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Marta CZARNECKA-GALLAS*

The Efficiency of Industrial Policy in 21st Century? The Case of Brazil

Summary: The article aims to identify the key factors that undermine the efficiency of industrial policy in Brazil. It also draws attention to the importance of academic research into the nature and implications of industrial policy in the modern economy.
The analysis starts with a systematization of industrial policy-related terms and a literature review. Because discussions on the topic are usually ideologically-biased, the author says, most of the existing studies are heavily polarized. Some economists strongly advocate governmental industrial programs, others express definite disapproval.
The article contributes to the existing research by outlining key theoretical problems related to industrial policy and by highlighting the different approaches to the subject that have emerged in response to the changing paradigm of state interventionism.
In light of the theoretical framework, Brazilian industrial policy is studied. Brazil warrants special attention, Czarnecka-Gallas says, because a historical analysis of government intervention in that economy confirms the importance of industrial policy – despite substantial policy changes and different methods used by the authorities over the years.
After a brief summary of how industrial policy was applied in Brazil in the postwar era, the author looks at some vital components of the country's current industrial strategy and confronts it with empirical data that point to a disparity between official goals and practice. As a consequence, in contrast to the strategy of Brazil's economic development, which is based on industrial growth and innovation enhancement, the structure of the country's economy and its trade patterns show that it is commodities and low-tech industries rather than innovative sectors that are driving the expansion of Brazil's trade, the author says.

Keywords: industrial policy, international trade, industrialization, development, Brazil

JEL classification codes: O14, O21, O24, O25, O54

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* Ph.D. student at the World Economy Collegium Warsaw School of Economics, e-mail: marta.cz@interia.eu

Introduction

Few countries have gone through a more profound change of development strategy and are marked by a stronger presence of industrial policy than Brazil. The country, which in the 1930s opted for heavy state interventionism and later became a strong supporter of a policy known as Import Substitution Industrialization (ISI), completely turned around its development strategy in the early 1980s by adopting a *laissez-faire* approach. However, that radical change of heart, aimed at enhancing market forces and limiting government intervention, did not last long. Overall, within the space of three decades, state intervention in Brazil was first glorified, then rejected and eventually reinstated.

The debate on the role of government in economic growth has not lost its momentum, even though recent experiences have caused it to refocus from yes/no questions about government involvement in the market to questions concerning the efficiency and long-term consequences of state intervention. Moreover, measures inspired by the Washington Consensus – which covered all kinds of economic activities and included macroeconomic adjustment, rearrangement of the financial sector, privatization of state-owned enterprises (SOEs), liberalization of trade, and welfare and labor reforms – have changed the Brazilian economy immensely and fostered a new approach to development. Neoliberal reforms were carried out in tandem with a political transformation from authoritarianism to democracy, a transition common to many Latin American countries. This may serve as a partial explanation for the failure of the initial stages of liberalization in the region because a fledgling democracy not deeply rooted in the institutional system usually offers more opportunities for special-interest groups to pursue their goals. Nevertheless, structural reforms created a new base for a modern Brazilian economy and strongly tied the country to the global marketplace.

Nowadays, in the post-democratization era, the debate on Brazil's development path remains valid and seems to favor state-led growth, which has traditionally been a crucial component of the Brazilian economic policy ethos. The government's right to shape the country's economic life and the strong position of industrial policy have prevailed despite much criticism from international financial institutions.

This article does not aim to provide an answer to whether or not industrial policy should be actively conducted by governments, but it investigates the problem of the emergence of a new industrial policy strategy that dominated Brazilian economic and political life at the beginning of the 21st century and was promoted by the government of Luiz Inacio Lula da Silva from 2003 to 2011[1]. The author attempts to provide an answer to what role industrial policy

[1] The controversy over state interventionism in the form of industrial policy, for example, is discussed in the next section of the article. For the purpose of this particular study, the author refuses to make a statement on whether an active state-led industrial policy is the best option or if such a policy should be completely abandoned (yes/no question), but rather

has played in the structural adjustment and economic turmoil in Brazil in the 1990s and if Brazil's recent economic performance results from a switch in industrial policy from import-substitution to a pro-export approach? Moreover, the article discusses the main features of the new industrial policy framework established by the government of Lula da Silva and continued to this day, and evaluates its feasibility in the light of the real internal processes and international trade.

The remainder of the article is organized as follows: Section I provides a theoretical framework for industrial policy, focusing on its definition and evolution. In Section II, the Brazilian industrial policy is analyzed, with a special focus on the gradual change from an import-substitution approach to an export-oriented strategy. Section III deals with the country's current industrial policy, and Section IV examines the drawbacks and feasibility of Brazil's industrial policy. The concluding remarks summarize the findings and investigate if industrial policy is an efficient development-enhancing tool in 21st – century Brazil.

Industrial policy: theoretical framework

Under the recently prevailing neoliberal economic ideology, the best industrial policy is no industrial policy at all. This model – having its roots in the belief that the government should not interfere with the market as the latter regulates itself in the most efficient way – has prompted many governments, including those in developing countries, to withdraw from industrial policy programs. However, the latest economic crisis, combined with the varied pace of growth across economies, has revived the debate on the need for a comprehensive industrial policy. Depending on their ideological background, governments across the world are carrying out different reforms and programs in order to support national industries, enhance competitiveness and boost innovation. The ideas of an effective industrial policy vary considerably, ranging from those advocating horizontal measures to those strongly supporting vertical measures such as picking winners and developing infant industries.

Industrial policy and particularly its influence on national competitiveness and economic development is a controversial topic, both theoretically and empirically, and one that until recently was strongly neglected by mainstream economists. The problem is incredibly complex, which stems from the fact that the insight into the role of economic policy in economic growth is still highly unsatisfactory. This seems even more controversial as far as selective policy is concerned. Few mainstream economists support the idea that it should be for the government to decide what production sectors should be developed or created. However, the latest economic changes fueled by factors including

tries to assess the real situation and focuses on highlighting the weaknesses of the existing system.

the global economic crisis have caused economists to rethink many concepts, among them industrial policy.

The problem of industrial policy is at the center of the contemporary discussion on the importance of national competitiveness and factors contributing to its growth. The relevance of this discussion is of high importance not only for highly developed states but also – and perhaps even more so – for developing ones (as these countries are the most active in designing competitiveness enhancing policies) as well as for transition economies, which at the beginning usually withdrew from state intervention and industrial policy as tools easing the process of system transformation. In the 1990s, the need appeared for a deeper analysis of methods for gaining national competitiveness in transition states and more attention was paid to industrial policy in the wake of an international trade liberalization plan launched by policy makers.

Today the discussion on the need for an industrial policy has reemerged among both policy makers and the public. According to the World Competitiveness Report 2011, a proactive industrial policy has been a widespread choice among governments. "The reasons for this are manifold," the report says, "and include, for instance, structural change and economic diversification, pressure from international competition, disappointment with the results of laissez-faire policy, the wish to 'guide' development, a desire to strengthen and protect national champions, and state intervention in response to various crises."

Terminology related to industrial policy

Industrial policy is a flexible and ontologically grounded concept that defies a precise definition acceptable to all. Depending on the philosophical orientation of the author, industrial policy may cover anything from corporate activities to regional development plans. The concept is understood differently by policy makers in the United States and the European Union. The U.S. International Trade Commission defines industrial policy as "coordinated government action aimed at directing production resources to domestic producers in certain industries to help them become more competitive." The EU takes a different approach to the subject in its Lisbon Agenda, assigning to industrial policy the role of a proactive "provider" of the right framework conditions for enterprise development and innovation in order to make the EU an attractive place for industrial investment and job creation, taking into account the fact that most businesses are either small or medium-sized enterprises (SMEs).

In a narrow sense, industrial policy refers to a range of sector measures directly aimed at companies and industries. However, in the scientific literature, it is common to refer to a broader definition. According to it, industrial policy is a set of government actions affecting companies in different productive sectors (including service companies) in a country and, more specifically, influencing their ability to compete both domestically and abroad. Such an interpretation includes microeconomic policies (antitrust, innovation and internationalization), the provision of broad infrastructures (transport, communications, education,

science and research), and sector-based aid to companies. As a part of government economic policy, industrial policy is a tool aimed at reaching various goals from a desirable structure of foreign trade through enhancing international competitiveness to national wealth maximization.

The World Bank sees industrial policy as a policy process designed to "foster restructuring and technological dynamism" and one that "offers solutions that go beyond the traditional focus on background conditions and improvement of the investment climate." The World Bank justifies the relevance of industrial policy on the basis of certain empirical evidence cited in its reports. This includes the surprising frequency of spontaneous growth episodes in "poorly" endowed economies; sharp disparities in regional developments within national economies under the same general rules; and the periodic successes of economies that change their institutional endowments by growing (China) rather than growing by fixing the endowments first. The latter seems to contradict the belief of conventional economics that economies with appropriate endowments (investment climate, institutions, property and trade laws, etc.) grow, and those without do not. From this perspective, the World Bank proposes that policy making should be viewed as a process dealing with vested interest mandates focused on entry points, priorities, sequencing and alliances. Such an approach considers the institutional agenda of investment climate analysis as a vast "wish list" of required changes rather than a realistic policy proposal: "(…) From a broader analytical perspective, one needs to view the capabilities of governments, private sector firms and other agents as endogenous variables. To be useful for a policy maker, a theory of industrial policy should view policy making and policy implementation as a focus of analysis in itself, as an endogenous process of experimentation and learning, rather than conventionally brief afterthought of positive analysis."

Academics provide various definitions of industrial policy, depending on personal inclinations. In the literature there is a clear distinction between broad and narrow approaches to industrial policy.

The first one, represented by J. Pinder, refers to industrial policy as one that encompasses all policies aimed at supporting industry. In this case, industrial policy can be associated with anything from fiscal/monetary incentives for investment, direct public investment and public procurement programs, through incentives for investment in research and development, to major programs for the creation of "national champions" in strategic sectors, and policies to support small and medium-sized enterprises. Moreover, viewed in this way, industrial policy has multiple and diverse goals exceeding those related to production and the creation and improvement of infrastructure. Social institutions and labor programs play an important role in this process.

The second, narrow, approach is connected with a certain aspect of governmental activity, with specific tasks attributed to the state. Those authors who, like R. Reich, are avid supporters of a selective industrial policy, tend to define it as a set of government actions targeted at supporting industries that have major export potential and job-creation capacity as well as the potential

to directly support the production of infrastructure. On the other hand, authors who oppose heavy state involvement in the economy may define industrial policy in a way similar to C. Johnson as "government activities that aim to support the development of certain industries in a national economy to maintain international competitiveness."

Recent publications on industrial policy tend to use the approach presented by H-J. Chang, who defines industrial policies as "governmental actions supporting the generation of production and technological capacity in industries considered strategic for national development." The discrimination among activities, sectors and agents is justified by their potential to boost the overall economy and the assumption that there exist substantial quality differences between various economic activities and their contribution to the economy's development.

The state's involvement in industrial policy may vary from a very limited to a crucial one. In their paper *Theory and Practice of Industrial Policy Evidence from the Latin American Experience*, W. Peres and A. Primi distinguish between four typical ways in which the state can be engaged in industrial policy. According to the paper, the state can act as: a) a regulator, e.g., by setting tariffs and production levels for certain activities, or by creating fiscal incentives or subsidies to support industrial sectors; b) a producer, participating directly in economic activity, as in the case of state-owned enterprises; c) a consumer, ensuring a market for strategic industries and economic activities through public procurement programs; d) a financial agent and investor, influencing the credit market and promoting the allocation of public and private financial resources to industrial projects considered strategic because of their impact on productivity, or because of their capacity to absorb labor.

There have also been many attempts to describe industrial policy by dividing it into separate sets of initiatives. One of the most common distinctions is offered by Lall and Tuebal (1998), who single out three main types of industrial policy:

- "functional" policies that improve market operations; for example, policies designed to enhance competitive pressure (competition policy; tariff reduction),
- "horizontal" policies that cross sectors, such as generalized incentives to promote greater R&D and training,
- "selective" policies designed to promote the advancement of particular sectors (for example, preferential access to capital; sector-specific subsidies) or particular firms (for example, the promotion of "national champions").

However, every state can apply its own categorization as far as the description of the term is concerned, as shown by research reports and government documents on economic and industrial policy.

Industrial policy components

An active industrial policy became a part of the growth and industrialization strategy of a great majority of developing countries and some developed states in the early 1950s. One of the first widespread solutions adopted by governments

was an attempt to control trade in a way that would favor domestic firms and influence their investment decisions. Consequently, protectionism, high tariffs and various entry barriers imposed on foreign companies gave rise to what is known as Import Substitution Industrialization (ISI). The main idea behind it was to protect local enterprises and the domestic market as a whole against foreign competition and at the same time enable domestic firms to learn, implement innovations and increase their international competitiveness. Trade policies were combined with various other tools designed to increase technological capability and investment in research.

The least controversial use of industrial policy concerns technological innovations. The widespread notion of innovation-based economic growth protected policy makers implementing innovation-oriented policies from the common criticism of industrial policy opponents. However, governments approached market innovativeness and technological improvement in a variety of ways. One of the most common instruments was the emergence of national innovation systems. The appearance of various public research institutes and public enterprises that could be an important source of innovations dates back to 1940s' Latin America. In the 1950s, several important pro-science, technology promoting agencies were set up in order to provide funds for technological development, coordinate research and development programs, spread technological information, and administer the system of property rights [Cimoli and Primi, 2004]. The largest agencies included the Brazilian National Council for Scientific and Technological Development (CNPq), launched in 1951; the Argentinean National Council for Scientific and Technological Research (CONICET), established in 1958, and the Mexican National Council for Science and Technology (CONACYT), founded in 1970. To encourage investment in innovative sectors, most developing countries established special research institutes. Examples include the Argentinean National Atomic Energy Commission and the Institute of Industrial Technology (both launched in the 1950s), the Brazilian Aerospace Technology Center (CTA), the Mexican National Institute for Nuclear Research, the Petroleum Institute, and the Institute of Water Technology [Casalet, 2003]. At the same time, the governments of many countries, including Bolivia, Columbia, Peru, and Venezuela, made use of the law to force investors from abroad to disinvest in favor of domestic companies and to legally limit profit repatriation [DiMaio, 2008]. An even stronger commitment of the state to enhanced technology-based industrialization and knowledge accumulation could be observed among the East Asian "tigers." One example is South Korea, where the government adopted several measures starting from the early 1960s. At first, foreign technology was welcome, technology imports were highly subsidized, and various activities involving technology – such as the transfer costs of patent rights and technology import fees – were tax deductible. Moreover, profits from technology consulting services and those achieved by foreign engineers were exempt from income tax [Amsden, 1989]. However, in the late 1960s, the government started to promote domestic technological investment and private research and development in order to decrease the

country's dependence on foreign investors and foreign technology and mitigate the brain drain problem (Mazzoleni and Nelson, 2006).

Comparing East Asian and Latin American governmental initiatives in the area of technology and investment promotion, it can be noted that in Latin America governments played a far lesser role as venture capitalists and pioneers in high-technology sectors [DiMaio, 2008].

"Given an industrial structure characterized by small and medium enterprises (SMEs), the creation of high-tech firms needed an initial period of acquisition of foreign technologies. To this aim the import, adaptation, diffusion and development of new technologies was heavily stimulated. Besides the welcome policies for foreign direct investments (FDI), the favorite instrument of technology development has been the creation of science parks and technology clusters. Even if the cooperation between the public and the private sector is a characteristic feature of the technological upgrading strategy of the country [Lall, 2004], the public sector has also developed new technologies on its own. Public enterprises entered several heavy and technological advanced industries when the private sector was unable to develop the necessary capabilities. In addition, the government elaborated a number of venture capital projects and comprehensive Technology Plans to guide the allocation of resources" [Di Maio, 2008].

Another strategy used by the governments at that time was to get access to technology through foreign direct investment (FDI). According to Amsden, there were two different approaches to FDI among developing countries. The first was represented by so-called independentists (South Korea, Taiwan, China, and India) and was characterized by minimal dependence on FDI and multinational enterprises, accompanied by high reliance on domestic innovative capital and potential and the use of industrial policy for launching national champions. The second approach, promoted by so-called integrationists (Indonesia, Malaysia, Argentina, Brazil, Mexico, Chile, Thailand, and Turkey), was more complex and more heterogeneous. Amsden differentiates between two sub-groups within the integrationists – active and passive ones. While the first subgroup extensively counted on technological spillover effects from the activity of multinationals and tried to use selective policies to reach high-value-added production, the second did not aim at selecting multinationals but at attracting them through the macroeconomic climate and business facilitation programs [Amsden, 2001].

The technological policies of the advocates of Import Substitution Industrialization were accompanied by various attempts to improve human capital by eradicating illiteracy, increasing the number of skilled workers and promoting secondary and higher education, with a special focus on engineering. Undoubtedly, these initiatives were among the most successful measures adopted by the governments of the postwar era. Although they were not the core of industrial policy, one may argue that they were an indispensible element of reaching industrial policy aims, which usually revolved around upgrading the economy in terms of technology and innovation.

Brazil was the most active advocate of educational policies in Latin America. In the late 1950s, two important institutions were launched in the country to promote higher education and provide scholarships to students. These were CAPES, a ministerial agency for coordination and human capital improvement, and FINEP, an agency set up to finance university studies and various academic projects. Active promotion and financial help for students resulted in a substantial increase in the country's student population, from 1 percent of the total number of residents in 1950 to 11 percent in 1980 (UNESCO Statistical Database). The success in educating engineers, a priority for the Ministry of Education, was not spectacular, though. According to Amsden, the proportion of engineers in the total number of students initially increased to 12 percent in 1960, but it then dropped below 10 percent in the early 1990s [Amsden, 2001]. A similar pattern could be observed in other Latin American countries, including Argentina and Mexico.

East Asian countries showed a different trend. They made even stronger efforts to increase the quality of domestic human capital as an important strategy accompanying the Import Substitution Industrialization approach. In particular, when the governments focused on high-technology, high-value-added production, the targeted educational policies expanded. The number of students expanded from almost zero in the early 1950s to double digits in the 1980s, with the most spectacular growth in South Korea, where enrollment reached a record 34 percent in 1985, and in the Philippines, where the student population mushroomed to account for 25 percent of the total number of residents (UNESCO Statistical Database). The growth in the number of students was accompanied by an increased percentage of engineers. In South Korea, the figure rose from single-digit territory in the 1950s to 19 percent in 1960 and 21.7 percent in 1990. In Taiwan, the proportion of engineers in the overall student population increased from 19.8 percent in 1960 to 30.2 percent in 1990 [Amsden, 2001].

Singapore was an impressive case of effectiveness in educational policies. The country, similarly to Hong Kong, was less active in industrial policy application, while instead it focused on education, innovation and investment in human capital. In fact, in the mid-1980s, the country ranked second in the world in terms of the proportion of students and engineers in the total population, which is believed to have substantially increased Singapore's international competitiveness – due to the rapid acquisition of foreign technology, its effective exploitation, and in consequence faster economic growth [Kim, 1993].

The illiteracy rate was decreased in every developing country during the ISI era. In Brazil, the figure dropped from 51 percent in 1950 to 29 percent in 1960 and 22 percent in 1985; in Chile, the drop was from 20 percent in 1950 to 8 percent in 1985; and Mexico went down from 35 percent to 17 percent in 1985. Even better results were recorded in developing countries in Asia. In South Korea, where illiteracy ran at 85 percent in 1950, it went down to 5 percent by 1985; in Thailand the improvement was also significant – from 48 percent to 7 percent (UNESCO Statistical Database).

Educational policies accompanying core industrial policies undoubtedly increased the quality of human capital in all the studied economies. However, as noted by some academics, the most spectacular results were achieved by countries where science operated close to the market [Katz, 2000]. That arrangement was missing in other states, especially those in Latin America. Cimoli and Primi observe that even in Brazil, which was the most active in Latin America in education, public universities, scientific institutes and technological centers carried out research detached from the real needs of private enterprises and the market in general. Instead, they functioned more as training and education providers and did not help the private sector narrow its technological gap [Cimoli and Primi, 2004].

Far more controversial than technological and educational policies were other elements of the Import Substitution Industrialization approach, such as trade policies aimed at influencing the structure of trade and at protecting infant industries and picking winners.

The theoretical argument for infant industry protection was first formulated by A. Hamilton and F. List in the 19th century. The theory steadily gained support among economists and policy makers and was gradually deepened with an important contribution of J.S. Mill, who found a justification for protectionism in the presence of dynamic, external-to-the-firm learning effects, though at the same time underlined that protection should be limited in time and lead to a state in which industry becomes mature and viable on its own [Melitz, 2004]. Mill's conditions were later expanded by C.F. Bastable's requirement of total benefits generated by the protected industry exceeding the total cost of protection, which together comprised a Mill-Bastable Test [Corden, 1997, ch. 8]. In the modern history of economic thought, the infant industry argument was studied by authors including Kemp, who recognized that learning processes (for example, worker learning by doing and on-the-job training) are a part of cost saving and divided learning processes into internal and external to the enterprise. While, the first type is appropriable by companies, the second warrants assistance. This "assistance" may take the form of a temporal tax subsidy that would compensate for the higher costs. However, the cost of subsidy should not be higher than the gains obtained. As a consequence, the concept provided a justification for a subsidy or tariff based on the output of firms which have an equivalent effect on output, on the basis of some dynamic externality [Bora, Lloyd, Pangestu, 1999].

Policies aimed at protecting infant industries were a common practice among developing countries after World War II and became a trademark feature of Latin American ISI.

An interesting example of policy application was given by DiMaio [2008] in relation to the development of the machine tool industry in several Latin American countries in the 1960s and 1970s. The machine tool industry was selected as a strategic one since most components required domestic production that would lead to technological progress among local firms. In fact, the policy seemed to work well at the beginning – after a period of foreign technology and

design acquisition, domestic companies started to develop their own products and employ local engineers to work on innovative solutions. Nevertheless, the success was not complete as it was only producers who benefited from the protective measures. As a result, the prices of locally produced goods far exceeded the world prices, due to a lack of a scale effect and specialization in production combined with high component costs. Components were expensive because of a lack of economies of scale and high transport costs as well as due to import limits. In the end, the industry was extremely inefficient and increased the disparities between small private companies that could not afford more advanced equipment and large state-owned enterprises that could easily afford to buy foreign products [DiMaio, after Alcorta, 2008].

The disappointment with the inadequate performance of state-subsidized industries led to a general rejection of protective measures and a widespread belief that industrial policy fails to produce the expected results. This belief gradually dominated mainstream economics. The *laissez-faire*, or free-market, orientation was best demonstrated by policies referred to as the Washington Consensus. The concept suggested to all developing and transition economies was nothing other than a classical belief that an "invisible hand" of the market would automatically select sectors and companies in an efficient way, while taking into account available resources such as labor and capital. Seen from such a perspective, industrial policy would only distort the effectiveness of the market mechanism leading to worse factor allocation.

The evolution of the Brazilian industrial policy

It was not until the 1930s that Brazilian economic policy makers focused in earnest on promoting industrial development. Earlier the government initiated various industrial projects, but most of these lacked coherence and a broader focus (see [Versiani, 1987]). In the decade preceding World War II, particularly after the Great Depression, industrialization gained substantial attention among Brazilian policy makers but it was only in the mid-1950s that industrial policy started to be practiced in Brazil in the modern understanding of the term. At the same time, various coordinating institutions emerged and were equipped with tools needed to fulfill state industrial programs.

The Import Substitution Industrialization policy was pursued in Brazil from the 1930s to the end of the 1970s. It was based on several basic theoretical claims and was prone to many mutations and adjustments. The evolutionary character of this strategy of development was reflected by some principal institutional changes. This section of the article provides an institutional overview of the main components of the ISI policy adopted in Brazil, which include: (a) economic planning, strategy development and policy coordination; (b) legislative and organizational frameworks; (c) sector, industrial and technological targeting; (d) auxiliary policies and instruments; (e) investment in infrastructure (including educational policies).

Economic planning, strategy development and policy coordination

Economic planning and development strategies in the form of formal national plans were initiated in Brazil during the 1930s and 1940s, but with dubious practical results. The planning agencies launched at the time were largely a discussion forum rather than effective strategic bodies. The first economic plan, *Plano Salte*, launched by President Eurico Gaspar Dutra (1946-51) and aimed at stimulating the health, transport and energy sectors, was not provided with sufficient tools and was not in fact effectively implemented [Draibe, 1985, pp. 155, 156].

The institutional base for economic planning started to be formed in the early 1950s, particularly during the second government of G. Vargas, when the Commission for Industrial Development (CDI) launched a General Program of Industrialization (PGI), following a study of structural problems by a group of experts working as part of a joint Brazilian-U.S. commission (*Comissão Mista Brasil-Estados Unidos* – CMBEU), and using the findings of reports compiled by the mixed CEPAL/BNDE group. Even though the program was never formalized [Suzigan, 1996, p. 8], the initiatives made at the time served as a reference point for later governmental efforts.

The diagnostic and institutional components of the General Program of Industrialization inspired the first effective industrial development strategy in Brazil. This was launched by the Kubitschek government under the name of the Goals Plan (*Plano de Metas*). The plan, famous for its slogan "Fifty Years of Progress in Five," was designed to coordinate domestic and foreign investment programs according to a set of specified goals. The goals were divided and each type of investment was under the supervision of a different executive group, which in turn was coordinated by the Development Council (*Conselho de Desenvolvimento*).

The system of economic planning and coordination introduced by the Goals Plan was not effective, though. In the 1960s, as a result of a series of economic crises and a subsequent political crisis that led to the emergence of an authoritarian system in Brazil, national planning in industrial development was abandoned (Suzigan, 1996, p. 8). The national economic plans at the time were designed to stabilize the economy. Economic coordination was transferred to the National Monetary Council (*Conselho Monetario Nacional* – CMN).

During the so-called "Brazilian economic miracle" period (1968-1973), economic planning and development strategies reemerged as a vital part of government economic policy. The National Development Plans (*Planos Nacionais de Desenvolvimento*) were its most important tools. A characteristic feature of that period was the still-strong position of the National Monetary Council as a coordinating body, which resulted in the authorities giving priority to macroeconomic strategy rather than to projects focused on industrial/technological development.

The First National Development Plan (I PND) was carried out by the government of General E. Medici from 1972 to 1974. The plan was established

under Act 5.727 in November 1971. At the same time, the Goals and Framework for the Government Action Program for 1970-1974 were approved.

The key aim of the First National Development Plan was to build infrastructure necessary for the country's future fast growth. Priority was given to the transport and telecommunication sectors, but special attention was paid to investment in science and technology as well as to the expansion of the shipbuilding, steel and petrochemical industries (for more see [Almeida, 2004]).

The Second National Development Plan (II PND, 1975-1979) was another effective planning initiative implemented in Brazil under the government of Gen. Ernesto Geisel. The plan was launched in response to the first oil shock at the end of the Brazilian economic miracle period that lasted six years. The chief architects of the II PND were the ministers J. Paulo dos Reis Velloso, Mario Henrique Simonsen and Severno Gomes, who sought to stimulate basic inputs and capital goods as well as food and energy production. The Economic Development Council (*Conselho de Desenvolvimento Economico*), led by the President of the Republic, coordinated a new round of investment in economic and social infrastructure, combined with projects to benefit technology and science.

Legislative and organizational frameworks

A formal definition of industrial policy objectives and instruments was first used in the Goals Plan (*Plano de Metas*). However, that definition was based on work done by the Council for Industrial Development (CDI), the first Brazilian institution responsible for industrial policy. In 1952, the CDI published a classification of industrial activities and preference product groups in Brazil as part of the country's General Program of Industrialization (PGI) [Draibe, 1985, p. 237]. The classification made use of recommendations published by the CMBEU and of the findings of research carried out in cooperation with the President's Council [Suzigan, 1996, p. 9]. The initiative was not successfully implemented though, with the exception of two CDI sub-commissions created in 1952 to stimulate the automobile and electric equipment industries [Suzigan, 1996, pp. 8, 9].

The problem with the first legislative framework and institutions that shaped Brazilian industrial policy was that they lacked consistency and durability. The best example was initiatives carried out as part of the Goals Plan, which ceased to exist once the plan ended. The same happened with executive groups that were supposed to coordinate certain industrial segments and with the Commission for Industrial Development itself [Suzigan, 1996, p. 9]. The period, however, marked the start of a process of legislative and organizational formulation of Brazilian industrial policy, which was developed in the later decades. The two CDI sub-commissions which were successfully launched served as the pattern to follow. Moreover, the Goals Plan period witnessed the emergence of other important institutions that had important aspects of industrial policy under their jurisdiction, namely the Council of Customs Policy (CPA) and *Carteira de*

Comércio Exterior do Banco do Brasil (CACEX), a department within the Bank of Brazil tasked with financing the country's foreign trade, licensing imports and exports and providing official foreign trade statistics.

The Council of Customs Policy was created as an advisory body to the Ministry of Finance on issues such as tax rates, minimum tariffs and tariff nomenclature (de Godoy in: *Receita Federal, Administracao Aduaneira*, accessed Nov. 5, 2012). CACEX, in turn, replaced a previous Bank of Brazil department called *Carteira de Exportação e Importação do Banco do Brasil* (CEXIM).

In the 1960s the executive groups, after a period of neglect, were regrouped to form the new Council of Industrial Development, which was responsible for shaping industrial policy until 1979. Its key responsibilities included formulating guidelines and IP objectives, setting IP priorities and administering fiscal incentives to industrial projects. At the same time, the institutional framework was expanded to encompass various sector, regional and technological organizations that coordinated specific projects [Suzigan, 1996, p. 9].

Sector, industrial and technological targeting

From the 1930s onward a variety of sector policies were practiced in Brazil. At first, vertical policies aimed to promote industries that produced basic inputs such as iron ore, steel, and pulp and paper. On the one hand, these sectors were believed to play a crucial role in the industrial development of the country; on the other, they were especially important for the labor market. However, the practice of setting sector goals was only introduced after World War II and can be attributed to the Goals Plan. The targeted sectors changed and in the 1950s special projects were expanded to cover industries such as heavy chemicals, electrical engineering, transport equipment and shipbuilding [Suzigan, 1996, p. 9]. This extended list of preferred industrial activities was due to the industrial strategy ushered in by the Goals Plan and was subject to supervision by various sector-specific executive groups.

Industrial targeting and vertical policy promotion were characteristic of the 1970s, especially after the II PND was launched. The priority sectors were reconsidered and special governmental help was extended to industries such as petrochemicals and non-ferrous metals (as examples of basic input producers) as well as telecommunications, aircraft production, armaments, nuclear energy and information technology infrastructure (as examples of capital goods and technologically advanced industries).

Auxiliary policies and instruments

Auxiliary policies and instruments were divided into four categories: foreign trade policies; financing instruments and guidelines; promotional incentives; and competition and regulation policies. Until the mid-1950s there was no official

articulation or national coordination of these measures. Industrial protection of the domestic market took the form of an increasing number of administrative controls for trade and non-tariff barriers imposed on imports, a measure that, much as the custom tariff, was eroded by inflation. Another significant feature of the 1950s industrial policy was the lack of any incentives to exports and no production subsidies to manufactured goods. The general lack of capital negatively affected investment. There were some institutions that were supposed to provide credit for investment activities and finance industrial projects in line with the governmental preference list, but their help was limited to a narrow range of sectors and companies. One of the bodies created to finance industrial initiatives was the Bank of Brazil, but most of the financial help went to agriculture. Another institution, the National Bank for Economic Development (BNDES), in a great majority of cases supported only infrastructure projects. Moreover, from 1953 to 1957, a government strategy aimed at regulating trade transactions led to the introduction of multiple exchange rates. Apart from the poor financing system, which failed to stimulate investment and introduce innovation, there was no incentive system as part of the industrial promotion policy. However, many elements of regulation and competition policies were introduced in Brazil in the 1950s. These included a system of FDI controls, followed by measures such as price, tax and public-service tariff controls as well as labor market regulation [Suzigan, 1996, p. 10].

The mid-1950s marked the emergence of government intervention aimed at promoting industrialization. In the mid-1960s, protective policies were strengthened in the form of both tariff and non-tariff measures and pro-export incentives were introduced. The system matured steadily and reached its peak in the late 1970s. Trade protection became more discriminatory in those days via non-tariff barriers and custom tariffs, after a slight relaxation in the mid-1960s. A special law enacted in 1957, known as Law 3,244, created a new tariff structure and instituted the administrative apparatus to decide on tariffs and adapt them to the development goals and industrial policy objectives (U.S. Library of Congress, accessed Nov. 6, 2012). At the same time, investment financing sources became more diverse thanks to a diversification of BNDES prerogatives and the emergence of regional development banks and bank research departments, in addition to the establishment of various special funds as well as instruments for foreign capital acquisition and export financing programs. Other important elements of Brazilian industrial policy building were investment incentives, regional development policies, incentives for small and medium-sized enterprises, and the promotion of scientific and technological development, which gave rise to a national innovation system. The use of all these measures was characteristic of the 1970s when the vision of industrial growth was clear and Brazil advocated state-led development. Until 1979 the country pursued strong, generally non-selective, protectionism, offered a huge system of subsidies for capital creation and export promotion, and implemented heavy regulatory policies.

Investment in infrastructure (including educational policies)

The first infrastructure projects in postwar Brazil were carried out in the transport and energy sectors, following a study conducted in the early 1950s. The main pool of financing for infrastructure projects came from the BNDES, and various state-owned companies and public institutions were another source of funds. The money was spent on urban infrastructure, basic sanitation, housing and telecommunications. Many problems were overcome and by the end of the 1970s the country's economic infrastructure met the requirements of the II PND in what was a sign of more advanced industrial development. Education and training were in worse condition. Despite advances in higher education, postgraduate studies and research, shortcomings in basic education were not mitigated.

The emergence of a pro-export industrial policy in Brazil

An industrial policy based on export promotion is commonly regarded as an element of a development strategy adopted in Brazil and other middle-income economies in Latin America in the 1990s. According to many scholars, the policy was the answer to macroeconomic imbalances and international pressure, on the one hand, and an attempt to emulate the success of East Asian economies, on the other. External shocks such as oil crises and debt burdens deepened the economic stagnation in Latin America and enforced a new policy designed to stabilize the economy and attract international capital. Multilateral financial institutions discouraged state intervention and promoted an openness to trade, FDI and international financial flows. As a result, a number of developing countries, including Brazil, followed the prescriptions of the Washington Consensus[2] and concentrated governmental action on promoting exports and acquiring new trade partners.

However, Brazil's experience with export promotion measures dates back to the 1960s. The first attempts were based on exchange rate manipulation, but unpredictable and accelerating inflation eliminated potential export gains from devaluation and the policy was eventually dropped [Cason and White, 1998 p. 49]. Moreover, the government's trade policy was based on a principle of full supply of the domestic market, and only after fulfilling this condition could Brazilian firms export their products. Brazilian exporters did not benefit from official tax incentives for exports, either. Such measures were only occasional and subject to complex bureaucratic requirements that were almost impossible to overcome. In the second half of the 1960s, after the country's industrial

[2] For more on the Washington Consensus policy recommendations, see: Williamson 1990 and Williamson 1993, where the author highlights certain modifications to the consensus that brought more social and equity issues to the fore. According to Williamson, Washington Consensus supporters advocate a market-friendly approach, while being highly skeptical about state interventionism.

policy was modified, Brazil witnessed spectacular growth in its manufactured goods exports. Yet various studies suggest that the Brazilian export success story should be attributed to global market expansion rather than the pro-export policies themselves [Malan and Bonelli, 1977].

The Brazilian export-promotion drive shows just how important timing and market access are in industrial policy making [Cason and White, 1998]. The Brazilian case proved that skillful bargaining alone does not guarantee success in overcoming obstacles connected with market entry [Cason and White, 1998, p. 57], even if this was believed to be the secret behind the success of East Asian exporters. The case of Brazilian steel exports shows that, when embarking on an export-oriented development strategy, special attention should be paid to the choice of industrial sector in order to benefit from internationalization and global trade[3].

An important role in the Brazilian export-oriented industrial policy was assigned to foreign firms. The main reason was the high level of foreign capital in the Brazilian economy and the country's strong reliance on foreign direct investment. The role of foreign enterprises in direct exports depended on their bargaining with the government and on global market trends [Cason and White, 1998, p. 60].

The automobile industry was a case in point. The government successfully used foreign companies active in that sector in its export strategy, especially as these companies dominated the domestic market. Global market trends appeared to be even more important, especially after Brazil joined the World Trade Organization in 1995.

A standout feature of the Brazilian economy was the existence of "buyer-driven commodity chains." The term was used by Gereffi with reference to industries "in which large retailers, brand-named merchandisers, and trading companies play the pivotal role in setting up decentralized production networks in a variety of exporting countries, typically located in the Third World" [Gereffi, 1994, p. 97]. A state-led export strategy under such circumstances is less secure because foreign firms generally follow the global strategies of their parent companies. However, there are some successful examples of making use of buyer-driven commodity chains. In Brazil, the main beneficiary was the footwear industry, which continued, or even expanded, its exports thanks to international buyers.

The emergence of the pro-export industrial policy and generally changes in the state-led development strategy had an impact on domestic institution building in Brazil. New policies favoring and promoting exports tied both the public and private sectors to policy continuation and stimulated private enterprises to present and defend their interests in the form of public debate

[3] Brazil's exports in the steel industry could not resist protective measures imposed in Europe and the United States where the steel industry was politically strong. As a consequence, the pro-export strategy in the steel sector did not work for Brazil [Cason and White, 1998, p. 57].

or lobbying. The establishment of industrial/sector organizations strengthened their position in the bargaining process and allowed for the enforcement of preferential treatment on the domestic market. Moreover, industrial lobbyists tried to use their influence among Brazilian policy makers to better access foreign markets and promote a pro-export business approach. The public-private alliance in promoting exports was drastically weakened in the 1980s when Brazil experienced spiraling inflation and a debt crisis. The country's financial situation prompted the government to adopt measures disastrous for exporters. These included exchange rate manipulation (using an undervalued currency rate to curb inflation), which hurt exporters by making their products expensive and not competitive on the global market. An insufficient amount of foreign exchange, in turn, made the country unable to pay back its foreign debt. To keep their business going, many exporters sought to establish informal ties with policy makers. Boschi describes such influence-seeking practices, blaming the "fragmentary nature of the state" for the easy enforcement of minor changes in regulations to better suit the interests of individual industrialists [Boschi, 1979, p. 35]. The practice of informal decision making, even if it worked for selected industries, weakened the bargaining power of the public sector as a whole and made collective action more difficult [Cason and White, 1998, p. 60]. Moreover, it undermined the general trust in public institutions and added to the conflict between policy makers and Brazilian exporters. The policies introduced in the 1980s to overcome the crisis were generally unsuccessful. The common belief in the need for a substantial, structural change was not enough to introduce new policies that would put an end to the inefficient practices and the already established pattern of public-private interaction. The cost of industrial policy was immense. On the one hand, there were many import-substitution measures still in existence in the 1980s, and many industrialists benefited from state subsidies; on the other, the emerging pro-export policies were chaotic, uncoordinated and lacked a strategic vision [Cason and White, 1998, p. 61].

The key objectives of the 2011-2014 Greater Brazil Plan and industrial policy instruments

The Greater Brazil Plan (*Plano Brasil Maior*) for the 2011-2014 period is the newest program of the Brazilian federal government in relation to industrial policy, technology, services and foreign trade.

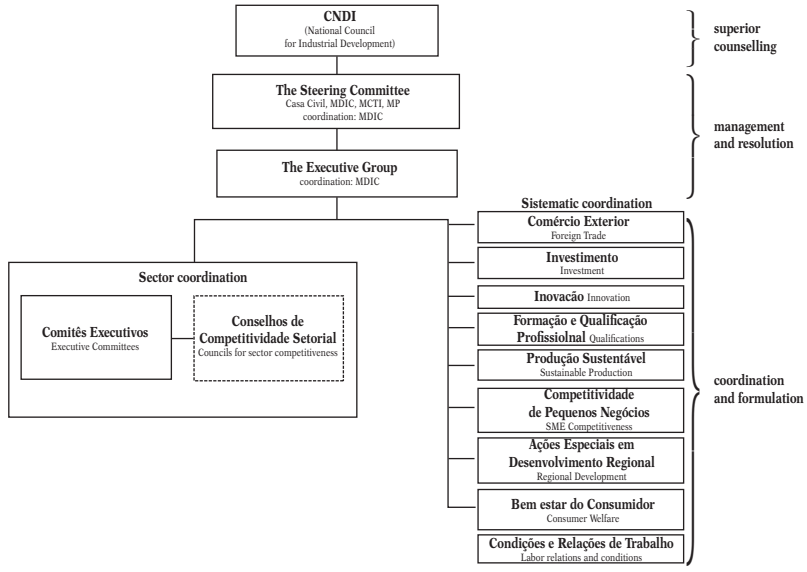
Focusing on innovation and national production as competitiveness-driving forces, the plan was announced and launched in order to facilitate private investment in research and development, technology and internationalization. The program's motto *Inovar para competir. Competir para crescer* (Innovate to compete. Compete to grow) is the key to Brazil's current industrial policy.

The idea behind the plan is to integrate different institutions, both public and private, to work together for the initiative. The instruments applied require

the participation of various ministries and government agencies as well as scientific institutes, universities and chambers of industry. From an operational standpoint, the Greater Brazil Plan has a multi-tier structure. The bodies are divided and operate on three levels: (i) coordination and formulation, (ii) management and resolution, and (iii) advisory activities.

Figure 1

Operational Structure of the Greater Brazil Plan



Source: own translation, MDIC

The plan is a follow-up to the government's policy of encouraging and strengthening the domestic industry, which was launched in 2003 as part of the country's Industrial, Technological and Foreign Trade Policy (*Política Industrial, Tecnologica e de Comercio Exterior* – PITCE) and strengthened in 2008 by adopting the Policy of Production Development (*Política de Desenvolvimento Produtivo* – PDP). However, from an institutional point of view, the Greater Brazil Plan is more comprehensive. It includes more actions than the PDP and more measures for encouraging foreign trade, commerce and services (for more see [Canedo-Pinheiro, 2008, 2011]; [Suzigan, Furtado, 2006]; [Hay, 1998]).

In line with the traditional approach to industrial policy, the plan combines horizontal and vertical initiatives. The former aim at increasing the productivity of the Brazilian economy as a whole, while the latter are targeted at specific sectors of the economy.

Table 1

The key targets of the Greater Brazil Plan

Aim	Reference position	Target (2014)
Increase in fixed investment as percentage of GDP	18.4% (2010)	22.4%
Increase in business expenditure on R&D as percentage of GDP (target shared with the National Strategy for Science, Technology and Innovation – ENCTI)	0.59% (2010)	0.90%
Improvement of HR qualifications: % of industrial workers with at least secondary education	53.7% (2010)	65.0%
Increase of national value added: Value of Industrial Transformation/Gross Value of Production (*Valor da Transformação Industrial/Valor Bruto da Produção: VTI/VBP*)	44.3% (2009)	45.3%
Expansion of knowledge-intensive industry: high- and medium-high-tech industry *VTI*/total industrial *VTI*	30.1% (2009)	31.5%
Strengthening of SMEs: 50% increase in the number of innovative SMEs	37,100 (2008)	58,000
Cleaner production, reduction of energy consumption per unit of industrial GDP (energy consumption in tons of oil equivalents (TOE) per unit of industrial GDP)	150.7 toe/R$ million (2010)	137.0 toe/ R$ million
Diversification of Brazilian exports, expanding the country's participation in international trade	1.36% (2010)	1.60%
Expansion of energy-related sectors (by increasing their *VTI/VBP* ratio)	64.0%	66.0%
Expanding access to goods and services that improve quality of life: increasing the number of urban households with broadband access	13.8 million households	40.0 million households

Source: own translation, MDIC

Horizontal dimension of Brazilian industrial policy in the Greater Brazil Plan

The horizontal dimension of Brazil's industrial policy under the Greater Brazil Plan involves actions aimed in particular at: reducing the costs; accelerating the growth of productivity; promoting the business environment with a view to ensuring equal initial conditions for Brazilian companies in relation to their international competitors; strengthening the national innovation system through the expansion of scientific and technological competencies and their integration into the corporate sector. To attain these goals, the government has chosen several factors related to both the macroeconomic and microeconomic aspects of business activity. Crucially, the Brazilian horizontal economic policy concept

focuses on foreign trade and addresses concrete concerns about innovation policy, investment (including investment in human capital) and the sustainable regional development of the country. The most important features of Brazil's horizontal industrial policy are summarized in the table below.

Table 2

Horizontal dimension of Brazilian industrial policy under the Greater Brazil Plan

Foreign trade	• Improvement of financial and tax incentives for exporters • Trade protection, consolidation and harmonization of tariffs • Trade facilitation • Encouraging the internationalization of domestic companies seeking to expand into foreign markets and to access new technologies, • Encouraging foreign companies to open research-and-development centers in Brazil
Investment	• Offering competitive interest rates in long-term financing • Eliminating or substantially reducing tax burdens for investors • Modernizing and simplifying registration and paperwork for companies
Innovation	• National Strategy for Science, Technology and Innovation (ENCTI) 2011-2014
Education, Professional Qualifications	• access to the National Technical School (PRONATEC) • Pro-Engineering National Plan • 'Science Without Borders' Program
Sustainable production	• Eco-design, in search of improved products and processes for cleaner production • Modular construction to reduce waste in construction projects • Setting clear criteria for sustainable construction • Supporting the development of recycling chains (in accordance with the National Solid Waste Policy) • Sustainable regional development based on locally available expertise and resources • Incentives for the development of the renewable energy industry (in line with the National Policy on Climate Change and the National Energy Policy)
Competitiveness of small enterprises	• Expanding access to credit for working capital and investment • Local preference in government procurement
Regional development	• National Policy for Regional Development (RUP) coordinated by the Ministry of National Integration (MI) • Citizenship Territories (Ministry of Agrarian Development – MDA) • Permanent Working Group for Local Productive Arrangements (GTP-APL/MDIC) • National Investment Information Network (Renai/MDIC) • National Network for Industrial Policy (RENAPI/ABDI)
Consumer Welfare	• Accessibility and convenience of consumer credit • Adherence to global standards and norms, especially in health, safety and environmental sustainability • Expanding the range of products and services, improving efficiency in logistics and supply chains
Labor relations and conditions	• establishment of strategies and action associated with working conditions

Source: Greater Brazil Plan, MDIC

Vertical dimension of Brazilian industrial policy in the Greater Brazil Plan

The Brazilian government largely focuses on vertical initiatives in its industrial policy. These are organized into five basic sets of programs and projects agreed between the government and the private sector and related to following directives from the legal perspective:

- Strengthening the production chains: supervising the process of domestic production substitution in industries heavily affected by import competition; increasing the productive efficiency of domestic enterprises; increasing value added; curbing unfair methods of competition. The sectors particularly targeted by the directive include plastics, footwear and manufactured goods, textile and clothing, furniture, toys, toiletries, perfumes and cosmetics, as well as production supportive services;
- Expansion and creation of new technology and business skills: giving incentives to companies to join dynamic markets with high technological opportunities; encouraging firms to use the purchasing power of the public sector in creating knowledge-intensive businesses and benefit from scale effects. The directive is expected to benefit sectors including capital goods, information and communication technologies (ICT), the chemical and petrochemical sector, aeronautics and space, the defense sector, and the industrial health complex.
- Development of energy supply chains: making use of/improving environmental and business opportunities in the area of energy production so that the country occupies a privileged position among the world's largest suppliers of energy and technology, capital goods and related services. The priorities identified include opportunities in oil and gas as well as renewables such as ethanol, wind, solar power and charcoal.
- Diversification of exports (products and markets) and enhancing the process of corporate internationalization, focusing on the following objectives: promotion of companies focused on knowledge-intensive manufacturing; deepening the internationalization efforts of firms through product differentiation and adding value; attracting foreign companies in the long term and stimulating research and development (R&D) in Brazil. Priority areas include health services, defense, and ICT.
- Consolidation of skills in the "Natural Knowledge Economy": implementing solutions provided by a knowledge-based economy to expand the scientific and technological content of natural-resource-intensive sectors, allowing the country to take advantage of the production of commodities and stimulate product differentiation. Examples include wholesale and retail trade, logistics, personal services for households, and supportive services for production.

The beneficiary sectors have been chosen according to two main principles. The first principle is to enhance the technological advancement of Brazilian industry; the second is to protect labor-intensive sectors against unfair competition from cheap imports. This explains why the privileged sectors include textiles, furniture, shoes, renewable energy, chemicals and health services.

However, unlike in previous decades, the Brazilian industrial policy today involves far more than just picking winners or protecting infant industries. It is much more complex, in line with the concept that a successful industrial policy *"comprises trade policies, science and technology policies, public procurement, policies affecting foreign direct investments, intellectual property rights and the allocation of financial resources. Industrial policies, in this broad sense, come together with processes of 'institutional engineering,' shaping the very nature of the economic actors and the boundaries between what is governed by market interactions and what is not"* [Stiglitz and Dosi 2008, p. 2].

A vital component of an industrial policy defined in such a way is a national innovation system and generally all innovation promoting measures. The Brazilian innovation system is based on institutions including the National Council of Science and Technology (CCT), an advisory body to the President; the Ministry of Science and Technology (MCT); the ministry's financial aid agency (FINEP); the National Council of Scientific Development, (CNPq); and the Management and Strategic Studies Center (CGEE). Innovation-related issues are also handled by the Ministry of Development, Industry and Foreign Trade (MDIC) via its Innovation Secretariat; the National Industrial Development Council (CNDI); and the Brazilian Industrial Development Agency (ABDI) – for more see (Almeida 2009, Brito Cruz 2006). The legal framework for the Innovation System is laid down in government regulations and laws including Innovation Law 10.973/04, Incentives Law 11.196/05, Decree 5.798/06, and the Science, Technology and Innovation Action Plan (PACTI). The country's Innovation System is also anchored in the national industrial strategy and regulated by the Industrial, Technological and Foreign Trade Policy (PITCE), the Productive Development Policy (PDP), and the Greater Brazil Plan. This complex institutional system shows that innovation-related matters receive special attention from the authorities (innovation policy is officially included in the government's industrial policy and in the country's development strategy). However, the situation in which various ministries and state agencies are empowered to deal with innovation policy creates room for uncoordinated, and sometimes contradictory, action.

Factors undermining the efficiency of industrial policy in Brazil

Brazil's comprehensive economic development strategy has been based on industrial growth and innovation enhancement, which is visible in the country's industrial policy. However, the idea, good on paper, fails to correspond with the real developments in the Brazilian economy. In a country where the production structure shows a huge prevalence of low- and medium-technology-intensive sectors – whose exports are based on commodities and which have an insufficient infrastructure and not enough domestic investment capital – it takes time and money to achieve the official industrial policy goals. Consequently, the question is if Brazilian officials should at all strive to follow an "innovation

path" and enforce a plan of industrial transformation via selective measures. Shouldn't they simply focus on creating a favorable business environment and maximizing Brazil's benefits from its comparative advantages?

One of the key characteristics of the Brazilian economic-political scene is that it is fertile ground for various public-private alliances and (semi-)informal interactions. The problem of relationships between state officials and society that lead to different rent-seeking activities and the establishment of informal rules of conduct has been widely discussed in the literature (see Section I). In the case of Brazil, it appears that P. Evans' notion of an "embedded autonomy" as a crucial feature of a developmental state is particularly accurate as the government is involved in a "dense network of ties that bind them to societal allies with transformation goals" [Evans, 1995, p. 248]. These alliances do not need to be a negative thing though – they may promote innovation, entrepreneurship and economic transformation.

Looking at Brazil, one may study the alliances between the federal administration and its supporters by focusing on corporate representatives in public institutions that are involved in industrial policy making and those who finance presidential campaigns. A study by J. Menezes finds that there was a correlation between campaign financing and landing a post on the Economic and Social Development Council (CDES) and that members who tended to promote innovation served less time on various strategic policy councils in Brazil [Menezes 2010, p. 28]. In fact, according to the study, the country's industrial policy, which is officially claimed to be innovation-oriented, is formulated by representatives of traditional, low-technology sectors. Consequently, public-private alliances in Brazil may undermine the country's industrial policy and contribute to the growing gap between the official industrial strategy and the real application of the proclaimed measures.

A similar disparity can be found while analyzing the investment policy of the National Bank of Economic and Social Development (BNDES). The bank was established in line with the idea of development banks expected to "solve market imperfections that would leave either profitable projects or projects that generate positive externalities without financing" [Bruck, 1998]. Another aim was to alleviate capital scarcity and promote entrepreneurial action to boost new and existing industries in economies with significant capital constraints [Armendáriz de Aghion, 1999].

Brazil's National Bank of Economic and Social Development is now among the biggest development banks in the world. Its tasks extend far beyond providing loans for large infrastructure projects. The bank is expected to lend to enterprises that without its help would be unable to carry out projects and equip companies with funds necessary for operational innovation and performance targets [Lazzarini et al., 2011]. However, researchers studying development banks note that there is a risk of misallocation of credit due to rent-seeking activities and these banks tend to bail out firms that would otherwise fail [Kornai, 1979].

A study by the Institute for Applied Economic Research (IPEA), a Brazilian government-led research organization, found that, despite the BNDES's diverse

contribution to the country's development, the bank tends to strengthen the current production structure rather than enhance the development of innovative, technology-advanced sectors. According to Almeida, between 2002 and 2007, direct BNDES loans to low- and medium-low-tech sectors increased by about 15 percent [Almeida, 2009, p. 28].

A similar pattern can be observed in other BNDES activities. For example, in 2008, roughly 80 percent of the bank's largest investments were made in low and medium-low-tech industries, particularly with a view to promoting the internationalization of huge commodity corporations (*Ibidem*). Moreover, it seems that BNDES's allocations "do not affect firm-level operational performance and investment decisions, although they do reduce firm-level cost of capital due to the governmental subsidies accompanying loans" [Lazzarini et al., 2011]. The study also revealed that the bank chooses enterprises with good operational performance and generally selects firms capable of repaying their loans, as regular commercial banks would do (*Ibidem*). Finally, according to the Lazzarini et al., the BNDES provides more capital to firms with political connections (measured as campaign donations to politicians who won an election), which confirms that public-private alliances have a strong influence on how industrial policy is applied in Brazil.

The key point of the analysis of Brazil's industrial policy from the point of feasibility of its goals is the study of the country's performance on the global trade scene. There have been various attempts to evaluate Brazil's industrial policy – by both domestic scholars (independent or working for state-affiliated institutes) and foreign academics. One of the most comprehensive studies was carried out by the IPEA institute and it concerned industrial policy during Lula da Silva's presidency.

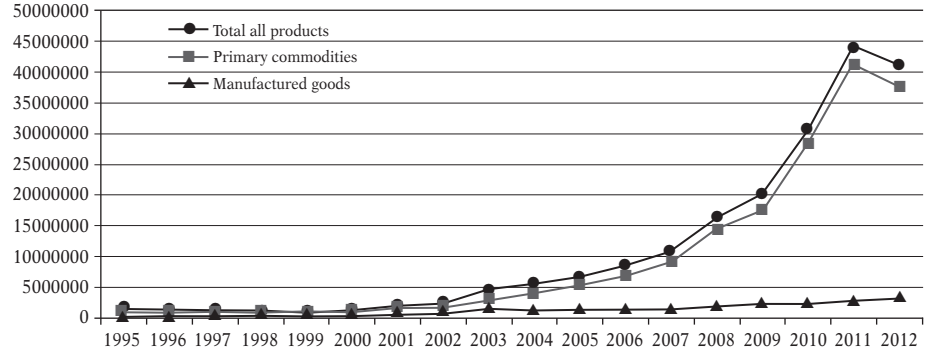
The IPEA report draws attention to several circumstances of Brazil's new industrial policy, which was introduced with new legislation including the Productive Development Policy (PDP). According to the report, "PDP was launched in a positive state of affairs, a moment in which Brazil was about to be upgraded to investment grade by international agencies. The country had been obtaining consistent trade surpluses, accumulating foreign currency, reducing public debt and income distribution. Brazil had completed 23 consecutive quarters of industrial production expansion, 15 quarters of increased consuming and 13 quarters of investment growth" [Almeida, 2009, p. 18]. The report argues that Brazil's industrial policy was developed under favorable circumstances, and that, due to the global economic situation and terms of trade, the government stimulated traditional sectors (such as commodities and low-value products) instead of enhancing the innovation capacity of the economy as a whole. The report's authors also argue that trade with China has contributed to Brazil's reliance on low-tech goods and commodities.

Statistics show that in 1994 Brazil exported 822 million USD worth of goods to China, which constituted 1.89% of the country's total exports. Ten years later Brazil's exports to China exceeded 20 billion USD and in 2009 more than 13 percent of Brazil's total exports went to China. A spectacular rise was

also noted in imports, which increased from 463 million USD in 1994 (1.4%) to 15.91 billion USD (12.46%) in 2009 and 25.6 billion USD in 2010. This last figure represented 14.1 percent of Brazil's total imports (SECEX/MDIC).

Figure 2

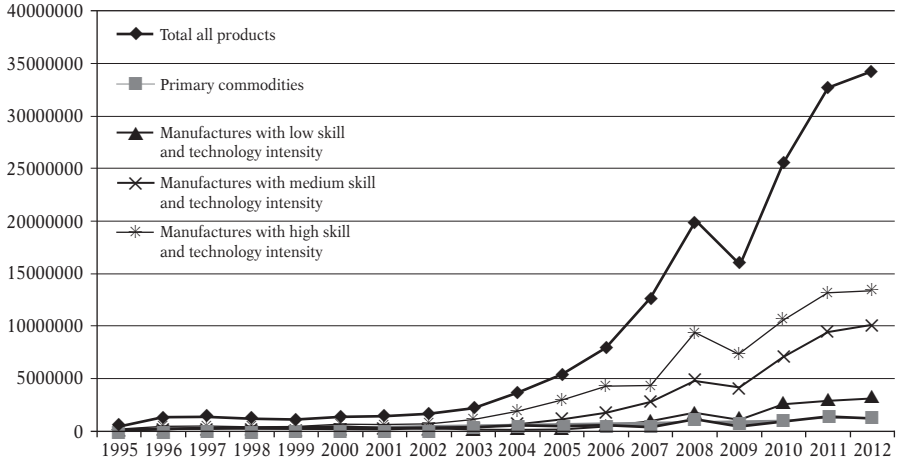
Brazil's exports to China, 1995-2011, million USD



Source: UNCTAD statistics, access: Feb. 13, 2013

Figure 3

Brazil's imports from China, 1995-2011, thousand USD



Source: UNCTAD statistics, access: Feb. 13, 2013

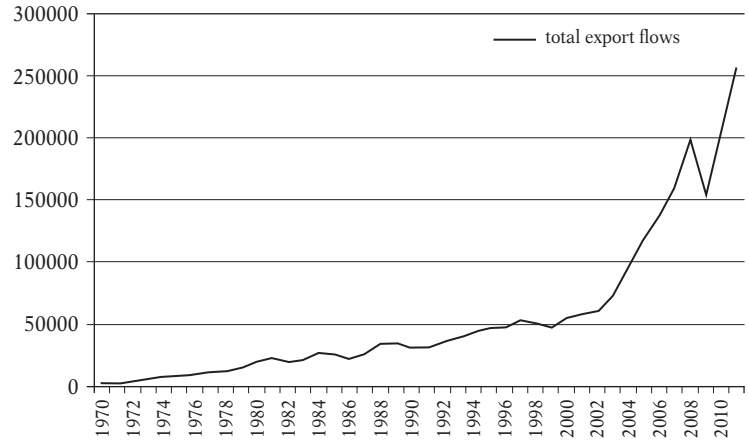
With such an impressive trade growth, China surpassed the United States as Brazil's top trading partner in 2009. Thanks to China, Brazil has gained not only economic benefits in the form of income from sold goods and access to cheaper products imported from the Asian market, but has also become more involved in global trade and international relations. However, Brazil's exports to China tend to be dominated by natural resource-intensive goods

with a low level of technological intensity, while imports are dominated by higher-value-added products. Approximately 78 percent of Brazil's total exports to China are basic goods. Furthermore, 68 percent of Brazil's exports to that giant Asian market are made up of iron ore, oil and soya. China imports more than 76 percent of Brazil's total soya output, according to 2009 data. The latest trade statistics show that this trend deepened and in 2010 Brazil's imports from China were 97.5 percent made up of manufactured products, while exports were 83.7 percent made up of basic goods (SECEX/MDIC, UNCTAD, see Figure 2).

Studying a country like Brazil it seems questionable whether industrial policy aimed at enhancing economic growth by stimulating the industrial growth of high-tech sectors at all makes sense. The data show that, although Brazil's share of global exports increased from 0.86 percent in 2000 to 1.25 percent in 2008 and 1.4 percent in 2011 (according to 2012 WTO data) – in a trend that was accompanied by a rising volume and value of the country's exports – the growth applies mainly to commodities.

Figure 4

Brazilian export growth, million USD



Source: IPEAdata, access: Feb. 5, 2013

Despite the governmental guidelines and official goals, Brazil's high-tech industries are not expanding, and their exports have in fact decreased in recent years. Rising commodity prices add to the trend by giving an incentive to exporters and to the government, which is aware that "the legitimacy of an industrial policy sometimes depends on traditional sectors being included in pretty much any stimulus provided by the state" [Menezes, 2010, p. 31]. The IPEA report evaluating the industrial policy of Lula da Silva's administration concludes that Brazil's industrial policy in fact promotes the reverse of the neo-Schumpeterian synthesis by contributing to the growth of low-tech sectors [Almeida, 2009, p. 16]. This is evident from Brazil's trade patterns and indicators such as R&D spending and the number of patents.

Concluding Remarks

Thanks to a gradual evolution process, Brazil's industrial policy has been transformed into a modern set of measures that aim to make the country's industry more diverse and technologically advanced. Initiatives promoting higher education with a view to improving human capital and employment in sectors based on innovation are combined with policies protecting the labor force in the transformation process. There is a visible emphasis on technological progress in the state-led innovation system and support for "rising industries." On the other hand, Brazil faces several problems related to its industrial policy. First of all, rent-seeking seems to seriously undermine the industrial policy, and selected groups have been able to secure privileges and defend their interests at the expense of the rest of society. Secondly, international trade patterns seem to negate the purposefulness of Brazil's industrial aims, showing that, despite the governmental measures, the country's trade is still based on traditional sectors whose comparative advantages appear to be impossible to change at the moment. As a consequence, although the government promotes the development of technologically-advanced sectors and goods, Brazil's exports are still – and increasingly – dominated by low- and medium-technology-intensive goods, primarily commodities.

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SKUTECZNOŚĆ POLITYKI PRZEMYSŁOWEJ W XXI WIEKU? PRZYPADEK BRAZYLII

Streszczenie

Celem artykułu jest zaprezentowanie najważniejszych czynników podważających skuteczność brazylijskiej polityki przemysłowej oraz zwrócenie uwagi na wagę problematyki polityki przemysłowej w XXI wieku jako przedmiotu badań nauk ekonomicznych. W części teoretycznej artykułu, autorka dokonuje systematyzacji pojęć związanych z polityką przemysłową oraz przeglądu stosownej literatury. Z uwagi na fakt, iż dyskusje na poruszony temat zależą od ideologicznych inklinacji dyskutantów, większa część istniejących badań jest bardzo spolaryzowana – od takich, które mocno popierają rządowe programy przemysłowe do tych, które je stanowczo odrzucają. Niniejszy artykuł, z założenia próbuje prezentować stanowiska obu stron, omawia najważniejsze teoretyczne ograniczenia polityki przemysłowej i ukazuje, jak zmieniał się stosunek do polityki przemysłowej w zależności od przyjętego paradygmatu interwencjonizmu.

W świetle rozważań teoretycznych, autorka przeprowadza historyczną oraz przedmiotową analizę brazylijskiej polityki przemysłowej. Po zaprezentowaniu nowego kształtu polityki przemysłowej zapoczątkowanej przez prezydenta Lula da Silva, analiza przybiera empiryczny charakter, gdzie oficjalne zapewnienia i cele rządu skonfrontowane są z realnymi danymi gospodarczymi. Wynika z niej, iż wbrew strategii rozwoju gospodarczego Brazylii, aktualna struktura gospodarki oraz struktura handlu zagranicznego wskazują, że to nie branże innowacyjne napędzają brazylijską ekonomię, ale surowce oraz przemysł tradycyjny. Próbując znaleźć przyczynę takiego stanu rzeczy, autorka wskazuje na główne czynniki osłabiające skuteczność brazylijskiej polityki handlowej.

Słowa kluczowe: polityka przemysłowa, handel międzynarodowy, industralizacja, rozwój, Brazylia

Kody JEL: O14, O21, O24, O25, O54