

The Profit Rate in Brazil, 1953-2003

Review of Radical Political Economics
42(4) 485-504
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Political Economics
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DOI: 10.1177/0486613410375058
<http://rrpe.sagepub.com>



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Abstract

This paper investigates the profit rate in Brazil between 1953 and 2003. There was a tendency for the profit rate to fall during the period under study determined mainly by the declining productivity of capital. There were three phases in the behavior of the profit rate. In the first phase, between 1953 and 1973, it slowly declined; in the second, from 1973 to late 1980s, it fell sharply; in the third, from late 1989 to 2003, it increased moderately. These phases correspond to the institutional arrangements of the Brazilian economy, respectively, to the import substitution industrialization (ISI) during the golden age of capitalism, to the crisis and rupture of ISI, and to neoliberalism.

JEL classification: E25, N16, O30

Keywords

profit rate, wage, labor productivity, capital productivity, Brazil

1. Introduction

The Great Depression of the 1930s was seen as the failure of economic liberalism as an organizing principle of modern societies. The understanding that the role of the markets in allocating resources should be restricted superseded the conception that free markets were the foundation for economic progress. Then, the conception became prevalent that capitalism had to be organized not according to the principles of liberalism but rather by some sort of regulated capitalism or “embedded capitalism.”

After World War II, the domestic markets gave the dynamic to national economies in regulated capitalism. Labor market regulations coupled with high economic growth (Maddison 1995) and reduced rates of unemployment gave more power to the working class in its bargain with

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Date received: January 10, 2008

Date accepted: June 24, 2009

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capitalists. As a consequence, the working classes in the advanced capitalist countries experienced an unheard of improvement in their standards of living (Glyn et al. 1991).

Nevertheless, by the late 1960s there were signs that the model of regulated capitalism was not working properly; a structural crisis was under way. What caused this crisis? The Marxian analyses of the Golden Age pointed to the fall of the profit rate due to the decline in capital productivity and the rise of wages in parallel with gains in labor productivity (Duménil and Lévy 2003).

The regulatory framework was restricting the ability of the capitalist class to overcome the profitability crisis. It was necessary to embark on a process of neoliberal reforms which would restore free markets as the central mechanism for the allocation of resources in order for the capitalist class to regain its strength. Neoliberalism was successfully imposed within advanced capitalist countries by the late 1970s and early 1980s. The empirical evidence shows that, after the restoration of capitalist class power, there was a rise in the profit rate in developed capitalist economies (Duménil and Lévy 2002).

For many developing capitalist countries, the turning point was the debt crisis in the 1980s. From then on, developing countries began a process of reforming their institutional framework in order to build up the neoliberal one. The International Monetary Fund and the World Bank played an important role in this process.

The changes in the institutional framework of the world economy and its dominant economic ideology, as briefly stated above, are fundamental for analyzing the evolution of the Brazilian economy and the movements of its structural economic variables. The international context gave the economic and ideological constraints and incentives for the building up of the Brazilian economic models: the import substitution industrialization model (ISI) during the Golden Age of capitalism and the neoliberal model. The crisis and rupture of the ISI extended from the middle 1970s to the late 1980s.

During 1953-2003, there were two phases of economic growth in the Brazilian economy. It was very dynamic during the Golden Age, growing at 7.3 percent per year between 1953 and 1980. Then, there was a sharp decline in growth in the neoliberal years, as Brazilian GDP expanded at 2 percent between 1980 and 2003.

The aim of this paper is to explain, from a Marxian perspective and taking into account the changes in the world economy and ideological frameworks, the evolution of the profit rate and its decomposition in Brazil during the 1953-2003 period. Behind this goal is the conception "that the profit rate is crucial to the functioning of ... capitalist economies" (Duménil and Lévy 1993: xi).

This is a first and necessary step towards a more ambitious objective, which is to employ the Marxian analytical framework to explain the process of accumulation of capital in Brazil since the beginning of the 1950s, in particular, to explain the decline of GDP growth after 1980. This is a major task, which is left for future research.

In accordance with Marx's conception, there was a declining tendency of the profit rate during the period in analysis determined by technological change, which reflects the rapid mechanization of the economy after World War II. The evolution of the profit rate displayed three phases that are consistent with institutional changes in Brazil as well as with international capitalist transformations.

The paper is organized as follows: Section two presents a brief delineation of the Brazilian economy's growth for the 1953-2003 period; section three addresses the Marxian theory of the profit rate and its decomposition; section four describes the evolution of the profit rate and its components for the Brazilian economy; finally, the last section concludes with a brief review of the results and implications for further research.

2. Brazilian Economic Growth: 1953-2003

The difference in the historical record in terms of economic growth between the Golden Age and neoliberalism is remarkable in both advanced and developing countries. In relation to the latter, Easterly's analysis (2001: 21)—among many others—has “documented a significant puzzle in empirical growth research: the stagnation of the typical developing country in the 80s and 90s, despite policy reforms that according to growth regressions should have led to accelerating, not falling, growth.”

In few countries is the difference in economic performance as striking as in Brazil. The Brazilian economic growth in the 1953-2003 years, as stated above, was characterized by two phases. In the Golden Age of capitalist development, the country was one of the most dynamic economies worldwide. GDP rose at 7.3 percent per year between 1953 and 1980, but it collapsed to 2 percent in the 1980-2003 phase.¹

Between 1953 and 1980, economic growth was led by the industrial sector in a process of import substitution industrialization. The industrial share increased from 26.3 percent in 1953 to 44.1 percent in 1980, while the agricultural share declined from 24.4 percent to 10.9 percent. In the 1980-2003 period, the share of industry dropped to 38.8 percent and of agriculture to 9.9 percent.

During the golden age of ISI (1953-1973) there were two economic booms in the Brazilian economy. The first was in the 1950s, when Brazil went through a very rapid industrialization process, led by the expansion of the consumer durable and capital goods sectors. This expansion was especially fast during the “Plano de Metas” (Target Program) in the 1956-1960 years. Brazilian GDP expanded at an annual compound growth rate of 7.7 percent between 1953 and 1962.²

In the beginning of the 1960s, the growth rates declined, inflation accelerated, and class struggle intensified. In 1964, a military coup overthrew the left-wing government, restoring capitalist class power, carrying out institutional reforms, and launching a stabilization program to control inflation. Insofar as the reforms are concerned, the most important ones were implemented in the years 1964-1965 which reshaped the financial markets, the tax system, and the labor markets. The labor market reform plus the repression against labor unions and the left-wing political parties led to the increase in the rate of surplus value.

Despite the market-oriented flavor of the reforms, they did not redirect the Brazilian development strategy. In fact, the ISI model was strengthened, and coordination and planning by the central government continued to be pivotal for economic policy. The reforms and economic policies implemented by the military dictatorship consolidated the industrialization of the Brazilian economy. These reforms had their economic apex in the 1968-1973 years. The so-called “Milagre Econômico” (Economic Miracle), as this period is known, was marked by an impressive annual compound growth rate of 10.8 percent in GDP and 14 percent in manufacturing.

After 1973 the Brazilian ISI model started to show its limits as the international economy entered into a period of stagflation. The answer to the international crisis by the military dictatorship was not only to keep its commitment to the industrialization model but also to implement a new and ambitious plan—II National Plan of Development—that aimed to extend ISI to intermediate goods and to greatly expand energy production. The investment boom was led by state

¹From the standpoint of Brazilian orthodox economists, this dismal performance is a mysterious one. According to Bacha and Bonelli (2004: 1) a “mystery surrounds Brazil's long-term growth experience. Why is it that this country's GDP collapsed since 1980 after expanding at some 7% per year from 1940 through 1980?”

²The 1962, 1973, 1980, 1989, and 1997 years are at or close to the peak of the business cycle. Estimates of the GDP time trend display 1953 on the time trend and 2003 on the bottom of the business cycle.

enterprises and it was mainly financed by massive foreign loans. The public enterprises raised their share of gross fixed capital formation from 12.9 percent in the 1969-1973 years to 23.1 percent in the 1974-1979 years, while the external debt rose from US\$14.9 billion in 1973 to US\$55.8 billion in 1980 (Ipeadata 2009).

Although the Brazilian average rate of growth declined after 1973, its performance was still strong. For the 1973-80 period, the GDP annual average rate of growth was 6.6 percent. Perhaps the most obvious manifestation of the crisis was the acceleration of inflation which, measured by the GPD deflator, rose from 29.6 percent in 1973 to 92.1 percent in 1980 (IBGE 2003).

The period of reduced economic growth between 1980 and 2003 can be divided into two sub-periods: first, the 1980-1989 years, when the Brazilian economy was characterized by stagnation and accelerating inflation but had not yet adopted a new development strategy; and second, the 1989-2003 years, when the Brazilian economy embraced the neoliberal model.

Brazil, which had adopted a risky strategy of rapid growth within a context of stagflation of the advanced capitalist economy, was severely hit by the external debt crisis. The country had one of its worst recessions in the early 1980s. It was becoming increasingly clear that the Brazilian economic model had structural problems in the 1970s, but it was the global debt crisis and its aftermath that raised the possibility of adopting a new economic model.

As the next sections show, the profit rate and the growth rate of labor productivity declined markedly during the II National Plan of Development. The country was not able to generate a current account surplus to service and pay the foreign debt. The answer of the military dictatorship to the international crisis expanded the external debt and it put Brazil in a position of high financial fragility.

In the early 1980s, there were lively and illuminating discussions among Brazilian economists about the causes of the economic crisis and the alternatives for returning to the path of economic growth. Several economic plans, combining orthodox with heterodox measures, were implemented, but all of them failed to control inflation and to spur growth. After 1986, the plans were known as heterodox plans because their central economic measure was freezing prices and wages. These failures increasingly gave political support for the implementation of a program of neoliberal reforms which the IMF and the international and national financial capitals were advocating as the only model for organizing the economy and society.

The 1980s were thus characterized by persistent economic crisis, and from the ideological and practical standpoints, it marks the transition from ISI towards neoliberal capitalism. The annual GDP growth rate declined to 2.2 percent between 1980 and 1989, and for this reason the 1980s are known as the "lost decade"; the inflation rate reached 1,034 percent in 1989.

It is important to emphasize that it took a long transitional phase for the Brazilian economy to move from ISI to the neoliberal model. Brazil was one of the last countries in Latin America to adhere to the neoliberal paradigm, and this is partially explained by the success of the ISI and the long process of political transition between dictatorship and democratic order. Neoliberalism represented the adoption of a market-led growth model. This new model implied the reduction in the role of the state in the economy, privatization of public enterprises, more flexible capital and labor markets, and greater international integration. For its proponents, after these reforms the Brazilian economy would benefit from the globalization process, receiving a new influx of international investment (Franco 1998). From a political perspective it represented the change in hegemony within the bourgeoisie from industrial to financial capitalists.

From 1989 onwards the Brazilian economy went through a series of neoliberal reforms. Among them was the adoption of a new form of international integration with commercial and financial liberalization (Cysne 1998). The national program of destatization started in 1990, and the public enterprises in petrochemical and metal sectors were sold initially.

The renegotiation of external debt within the context of the Brady Plan allowed the return of Brazil into international financial markets which established the basis for launching the

Table 1. GDP growth rates, Brazil, 1953-2003 (compound annual growth rate)

Period	GDP annual growth rate
1953-2003	4.9
1953-1973	7.5
1953-1962	7.8
1962-1973	7.3
1973-1989	4.2
1973-1980	6.8
1980-1989	2.2
1989-2003	1.8
1989-1997	2.1
1997-2003	1.5

Source: See appendix.

Real Plan in 1994.³ This plan was composed of two parts. The first was a set of short-term macroeconomic policies to control inflation, and the second was neoliberal reforms to spur growth. High interest rates coupled with the return of Brazil to international capital markets led to an overvalued exchange rate which was the main factor in reducing the inflation rate from 1,996.2 percent per year in 1993 to 8.3 percent in 1997. After 1994 the destatization in public services also started, with the selling of enterprises in the telecommunication, electrical, and financial sectors.

With the Real Plan, Brazil fully adopted the neoliberal agenda. Even though these reforms and the macroeconomic policies implemented succeeded in bringing down inflation, they failed to revive the former dynamism of the Brazilian economy. GDP expanded just 1.8 percent per year between 1989 and 2003, lower than during the so-called "lost decade," but the economic structure changed significantly as a result of the adoption of the neoliberal model, the industrial share in GDP declining from 46.3 percent in 1989 to 35.5 percent in 1997 (IBGE 2003).

Even from the standpoint of the neoliberal model, one of the major shortcomings of the Real Plan was the strong expansion of Brazilian external debt. It rose from US\$124 billion in 1991, the year of the intensification in the opening of the capital account (Cysne 1998), to US\$241.5 billion in 1998. The export share of GDP declined from 8.9 percent in 1989 to 7.5 percent in 1997, while imports expanded from 5.5 percent to 9.9 percent. The increase in external financial fragility associated with the volatility of international capital drove the devaluation of the real in the beginning of 1999. The Brazilian external financial problems followed a sequence of international financial crises, initiated by Mexico in 1994, succeeded by Asia in 1997, and Russia in 1998.

The Brazilian economic authorities answered the 1999 crisis by adopting an economic policy that combined an inflation target program, primary fiscal surplus, and a floating exchange rate. Monetary policy based on a high interest rate played a central role in this economic arrangement to keep inflation under control and to attract international capital. The result was the continuation of the reduced economic growth between 1997 and 2003, GDP expanding at 1.5 percent per year. This growth was led by the increase in exports, whose share in GDP rose to 16.4 percent in 2003.

Table 1 summarizes the evolution of Brazilian GDP over the 1953-2003 period. Between 1953 and 1973 there was the golden age of the ISI. Between 1973 and 1989 there was the erosion and crisis of ISI, and between 1989 and 2003 there were the neoliberal years.

³Although some market-oriented reforms were introduced previously, it was the Collor Plan in 1990 which initiated a deliberate transformation of the institutional framework of Brazil towards neoliberalism. The Real Plan broadened and deepened the process of transformation. For a critical assessment of the Real Plan see Saad-Filho and Maldonado-Filho (1999).

3. Analytical Framework and Definition of Variables

From the standpoint of Marxian theory, profit—and not self-interest or welfare maximization—is the overriding driving force of capitalism. Money capital is advanced in order to make more money, that is, profit. The profit rate measures the degree of valorization of the total capital advanced. It is central for the dynamics of the capitalist system, regulating the macroeconomic processes of accumulation, the competition among capitals, and the degree of capacity utilization that firms operate. The profit motive provides the rationale for the capitalists' defense of free markets, resistance to wage increases, and compulsion to increase productivity.

According to Marx's theory, profit—the apparent form of surplus-value—is created in the process of production, but its appropriation is realized in the markets. Competition is one of the main mechanisms that redistribute profit among industrial, commercial, and financial capitalists and also among landlords. The state also plays an important role in the process of redistribution of surplus value.

The profit rate is measured by the ratio between the total profits created during a period of time, to total advanced capital. This is the broadest measure of the degree of valorization of the total productive capital in operation. The profit rate is the most relevant variable for analyzing long-run tendencies of capitalism such as accumulation and crises; that is to say, it is the crucial variable for analyzing the dynamism of the economy as a whole. It is also clear that this variable does not provide the necessary information for analyzing the dynamics of competition and its effects. In other words, according to a Marxian approach, it is the time profile of the profit rate that ultimately underlies the visible ups and downs of the process of capital accumulation and the attendant class struggle.

It is important to remember, however, that only one part of the total profit created is really appropriated by capitalists and rentiers (capitalist classes for short). Part of the total surplus-value created is appropriated by unproductive workers, for example, commercial workers and by the state, not to mention the international transfer of surplus-value. Moreover, from that part of the total profit that is in fact appropriated by the capitalist classes, competition and property rights operate to redistribute it further as industrial profit, commercial profit, interest, and rent. It is therefore theoretically possible that a rising profit rate does not necessarily generate a speeding up of capital accumulation.

The following analysis of the time profile of the profit rate in Brazil is based on a model that is informed by the Marxian approach. However, it must be made clear that due to limitations of the data base the empirical measurements must be seen as a first approximation of the theoretical categories. For a better approximation of the traditional Marxian measurements of the profit rate, it would be necessary to have information on the amount of productive and unproductive labor and on total capital advanced in production.

The computation of the profit rate is based on national income accounts, a procedure which is similar to that employed by Weisskopf (1979), Duménil and Lévy (2002), and Wolff (2003), among others. The profit rate is defined as:

$$r = \Pi / K \quad (1)$$

where Π is the total profits and K is a measure of the nonresidential fixed capital stock, both expressed in current prices. The appendix presents the source and basic methodological procedure employed in the organization of the data set and in the computation of the variables.

In order to better understand its determinants, it is useful to decompose the profit rate as follows:

$$r = (\Pi / Y) * (Y / K) \quad (2)$$

where Y is output at current prices.

The profit share (Π / Y) reflects the effects of distribution between capital and labor on the profit rate, whereas capital productivity (Y / K) reflects the effects of technology. This conception resembles Marx's analysis of the profit rate in terms of distribution and technology.

Initially, it is carried on the decomposition of the profit share. It is expressed by:

$$(\Pi / Y) = (Y - W) / Y \quad (3)$$

where W is the total nominal wage. It can be written as the product between nominal average wage (w) and number of workers (L). The output can be expressed as the multiplication between real output (Y_R) and the output deflator (P_Y). Thus, it is possible to rewrite (3) as

$$(\Pi / Y) = [(P_Y Y_R - w L) / (P_Y Y_R)] = 1 - [(w/P_Y) / (Y_R/L)] = 1 - (w_R / y_R) \quad (4)$$

where w_R is the real average product wage and y_R is real labor productivity. The evolution of the profit share is thus determined by the difference between the growth rates of real labor productivity and real product average wage. The latter expresses the real cost of the employee from the capitalist's perspective. It is different from the nominal wage deflated by the consumer price index, which reflects the command of workers over consumption goods. The profit share will increase—and consequently the profit rate—if the real product wage rises at lower rates than the real productivity of labor.

Capital productivity, in its turn, can be decomposed into relative prices and the real output capital ratio:

$$(Y / K) = (P_Y Y_R) / (P_K K_R) = (P_Y / P_K) * (Y_R / K_R) \quad (5)$$

where P_K is price index of net capital stock and K_R is the real net capital stock, that is, $K = P_K K_R$. The real capital productivity can be written as the ratio between real labor productivity and the real capital labor ratio. Thus, it is possible to express (5) as:

$$(Y / K) = (P_Y / P_K) * [(Y_R / L) / (K_R / L)] = (P_Y / P_K) * (y_R / k_R) \quad (6)$$

where k_R is the real capital labor ratio.

Therefore, capital productivity rises - and as a consequence the profit rate declines - whenever (i) the price of fixed capital in relation to the price of output declines; (ii) labor productivity in real terms increases; and finally (iii) the real capital-labor ratio decreases.

4. The Evolution of the Profit Rate and its Determinants: Empirical Results

The profit rate over the 1953-2003 period is shown in Figure 1. In a long-run perspective, the profit rate declined substantially; in 2003 it represented 40 percent of its peak level in 1953.⁴ However, the downward trend extended from 1953 to the early 1990s, when the profit rate started to increase.

⁴The high profit rate in Brazil is a result of the high productivity of capital. Underdeveloped countries tend to have higher capital productivity than developed economies (Marquetti 2003). The appendix describes the data set and makes a comparison between three estimates of the fixed capital stock in the Brazilian economy.

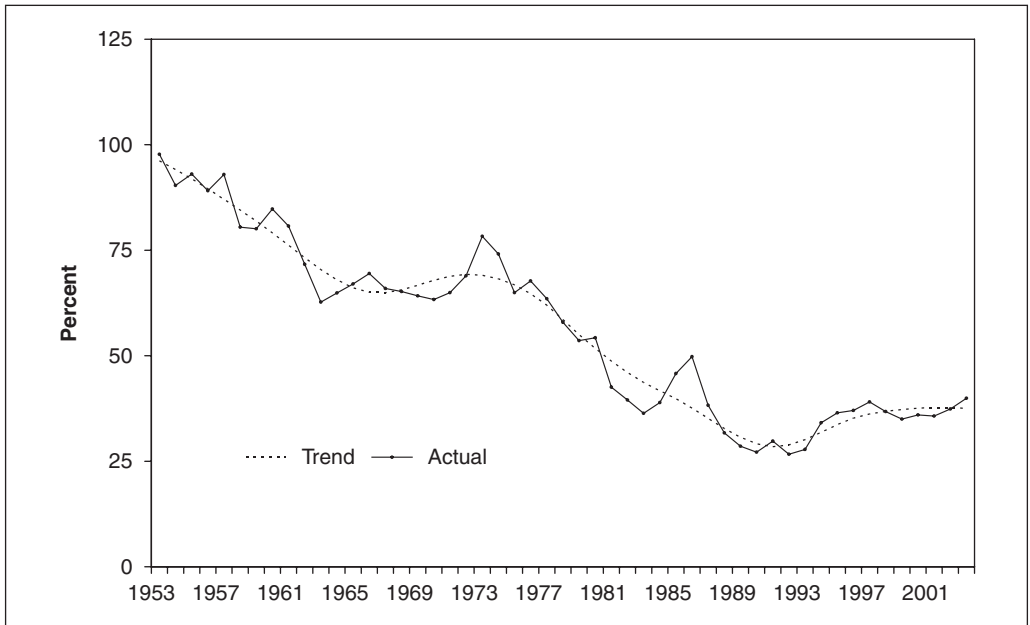


Figure 1. The profit rate, Brazil, 1953-2003

Source: See appendix.

The time profile of the profit rate has three main phases. First, the profit rate declined at 1.1 percent per year during the golden age of the ISI (see Table 2). Industrialization in the 1950s and political turmoil in the early 1960s were followed by the military coup in 1964 and the economic boom in the 1968-1973 years. The political change and rapid economic growth may explain the expansion in the actual profit rate from the middle 1960s to the early 1970s. Second, the profit rate fell markedly between 1973 and 1989. From a Marxian perspective, this decline represents one of the central determinants of the structural crisis of the Brazilian economy.⁵ This phase is marked by the II National Plan of Development and accumulation of external debt in the 1970s followed by the combination of debt crisis, high inflation rate, and low growth rates of the 1980s. Finally, in the third phase between 1989 and 2003, there was an increase in the profit rate. This later phase corresponds to the neoliberal years in the Brazilian economy. Despite its recovery, the profit rate in 2003 was somewhere between its 1983 and 1984 levels. The phases of the profit rate were correlated to the institutional changes and economic growth in the Brazilian economy.

A relevant question is: what are the main determinants of movements of the profit rate in the Brazilian economy, distribution or technology? The decomposition of the profit rate allows us to answer this question.

There are three interesting features of the time profile of the profit share, which are displayed in Figure 2. First, it remained relatively stable in the long term, with an average of 52 percent. Second, between 1953 and the early 1990s, it revealed a cyclical pattern. The profit share increased during the economic boom of the late 1950s, and then declined during the 1960s in the period of sluggish growth. Its fall in early 1960s is also associated with the rise of the working class and peasants movements and the central government pursuing left-wing reforms and economic policies. Among the reforms were the statute of the rural worker that regulated the rural

⁵In the U.S. economy the fall in the profit rate started in the 1960s (Wolff 2003).

Table 2. Decomposition of the profit rate determinants, Brazil, 1953-2003 (compound annual growth rate)

Period	r	Y / K	Π / Y
1953-2003	-1.8	-1.9	0.1
1953-1973	-1.1	-1.4	0.3
1953-1962	-3.4	-3.7	0.3
1962-1973	0.8	0.5	0.3
1973-1989	-6.3	-5.5	-0.8
1973-1980	-5.2	-4.8	-0.4
1980-1989	-7.1	-6.1	-1.1
1989-2003	2.4	1.4	0.9
1989-1997	3.9	3.2	0.7
1997-2003	0.4	-1.0	1.3

Source: See appendix.

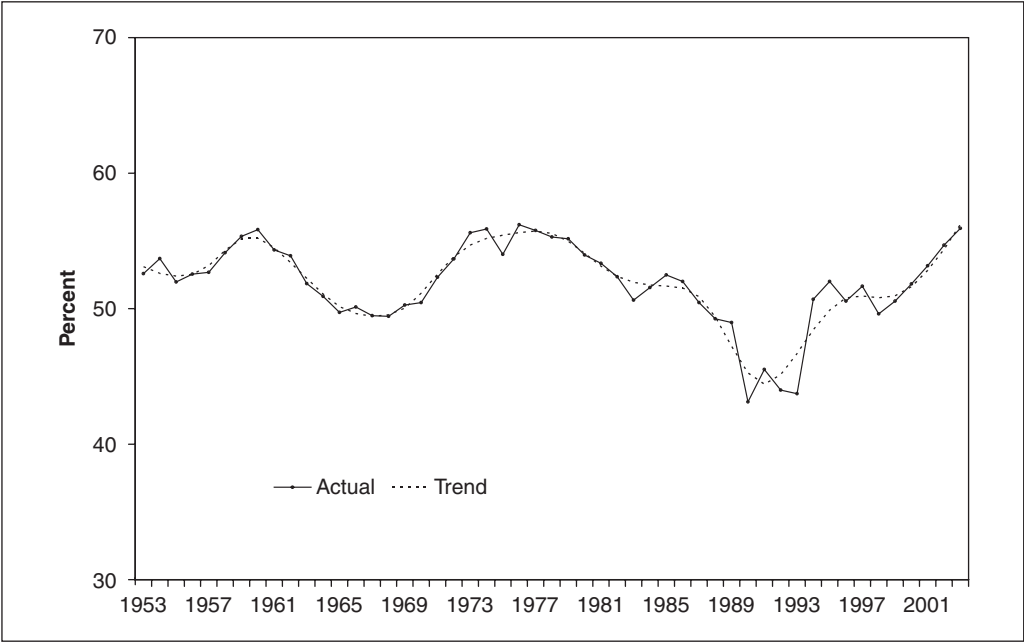


Figure 2. The profit share, Brazil, 1953-2003

Source: See appendix.

labor market and the law that restricted profit remittances by multinationals. The profit share stabilized with the military rule when pro-capital reforms and economic policies were implemented, and it rose during the 1968-1973 economic boom. The military dictatorship ended job tenure in the private sector, introduced a new wage policy that restricted wage increases, and removed the restriction to profit remittances. From the mid-seventies to the late 1990s, the profit share fell once again. Economic stagnation, combined with the indexation of wages in a period of accelerating inflation as well as the reawakening of working class militancy in the late 1970s, played an important role that explains this decline.⁶

⁶The Worker's Party was founded in 1980, after the strikes in 1979.

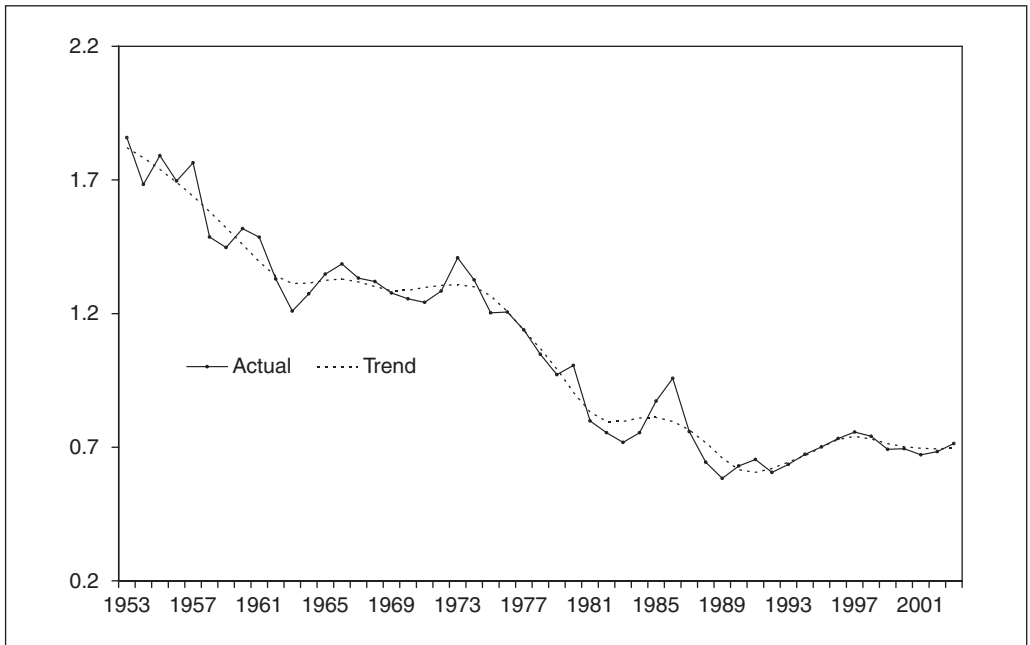


Figure 3. The productivity of capital, Brazil, 1953-2003

Source: See appendix.

Third, during the neoliberal years the profit share rose steadily from 43 percent in 1990 to 56 percent in 2003, which departs from previous experience, when its behavior was positively associated with economic growth. This upward movement seems to be related to the impact of neoliberal reforms and macroeconomic policies upon the rate of surplus value. Neoliberalism represented a major institutional change which reinforced the political power of the capitalist class.

Figure 3 presents the productivity of capital. There were three phases in its movements, quite similar to that observed for the profit rate. During the first phase between 1953 and 1973, it declined at 1.4 percent per year. In the second phase between 1973 and 1989, there was a steep fall, 5.5 percent per year, in capital productivity. It is important to point out that Brazil was going through a particularly intense process of industrialization in the 1950s and 1970s with the Target Program and the II National Plan of Development. In the third phase from 1989 to 2003, there was a mild rise in the productivity of capital. In 2003 it was close to its early 1980s level. The third phase represents a change in the long-term behavior of capital productivity in Brazil.⁷ The increase may reflect the incorporation of the technological innovations associated with the third industrial revolution. The effects of the business cycle on the productivity of capital are less apparent than in the case of the profit share; therefore, the long-term behavior of the profit rate in the Brazilian economy was mainly determined by technology, as it is reflected in capital productivity. This result is consistent with the Marxian analysis of the tendency for the profit rate to fall in volume III of *Capital*.

4.1 Explaining the Behavior of the Profit Share

The decomposition of the determinants of the profit share demonstrates that the evolution of the profit share depends positively on the growth of labor productivity and negatively on the growth

⁷Capital productivity started to rise in the United States in the early 1980s (Duménil and Lévy 2002).

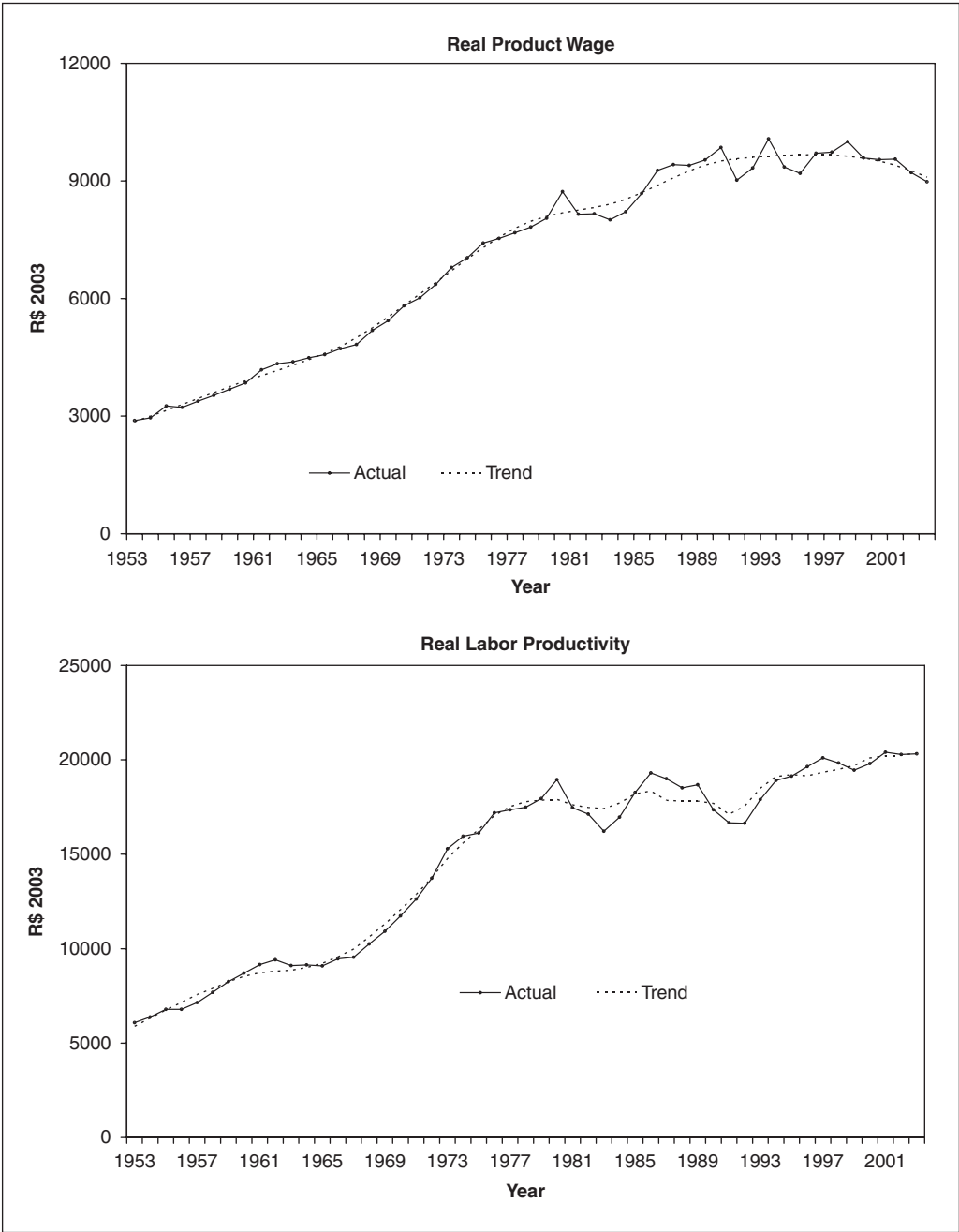


Figure 4. Real product wage and real labor productivity, Brazil, 1953-2003
Source: See appendix.

of the real product wage. Figure 4 displays both labor productivity and the real product wage for Brazil over the 1953-2003 period. It is possible to identify three phases in the real product wage. First, between 1953 and the late 1970s, when it increased markedly, was a period of high capital accumulation and raising demand for labor in urban and industrializing regions. Brazil had a

large reserve army of labor in the rural sector and this demand was mainly attended by rural migration. Moreover, from 1964 to the middle 1970s, political repression by the military dictatorship played an important role in restraining wage rises and maintaining, under strict control, the worker's movement.

Second, between the late 1970s and late 1980s there was a strong decline in the growth rate of the real wage, particularly in the 1980s. During this phase there was the reorganization of the labor movement, particularly the organization of the "Partido dos Trabalhadores" (Worker's Party) in 1980 and the "Central Única dos Trabalhadores" (Unified Workers' Central) in 1983. The reorganization of the labor unions and the process of redemocratization played key roles in the ability of wages to keep pace with high inflation.⁸

Third, from the late 1980s to 2003, the real product wage declined 0.4 percent per year. In 2003 it was somewhere between its 1985 and 1986 levels. It had never happened before, neither in the period of high political repression of the military dictatorship nor in the period of high inflation. This decline may be explained by a combination of slack labor markets due to reduced capital accumulation and neoliberal reforms in the economy and in the labor market itself.

The productivity of labor also presents three phases: first, between 1953 and the middle 1970s, when it rose; second, from 1976 to the late 1980s, when it was basically constant; and third, from the early 1990s to 2003, when there was a moderate increase in labor productivity.

Clearly, there was a fundamental difference between 1953 and the late 1980s with relation to the early 1990s to 2003. In the former years, the real product wage and labor productivity grew at similar rates, while under neoliberalism real labor productivity rose at higher rates than the real product wage (see Table 3). The increase in the profit share in the neoliberal years was one of the factors behind the expansion in the profit rate.

4.2 Explaining the Behavior of the Productivity of Capital

Previous analysis showed that the fall in capital productivity was the main cause behind the declining profit rate in Brazil. This section discusses the evolution of the productivity of capital and its main determinants: the price of output relative to the price of fixed capital, the real productivity of labor, and the real capital-labor ratio.

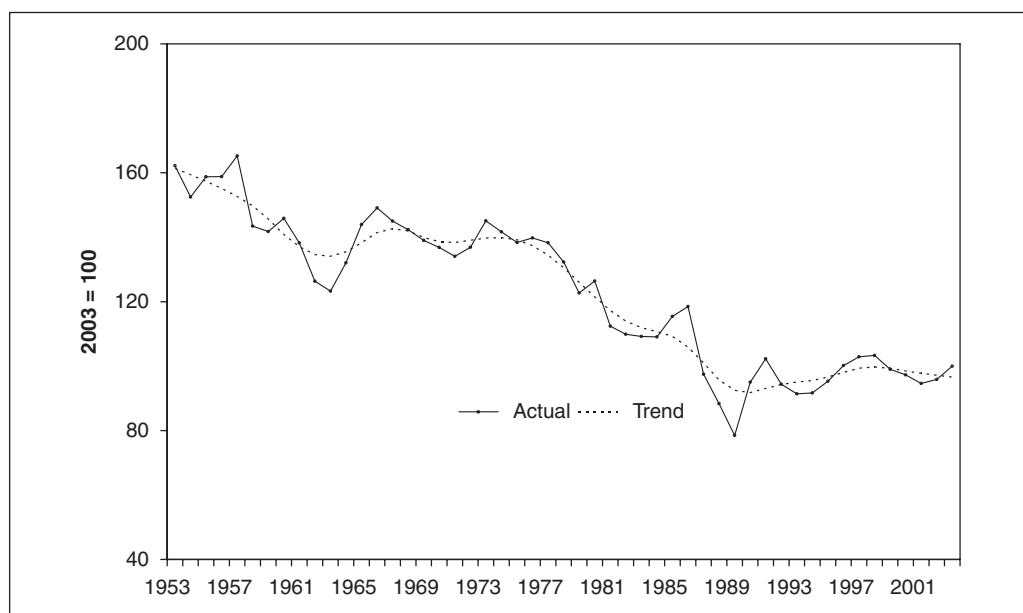
Figure 5 displays the price of output relative to the price of fixed capital. It has a general downward trend, indicating that the price of capital goods became relatively costly. As Table 4 shows, it declined at 1.0 percent per year in the 1953-2003 period. The time profile of the relative price displays three phases. In the first phase, from 1953 to the early 1970s, the effect of relative price on the productivity of capital was negative, declining 0.9 percent per year between 1953 and 1973. During the second phase, from 1973 to late 1989, the relative price of output relative to the price of fixed capital declined 3.8 percent per year. This was the major event responsible for the fall in capital productivity.

⁸Redemocratization was the process of moving from military dictatorship to democracy. It started in the second half of the 1970s and extended to the late 1980s. In 1979, the law of political parties and the amnesty law were passed, opening the possibility of organizing new political parties and the return of exiled Brazilians. The Worker's Party was established in 1980. In 1983, there was the movement *Diretas Já* (direct elections now), which demanded a direct presidential election for 1984. Although the proposal was not approved, the movement had enormous relevance. After this social mobilization, some political sectors that supported the military dictatorship made a deal with the opposition parties, electing a civilian government. In 1988, the new Constitution was approved and, finally, in 1989 there was a direct presidential election.

Table 3. Decomposition of the wage share, Brazil, 1953-2003 (compound annual growth rate)

Period	$(1-\Pi)$	w_R	y_R
1953-2003	-0.15	2.26	2.41
1953-1973	-0.33	4.28	4.60
1953-1962	-0.31	4.52	4.83
1962-1973	-0.34	4.07	4.42
1973-1989	0.87	2.12	1.25
1973-1980	0.52	3.58	3.06
1980-1989	1.14	0.99	-0.16
1989-2003	-1.05	-0.45	0.60
1989-1997	-0.68	0.24	0.92
1997-2003	-1.54	-1.37	0.18

Source: See appendix.

**Figure 5.** Price of output relative to price of capital, Brazil, 1953-2003

Source: See appendix.

Table 4. Decomposition of capital productivity, Brazil, 1953-2003 (compound annual growth rate)

Period	Y/K	P_Y/P_K	y_R / k_R	y_R	k_R
1953-2003	-1.9	-1.0	-0.9	2.4	3.4
1953-1973	-1.4	-0.6	-0.8	4.6	5.4
1953-1962	-3.7	-2.8	-0.9	4.8	5.8
1962-1973	0.5	1.3	-0.7	4.4	5.1
1973-1989	-5.5	-3.8	-1.7	1.3	2.9
1973-1980	-4.8	-2.0	-2.8	3.1	5.9
1980-1989	-6.1	-5.3	-0.8	-0.2	0.6
1989-2003	1.4	1.6	-0.3	0.6	0.9
1989-1997	3.2	3.3	-0.1	0.9	1.1
1997-2003	-1.0	-0.5	-0.5	0.2	0.7

Source: See appendix.

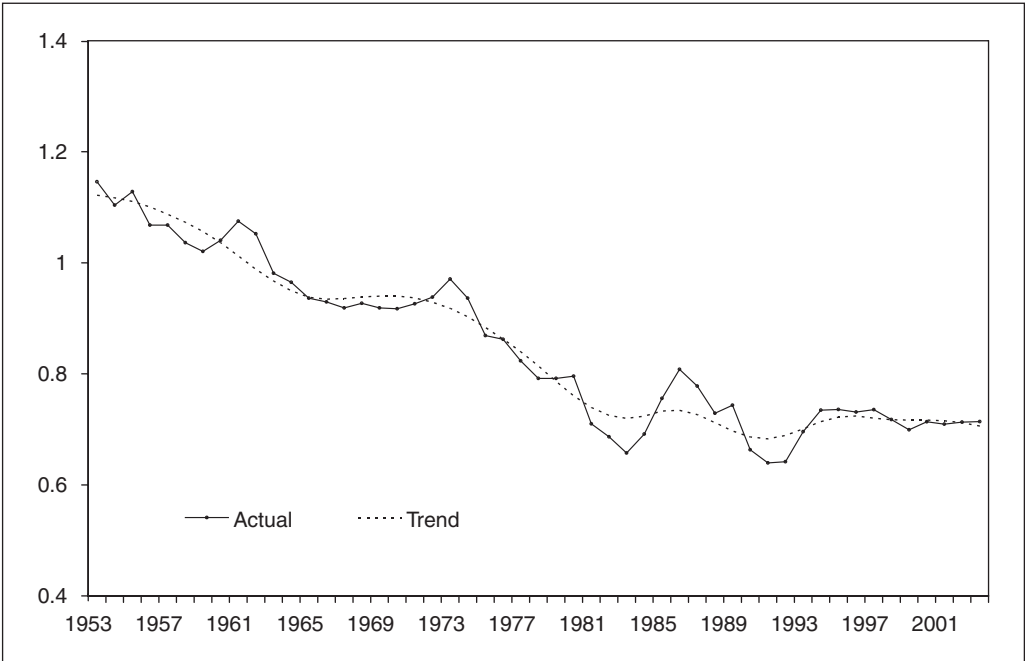


Figure 6. Real capital productivity, Brazil, 1953-2003
Source: See appendix.

Critics of the ISI model, such as Bacha and Bonelli (2004), pointed out that it resulted in a highly concentrated industry of capital goods with lower productivity than their international competitors. An environment of expanding inflation combined with commercial protection allowed these oligopolistic firms to raise prices in order to maintain their high profitability. In their view, the ISI model resulted in inefficient industry, mainly in the capital goods sector.

Another line of research considers that the rising prices of capital goods after the middle 1970s resulted from the high cost of implementing the projects associated with the Second National Plan of Development, combined with reduced capacity utilization in the 1980s (Marquetti 2002). Various segments of the capital goods sector were industrialized in this period. However, the projects associated with the ISI were less successful in raising labor productivity than in the past.

In the third phase, between late 1989 and 2003, the price of output relative to the price of capital goods expanded at 1.6 percent per year, contributing to the rise in capital productivity. However, the trend of the relative prices was practically constant from the early 1990s to 2003. It indicates that there was no significant reduction in the relative price of capital goods after the adoption of neoliberalism by the Brazilian economy.

The time behavior of the real capital productivity is displayed in Figure 6. It declined at 0.9 percent per year between 1953 and 2003. The phases of real capital productivity are less apparent in the data; their trend shows just two phases. During the first phase, it declined at 0.8 percent per year between 1953 and 1973. From 1973 to 1980, real capital productivity fell at 2.8 percent per year, its strongest decline during the whole analyzed period. Then, in the second phase from the early 1980s to 2003, it fluctuated according to the business cycle around a slowly declining trend. In 2003, it was close to its level in 1984 and 1985.

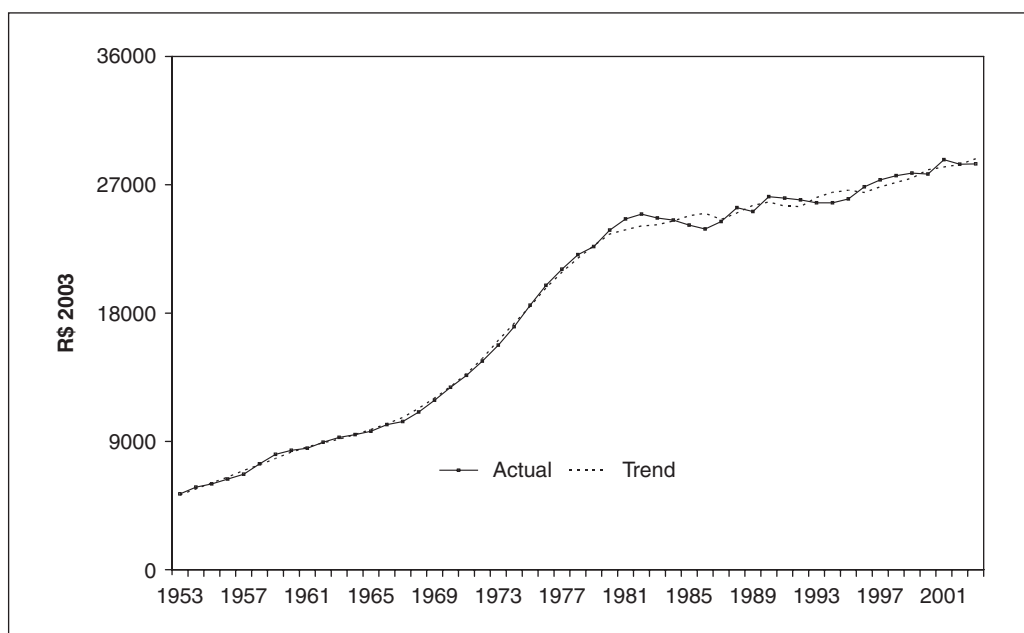


Figure 7. Real capital labor ratio, Brazil, 1953-2003

Source: See appendix.

The real productivity of capital declined during the process of industrialization and higher economic growth from the 1950s to the late 1970s. It was relatively constant after 1980, the period of lower capital accumulation and economic growth. From the mid-1980s on, investments in information and computer technology may have had some positive effects on the real productivity of capital.

The drop in capital productivity is explained by a combination of rising relative cost of capital goods and declining real capital productivity. Each one explains approximately half of the fall in capital productivity.

The movements of real capital productivity can be further decomposed into the growth rates of real labor productivity and the real capital labor ratio. As Table 4 shows, the growth rate of the real capital labor ratio was superior to that of real labor productivity in the phases under analysis. The path of real capital productivity in the Brazilian economy was determined by the evolution of the real capital labor ratio.

As regards the real capital labor ratio, two phases are apparent in Figure 7. From 1953 to 1980, the real capital labor ratio grew at 5.6 percent per year. Then, from 1980 to 2003 its growth dropped to less than 1 percent per year. There was a sharp transition between these phases.

The growth rate of the real capital labor ratio is a measure of capital accumulation and it is one of the main determinants of labor productivity growth.⁹ Table 4 indicates that capital accumulation during the 1953-1980 period was much higher than in the 1980-2003 years. The reduced economic growth of the Brazilian economy after 1980 originates from the fall in capital accumulation.

⁹The estimate of the elasticity of real labor productivity in relation to the real capital labor ratio was 0.79 in the 1953-1973 and 1989-2003 phases. It declined to 0.41 in the 1973-1989 phase; there was a slowdown in the growth rate of real labor productivity in relation to the capital accumulation in this period.

The latter is explained by a combination of a declining profit rate and falling investment due to the payments of external debt in the 1980s.

After the adoption of neoliberalism there was no increase in capital accumulation. In the 1989-2003 period, the growth rate of the capital labor ratio was just 1 percent per year. The expansion of the growth rate of labor productivity from 0.1 percent in the 1980s to 0.8 percent in the 1989-2003 years might be explained by technical change associated with investments in information and computer technologies. Hence, during neoliberalism the Brazilian economy did not expand the growth rates of either the real capital labor ratio or real labor productivity. It contradicted the prediction of many neoliberal economists.

5. Conclusion

The growth performance of the Brazilian economy between 1980 and 2003 was extremely poor: the annual average growth rate, which had been 7.3 percent during the period of the ISI model, collapsed to a meager 2.0 percent. From the standpoint of mainstream economics this collapse of growth performance is seen as a “mystery,” especially after the adoption of neoliberal reforms in the late 1980s and early 1990s. However, this performance is not a phenomenon peculiar to Brazil, as Easterly (2001) has shown this to be the case among many developing countries.

Although this paper did not tackle the reasons for the collapse of growth in Brazil, the analysis of the time behavior of the profit rate, and its determinant factors, is a preliminary and necessary step towards that end. It is well known that from the standpoint of the Marxian analytical perspective, the overriding force of capitalism is the profit motive, and consequently the time behavior of the profit rate is central to understanding growth performance in capitalism.

Section two outlined the main characteristics of Brazilian economic growth over the 1953-2003 period. Whereas Brazil was one of the most dynamic economies during the Golden Age, it became one of the laggards during neoliberalism. This empirical characterization set the background scenario for the study of the profit rate in Brazil.

Informed by the Marxian theory of the profit rate, the profit rate was decomposed into profit share and capital productivity. Each one of these was further decomposed. The main empirical results can be summarized as follows:

1. The profit rate presented a downward trend from 1953 to the very beginning of the 1990s; from then on its trend was slightly upwards, but its 2003 level was similar to the early 1980s.
2. The main determinant of the falling profit rate was declining capital productivity, which is a proxy for technology. This evidence is consistent with Marx's theory of the falling tendency of the profit rate. The profit share presented a cyclical pattern, but its trend was relatively stable, around 52 percent in the whole period. The neoliberal reforms and macroeconomic policies led to an increase of the profit share.
3. There were three phases in the evolution of the profit rate and in most of its determinants. The third phase represented a structural crisis of the ISI model of development. These phases were consistent with the institutional changes and growth of the Brazilian economy.
4. The fall in capital productivity was explained by the rising cost of capital goods and declining real capital productivity. The growth rate of the real capital-labor ratio was the main determinant in the evolution of real capital productivity.
5. Neoliberalism was not capable of significantly expanding the profit rate, despite the sharp decline in wage share during this period. It failed to reduce the cost of capital goods and provide a significant rise in capital and labor productivities.

These results answer some questions and open up others for which further investigation might explain the collapse of economic growth in Brazil since 1980. From a Marxian perspective, the strong decline in the profit rate during the 1973-1989 period followed by a slim expansion in the 1990s, is certainly a part of the explanation for this apparent puzzle. The question of what are the links between the profit rate, capital accumulation, and institutional arrangements in Brazil is not answered yet. The answer to this question will almost certainly solve the so-called "mystery" of the performance of the Brazilian economy.

Appendix

This appendix presents the data sources and the basic procedure employed to organize and construct the data set. One of the major problems in writing this paper was to collect and organize a consistent data set over a relatively large timeframe for the Brazilian economy. The country started to publish data on national accounts in 1947. However, just after the last major methodological change in the Brazilian National Accounts (BNA) in 1990, it started to contain the necessary information for computing the profit rate, except for the capital stock. For the period 1953-1989, the BNA is available on IBGE (2003) and IBGE (1990). The BNA between 1990 and 2003 is available on IBGE (2003, 2004).

The profit rate is defined as the ratio between total profits at current prices and the net nonresidential fixed capital stock at current prices. The total profits at current prices are computed as the value added at current prices minus total wages at current prices. The value added at current prices is measured as the GDP minus depreciation minus imputed rent. The data on GDP and the GDP deflator was obtained in IBGE (2003) for the 1953-1998 period and in IBGE (2004) for the 1999-2003 period.

For the 1990-2003 period, there is information on real and imputed rents. The latter oscillates from 64 percent to 70 percent of total rents. For the 1953-1989 period, imputed rents were computed by the multiplication between their average share during 1990-2003 and the total rent. The data source for these pieces of information is IBGE (1990, 2003, 2004).

There is information on wages and employee compensation at current prices in the BNA for the period 1990-2003. The income of the self-employed and employers is divided into two parts: one summed with wages, another with profits. This procedure is employed to facilitate the wage computation in the 1953-1989 period. There are data on wages available for 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1970, 1975, 1980, and 1985. The data source for this information is IBGE (1990 and 2003). For the years without this information, the wage was estimated employing an econometric exercise.

The profit rate is computed employing the net nonresidential fixed capital stock. The data on inventories are not available for the whole period in study, thus they are not considered in the analysis. Brazil has no official measurement of capital stock and depreciation. Mesquita and Marquetti (2005) computed the net nonresidential fixed capital stock and depreciation for Brazil between 1950 and 2003 through a perpetual inventory method (PIM). It was calculated in constant prices and then converted to current prices using the price indexes for gross fixed capital formation.

The PIM procedure employed is similar to the methodology followed by the Bureau of Economic Analysis (BEA). The depreciation rate is calculated by R / T where R is the factor that defines the degree of declining balance due to depreciation and T is the average asset life. There are two main differences in relation to BEA methodology. First, the double declined balance where R is equal to two is assumed. Second, the assets are retired when they reach their average life. Three kinds of assets were considered in the computation of the net non-residential capital stock: non-residential structures, machinery and equipment, and others. The asset life was 40

Table 5. A comparison of the real capital productivity estimates in Brazil, 1953-2002.

Year	Hofman (2000) ^a	Morandi and Reis (2004) ^b	Mesquita and Marquetti (2005) ^c
1953	1.45	0.82	1.15
1960	1.25	0.75	1.04
1973	1.07	0.69	0.97
1980	0.82	0.57	0.80
1990	0.66	0.49	0.66
1994	0.68	0.52	0.73
2002		0.54	0.71

Source: Hofman (2000), Morandi and Reis (2004), and Mesquita and Marquetti (2005).

Notes: a) It was computed at 1980 international dollars, b) it was computed at 2000 Brazilian real, c) it was computed at 2003 Brazilian real.

years for non-residential structures, 14 years for machinery and equipment, and eight years for others. It is assumed that new assets are placed in service in the middle of the year. The series on gross capital formation and price deflators for the 1910-1998 period was obtained in IBGE (2003) and for 1999-2003 in IBGE (2004). The consumption of fixed capital is measured as the capital stock at the beginning of the year plus investment less the capital stock at the end of the year.

Hofman (2000) also employs PIM to compute the gross and net fixed capital stocks for seven Latin American countries, including Brazil, in the 1950-1994 period. He calculates the gross fixed capital stock employing a simultaneous exit mortality function, then he considers a straight-line depreciation function to calculate the consumption of fixed capital to obtain the net fixed capital stock. The asset life for non-residential structures was 40 years and for machinery and equipment 15 years.

Morandi and Reis (2004) compute the gross and net stock of fixed capital for the 1950-2002 period. They employ an asset life of 40 years for non-residential structures and 20 years for machines and equipment. The gross capital formation in the category "other" is summed with the gross capital formation in machines and equipment. The retirement of the assets follows a simultaneous exit mortality function and depreciation is computed using a geometric function. The depreciation rate is calculated employing the results estimated for R to the U.S. economy by Hulten and Wykoff (1981). The value of R is 1.65 for equipment categories and 0.91 for structure categories.

Table 5 displays the real productivity of capital for some years in the 1953-2002 period for the three estimates. Hofman (2000) and Morandi and Reis (2004) did not compute the stock of capital in current prices. The estimated real productivity of capital by Mesquita and Marquetti (2005) is higher than Morandi and Reis (2004) and lower than Hofman (2000) for the 1953-1989 years. From 1990 on, Mesquita and Marquetti (2005) presents the highest estimated real capital productivity. The trends of the three estimates were similar; there was a decline from the early 1950s to late 1980s, followed by a rise.

The sources of difference between Mesquita and Marquetti (2005) and Morandi and Reis (2004) are the employment of distinct average asset life and depreciation rates. The employment of higher asset life and lower depreciation rates results in a greater net capital stock. The differences between Mesquita and Marquetti (2005) and Hofman (2000) are due to variations in the PIM procedure. The former follows closely the BEA methodology and the latter employs the traditional approach that computes the gross stock of capital as a step to compute the depreciation and net capital stock. OECD (2001) presents both procedures and discusses their peculiarities.

The quality of the capital stock in Brazil depends on the capacity of the deflators of gross fixed capital formation to capture the price changes in an inflationary environment. Inflation in

the Brazilian economy accelerated in the second half of the 1970s. The inflation measured by the GDP deflator rose from 33.4 percent in 1975 to 149.6 percent in 1986. The period of high inflation started during 1987, when inflation went from 206.2 percent to 1,996.2 percent in 1993. However, in the 1987-1993 period, real capital productivity and nominal capital productivity moved closer to each other. This is also observed in the 1995-2003 years, when the inflation rate was less than two digits per year. It is significant that the deflators of the capital goods were capable of measuring accurately the changes in price in the high inflation period. Therefore, the quality of the net capital stock estimate is not negatively influenced by the employment of incorrect price deflators.

The number of workers for the 1990-2003 period was obtained in IBGE (2003, 2004). It was collected from the Brazilian census for 1959, 1970, 1975, 1980, and 1985. The data source for the missing observations is Summer and Heston (1991). The data obtained in this publication were adjusted to fit in the existing series. The difference between the figures in Summer and Heston (1991) and in IBGE (2003) was just 2 percent for 1990.

The average real product wage was calculated as the ratio between total wages deflated by the GDP deflator and the number of workers.

Real labor productivity is the ratio between real value added and the number of workers.

The real capital labor ratio is the ratio between the net non-residential fixed capital stock in constant price and the number of workers.

The productivity of capital is the ratio between value added and the net non-residential fixed capital stock. It was computed at current and real prices.

Authors' Note

We thank the reviewers for their constructive comments.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research and/or authorship of this article: Financial support was partially provided by CNPq.

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