

Institutions and economic growth: an analysis of the Brazilian economy during the import-substitution period

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Abstract:

Brazil went through a process of economic change over the twentieth century that altered its primary-export structure. From the 1930s, with the import-substitution process, the idea of economic development became associated with industrialization. The objective of this paper is to evaluate the role of institutions in Brazilian economic development during the import-substitution period, with focus on the institutional impacts on the total factor productivity (TFP). Indexes were built to measure the institutional aspects related to trade, size of the government, tax, and financial policies, and an econometric model was estimated to evaluate the influence of these institutional variables on the total factor productivity. The results show that the main source of Brazilian economic growth in the period 1930-1980 was the physical capital accumulation, but TFP growth also was relevant to the growth dynamics. The productivity was affected by the size of the government, the financial policy, and the tax policy.

Resumo:

Ao longo do século XX, o Brasil passou por um processo de mudança econômica que alterou sua estrutura primário-exportadora. A partir de 1930, com o processo de substituição de importações, a ideia de desenvolvimento ficou associada com industrialização. O objetivo deste artigo é avaliar o papel das instituições no desenvolvimento econômico brasileiro durante o período de substituição de importações, com ênfase nos impactos das instituições sobre a produtividade total dos fatores. Foram construídos índices para medir os aspectos institucionais relacionados com as políticas comercial, tributária e financeira, e com o tamanho do governo, e foi utilizado um modelo econométrico para estimar a influência dessas variáveis institucionais sobre a produtividade. Os resultados mostram que a principal fonte de crescimento econômico no período foi a acumulação de capital, mas o crescimento da produtividade também foi relevante. De acordo com o modelo, a produtividade foi afetada pelo tamanho do governo e pelas políticas financeira e tributária.

¹ Financial support from CAPES Foundation, Ministry of Education of Brazil, is acknowledged.

1 INTRODUCTION

Traditional growth theory focuses on capital, labor, and technical change as the sources of economic growth, but in recent years several studies have highlighted the importance of institutions for the economic performance of countries. Acemoglu, Johnson and Robinson (2001, p.1369) say that “countries with better ‘institutions’, more secure property rights, and less distortionary policies will invest more in physical and human capital, and will use these factors more efficiently to achieve a greater level of income”. Under the influence of Douglass North, a general framework to explain how institutions affect economic growth has been provided by the New Institutional Economics (NIE). According to North (1995, p.3) “institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction”. These rules can be formal or informal, created or resulted from evolution over time, and they affect economic performance by their effect on production and transaction costs.

Although the origin of the concept of transaction cost goes back to Coase (1937), only in recent decades it gained importance to explain economic growth. According to North (1995, p.108), “the costs of transacting arise because information is costly and asymmetrically held by the parties to exchange and also because any way that the actors develop institutions to structure human interaction results in some degree of imperfection of markets”. Institutions are important to explain economic performance because they affect the magnitude of transaction costs and, as a consequence, influence the decisions of the agents toward more or less efficient actions. High transactions costs in political and economic markets result in inefficient economic outcomes.

Brazil went through a process of economic change over the twentieth century that altered its primary-export structure, inherited from the Imperial period. From the 1930s, with the import-substitution process, the idea of development became associated with industrialization. Fonseca (2003) points out that the creation of institutions by the government evidenced the choice of industrialization as its main objective. The “developmentalism”, an ideology that has been considered similar in some aspects to Keynesianism in Western Europe, conditioned the functioning of the economy in general and the economic policy in particular. Not only institutions and organizations were created to support industrialization, but also new beliefs and values were shaped in the period. The structure of the state was reformed and a set of regulations was designed to sustain the project of development.

The government was one of the main actors in the import substitution process, guiding investment toward the industrialization in many ways: allocation of resources, creation of state monopolies, protection against foreign competition, regulation of the financial system, and configuration of discretionary taxes and tariffs. Although the benefits in terms of industrial upward are evident, the interventionist measures had implications in terms of productivity and overall costs. The

distortions associated with the role that the Brazilian government played in the process of industrialization eventually affected the macroeconomic performance after 1980.

Most analysis for the productivity of the Brazilian economy during the process of import-substitution and loss of momentum from the 1980s mention aspects that could be associated with the institutional framework². Few studies, however, seek to identify the relationship between productivity and institutions. Gomes, Pessoa and Veloso (2003) used a methodology that is particularly convenient to analyze the determinants of productivity in Brazil. They separate the total factor productivity into two components: one that measures the progress of the technological frontier, common to all countries, and another regarding the total factor productivity (TFP) in Brazil. The difference between the TFP and the rate of technical change is called discounted total factor productivity (DTFP). Using this methodology, it is possible to identify the productivity gain, net of the expansion of the technological frontier. According to the authors, DTFP captures the influence, among other things, of the institutions, but they did not measure this effect. Yano and Monteiro (2008) used the DTFP to identify the impact of institutional changes of the 1990s on economic growth. The analysis showed that there was influence of trade liberalization and financial reform on productivity in the period, which suggests that similar effects could be found to the whole process of import-substitution.

The main objective of this paper is to investigate the role of institutions on Brazilian economy performance during the import-substitution period (1930-1980). In particular, this work seeks to identify the extent to which institutions affect the Brazilian economy productivity. It is assumed that institutions define the set of opportunities, the basic system of incentives and the transaction costs associated with a particular exchange. The government can reduce the transaction costs involved in this process by establishing clear and stable rules with respect to property rights (laws, regulations, and sanctions) and providing a system to enforce the law. The role of the government should be to create an enabling environment for the functioning of the markets. The hypothesis is that Brazilian institutions led to the adoption of policies that were not market-oriented and affected negatively the level of productivity in the period.

This paper is structured in three sections. The second section reviews the literature on institutions and economic growth. Section 3 presents the Brazilian institutions that shaped the developmentalism. In section 4, the influence of developmentalist institutions on productivity is evaluated.

2 INSTITUTIONS AND ECONOMIC GROWTH

² See, for example, Abreu and Verner (1997), Hofman and Mulder (1998), Bonelli and Fonseca (1998), and Bacha and Bonelli(2005).

Within the neoclassical tradition, differences in the trajectories of accumulation of factors of production explain the differences in rates of growth of countries. The accumulation of factors, in turn, is explained by some exogenous element, such as the savings rate (Solow model) or the preferences (Cass, 1965; Koopmans, 1965). In late versions of growth models (Romer, 1986; Lucas, 1988; Romer, 1990; Grossman and Helpman, 1991), the accumulation is an endogenous result of the economic system, triggered by technological innovation. These views of growth, however, do not explain what makes some countries more able to accumulate physical and human capital or to promote technological innovations more quickly than others. Using this theoretical framework it is not possible to answer why some countries grow faster than others or why some countries enrich and others remain poor over time. And these are key issues in development economics.

According to North (1995), the institutions explain the difference in the performance of the countries. A set of political and economic institutions that provide low transaction costs and credible commitments increases efficiency and is in the basis of economic growth. Institutions define the incentive structure that prevails in the market economy and contribute to economic growth for reducing uncertainty and increasing efficiency in the environment in which transactions occur.

Although it is accepted that institutions are fundamental to explain economic growth, it is not clear what connects institutions to economic performance. The broad idea is that institutions define the existing transaction costs in an economic system. Transaction costs consist of “the cost of arranging a contract *ex ante*, and monitoring and enforcing it *ex post*, as opposed to production costs, which are the costs of executing the contract" (Matthews, 1986, p. 906). Transaction costs affect the allocation of resources and are directly related to how property rights are established in a society. The more resources are spent to ensure those rights, the higher the transaction costs associated with exchanges, the lower the degree of efficiency in the economy, and the lower the economic growth.

The concept of institutions as rules proposed by North includes not only the formal rules, such as constitutions and laws, but also informal rules, established from traditions, customs and codes of conduct. Williamson (2000) presents a scheme with four levels of institutional analysis that helps to understand how NIE works. There is a hierarchy, in the sense that the higher level imposes constraints on the lower level, but all levels are connected to each other by feedback mechanisms. The first level, called social embeddedness, includes norms, customs, taboos, traditions and codes of conduct. It is the space of informal constraints, in which institutional change may take centuries or millennia. The second level is the institutional environment. In part this environment is the result of evolutionary processes, as in the previous level, but it also relates to incentives in the economy. Changes in relative prices, usually caused by changes in technology, stimulate institutional change in this level. Formal rules, such as established by constitutions and laws, stand at this level. For North (1995, p.46), the

formal rules can complement and enhance the effectiveness of informal rules. The third level encompasses the institutions of governance. For Williamson, governance is an effort to establish order, reduce conflict and allow mutual gains (p. 599) by setting a structure that delivers the right incentives to *ex ante* and *ex post* stages of contracts. Finally, the fourth level is where the traditional neoclassical analysis works. The firm is described as a production function and the conditions of marginal optimization prevail. At this level, quantity and price adjustments occur continuously.

The Williamson's scheme highlights the limits of economic theory. While traditional growth models operate at level 4, which deals with the allocation of resources, the NIE allows incorporating levels 2 and 3, which deal with the formal rules and governance, into the analysis of economic growth. Assuming that informal institutions only change in the long run, they can be treated as exogenous in the model. Then, with the analytical tools offered by NIE, it is possible to concentrate on the impact of formal rules and organizations on economic performance.

According to Acemoglu and Robinson (2010, p.7): "economic institutions matter for economic growth because they shape the incentives of key economic actors in society. In particular, they influence investments in physical and human capital and technology and the organization of production". Besides determining the potential output of the economy, institutions also affect the distribution of resources among economic agents. Several studies identify a correlation between institutional variables and economic growth and show that countries with better economic institutions have higher average incomes.

More efficient institutions are necessary for economic growth, but how do they evolve? Institutions result of collective choices of society in response to stimuli offered by the environment. In this sense, they are endogenous. As the institutional framework consists of formal and informal rules, the existence of a particular institutional arrangement rather than another cannot be explained only by economic variables. According to Acemoglu et al. (2004), although the efficiency of an arrangement in comparison with another plays a relevant role in collective choice, the key variable is the power of political groups. A technological change can determine a change in relative prices, which demands a new institutional framework to lead the economy to a more efficient stage. The institutional change, however, is subject to the political power exercised by those who are affected by the new arrangement.

Institutional change, according to North (1995), is given by the interaction of organizations and institutions. Institutions and other economic restrictions, such as technology, income, and preferences, define the set of opportunities in a society. Organizations are entities formed by groups of individuals with common goals that attempt to survive in the institutional structure in which they are constrained. They try to acquire the skills and the knowledge that give them better possibilities of surviving in the institutional environment. When there are changes in relative prices or in preferences, the

organizations with enough power may have incentives to change the institutions. This change will be implemented only if the returns on the investments within the existing institutional structure become smaller than the return that can be obtained with the institutional change. As formal institutions depend on the bargaining power of organizations, the new institutional structure will be formed by institutions that may or may not reduce transaction costs.

The failure of countries to converge in per capita income and the lack of dissemination of the "best" institutional arrangement is related to the institutional background. The persistently poor performance of developing countries may be explained by the evolution of their institutions. In these countries, the institutional structure is characterized by great uncertainty and high transaction costs, for the formal rules and the mechanisms of enforcement do not give support to efficient markets. The existence of informal sectors is an attempt to provide a framework for exchange, but this structure, because it is not formal, results in high transaction costs. There is a tendency to perpetuate the underdevelopment since the returns for the selected institutional path hold the countries on it. As the institutional matrix progresses very slowly, it is difficult for the economies walk out of one path into another more efficient. This is reinforced by the structure of power in the societies, for those who have greater political power will oppose the changes.

Shirley (2005) emphasizes that an appropriate institutional arrangement should stimulate trade by reducing transaction costs. The government must protect private property and create a favorable environment to investment. Throughout history, high transaction costs result in economies of small scale, short-term contracts, and overall inefficiency. By grouping the explanations into four categories, Shirley summarizes the literature about the possible institutional reasons for the difference in economic performance among countries. The first category includes the explanations that attribute the underdevelopment to the colonial heritage, in the sense that the colonies that inherited inadequate institutions from the colonizing country performed poorly. The second category is a refinement of the first: colonial heritage plus. In this group are the explanations that consider that colonies that had valuable natural resources, people that could work as slaves, and land favorable for plantation-type agriculture turned into underdeveloped countries because of "extractive colonial institutions". These institutions were designed to concentrate political and economic power in the hands of a small group of people at the expense of the rest of the population. The third category embraces the explanations that associate the underdevelopment to little external or internal political competition. In countries where the elites didn't have to call for support and were not constrained for political opposition to their decisions, institutions were intended to serve interest groups, rather than serving the overall population. The studies that appeal to beliefs and norms as the explanation for underdevelopment are in the last category. Countries that had beliefs and norms unfavorable to the market ruled out the possibility of developing institutions that would encourage trade and investment.

In the sense that all categories make reference to some level of institutional analysis, this summarization is a good start point to understand the difference of performance between countries using the concept of institutions. However, we must move toward identifying the channels through which institutions influence performance. The literature on growth models offers some possibilities to use the institutions as an explanatory variable for economic performance. Assuming a Cobb-Douglas type production function, the output is produced according to:

$$Y_t = A_t K_t^\alpha H_t^{1-\alpha},$$

where K_t is the stock of physical capital, H_t is the stock of human capital-augmented labor, and A_t is a measure of labor-augmenting productivity. Human capital-augmented labor stock follows:

$$H_t = e^{\phi(E_t)} L_t,$$

where $\phi(E)$ is the efficiency of a unit of labor L with E years of schooling relative to a unit with no schooling ($\phi(0) = 0$). Rewriting the production function in terms of output per worker and taking logs, we obtain:

$$\log y_t = \log A_t + \alpha \log k_t + (1 - \alpha) \log h_t,$$

where $y \equiv Y/L$, $k \equiv K/L$, and $h \equiv H/L$. This equation highlights that the differences in output per worker (y_t) can be decomposed into differences in factor inputs and differences in productivity. Hall and Jones (1999) suggest that the impact of institutions may be on both: “Our hypothesis is that differences in capital accumulation, productivity, and therefore output per worker are fundamentally related to differences in social infrastructure across countries. By social infrastructure we mean the institutions and government policies that determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output.” (Hall and Jones, 1999, p.84)

Assuming that institutions affect the level of productivity, Eicher, García-Peñalosa and Teksoz (2006) postulate that:

$$A_t = A e^{\delta I},$$

where I measures the quality of institutions. Then we can express the output per worker as:

$$\log y_t = \log A + \alpha \log k_t + (1 - \alpha) \log h_t + \delta I.$$

There are several possible functional forms to include institutional variables in the Solow model and to adjust the growth theoretical model to institutional economics. The idea is to test if the inclusion of institutional variables increases the explanatory power of the model.

Aron (2000) points out some difficulties in assessing economic growth using institutional variables. Based on an extensive literature review, she detects at least three problems to build empirically testable theoretical models. First, the addition of institutions and institutional change into economic theory is recent and the connections between institutions and economic growth are not clear. Second, there are problems to obtain the data, to define the appropriate methodology of analysis, and to specify the models, “which many authors underestimate or choose to ignore” (p.100). Finally, the use of institutional variables in the Solow(1956) and Mankiw, Romer, and Weil (1992) framework usually assumes a direct effect of institutions on growth, neglecting the effect that the quality of institutions may have on the independent variables of the model.

Despite those obstacles, several studies tried to estimate the impact of institutions on economic growth³. Accounting for quality of institutions, Knack and Keefer (1995) used indexes of security of contracts and property rights, based on indicators compiled by the International Country Risk Guide (ICRG) and by the Business Environmental Risk Intelligence (BERI), to examine the impact of property rights on economic growth. Engerman and Sokoloff (1997) adopted a geographical approach, linking institutions to geography to explain the differences in countries’ performances. Using a similar approach, Acemoglu, Johnson and Robinson (2001) formulated a more sophisticated version of their explanation. They estimated the effect of institutions on GDP per capita using the mortality rates faced by settlers as an instrument. Easterly and Levine (2003) advanced by testing the influence of institutions, geography and policies on growth. They use an Institutions Index, to assess how institutions influence economic development. Rodrik, Subramanian and Trebbi (2004) also tested the relevance of institutional and geographical aspects, but included trade as an explanatory variable. Controlling for institutions, the authors observed that the integration does not exert a direct effect on the level of income and that geography exerts a reduced direct effect. In this sense, institutional quality has effect on income.

These and others similar papers have advanced the understanding of the role of institutions in economic growth, but all faced the methodological problems mentioned by Aron (2000) and found in cross-country studies⁴. Solow (2001, p.286) proposed a different approach on the comparative growth studies. According to him, the focus should move to the study of cross-country differences in total factor productivity, taking into account its technological and non-technological determinants. Solow expressed doubt about the validity of estimating cross-country regressions, involving countries with different institutional trajectories, to evaluate those differences. He suggests that non-technological aspects, such as regulation, competition, and security of contracts, may be more important than the

³ For a more extensive list of references on institutions and economic growth, see Aron (2000).

⁴ See Temple (1999) for a survey on the subject.

technological to explain differences in TFP. That is why he recommends “thinking more seriously about right-hand-side variables that might legitimately account for differences in TFP.”(p.285)

3 BRAZILIAN INSTITUTIONS

3.1 Patrimonialism

Portugal held its colonial rule over Brazil from 1500 to 1822. After the independence, Brazil became a monarchy, known as the Empire of Brazil. In 1889 a military coup established a republican government. In its early republic, the country experienced a period of relative democracy until 1930, when a civilian coup, lead by Getúlio Vargas and backed by the armed forces, began a new phase of dictatorship that lasted until 1945. After a democratic interregnum from 1946 to 1964, another military coup installed a dictatorship that ended in 1985. Since then, the country has entered a phase of democratic normality that continues nowadays.

The Portuguese rule exerted a significant influence on the way that Brazilian institutions were shaped. According to Faoro (2001), patrimonialism⁵ is one of the Portuguese legacies to Brazil. The Portuguese patrimonialism was transplanted to Brazil and was the basis on which the Brazilian state was organized, from Empire to Republic. Faoro highlights the economic, political, and social consequences of patrimonialism on the Brazilian nation, and assigns to patrimonialism part of the responsibility for the structural problems that Brazil had faced since its independence.

In 1930, the president Getúlio Vargas began a process of modernization of the Brazilian state toward a rational-legal type administration. Sikkink (1991) points out some actions that illustrate the commitment of Vargas with a new management model: Vargas Administration organized the careers in the civil service and established the public examination as the way of entering in these careers and, in 1938, the government created the Administrative Department of Public Service (DASP), responsible for controlling the bureaucratic functions of government. These initiatives provided the government with a group of employees with skills and training for the bureaucratic functions.

Sikkink (1991) mentions a strategy that was used in response to the shortcomings of the process of civil service reform: the creation of "pockets of efficiency" outside the traditional

⁵ Max Weber created the ideal-typical concepts of bureaucracy and patrimonialism to describe the legitimate types of domination. Patrimonialism is a traditional form of domination in which there is no clear division between private and public matters, and the ruler exercises the power by tradition. The administration is a personal instrument for the ruler. Patrimonial domination contrasts with rational-legal domination, in which domination is based on a system of legally enacted rules. Weber argues that the rational-legal administration is superior to patrimonial administration because it is based on a legal system that favors the calculability, allowing individuals to know in advance the consequences of their actions. Rational-legal bureaucratic systems are impersonal, clearly distinguish public and private spheres, and favor specialization and division of labor. For these reasons this system is a more conducive environment for economic development. According to Morrison (1995, p.443), rational legal authority “arises in societies with a developed system of industrial production, democratic procedure, rational markets and a bureaucratic means of administration.”

bureaucracy, in areas that were not affected by the reforms. This "insulated bureaucracy" included state enterprises, state-owned banks such as the National Bank for Economic Development (BNDE), the Superintendency of Money and Credit (SUMOC), policy-making councils, and executive groups. This branch of the bureaucracy was responsible for the formulation and implementation of some of the economic policies adopted by the government after the 1940s. The specific arrangement that included both types of bureaucracy set up a dual system: in some areas of the government, the rational-legal administration prevailed, in other areas, the practices of a patrimonial nature continued. This duality often operated simultaneously within the same organization.

The Brazilian state, despite incorporating rational-legal features in its structure of domination, kept well preserved its patrimonial heritage; contractual and impersonal actions coexisted with personal, arbitrary, and discretionary actions in the public administration. The rational-legal structure that had been set up by the government since the 1930s rested on a patrimonial superstructure. The changes in the formal rules were constrained by the informal rules. The unstable constitutions of the period attest the nature of the problem: although they contained the basic Republican principles of separation of public and private domains, they were enacted in an environment where the patrimonial values were still in force⁶. When the elite interests conflicted with those principles, the interests overcame the principles.

In his analysis of the Brazilian patrimonialism, Faoro (2001) highlights two aspects which marked its influence in the economy after 1930: the nationalism and the interventionism. Both are closely connected and are byproducts of the patrimonialism in its process of adaptation to the changes in the economic environment. Nationalism has fulfilled the role of giving an ideological varnish to the government intervention in the economy. According to Faoro, "Nationalism is the ideology of the oars hitting retracted and shallow waters, despite the claims of loyalty to stable currency and to the gold standard." (Faoro, 2001, p.849). It was not the same nationalism of the rebels against Portuguese colonial rule, nor the liberal nationalism of European inspiration, in the beginning of the Republic. The anti-liberal nationalism after 1930 was a reaction against the early Republic federative and individualistic structure. Regarding the interventionism after 1930, Faoro argues that there was a "patrimonial regress", when the rulers felt able to command the economy. They formed a "bureaucratic community" that stood above social classes and took on the task of leading the country.

⁶ Although they do not mention the patrimonialism, North, Summerhill and Weingast (1999, p.47) allude to the existence of a similar phenomenon in Spanish America: "Throughout this region, attempts to create new republican institutions clashed with the political foundations of the old order. Under the royal system, rights were granted to individuals and groups based on personalistic ties to the crown. The result was huge land grants to wealthy individuals and the church; rights and privileges for the military; and a large series of local monopolies ranging from production, to commerce, to long-distance trade."

In economic terms, Brazilian patrimonialism generated a capitalism deformed by the state intervention. Instead of providing economic agents the conditions for the calculability of the production process, the State intervened in favor of the groups that hold economic and political power. Using the expression of Faoro(2001), it is a “capitalism without soul”, because it adopts the technique of modern capitalism but doesn’t accept its impersonal legal rationality. Without this rationality, which is present in the cultural, religious and ethical values, it is not possible to establish the calculability which, according to Weber, characterizes and distinguishes modern capitalism from other modes of production. There are no stable political and economic rules. The rules are made to serve the interests of the groups that are in power, and the rules have to change when those interests change.

The nationalism and the interventionism functioned as instruments to convert the personal patrimonialism, typical of the colonial and the Empire periods, into the state patrimonialism, giving rise to the economic development model adopted after 1930: the developmentalism.

3.2 Developmentalism

Faoro (2001) argued that nationalism and interventionism combined into a patrimonial structure and a centralized state order to define a new way of functioning of the economy, in which the state lead the economic development. However, the genesis of Brazilian developmentalism occurred when a new element was integrated into the ideological scenario. According to Fonseca (2004), developmentalism has established itself as an ideology when it incorporated the defense of industrialization in its program⁷. More than that, it was only when nationalism and interventionism were combined with defense of industrialization that developmentalism became a guide for government action. Fonseca notes that, as an ideology, developmentalism has justified itself by incorporating the idea that the primary function of government is to promote economic development.

Throughout the history of ideas in Brazil, nationalism, interventionism and defense of industrialization not always walked together. Nationalism is the oldest one; its origin dates back to the colonial period and it took various forms throughout the years. According to Burns (1968, p.7), "An unbroken territory, a common language, a unifying religion, and shared ideological preferences have formed the basis for Brazilian nationalism." Burns divides Brazilian nationalism into three phases. The first he called "colonial nativism." It was characterized by a devotion to the land, without greater economic or political connotation. The second phase, typical of the nineteenth century, was called defensive nationalism. Besides devotion to the fatherland, there is a growing distrust of foreigners and of their interests in the country. The author divides the third phase into two subphases. The first

⁷ This phenomenon was not unique to Brazil. As mentioned by Sikkink (1991, p.32), "In one form or another, all developmentalism was based on the belief that industrialization was necessary for development."

subphase covered the first three decades of the twentieth century, and was characterized by focusing on political and cultural aspects. The second subphase began in 1930 and assumed an economic character. According to Burns, in this last stage nationalism became an offensive force. Faoro (2001, p.792) supports this view by stating that after 1930 nationalism was not limited to speeches against foreigners. Under nationalistic inspiration, it began the process of “rebuilding, reorganizing, reforming the country through the state.” Nationalism was turned into one of the philosophical pillars for development, and became “an instrument for change” and the “key to development”, as cited by Burns.

Fonseca (2004) remarks that before 1930 nationalism was not associated with interventionism or with defense of industrialization. In its second phase, nationalism and liberalism were together because the nationalist reaction against Portugal took a liberal form by repudiating the Portuguese mercantilist institutions, with all regulation and monopolistic concessions related to them. Likewise, the existence of an agrarian nationalism attests that nationalism was not necessarily industrializing. Alberto Torres, an important Brazilian politician and thinker, was one of the main representatives of the nationalism of the early twentieth century, and his work was an "attempt to react to the industrialization process" (Souza, 2005, p.316). To Faoro (2001), industrialist nationalism resulted of a "sense of exploration" and took shape with the Water Code and the Mining Code, both promulgated in 1934, and the National Steel Company (Companhia Siderúrgica Nacional), created by suggestion of the National Steel Plan Commission in 1940.

According to Fonseca (2004), the Brazilian interventionism had a strong influence of positivist ideas. These ideas found fertile ground among idealists republicans, especially in the military, at the end of Empire and early Republic. Although in a diffuse way, Brazil adopted Auguste Comte's positivism with regard to the rejection of liberalism and acceptance of authoritarianism. In the Brazilian view of positivism, the state could intervene in the economy, since this intervention would lead to progress in society⁸. The Brazilian positivists saw the state as the entity responsible for the implementation of bureaucratic rationality in the country. However, as noted by Fonseca, interventionism was restricted by the defense of balanced budget (justified by the need of order). But the embryo of interventionist thinking can be found on the Brazilian positivism, and the exposure of this embryo to a patrimonialist environment made interventionism another pillar of the developmentalism.

Fonseca (2004) mentions that interventionism is also a byproduct of the “metalismo” versus “papelismo” controversy. This controversy was a Brazilian version of the British debate between Banking and Currency Schools. Based on the conventional economic theory, the “metalistas”

⁸ According to Comte's motto to the reorganization of society, "Love as principle, order as basis, progress as end."

advocated in favor of the Gold Standard system and stated that the priority of economic policy should be the currency stability. The “papelistas” were more pragmatic and focused on the countercyclical role of the economic policy. They defended that economic growth should be the priority and that interest rates could be manipulated to stimulate the economy. The “papelistas” contributed to the formation of developmentalism thinking by proposing the use of a non-conventional economic theory and by recommending the use of economic policy as an instrument to boost growth.

Regarding the defense of industrialization, the debate was intense in the late nineteenth century. The discussions were focused on the concepts of artificial industry (manufacturing activities that needed protectionism) and natural industry (manufacturing activities that were extensions of the primary sector and didn't need protectionism). According to Fonseca (2004), the manifesto issued by the Industrial Association of Rio de Janeiro in defense of industrialization on May 11, 1882 marked the inauguration of the pro-industry interventionism. The arguments in favor of industrialization centered on two aspects that are in the core of the Brazilian developmentalism. On one side, the industrialization supporters accused the liberal thinking of condemning the country to primary production and hence to economic stagnation. Therefore, they advocated for the interventionism. On the other side, they associated industry with country's independence, giving a nationalist connotation to industrialization.

By combining up nationalism, interventionism, and the defense of industry in the same set of ideas, the developmentalism acquired its final configuration. In the basis of this arrangement was the state patrimonialism. In the words of Faoro (2001, p. 871): “the patrimonialism conforms itself to transitions, and changes of the external model in a flexibly stabilizing way, concentrating on the state structure the intermediation mechanisms (...) in a range that goes from direct management to economic regulation”.

3.3 Measuring the Brazilian institutions through the policies

The developmentalism was not just a set of ideas articulated around the goal of industrialization. It was an action guide and oriented the formulation of policies toward industrialization. The economic policies that were adopted during the developmentalist period reflected the Brazilian institutional framework, characterized by nationalism, interventionism, and defense of industrialization during the import-substitution period. The connection between institutions and policies can be made using the Rodrik, Subramanian and Trebbi (2004) approach. They treat policy as a flow and institution as a stock variable. Assuming that institutional quality is the result of past policies, the authors propose the following formalization (p.156):

$$\dot{i} = \sum \alpha_i p_i - \gamma I,$$

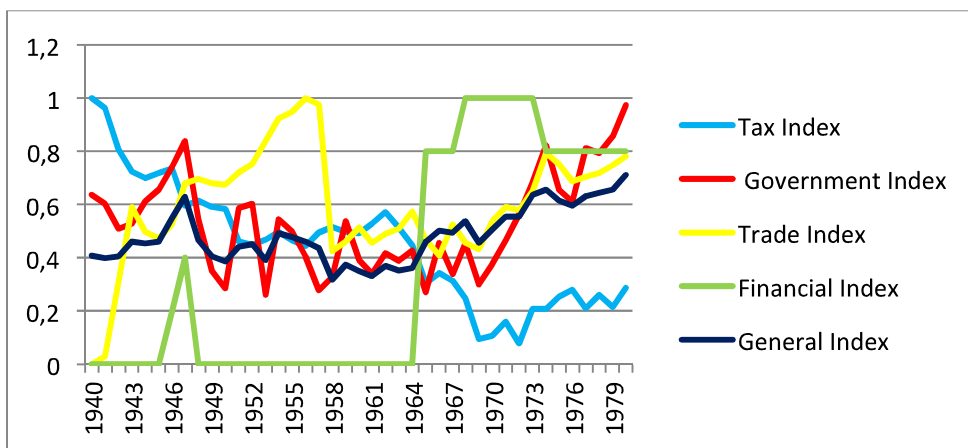
where p_i is the policy on dimension i , α_i is the impact of policy i on institutional quality, I is the institutional quality, and γ measures the institutional quality deterioration, if no action was taken to avoid it. The main advantage of this formalization is to identify the institutional changes triggered by the policies that were implemented.

The first step to measure the quality of institutions is to build a quantifiable index to evaluate them. It is assumed that market-oriented policies generate more efficient outcomes and tend to increase the level of productivity in the economy, and then the indexes must measure whether the policies adopted by the government are more or less market-oriented. Some studies used performance variables, such as inflation and financial depth, to build the institutional indexes, but most studies used policy variables, such as tax rates and tariffs⁹. Policy variables are a better proxy for the institutional environment because the result variables may not reflect the effect of the policies.

To measure the quality of institutions, indexes for four areas were built: trade, tax, financial, and size of the government. The trade policy index is based on the effective import tariff. It measures the degree to which the country interferes with foreign trade. The tax policy index is the average of two components: collection of income tax as a percentage of GDP and collection of value-added tax as a percentage of GDP. The financial policy index is the average of three components: interest rates legislation, foreign capital legislation and currency exchange legislation. This index is qualitative and has four categories, assuming values from 0 to 3. The value 0 is associated with a restrictive legislation, 1 with a partially restrictive legislation, 2 with liberal legislation, and 3 with a highly liberal legislation. Based on Morley, Machado e Pettinato (1999), each index is normalized to be between zero and one, with zero being the most interventionist policy and one the most market-oriented policy. These indexes are an attempt to capture the effect of nonmarket-oriented measures resulting of the developmentalist policies. Graph 1 shows the evolution of the institutional indexes. It may be seen that there is an improvement in the evolution of the indexes in the second half of the 1960s, except for the tax index.

Graph 1: Evolution of institutional indexes

⁹ Easterly, Loayza and Montiel (1997), for example, used performance variables; Lora (1997), Lora and Barrera (1997), Fajnzylber and Lederman (1999), Morley, Machado and Pettinato (1999), and Bandeira (2002) used policy variables.



4 INSTITUTIONS, POLICIES AND PRODUCTIVITY

To evaluate the influence of institutions on productivity, the discounted total factor productivity (DTFP) was calculated using the theoretical framework of growth accounting. I followed the methodology used by Gomes, Pessôa and Veloso (2003), separating the total factor productivity (TFP or Solow residual) into two components: the evolution of the technological frontier and the evolution of total factor productivity discounted (DTFP). The first component was based on the long-term behavior of output per worker in the U.S. economy. The second component refers to what is specific to Brazil. Based on Gomes, Pessoa, and Veloso (2003), the following assumptions were adopted:

1. The rate of evolution of the technological frontier is given by the rate of long-term growth in output per worker in U.S.;
2. The rate of long-term growth in output per worker is, *caeteris paribus*, the evolution of labor productivity;
3. The aggregate production function is homogeneous of first degree in capital and labor;
4. The impact of education on worker productivity is given by the impact of education on the remuneration of workers in the labor market, and the impact of capital on output is given by the return on the capital market.

Considering a neoclassical production function, the series of total factor productivity deduced from the technological frontier was calculated by:

$$A_t = \frac{y_t}{k_t^\alpha (H_t \lambda_t)^{1-\alpha}}$$

The relative importance of each factor of variation of the production function for the growth rate of output per worker was estimated by:

$$\ln \frac{y_{t+N}}{y_t} = \ln \frac{A_{t+N}}{A_t} + (1-\alpha) \ln \frac{\lambda_{t+N}}{\lambda_t} + \alpha \ln \frac{k_{t+N}}{k_t} + (1-\alpha) \ln \frac{e^{\phi(h_{t+N})}}{e^{\phi(h_t)}}$$

The contribution of each element to the growth rate in each year was obtained by:

$$\frac{\ln \frac{A_{t+N}}{A_t}}{\ln \frac{y_{t+N}}{y_t}}, \frac{(1-\alpha) \ln \frac{\lambda_{t+N}}{\lambda_t}}{\ln \frac{y_{t+N}}{y_t}}, \frac{\alpha \ln \frac{k_{t+N}}{k_t}}{\ln \frac{y_{t+N}}{y_t}}, \frac{(1-\alpha) \ln \frac{e^{\phi(h_{t+N})}}{e^{\phi(h_t)}}}{\ln \frac{y_{t+N}}{y_t}}$$

The graph 2 below shows the evolution of total factor productivity and the discounted total factor productivity from 1940 to 1980 (1940=100). There are two periods of higher productivity growth. The first period was the second half of the 1950s, and the second occurred in the late 1960s and early 1970s.

Graph 2: TFP and DTFP evolution from 1940 to 1980

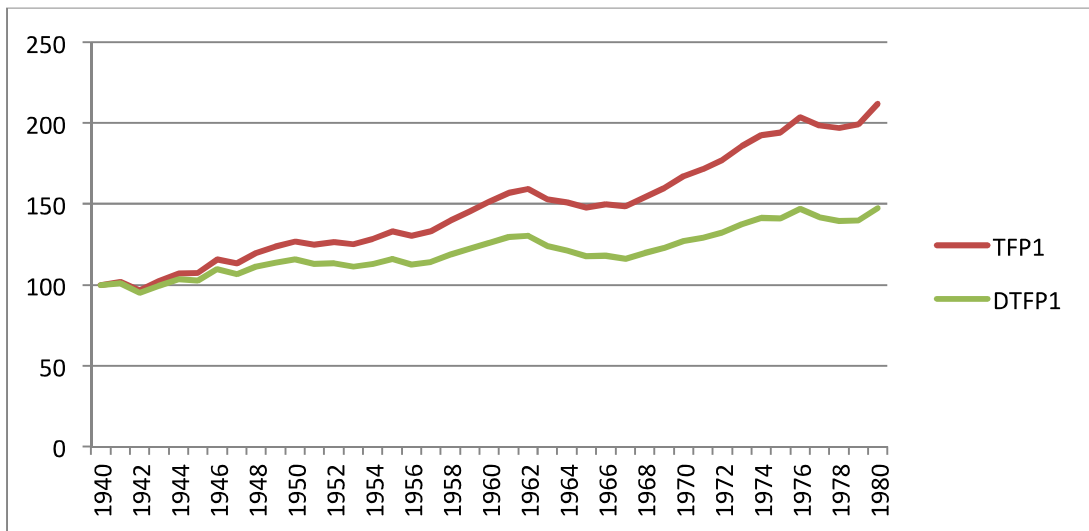


Table 1 shows the rates of growth per period. The two periods of higher productivity growth that can be seen in the graph correspond to the Juscelino Kubitschek Administration, in which the Target Plan was conceived and implemented, and measures to stimulate foreign direct investment were adopted, and to the “Economic Miracle” period, in which a set of institutional reforms was implemented. In both periods the discounted total factor productivity growth rates were closer to the total factor productivity growth rates. It can be noticed that productivity is pro-cyclical, growing faster when the economy is growing.

Table 1: Annual percentage growth rate (accumulated growth rate between parentheses)

Characterization	Period	y	k	H	TFP	DTFP
Vargas Era	1940-1955	3.97 (81.46)	5.42 (125.50)	1.17 (19.21)	1.90 (33.04)	0.99 (16.04)
Target Plan	1956-1960	6.39 (29.15)	7.33 (34.08)	1.29 (5.31)	3.73 (16.09)	2.82 (11.93)
Crisis and Adjustment	1961-1966	1.13 (5.79)	5.82 (33.75)	1.37 (7.07)	-0.94 (-4.57)	-1.85 (-8.82)
Economic Miracle	1967-1973	5.30 (37.43)	8.63 (67.82)	0.35 (2.15)	3.74 (25.18)	2.83 (18.52)
II National Plan of Development	1974-1980	4.52 (31.16)	8.76 (69.14)	0.45 (2.74)	1.59 (10.03)	0.68 (4.18)
The whole period	1940-1980	4.09 (413.72)	6.80 (1419.42)	0.95 (46.01)	1.88 (111.91)	0.97 (47.19)

The decomposition of output per worker growth is shown in Table 2. Considering the period from 1940 to 1980, the main contribution to growth was given by the accumulation of physical capital. However, productivity also was important to growth. The contribution of discounted total factor productivity for growth was very small or negative, except for the two periods mentioned before (Target Plan and Economic Miracle).

Table 2: Output per worker growth decomposition (%)

Characterization	Period	K	H	Frontier	TFP	DTFP
Vargas Era	1940-1955	34.4	17.7	22.9	25.0	2.1
Target Plan	1956-1960	29.6	12.1	14.2	44.1	29.9
Crisis and Adjustment	1961-1966	110.3	72.9	81.0	-164.2	-83.2
Economic Miracle	1967-1973	25.3	4.0	17.2	53.4	36.2
II National Plan of Development	1974-1980	58.8	6.0	20.2	15.1	-5.1
The whole period	1940-1980	40.2	13.9	22.3	23.6	1.3

The impact of institutions on productivity was estimated in a model in which the total factor productivity and the discounted total factor productivity are explained by the institutional indexes. The results are shown in Table 3. For the TFP, the size of the government is associated with higher productivity and the tax policy is associated with lower productivity. For the DTFP, besides these effects, financial policy also negatively affected productivity.

Table 3: OLS estimation of the effects of institutional variables on productivity

Independent variables	Dependent variables	
	TFP	DTFP
Trade	-26.96 (16.37)	-12.93 (7.91)
Government	63.19*** (15.20)	30.20*** (6.88)
Tax	-151.95*** (30.58)	-72.32*** (14.48)
Financial	-15.82 (15.82)	-13.33* (7.67)
Constant	203.80*** (26.77)	149.65*** (12.70)

5 CONCLUDING REMARKS

This paper presents a preliminary assessment of the influence of Brazilian institutions on the level of productivity of the economy. We related the size of the government and the tax, financial, and trade policies to the interventionist institutions of the developmentalist import-substitution period. It may be noted that the periods in which the total factor productivity had higher growth correspond to periods of institutional indexes improvement.

The results indicate that there is an influence of the institutions on the productivity through the size of the government and through the tax and the financial policies. Although the results do not allow us to infer causality from institutions to productivity, they suggest us that there is a link between institution-influenced policies and the level of productivity in the Brazilian economy.

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**EARLY FINANCIAL CRISES IN AN INFANT REPUBLIC:
AN EMPIRICAL ANALYSIS OF THE *ENCILHAMENTO* IN BRAZIL (1889-1906)[†]**

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ABSTRACT

The end of the nineteenth century is a remarkable period in Brazilian economic history. In 1889, Brazil had just turned from Empire to a Republic when a monetary and financial crisis known as *Encilhamento* took place. The infant Brazilian republic had neither experience nor adequate institutions in dealing with such phenomena. This paper analyses the difficulties faced by the early republican government using two different methods to date the crisis. The exchange rate reflects domestic and foreign shocks faced by the Brazilian economy and is one of the most reliable macroeconomic series for the period. We empirically estimate the breaks in the exchange rate monthly series from 1889 to 1906 to identify each period of the crisis. We conclude that there were up to six structural breaks in the exchange rate of the period. We suggest, from our tests, that economic events were responsible for most of the changes, although institutional and political events also contributed to explain several breaks in the period.

[†] We thank Reginaldo Nogueira, Jr. (IBMEC Minas Gerais) for useful comments on a first draft of this paper. Remaining mistakes are our full responsibility.

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