain policies which have a significant transformative impact. It is also critical for the preservation of policies which require continuity. As a consequence, limited

capacity to shape alliances, presence of persistent opposition and incapacity to achieve agreements tend to hinder the institutionalization of the policy on a long term basis.²⁵

A good illustration is provided by the comparison between Singapore and Thailand, countries which, after a phase centred on the attraction of foreign capital, attempted to adopt policies to aggregate value, diversify production and develop technological capacities. In Singapore, the government succeeded in orchestrating a set of measures to strengthen training and high education institutions and improve industrial and technological capacity. Policies were adopted to approximate scientists from enterprises and significant advances were achieved in R&D infrastructure.

The results were very different in Thailand. Many attempts were made to increase the quality of the universities, improve the training apparatus, modernize and promote key industrial niches, promote industrial technical design and create technological agencies. However, the large number of veto players impeded the adoption of a consistent strategy. The difficulties were related to the political system, marked by the large number of parties and by very broad coalitions. In the attempt to obtain political support, the government had to distribute key posts in ministries and agencies to political allies. This increased the number of veto forces and negatively affected the coherence of policies.

Doner, Hicken and Ritchie provide an interesting interpretation about the circumstances in which certain states obtain the necessary political support to implement a rupture with traditional strategies. A critical variable is systemic vulnerability, a result of external threat, domestic dissatisfaction and constraints of resources. In a context of high vulnerability and uncertainty, differences tend to be reduced and social mobilization orchestrated to defeat a common challenge and promote national objectives. This was the South Korean and Taiwanese situation in the 1960s and the case of Singapore after Great Britain's exit. In Thailand and Latin America, by contrast, the crises and external threat were never serious enough to provide a "compromise" able to overcome national divergences.

The Revival of Industrial Policy in Brazil – 2003 – 2007

Industrial policy was a key part of the Brazilian strategy of development from the 1930s to the 1970s. After a serious macroeconomic crisis in the 1980s, stabilization was achieved in 1994, accompanied by a package of liberal policies which included privatization, trade and financial liberalization and attraction of foreign capital. Segments of the Brazilian industry suffered from a macroeconomic policy characterized by high interest rates and overvalued

²⁵ Richard Doner, Allen Hicken and Ritchie Bryan. 'Political Challenges of Innovation in Developing World', *Review of Policy Research*, 26: 1-2 (2009), pp. 151-171.

exchange rates. Concerns were demonstrated with the fate of industry, but they were defeated by the powerful Finance Ministry, who was very sceptical in regard to selective industrial policies²⁶. Competitiveness was believed to be achieved through competition and market forces.

The victory of the opposition in the 2002 election marked the shaping of a different project of development. The elected president, Lula da Silva, had built his career as a trade union leader and had a commitment to revive Brazilian industry. He was supported by a group of industrialists who, frustrated with liberal policies, had departed from the main business associations and demanded an active state role.

Lula's team included economists and technicians who considered that an essential step was to recover the state's capacity for intervention. They also recognized that industrial policy had to be shaped through a close interaction with the private sector. An important step was the settlement of the Chamber of Economic Policy (Câmara de Política Econômica - CPE), joining ministers and top directors of economic agencies, with the objective of defining key directions of the economic program.²⁷ The debates in CPE and in the National Council of Economic and Social Development (CNPES) were very important for the definition of the main lines of the Industrial, Technological and Foreign Trade Policy (Política Industrial, Tecnológica e de Comércio Exterior - PITCE), adopted in 2004. PITCE had three main lines. The first was the promotion of horizontal measures, including the improvement of the institutional environment and the stimulus to innovation, exports and small and medium enterprises. The second was the promotion of strategic sectors: capital goods, information technology, semiconductors and pharmaceuticals. The third was the promotion of "sectors of future", including biomass, biotechnology, nanotechnology and renewable sources of energy.

The group behind industrial policy saw the necessity of an agency to increase the capacity to formulate and coordinate industrial policy. Coordination of industrial policy had been a critical difficulty in Brazilian previous industrialization, marked by frequent conflict of attributions and divisions inside the state. Previous experiences of government-business councils and sectoral coordination had been marked, with few exceptions, by low effectiveness. In addition, it was considered that the Brazilian state lacked technical capacity to formulate an integrated program of industrial development. This was the rationality behind the creation of the Brazilian Agency for Industrial Development (Agência Brasileira de Desenvolvimento Industrial - ABDI), which aimed at providing technical expertise to

²⁶ Jackson De Toni, 'Novos arranjos institucionais na política industrial do governo Lula: a força das novas ideias e dos empreendedores políticos', unpubl. PhD diss., University of Brasília, 2013.

²⁷ Evandro Mirra and Mario Sergio Salerno, 'ABDI – a que Veio, a que Ficou', in Jackson de Toni (ed.), *Dez anos de Política Industrial: Balanço e perspectivas* (Brasília: ABDI, 2015), pp. 113-130.

formulate an integrated plan for industrial development. It was attributed to ABDI two key roles: the main channel of interaction with business sector and a high level chamber to achieve inter-ministerial coordination.

ABDI was created in 2004 with legal private status and operational and financial autonomy. Its directors were appointed by the President of the Republic for a mandate of four years and its staff was recruited by meritocratic exams. However, the objective of creating a powerful agency to deal with the imperatives of industrial policy was blocked by one of the powerful Ministers, who argued that the role of industrial policy formulation and implementation should be played by the government and not by a specific agency. This veto was not something new in Brazilian history, given the politicians' resistance to losing control of measures and instruments.

As a consequence, ABDI was created with much less power than had been previously intended. It did not obtain the instruments and the capacity to implement and coordinate industrial policy. This result had very significant implications. The attempts at achieving coordination were undertaken in a very precarious way, in a process marked by the overlapping of attributions and dependence on personal networks.

The obstacles were temporarily compensated by the creation of the National Council of Industrial Policy (CNDI), composed by the main ministers related to the economic area, the president of the National Bank of Development (BNDES), ten business representatives and two labour union leaders. It was headed by the Minister of Development, Industry and Trade, Luis Furlan, a business man who revealed a very skilful articulator. When he left the government, in 2007, CNDI lost effectiveness.

CNDI was very well organized and had an annual schedule of meetings, prepared many months in advance. Each meeting was centred on up to three topics, in order to keep the focus and permit the adequate treatment. Another key feature was the support received from the president of republic. The meetings took place in the saloon at the presidential palace and the president used to show up to greet the participants.²⁸

CNDI revealed a very effective space for strategic debate and search for coordinated solutions. It permitted the approximation between the Finance minister and those ministers related to development, industry and science and technology. Secondly, the council, by joining the relevant actors, provided agility for the adoption of the necessary measures. Thirdly, it provided the dialogue between government and top productive sector representatives. In brief, CDNI provided a space to achieve agreements which would be very

²⁸ Jackson De Toni, 'Novos arranjos institucionais na política industrial do governo Lula'.

difficult by other means. It worked as an office of ideas responsible for important projects for the development of Brazilian industry.

From 2003 to 2007, CNDI approved relevant measures, which included the approval of reduction in tax on strategic sectors and the adoption of a special tax regime for capital goods. Important sectoral programs were adopted and CNDI approved the creation of a state enterprise in biotechnology and of a law for the information technology sector. The Brazilian Agency of Exports Promotion was also reformed.

A critical measure was the Innovation Law, in 2004. The CNDI debated the subject three times and achieved the conclusion that the problem was inadequate regulation and lack of instruments. Brazil suffered from a strong dissociation between science and technology and scientists and researchers had very little incentive to cooperate with enterprises. The Innovation Law approved changes in regulations which permitted the discrimination of strategic sectors to receive public resources. Measures were also adopted to approximate scientists and researchers from enterprises. Temporary leaving and additional payment were allowed to researchers employed in public institutions in order to collaborate with other institutions and enterprises. By doing this, Innovation Law contributed to changing the culture of the universities and increasing the disposition to cooperate with the business sector. In brief, the three key contributions of innovation Law was to stimulate corporate innovation, approximate science and technology and produce an environment favourable for partnership among universities, technical institutes and companies.²⁹

Innovation Law was followed by the Good Law (Lei do Bem), which significantly facilitated the concession of incentives to enterprises engaged in the innovation effort. Before the Law, the enterprises had to submit a project and participate in an application process which was bureaucratic and time consuming. As a result of the Good Law, the enterprises simply declared how much they spent and automatically deduced it from the due tax.

PITCE played an important role by bringing industrial policy back to the agenda. The creation of ABDI improved expertise and technical capacity and CNDI provided a rare experience of successful inter-ministerial coordination and cooperation with the private sector. PITCE was also marked by the expansion of support to sectoral programs and by the expansion of resources to fund innovation. Nevertheless, PITCE faced significant limits. A critical one was the limited scope of the sectors supported and the weak impact on industrial

²⁹ Mansueto Almeida and Ben Ross Schneider, *Globalization, Democratization and the Challenges of Industrial Policy in Brazil* (Ministério das Relações Exteriores – Foreign Relations), available at <http://sistemas.mre.gov.br/kitweb/datafiles/IRBr/pt-br/br/file/CAD/LXII%20CAD/Economia/Almeida%20%20Schneider%20612%20v7.pdf>

development³⁰. In fact, the main advances took place in the policies of innovation, which is explained by resistance, inside the Finance Ministry, against selective industrial policies.

Productive Development Program – (Programa de Desenvolvimento Produtivo)

In 2008, the government adopted the Productive Development Program (PDP), which represented a substantial increase in magnitude. At the moment of PDP formulation, the economy was growing at high rates and the government saw the opportunity to adopt a very ambitious program to push industrial activity. PDP contemplated a set of horizontal objectives and had also three axes centred on specific sectors. The first one was centred on strengthening the sectors in which Brazil had a comparative advantage, including oil, gas, petrochemical, aeronautic, pulp and paper, mining, bioethanol, animal protein and steel.³¹ The second axis was centred on building capacity in sectors intensive in technology and with high potential, including segments of the health sector, telecommunications, nuclear energy, defence, biotechnology and nanotechnology. A third set of measures was targeted on sectors which faced problems of competitiveness and threat from international competition. This axis joined the largest number of sectors, including textiles, automobiles, shipbuilding, capital goods, textile and apparel, timber, furniture, cosmetics, housing, services, shipbuilding, leather and footwear, biodiesel, plastics, consumer electronics and toys.

The main instrument was BNDES's loans, which were significantly increased as a result of the government's decision to transfer resources from the Treasury. From 2006 to 2010, BNDES disbursement grew from R\$ 51 billion to R\$ 168 billion. As a response to the international crisis, the Program of Investment Sustaining (PSI) was created to provide credit in favourable conditions for investment projects. Other instruments included fast depreciation of capital, tax exemption and subventions, stimulus to innovation and technical support.³² A strong emphasis was also given on government purchase policies and on exigencies of national content. They were employed mainly in the oil and gas sector where the national state enterprise, Petrobrás, directed a large part of its demand towards promoting the capital goods and the shipbuilding sectors.

PDP represented a significant offensive to stimulate Brazilian industry. The instruments and the significant amount of resources encouraged investments in different economic sectors and softened the immediate impacts of the crisis. It is possible, nevertheless, to

³⁰ Luciano Coutinho, João Carlos Ferraz, André Nassif and Rafael Oliva, 'Industrial Policy and Economic Transformation', in Javier Santiso and Jeff Dayton-Johnson (eds.), *The Oxford Handbook of Latin American Political Economy* (New York: Oxford University Press, 2012), pp. 100-130.

³¹ Ian Ramalho Guerreiro, 'Formulação e Avaliação de Política Industrial e o Caso da PDP', unpubl. PhD diss., Universidade Federal do Rio de Janeiro, 2012. There were specific objectives for each sector.

³² Ibid; Coutinho, Ferraz, Nassif and Oliva. 'Industrial Policy and Economic Transformation'.

emphasise features which negatively influenced its chances of success. The first one is related to the broadness of the policy and to the decision to support a large number of sectors, a result of the political difficulties to exclude sectors. Despite the presence of disguised selective mechanisms, a broad policy, combined with the lack of evaluation, increased its vulnerability to criticisms that the government was giving money to unproductive enterprises.

A second criticism is related to the precarious institutional structure and to the obstacles to coordination. Despite the complex structure of governance (explored below), inter-ministerial integration was rare. CNDI did not work effectively and the list of integrated programs was more a list of the government's intentions than something real.³³ Similarly, public-private consultation did not work as intended. In addition, the competitive forums, settled at sectoral level, failed to establish a routine, met very rarely, had a very broad agenda and did not have the necessary support. Fourth, the excess of organs involved provoked overlapping of attributions and reduced agility.

A third and very serious limit is related to the lack of monitoring and evaluation. Although sectoral targets were adopted for exports, R&D and participation of small and medium enterprises, they were dependent on other variables and were not necessarily related to the industrial policy measures. In most cases, they said very little, since the objective was merely to support the industrial sector, without exigencies related to productivity or competitiveness. In addition, there were no exigencies related to sectoral change, re-organisation of production and other initiatives to increase productivity and competitiveness. In the face of the lack of evaluation, the government had little capacity to know if the policy was working³⁴.

A last criticism is related to the macroeconomic impacts, since BNDES operations had a clear fiscal impact. This is explained by the fact that the Treasury issued bonds at market rates, while BNDES conceded loans at subsidized rate. As a consequence, the substantial increase in BNDES loans was made through an increase in public debt. This is an important issue when one considers the necessity to conciliate industrial and macroeconomic policies, a critical challenge in Brazil's previous (and present) process of industrialization.

The Great Brazil Plan (Plano Brasil Maior - PBM – 2011-2014)

In 2011, the Dilma Rousseff government adopted the Great Brazil Plan (PBM), a plan which shared many similarities with PDP. PBM also combined a horizontal and a sectoral

³³ De Toni, 'Novos arranjos institucionais na política industrial do governo Lula'; Mirra and Salerno, 'ABDI – A que Veio, a que Ficou'. According to Mirra and Salerno, PDP was basically a BNDES' policy, which suffered from a lack of coordination among policies and instruments.

³⁴ Almeida and Schneider, *Globalization, Democratization and the Challenges of Industrial Policy in Brazil*.

agenda, given significant attention to infrastructure, reduction in energy costs, increase in labour force quality and stimulus to innovation. PBM “innovates” in two aspects. The first one was the emphasis given to protection, a response to quantitative easing and to other measures considered by the government as predatory and unfair competition. This is very well illustrated by changes in regulation of public purchase policy allowing the acquisition of domestic goods at prices up to 25% superior to international competition.³⁵ The second aspect is related to the strengthening of the policies adopted in the oil and gas sectors and to the efforts of intensifying the employment of public purchase policies in the health and defence sectors.

BNDES loans continued to occupy the central role, given the decision to maintain and increase the transfers from the Treasury, and strong emphasis was also given on tax exemptions and special tax regimes. Another measure was the reduction in payroll tax in several sectors, an intention to reduce labour costs. Although having a wide scope, PBM also promoted a disguised choice of sectors, prioritizing those with a high technological spillover, such as ethanol, defence, aeronautics and petrochemicals.³⁶

Another critical characteristic of PBM was its compensatory nature. The government justified certain measures as a form to compensate enterprises for other problems in the economy, such as problems of infrastructure and the excess of complexity in the tax system. Given the incapacity to approve structural reforms, industrial policy was used as a form of compensating the enterprises for factors which negatively affected their competitiveness. As Schapiro³⁷ points out, most of the PBM instruments were centred on measures of systemic nature, dealing with deficiencies which affected the industrial sector as a whole.

PBM promoted significant advances in the technological area. The adoption of the plan Inova Empresa, in 2013, represented an effort to stimulate basic and applied research and to develop centres of expertise in science and technology. Inova Empresa conceded R\$32.9 billion (US\$ 13.9 billion in December 2013) to support innovation, arising a huge demand from the private sector. A large part of the resources was channelled to sectors intensive in knowledge and considered to be of high potential.³⁸ An important advance took place in the Financial Agency for Studies and Projects (FINEP), subject to a process of restructuring

³⁵ Ibid.

³⁶ Interview with Mauro Borges Lemos. Ex Minister of Development, Industry and Trade. Belo Horizonte, 28 Apr. 2015

³⁷ M.G. Schapiro. ‘Ativismo Estatal e Industrialismo Defensivo: Instrumentos e Capacidades na Política Industrial Brasileira’, in Alexandre Gomide and Roberto Pires (eds.) *Estado, Democracia e Desenvolvimento – arranjos institucionais de políticas críticas ao desenvolvimento* (Brasília: DIEST/IPEA, 2014).

³⁸ Glauco Arbix and João De Negri, ‘Avançar ou Avançar na Política de Inovação’, in Jackson De Toni (ed.), *Dez anos de Política Industrial: Balanço e perspectivas*. (Brasília: ABDI, 2015), pp.41-60.

aimed at increasing the instruments and improving its services. Internal processes were modernized to provide agility and quality in the analyses of the projects.

PBM shared with PDP the difficulties in providing intra government coordination.³⁹ The coordination was not an attribute of a state agency, but took place in “institutional hubs” with representatives of different agencies and ministries. The result was an empty institutional arrangement: the formal decision competences and attributions were not in the councils responsible for coordination, but in the respective organs. The representatives have fidelity to their respective organs and the measures approved were related to the organs’ necessities and possibilities, and not to industrial policies priorities. The difficulties are very well illustrated by the power held by the Finance Minister, who responded for the largest number of PBM measures. The problem is that the mandate of the Finance Ministry is not to promote industrial policy, indicating a conflict between the priorities of the Ministry and the necessities of industrial policy⁴⁰. Another problem came from the overlapping of attributions and the incapacity to identify the role of each organ and make them accountable for the measures.

Difficulties also marked public-private interaction. Public-private interface did not follow a decision making routine and lacked tools of public control. The sectoral competitiveness councils dealt with very general topics, lacked an effective agenda and failed to establish a credible relationship with the private sector. As Schapiro⁴¹ points out, it was not possible to identify a path going from the council meetings and decisions to the adoption of policies. As a consequence of the debility of the formal channels, informal forms of public-private interaction gained importance.

In addition, CNDI ceased to have a structured schedule of meetings and objectives and the competitive councils had a fragmented representation, joining different business associations, federations and enterprises. The excessive number of interlocutors hindered effective and agile decision making and impeded an encompassing business representation. Business representatives acted as distributive coalitions, bargaining for immediate and particularistic interests.

Another difficulty was the already mentioned broadness of the policy and the lack of conditionality. Most of the incentives were conceded in a compensatory nature, independent on performance in terms of productivity or competitiveness. These measures were ineffective

³⁹ Schapiro, ‘Ativismo Estatal e Industrialismo Defensivo’.

⁴⁰ Ibid. As Schapiro points out, quoting one interviewer, it is impossible to do industrial policy without the Finance Minister, but it does not mean that the Finance Ministry knows how to do industrial policy. So, it is necessary to have an adequate space to debate the topics and make the decision, also having the power to implement them.

⁴¹ Ibid.

in terms of promoting transformation and improving the patterns of competitiveness.⁴² A similar problem was the lack of evaluation. According to Mauro Borge Lemos, president of ABDI and Minister of Industry, Trade and Development in that period, attempts to introduce evaluation were blocked by influential people inside the government. A similar attempt, made to condition the reduction in payroll tax to productivity performance, was also refused.⁴³

Both PDP and PBM represented a return to an intense developmentalist program to strengthen Brazilian industrialization. However, the programs had many difficulties in design and implementation, being very distant from the industrial policy directions suggested by Hausmann, Rodrik and Sabel.⁴⁴ Despite the advances achieved in specific areas and programs, features such as lack of focus, excess of sectors, incapacity to specify credible targets and the lack of evaluation reduced the programs' transparency and effectiveness and increased their vulnerability. In addition, effective policies required to deal with two critical points: the low institutional capacity of coordination and the low capacity to impose burdens and concessions on the business class.

Industrial Policy in Brazil –general evaluation and challenges

From 2003 to 2014, industrial policy returned to the agenda and the government consolidated a substantial effort to support industry. The process was marked by institutional advances and by support to many economic sectors. Significant advances marked the policy of innovation, with the approval of Innovation Law, the strengthening of FINEP and the increase in resources to fund the activity. BNDES resources for innovation increased from R\$ 161 million in 2004 to R\$ 5.2 billion in 2013 and FINEP resources increased more than 20 times since 2002. As a consequence, R&D expenditure as a share of GDP increased from 1.01% in 2003 to 1.24% in 2012.⁴⁵ Although the numbers are still small, the new policies and institutions have potential for further advances.

Notwithstanding the advances, industrial policy was marked by features which reduced its effectiveness. A very serious liability was the failure to institutionalize a proper structure of coordination. The process was marked by precarious inter-ministry coordination, overlapping of competencies, failure to provide reliable channels of public-private interaction and strong dependence on personal networks. Another difficulty stemmed from the fragmented corporatism and the vicissitudes of business representation. Industrial associations were

⁴² Ibid.; Almeida and Schneider, *Globalization, Democratization and the Challenges of Industrial Policy in Brazil*.

⁴³ Interview with Mauro Borges Lemos, ex Minister of Development, Industry and Trade, Belo Horizonte, 28 Apr. 2015.

⁴⁴ Hausmann, Rodrik and Sabel, *Reconfiguring Industrial Policy*.

⁴⁵ Arbix and Negri, 'Avançar ou Avançar na Política de Inovação'.

subjected to a deep process of modernization. However, the pattern of business-state relationships, marked by many associations, lack of institutionalized routines and weakness of formal forums, has not been favourable to an encompassing process able to achieve the necessary agreements to modernize Brazilian industry. The process has been marked by particularistic demands and individual forms of access into the state apparatus.⁴⁶

Another difficulty is related to the broadness and imprecision of the policy, in terms of both sectors and objectives. The policy is not centred on clear objectives such as an increase in competitiveness or productivity. In many cases, the objective is to support sectors in difficulties and to compensate for other problems in the economy. A related criticism is that most of the measures neither correct market failures nor promote diversification. Another problem is the lack of evaluation of the impact of the policies; in general, there is no evaluation, but only contra-factual arguments saying that in the absence of the program things would be worse. In brief, industrial policy is very far from the direction of having clear and transparent targets, a form to increase support and legitimacy. The broadness and lack of precision increase its vulnerability and make it an easy target for opposition politicians.⁴⁷

Brazil has suffered from a precocious process of deindustrialisation. The share of industry in GDP has reduced before achieving industrial density and the capacity to insert itself into international productive chains. Brazilian industry, after decades of macroeconomic crisis and neoliberal experience, lost momentum and capacity to insert itself successfully into strategic sectors, such as microelectronics and electronic consumption goods. Productivity has been stagnated since the 1980s. The domestic challenges are substantial, including infrastructure problems and regulatory aspects related to the Brazilian cost. The tackle of these challenges requires a substantial effort, marked by the utilization of the right instruments and by high capacity of coordination. It has more chances to succeed if pursued through a clear and transparent industrial policy, determining targets, making clear what the policy intends and providing monitoring and accompaniment. In this case, it strengthens legitimacy and the chances of obtaining a mandate to reverse deindustrialization. A clear and transparent industrial policy also facilitates the generation of inter-party agreements which may, in future, be critical for the maintenance and improvement of the policy.

⁴⁶ Schapiro, 'Ativismo Estatal e Industrialismo Defensivo'; Almeida and Schneider, *Globalization, Democratization and the Challenges of Industrial Policy in Brazil*.

⁴⁷ Mansueto Almeida, Marcos Lisboa and Samuel Pessoa, *O Ajuste Inevitável ou o País que Ficou Velho Antes de se Tornar Desenvolvido* (manuscript, Jul. 2015), available at <http://www.alertatotal.net/2015/07/o-ajuste-inevitavel-ou-o-pais-que-ficou.html>, p. 8: "políticas de proteção social podem ser eficazes em casos específicos, desde que acompanhadas de metas de desempenho e avaliação cuidadosa de seus resultados, e a sua revisão em caso de fracasso. A expansão disseminada de benefícios públicos, sem a adequada gestão e controle de resultados, resulta, apenas, em subsídios e privilégios privados, sem a contrapartida do maior crescimento econômico e da geração de empregos"