EL BNDES DE LA SUSTITUCIÓN DE IMPORTACIONES AL NEOLIBERALISMO. UNA EXPLICACIÓN MARXISTA

THE CHANGING ROLE OF BNDES FROM IMPORT-SUBSTITUTION TO NEOLIBERALISM: A MARXIAN EXPLANATION

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RESUMEN

Después de funcionar de manera exitosa durante la época de sustitución de importaciones —incrementando los niveles de producción y del empleo—; en el neoliberalismo, muchos bancos de desarrollo han sido desmantelados o cambiado radicalmente sus funciones. Nuestro objetivo en este artículo es mostrar como el banco de desarrollo de Brasil (BNDES) funcionó durante el período de sustitución de importaciones y neoliberal usando herramientas estadísticas básicas y un marco teórico Marxista. A partir de este enfoque se encuentra que: (1) los desembolsos del BNDES contribuyeron a la industrialización desde 1952 hasta la década de 1970, (2) los desembolsos del BNDES están altamente correlacionados con las inversiones en maquinaria y equipo, y (3) la caída de la tasa de ganancia y la dinámica de la lucha de clases explican el papel cambiante del BNDES desde la sustitución de importaciones hasta el neoliberalismo.

Palabras clave: crecimiento, inversión, bancos de desarrollo, tasas de ganancia y lucha de clases.

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ABSTRACT

During the current neoliberal era in Latin America, the intervention of government has been considered pernicious to economic activity, and therefore several institutions have been dismantled or have radically changed their functions. Among these institutions are development banks. We claim in this article that development banks after WWII and before neoliberalism arrival positively affected economic growth, broadened domestic markets, and generated employment. We take as a case study the Brazilian development bank BNDES, founded in 1952. Using statistical data as well as a Marxian framework, we found that: (1) BNDES' disbursements contributed to industrialization from 1952 until the 1970s, (2) BNDES' disbursements are highly correlated to investments in machinery and equipment, and (3) the downfall of the rate of profit and the dynamics of class struggle explain the changing role of BNDES from import-substitution to neoliberalism.

Key words: Brazil, growth, investment, development banks, rate of profit and class struggle.

1. INTRODUCTION

This article aims to show the contributions of development banks in financing economic development in a Latin American country, specifically Brazil after WWII. Development banks in underdeveloped countries have helped to encourage a national bourgeoisie and to promote industrialization in an incipient way. Even though these institutions were (and are) capitalist oriented, we believe that their creation after WWII positively affected economic growth, broadened domestic markets, and generated employment. However, during the current neoliberal era, the intervention of public institutions and the government—in an attempt to direct economies—is considered pernicious to economic activity, and several institutions and state-owned companies either have been dismantled or have radically changed their functions.

We offer evidence indicating the relative success of development banks in supporting investments and encouraging economic growth during the import-substitution period. We take Brazil, and its development bank BNDES (National Bank for Economic and Social Development),[1] as a case study. Until now, evidence of BNDES' contributions to Brazilian industrialization has been based on the support that the state granted to the industrial sector during the import-substitution period, which was characterized by high rates of economic growth. In contrast to this period, low rates of economic growth have been associated with the greatly reduced involvement of the state in directing the economy during the neoliberal era. In addition to this fact, we provide insights into the changing role of BNDES during the import-substitution period and the neoliberal era based on Marxian groundings.

This article is organized as follows. After this introduction, in section 2, we address a historical account of the performance of Brazilian economic growth and divide it into historical units. In section 3, we briefly review the contributions of BNDES to Brazilian industrialization and discuss which sectors were most supported throughout the history of the bank. In section 4, we present statistical evidence of Brazilian investment and the BNDES' disbursements correlation. Section 5 deals with the political economy of development banks and the changing functions of BNDES from Import-Substitution to neoliberalism, and section 6 includes a summary and conclusions.

2. HISTORY OF BRAZILIAN ECONOMIC GROWTH

Brazil has followed three models of economic growth in the 20th century: (1) the primary-export model, (2) the import-substitution model (ISI), and (3) the neoliberalism model.[2] There are no strict dates when these models began. We describe each period based on the statistical structural change[3]

1 In Portuguese Banco Nacional de Desenvolvimento Econômico e Social (BNDES).

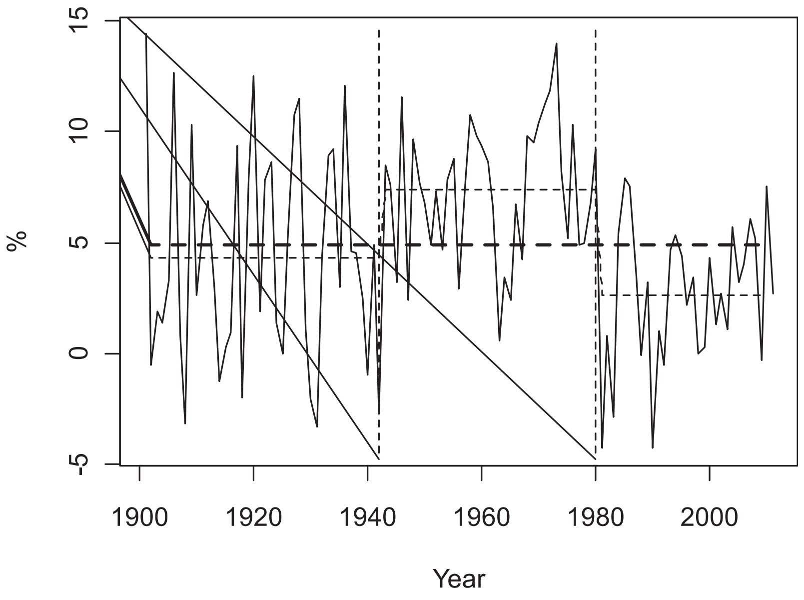
2 These models of economic growth are common to almost all Latin American countries (see Guimarães, 2010).

3 Structural change in the Brazilian rate of economic growth means that our time series is not stable over time. In other words, sharp changes can shift the mean to a lower or higher position.

occurring in the annual growth rate and by the economic policies implemented during each period.

From 1901 through 1942 —the primary-export model years— the growth rate was 4.3 percent; from 1943 through 1980, it was 7.4 percent, which represents the import-substitution model; and from 1981 through 2011, the neoliberal years, it dropped to 2.6 percent. Figure 1 plots the Brazilian growth rate (solid line), the average rate of growth throughout the 20th century (thick dotted lines), and the structural change (thin dotted vertical lines). We now describe the most important economic features of each period.

Figure 1. *Brazilian growth rates and breakpoints*



Source: Author's elaboration with data from Presidência da República Federativa do Brasil (2013).

First, the primary-export model was characterized by prosperous exports of coffee and rubber at the beginning of the period. Overproduction of coffee soon followed, but coffee prices did not decrease during the period because public-sector programs purchased the surplus (Furtado, 1962). According to Triner (1996, 1999), a common perception of Brazilian economic growth during this period was that agricultural exports were the most dynamic sector; in contrast, he believes that other activities, such as infrastructure and the food and textile industries, which were supported by private banks, were equally buoyant. The industrial sector had periods of high growth such as those before WWI, but a sharp change in the sectoral composition of GDP occurred at the end of the 1930s and the beginning of the 1940s (Baer, 1978). In addition, the amount of money flowing through the economic system was scarce in this period (Haber, 1991). Table 1 shows the sectoral composition of GDP, 1900-2000. Primary activities declined rapidly from 1900 to 1940. The secondary sector grew slowly from 1900 to 1920, declined in the following decade, and finally boomed in 1940.

Table 1. Sectoral composition of GDP, 1900-2000, constant 1949 prices

Year	*Primary*	*Secondary*	*Tertiary*
1900	44.57	11.59	43.84
1910	39.73	13.08	47.19
1920	38.09	15.72	46.19
1930	35.77	14.81	49.41
1940	29.43	18.74	51.84
1950	22.42	25.64	51.94
1960	16.91	29.85	53.25
1970	14.27	32.52	53.22
1980	9.81	34.29	55.90
1990	10.54	29.97	59.49
2000	11.04	27.74	61.22

Primary = Agriculture, forestry, and fishing.
Secondary = Mining, manufacturing, construction, and other public utility industries.
Tertiary = All other activities not included in the primary and secondary sectors.
Source: Bonelli (2003).

Second, the ISI model was characterized by fast industrialization, mostly in nondurable and durable goods but also in intermediate goods. During this period, industrial activities led the economy and were not only the result of the primary sector's needs. Although this kind of industrialization may have started during the 1930s (Guimarães, 2010; Baer 1978; Bulmer-Thomas 1994; Tavares 1977) because of the impact of the Great Depression on reducing external demand and national policies implemented by the government, high and sustained growth rates occurred from mid-WWII onwards.[4] Additionally, the Brazilian government created several institutions to foster industrial development: big public enterprises such as the National Steel Company (Companhia Siderúrgica Nacional) and Petrobras (oil) were founded in the 1940s and 1950s; an institution to coordinated the exchange rate and the interest rates, (the SUMOC), was created in 1945; and a development bank to provide long-term financing (BNDES) was established in 1952. By the end of the 1970s, Brazil was the most industrialized country in Latin America (Frank, 1972; Curralero, 1998; Matos, 2003; Guth, 2006).

During the ISI period, there was a process of convergence with the US in GDP,[5] and capital formation grew steadily. The Brazilian growth rate was highly volatile, but as Araújo, Carpena, and Cunha (2008) have reported, this instability did not affect the dynamics of the GDP pattern. High and sustained growth rates occurred along with extensive political stability after the 1950s (in spite of Getulio Vargas' suicide in 1954 and the military coup in 1964) (Barros, 2009).

However, despite the vigorous growth in GDP, the ISI model was not as successful as desired for three reasons:

(1) Building the stock of capital goods so that they would not need to be imported for continued industrialization was a slow process.

4 For example, the average rate of economic growth was 6 percent from 1941 through 1950 and 7.4 percent from 1951 through 1980; in contrast, it was only 4.5 percent from 1931 through 1940.

5 GDP at PPP, 1991 prices. We use Maddison's (2014) database.

(2) The Brazilian process of industrialization was dominated by foreign enterprises and countries, above all by the US. Almost 40 percent of Brazil's total exports were to the US from 1945 to 1970. Similarly, during the 1960s, the large inflow of foreign enterprises that located in Brazil to produce what had been imported before led to foreign domination of 40 percent of the manufacturing sector (Prado Jr., 1968).

(3) Inequality increased rather than diminished in spite of the existence of high and sustained growth rates.

Third, the neoliberalism era started in 1981 and has not yet ended.[6] Market-oriented policies were established right after the Brazilian dictatorship (1964), primarily in the financial sector (Hermann, 2002; Guth, 2006), in the tax system, and in the labor markets (Marquetti, Maldonado, and Lautert, 2010). For this article, the key turning point towards neoliberalism was the performance of the growth rate —just 2.6 percent— and the set policies implemented under the IMF's guideline such as fiscal balance, control of inflation, and the rise of exports after the debt crisis.[7] The objective of these polices was to enable Brazil to service external debt. It is not the focus of this article to describe in detail the neoliberal period, but we have to dig deep to find the macroeconomic environment under which development banks acted. The neoliberal approach to generating the fund to service Brazilian debt rested on five pillars: a reduced exchange rate, commercial liberalization, financial liberalization, privatizations, and stabilizations programs, which often included programs that promoted the first four pillars and in addition focused on hyper-low inflation and fiscal and trade surpluses, generally involving contractionary economic policies. However, not all the measures were established at the same time. During the 1980s, the tools used to generate the foreign exchange to pay debt

6 For many scholars, the full neoliberal era started during the 1990s, with implementation of the *Plano Real*. We took into consideration, as the key feature, the transition period that started in 1982.

7 Furthermore, for Marquetti, Maldonado, and Lautert (2010), market-oriented reforms introduced during the mid-60s did not reshape the Brazilian development strategy.

service were positive trade balance and a few privatizations. Competitiveness was encouraged through exchange rate devaluations, and inflation never was controlled (Curralero, 1998). In 1990, tariffs to imports were reduced and an ambitious program of privatization was launched, the PND.[8]

In 1994, a neoliberal plan was established (called the *Plano Real*), consisting of a new unit of account, a new coin pegged to the dollar (as positive trade balance had been obtained through devaluations throughout the 1980s, this competitiveness resulted in instability in the Brazilian economy), and contractionary policies to obtain a fiscal surplus. These contractionary policies included cuts in wages, layoffs in the public sector, and cuts in the education and health budgets. *Plano Real* did not result in high growth rates; it reduced inflation but caused a negative trade balance. Later on, the Brazilian economy was directed to attract foreign investment by means of a high interest rate, which disincentivized the productive sector (Stallings and Studart, 2006; Ban, 2013).

The process of convergence with the US ended, and capital formation stagnated after the 1980s with neoliberalism. Although some redistributive measures were carried out during the Lula Administrations (2003 to 2011), other neoliberal tenets remained as did the commitment to maintain the "...inflation targeting, central bank independence, large fiscal surpluses, free capital mobility, flexible exchange rates...support for export-oriented agribusinesses [and] no privatizations were reversed..." (Morais and Filho, 2011: 32; see also Ban, 2013).[9]

As stated above, poor growth rates have characterized the period since the peak of industrialization in 1980. Industrial activities were less important in the composition of the GDP during subsequent decades (see table 1; also see Medialdea, 2012 and Marquetti, Maldonado, and Lautert, 2010).

8 In portuguese Plano Nacional of Desestatização.

9 Though Morais and Filho (2011) were strongly critical of Lula's first presidential period (2003-2007), they were sympathetic to the second period when, according to them, a neo-developmentalist strategy was implemented that has increased the levels of consumption, investment, and credit.

3. DEVELOPMENT BANKS' CONTRIBUTION TO GROWTH: BNDES' EXPERIENCE

After addressing a historical account of the performance of Brazilian economic growth and dividing it into historical units. In this section we aim to see the following: (1) the definition of a development bank, (2) a development bank's goals in underdeveloped countries, and (3) BNDES' activities from 1952 onwards.

First, in underdevelopment countries a development bank is a post-WWII phenomenon. It is a result of the postwar belief that national policies are needed to foster industrialization to promote growth and maybe subsequently development. Yet, despite this historical fact, as Lazzarini *et al*. (2012) have reported, it is still troublesome to define what a development bank is. In short, in this article, a development bank must have two salient functions: (1) it is a financial intermediary (Lazzarini *et al*. 2012; Diamond, 1957; Bruck, 1998), and (2) it must have the goal of promoting development (Maung, 1973; Ramírez, 1986; Diamond, 1981; Armendáriz, 1999; Guth, 2006; Lazzarini *et al*., 2012). Both functions must correspond to the overall national economic policies implemented by the respective country, for the way in which the development banks carry out these activities can vary enormously between countries. The economic, political, and social conditions of a country and the concept of the development of its government interact to give very different structures and practices.

Second, even though Foreign Direct Investment (FDI) contributed in some way to Brazilian industrialization (see below), the lion's share in increased basic capital formation (infrastructure) was due to the public sector. The government had to raise investments to (1) encourage a national bourgeoisie, and (2) to maintain industrialization in an incipient way. According to Guth (2006), Brazilian industrialization needed investments in both infrastructure and basic industries such as steel; however, financing those areas was restricted by the private sector because of the high initial financing requirement and low short-term profit. Therefore, the state had to carry out these activities on its own through a development bank.

Third, the BNDES[10] was founded in 1952 with the main objective to provide long-term funding to branches of the economy that Brazilian industrialization made necessary. It was structured in accordance with the ideas of the Joint Brazil-United States Mission (CMBEU), which had worked on the project from 1950 to 1952 (Baer and Villela, 1980). The Bank's initial objective was to finance infrastructure and basic industries such as steel (Além, 1998; Batista, 2002) in order to promote economic development in Brazil. However, according to Diniz (2004), the active participation of the Finance Minister Horácio Lafer, who represented the interests of São Paulo industrial capitalists, in BNDES' foundation indicated that the Bank served the interests of Brazilian private capital mostly.

Generally speaking, from its creation until the starting of the Brazil's dictatorship, BNDES' resources financed public activities. After starting dictatorship (1964), BNDES granted resources primarily to the private sector (Curralero, 1998; Guth, 2006).[11] From the 1950s through the 1970s, BNDES tried to accomplish all phases of the ISI. The activities supported by the Bank were: (1) throughout the 1950s, investments in infrastructure such as energy and transportation and basic industries such as steel; (2) throughout the 1960s, investments in basic industries such as steel during the first five years and afterward investments in durables goods; (3) throughout the 1970s, investments in basic industries and in capital goods (especially machinery and equipment).

Declining profit rate trend and a heavy burden in external debt made the stagnation of investment, GFCF (Gross Fixed Capital Formation) (determined above all by the private sector, given its high percent of the total) averaged only 19 percent of GDP during the 1980s and1990s. In this scenario, BNDES' goals in the 1980s onward were to privatization and promote exports (Curralero, 1998).

First, BNDES promoted exports during the 1980s; in 1990, it founded a specific program to encourage the production of machinery and equipment for export (FINAMEX). In 1993, the financing of purchases

10 The name in 1952 was the Banco Nacional de Desenvolvimento Econômico (BNDE).

11 After the dictatorship, only in times of crisis did BNDES finance a great percentage of public activities. These crises occurred in the years 1982-1985 and 2009.

of Brazilian machinery and equipment overseas was included in that program. In 1997, BNDES exim was founded to finance the production and purchase of different Brazilian products beyond machinery and equipment. Second, regarding privatization, restructuring of state-owned companies was carried out by BNDES from 1982 to 1986. The companies restructured were Siderbrás (steel), Eletrobras (electricity), Caraíba metais (copper), and Usimec (steel). In 1986, BNDES was in charge of managing a privatization program. From 1987 to 1989, BNDES privatized 13 companies. After this neoliberal success, in 1990, BNDES was placed in charge of managing a national plan of privatization. This plan had the objective of generating resources to buy foreign debt and give to private hands the former state-owned companies.

Curralero (1998), Guth (2006), and Diniz (2004) have singled out the contribution of BNDES to Brazil's high growth rates during the ISI. For these authors, BNDES was helpful in building infrastructure as well as in creating the biggest industrial complex in Latin America. However, they hold that during the neoliberal era, BNDES was no longer a development bank because of its scarce long-term financing involvement, its second-tier financial intermediary function, and its active role in privatization and export activities.

Table 2 and figure 2 show the statistical structural change in BNDES' disbursements and the growth rates in each breakpoint. From 1973 to 1986, BNDES' disbursements amounted to 2.1 percent of GDP, reflected in high growth rates. The years 1987 to 1994 were characterized by macroeconomic adjustment, with minimal economic growth and with minimal BNDES' disbursements. During this period, BNDES contributed to privatization of the most important Brazilian steel companies such as Usaminas, Cosinor, Piratinas, Acesita, Companhia Siderúrgica Nacional, Cosipa, and Acomina. The period 1995 to 2002 was characterized by an increase in BNDES' activity in the Brazilian economy, which came to represent 2 percent of GDP. However, this high participation was due to the role of BNDES in the process of privatization in public services such as electricity and communications. This period was characterized by a boom in the privatization process in Brazil, with the value of all companies sold at 88 billion dollars (Pinheiro, Giambiagi, and Moreira, 2001). Then, BNDES either organized capitalists to buy state-owned companies or granted soft credit to them (Diniz, 2004).

It is paramount to highlight that from 1953 to 1972 the role of BNDES in financing growth appears to have been minimal with respect to GDP. This pattern is due primarily to the trend of the period 1953 to 1963, in which the key to financing domestic industrial companies was self-financing and foreign resources, with a secondary role for public credit (Studart, 1995; BNDES, 2002). Foreign capital made significant investments, particularly in durable goods, which dominated the most important industrial branches and picked up the technologies that have been used (Tavares, 1977). These previously mentioned facts lead us to state the following: (1) BNDES' financing began as a complement to the international and domestic private sector; for this reason almost all disbursements were directed to infrastructure; and (2) BNDES was more active as an entrepreneur only in the IIPND[12]. With this background, what statistical evidence can be obtained regarding BNDES' contribution to Brazilian industrialization, whether or not BNDES worked?

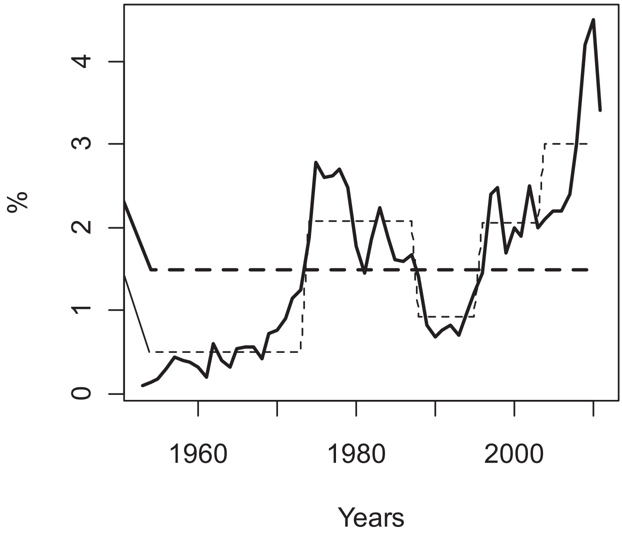
Table 2. BNDES' disbursements as a percentage of GDP and the percentage growth rate of real GDP

Years	*Average*	*GDP average*
1953-1972	*0.5*	*7.4*
1973-1986	*2.1*	*5.6*
1987-1994	*1.0*	*1.6*
1995-2002	*2.0*	*2.3*
2003-	*2.9*	*3.6*

Source: Author's elaboration with data from BNDES, 2012 and Presidência da República Federativa do Brasil, 2013.

12 Second National Plan of Development carried out in the 1970s.

Figure 2. *Breakpoints on total BNDES' disbursements as % of GDP*



Source: Author's elaboration with data from Guth, 2006; BNDES, 2012; and Presidência da República Federativa do Brasil, 2013.

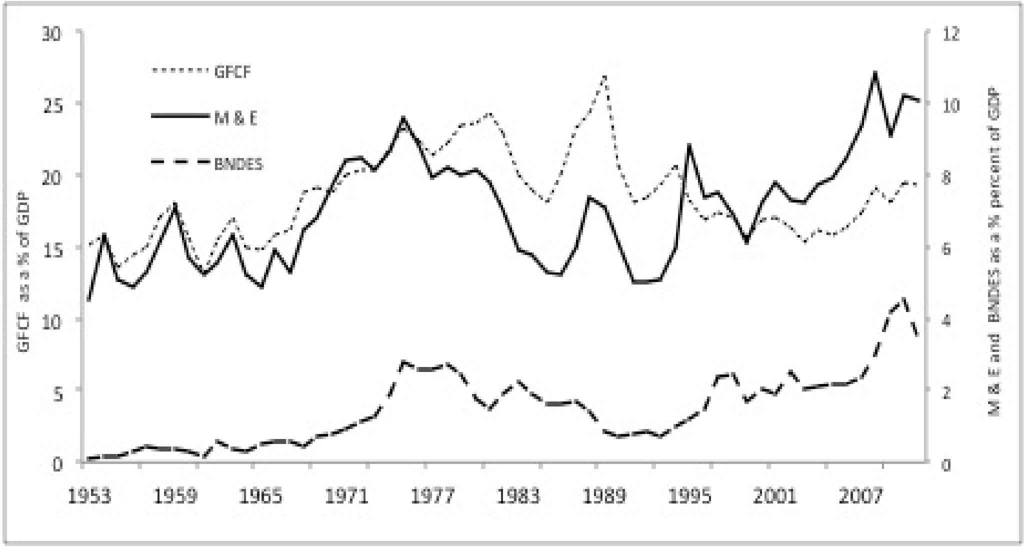
4. STATISTICAL EVIDENCE

According to Amsden (2001), development banks have to make their investments profitable for domestic and foreign capitalists. Paul Baran argues in the same vein: "Large-scale investment is predicated upon large-scale investment. Roads, electric power stations, rail-roads, and houses have to be built before businessmen find it profitable to erect factories, or invest their funds in new industrial enterprises" (1952: 75; see also 1957). We are not discarding what, in general, this hypothesis asserts, but in the Brazilian case, we have mentioned before that industrialization, which occurred during the 1930s and 1940s, made long-term financing necessary, primarily in infrastructure, and BNDES was founded in 1952 to address this need. As Brazil started its industrialization in a disorganized way, the first needs that appeared in the Brazilian process of industrialization were roads, steel, etc. The requirements of investment should have led to BNDES' disbursements throughout its history. Figure 3 plots Gross Fixed Capital Formation (GFCF) as a percent of GDP, the proportion of GFCF that is dedicated to machinery and equipment as a percent of GDP (M&E), and BNDES' disbursements as a percent of GDP. In short, the variables presented below depict the followings trends:

(1) The GFCF grew steadily from 1952 to 1980, decreased from 1980 to 2000, and increased from 2001 onward.
(2) The machinery and equipment sector did not grow as vigorously as the GFCF from 1952 through 1980. It was almost stagnant until the mid-60s, and then it grew continuously for a decade. From the end of the 1970s throughout the 1980s, the sector decreased steadily, and from the beginnings of the 1990s to the present day it started to rise again.
(3) BNDES' disbursements remained stagnant from 1952 until the end of the 1970s and started to grow significantly throughout the 1970s (years of the Brazilian Miracle and the IIPND). Afterward, disbursements diminished until the mid-1990s (the years of the structural adjustment and part of the neoliberal era), but they started to rise from the mid-1990s to the present day.

Because of the behavior of the variables, along with figure 3, there seems to be striking evidence that GFCF in machinery and equipment is highly correlated with BNDES' disbursements. This assertion is corroborated in Table 3, where we show the correlations between the variables mentioned above. Despite the presence of outliers in the years 2010 and 2011, a linear positive relationship can be established between the two variables (see figure 4), i.e., higher values in GFCF in machinery and equipment as a percent of GDP imply higher BNDES' disbursements values.

Figure 3. *Investment in the Brazilian economy, 1952 to 2011*



Source: Author's elaboration with data from Guth, 2006; BNDES, 2012; and Presidência da República Federativa do Brasil, 2013.

Table 3. Correlation between variables

	GFCF/M & E	*GFCF/BNDES*	*M & E/BNDES*
Correlation	0.4192	0.3320	0.7431

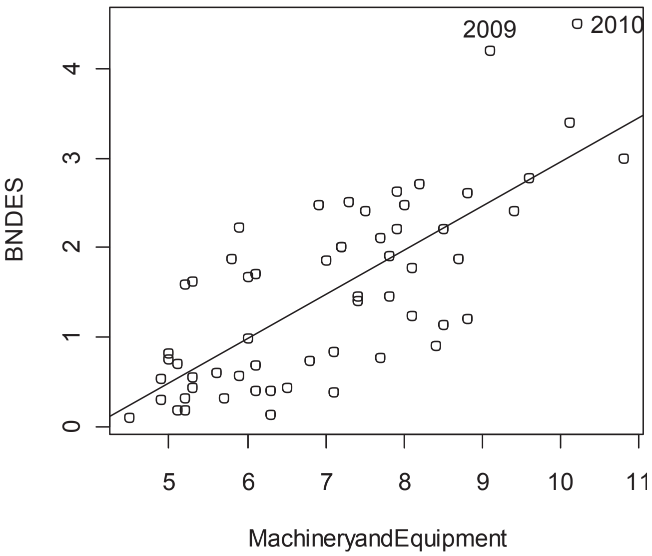
Source: My own elaboration with data from Guth 2006; BNDES, 2012; and Presidência da República Federativa do Brasil, 2013.

GFCF = Gross Fixed Capital Formation as percent of GDP.

M & E = Proportion of GFCF that is dedicated to machinery and equipment as a percent of GDP.

BNDES= BNDES' disbursements as a percent of GDP.

Figure 4. *GFCF in machinery and equipment and BNDES' disbursements as a percent of GDP in Brazil*



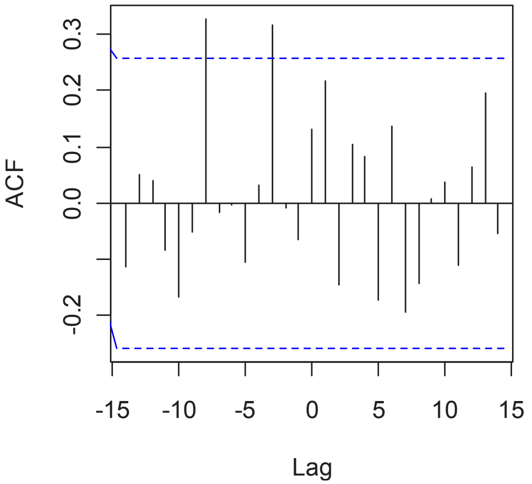
Source: Author's elaboration with data from Guth 2006; BNDES, 2012; and Presidência da República Federativa do Brasil, 2013.

In addition, it is more important for us to shed light on whether or not accumulation in machinery and equipment led to BNDES' disbursements. Historically, BNDES was created only to solve bottlenecks in Brazil's process of industrialization[13] and, hence, BNDES' disbursements could be related to past lags in machinery and equipment. The Cross-correlation Function (CCF) is a helpful tool for identifying lags in machinery and equipment that may be useful predictors of BNDES' disbursements. In short, cross-correlations indicate lags in which two variables are correlated. Figure 5 shows these cross-correlations between machinery and equipment and BNDES' disbursements. Lags are plotted on the horizontal axis, and cross-correlations are plotted on the vertical axis. Spikes that overpass the horizontal dashed lines are correlated.

13 This was a common task for the vast majority of development banks (see Aubey, 1966; Amsden 2001; Guth 2006).

Machinery and equipment clearly led BNDES' activity. The most dominant cross-correlations occurred in lags -8 and -3.

Figure 5. *Cross-correlations: Machinery and equipment on BNDES*



With this positive cross-correlation evidence, we ran a regression including the biggest spikes in figure 5. This regression does not fit very well because R square is 26 percent, median residuals are not close to 0, and maximum and minimum values differ quite significantly. As was expected, lags -3 and -8 are significant[14] (see table 4).

Table 4. Regression results

Coefficients	*Estimate*	*Std. Error*	*t-value*	*P-value*
$M \& E_{t-3}$	0.8133	0.2961	2.747	0.00845
$\Delta M \& E_{t-8}$	0.7612	0.2717	2.802	0.00730

14 We have highlighted that in doing this regression, as well as when we calculated the cross-correlation relationship, we did not consider each variable percentage of GDP. Instead, we took growth rates because cross-correlations could be sensitive to trends (Cowpertwait and Metcalfe, 2011; Penn State, 2012).

In order to improve our results, we can remove outliers and redo the model, but we choose to proceed in another way. If two time series are integrated for order $I(1)$, they cointegrate. Applying the Phillips-Ouliaris test for cointegration, we reject the null hypothesis of no cointegration (see table 5).

Table 5. Cointegration test

Phillips-Ouliaris Cointegration Test	*P-value*
Null Hypothesis: no cointegration	0. 02026

Once cointegration is detected between two variables, machinery and equipment can lead BNDES' disbursements or vice versa. Applying the Granger causality test, we reject the null hypothesis that machinery and equipment do not lead BNDES' disbursements. In turn, we accept that BNDES' disbursements do not lead investments in machinery and equipment (see table 6). In addition, the lack of instantaneous causality is accepted in both cases. To our way of thinking, we have found fair results because it seems plausible that investment needs in machinery and equipment lead to BNDES' disbursements and not the reverse. Furthermore, it is also plausible that BNDES reacts to Brazilian industrialization needs with some lags because some infrastructure activities can be expensive and can be carried out only in the long term.

Table 6. VAR Granger causality between machinery and equipment and BNDES

Null hypothesis	Statistics	P-value
BNDES does not Granger-cause M&E	0.9144*	0.404
No instantaneous causality between BNDES M&E	1.988**	0.1586
M&E does not Granger-cause BNDES	9.4232*	0.0001757
No instantaneous causality between M&E and BNDES	1.988**	0.1586

*F-test, ** Chi-squared

Two lags were selected according to AIC, HQ, and FPE information criteria. VAR model with trend and constant.

5. THE POLITICAL ECONOMY OF DEVELOPMENT BANKS

The antecedent of post-WWII development banking was the 19th century European investment bank. Several countries, such as Belgium, France, and Germany, used investment banks to industrialize in order to catch up to England. The question in this section is why development banks in underdeveloped countries, and especially in Brazil, did not produce the effect of catching up to the leading countries after WWII. We are tempted to single out Frank's hypothesis, which states that "contemporary underdevelopment is in large part the historical product of past and continuing economic and other relations between satellite underdeveloped and the now developed metropolitan countries. Furthermore, these relations are an essential part of the structure and development of the capitalist system on a world scale as a whole" (Frank,1972: 3). External factors undeniably contributed to some of the current problems in Latin America as other scholars have pointed out (Pinto and Di Filippo, 1979).

We can prompt two answers to the question outlined before. First of all, it has to be explained the relationship among development banks, investment rate, and the rate of profit; and second, it has to be explained the relationship between development banks and the class struggle.

In Marxian literature (Bakir and Campbell 2009; Duménil and Lévy 2007; Marquetti, Maldonado, and Lautert, 2010), the investment rate determines the growth rate, but the rate of profit determines the former. The rate of profit is one of the most important variables in an economy because it indicates the degree of valorization of capital and the degree of capital utilization in each company. The role of development banks in capitalism then is to increase the level of investment and subsequently produce growth (for that the role of granting long-term credit and owning companies), but the development banks do not control the rate of profit. As long as national bourgeoisies are weak, the state has to intervene through development banks to control the production process. Why in Brazil, from 1980s onwards, did the rate of investment not increase and why were BNDES' activities related to promoting exports and privatizations?

Marquetti, Maldonado, and Lautert (2010) describe three phases in the Brazilian rate of profit: (1) from 1953 to 1972, the rate decreased at 1.1 % per year; (2) from 1973 to 1989, it decreased sharply, reaching its lowest level at the end of the period (during this period Brazil built the biggest industrial complex in Latin America); and (3) from 1990 onwards, the rate of profit slightly recovered. However, the level of the rate of profit on average is much higher in the first two periods than in the last. Therefore, if BNDES had increased the rate of investment through the 1980s, the decline of the rate of profit would have exacerbated which would not have been convenient for Brazilian capitalists. For this reason, BNDES throughout the neoliberal era has totally changed its functions, primarily promoting privatization and exports. In this process, the winner has not been Brazilian society but Brazil's biggest companies. Primarily, the main Brazilian exports are not high tech products but commodities (similar to the primary-export model), and secondary, BNDES has encouraged the creation of big transnational companies as is the case with Vale do Rio Doce (mining), Grupo Bertin (foods), Grupo JBS/ Friboi (foods), and Brasil foods. Regarding BNDES' performance during the 2000s, even neoliberal scholars highlight that: "rather than providing funding for companies that were capital constrained and in need of resources to pursue large capital investments, [BNDES] actually appears to be supporting firms that would most likely be able to borrow elsewhere" (Lazzarini *et al*. 2012: 6). BNDES, therefore, is no longer functioning as a development bank.

A further determinant of the investment rate and of BNDES' performance is the magnitude of the surplus value and its use in an economy. Capitalists obtain a surplus/profit by exploiting workers. Part of the surplus can be either reinvested or consumed. The logic of capitalism and its revolutionary role in history consist of the surplus reinvestment and the unlimited expansion of the production process. However, scholars such as Baran (1952) and Cardoso (1969) have reported that the middle class in Brazil during the 1930s and 1940s failed in its bourgeois revolution. The Brazilian middle class chose to associate with the old oligarchy and foreign investors instead of with the workers and peasants. The Brazilian upper class when necessary, chose to use the state through development banks, but now a broader and stronger wealthy class exists in Brazil (and throughout Latin America) than in the time of the import-substitution model and BNDES' success. During this earlier period, the weaker wealthy class often saw the extension of the state into the economy as a tool to promote their interests, but today's wealthy class generally adheres to the dominant neoliberal view among capitalists that a capitalist market economy with minimal direct governmental involvement is better for their class interests.

Two other general factors strengthen the position of the upper class versus the working class in this neoliberal era: (1) the demobilization of the working class, and 2) the mobility of international capital, which results from two very different causes. First, there have been general technical (above all communications), financial, and legal changes in international capital. Equally important, however, is the ideological commitment of the ruling class of most countries to try to reduce all barriers to the unrestricted movement of capital (one aspect of neoliberalism). The importance of this second and sometimes overlooked aspect of today's worldwide increased mobility of capital is highlighted by those few countries that are protecting their economies through existing and/or developing barriers to such minimally restricted international capital mobility.

6. CONCLUSION

This article addressed five issues: (1) Brazilian growth models throughout the entire 20th century; (2) economic performance in the ISI period, which was much better than the economic performance in the neoliberal era; (3) BNDES' contribution to industrialization from 1952 onwards; (4) statistical evidence of the relationship between GFCF in machinery and equipment and BNDES' activities; and (5) the political economy of development banks.

The evidence presented in this article showed that BNDES responded to Brazilian industrialization needs, which makes sense because in their origins in the 20th century, development banks were created to deal with bottlenecks. We found a positive cross-correlation between investments in machinery and equipment and BNDES' disbursements, and that the former caused the latter in the Granger sense. We also found evidence to support that investment in machinery and equipment led BNDES' activities. A further implication of this finding is that BNDES' activities have been procyclical and not anti-cyclical. This fact also makes sense, because BNDES has not been an entrepreneur throughout its entire history nor has it invested important resources in the acquisition of machinery and equipment. Considering this latter point, BNDES was a great investor in machinery and equipment only during 1974 to 1979 and 2003 to 2011. BNDES, therefore, has been a complement to and not a substitute for other investment activities (which clearly rejects the conservative argument of the crowding out effects of public investment). However, whether or not BNDES can be a solid entrepreneur that can lead and foster accumulation of capital and promote growth is a matter for the future. Two variables are key in this process: (1) the evolution of the rate of profit, and (2) the dynamics of the class struggle to obtain more social benefits through development banks.

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