Theoretical analysis and empirical evidence of countercyclical economic policies implemented during the subprime and COVID-19 crises: The Brazilian case

Elisangela Araujo

Adjunct Professor at State University of Maringa, Brazil

Email: elisangela15.araujo@gmail.com

Eliane Araujo

Associate Professor at State University of Maringa and Researcher at National Council of Scientific and Technological Development, Brazil

Email: elianedearaujo@gmail.com

Fernando Ferrari Filho

Professor of Economics at Federal University of Rio Grande do Sul and Researcher at National Council of Scientific and Technological Development, Brazil

Email: ferrari@ufrgs.br

March, 2021

Theoretical analysis and empirical evidence of countercyclical economic policies implemented during the subprime and COVID-19 crises: The Brazilian case

Abstract

This article offers a theoretical and empirical investigation of the countercyclical economic policies, in particular the fiscal and monetary ones, implemented by the Brazilian Economic Authorities (BEAs) in response to the International Financial Crisis (IFC) of 2007-2008 and the current COVID-19 crisis of 2020. The main objective is to evaluate the effectiveness of those policies in different contexts, under the hypothesis that they are fundamental in times of recession. This is in line with the main arguments of Keynesian macroeconomics, which supports the theoretical framework of this analysis. The empirical part of the article analyzes the effects of shocks on fiscal (government spending) and monetary (interest rate) policies in the period between 1996 and 2019, using an MS-VAR model that considers two different regimes: high and low growth in Brazil. The main results indicate that the effects of monetary and fiscal policies are more pronounced in recessive contexts than in normal situations, supporting the centrality of activism in monetary policy and, particularly, in fiscal policy in reversing the crisis and uncertainty scenario as emphasized by Keynes.

Keywords: International Financial Crisis, COVID-19, Countercyclical policies, Brazil.

JEL Classification: E02, E42, E06

ÁREA 3. Economia e Conjuntura Brasileira

1. Introduction

Since the 1990s, the current globalization process — that is, the increased international mobility of trade and, mainly, due to financial liberalization, capital — has seen the world economy face several economic crises, the most notable of which was the 2007-2008 international financial crisis (IFC) that resulted in the 2009 Great Recession (GR).[1] More recently, 2020, the lockdown restrictions due to the COVID-19 pandemic initiated the largest economic recession in the history of world economy, involving both the financial and the commodity markets.[2]

The effects of these crises were not neutral in economic and social terms, mainly because the crises have substantially altered the dynamic process of the international economy and have represented a major turning point. Governments of both the G7 countries and the emerging countries

---

[1]It is important to mention that the IFC occurred after a period of prosperity in the world economy running from 2003 to 2007. According to the International Monetary Fund data (IMFa, 2020), the growth rates in 2009 for the United States, the Euro Area and Japan were, respectively, -2.4%, -4.0% and -5.1%. Moreover, according to the World Trade Organization data (WTO, 2020), the volume of world trade shrank 12.0% in 2009.

[2]According to the World Economic Outlook Update June 2020 (IMFb, 2020), at the end of 2020 the global GDP is projected at, approximately, - 5.0%.

have responded to the IFC, and COVID-19 crisis with massive countercyclical fiscal and monetary policies.

As is well known, in *The General Theory of Employment, Interest and Money*, hereafter GT, Keynes (2007) shows that in monetary economics, fluctuations in effective demand and in the level of employment occur because, in a world where the future is uncertain and unknown, economic agents prefer to withdraw currency. Consequently, their decisions to spend, whether on consumption or investment, are deferred. In other words, economic agents withhold currency as a kind of safeguard against the uncertainty that comes with their precarious knowledge about expected yields from their production plans. This situation occurred during the IFC, and, partially, in COVID-19 crisis, and, for this reason, Keynesian macroeconomic policies, in both conception and practice, were implemented to aim at recovering levels of effective demand for the purpose of mitigating the impacts of both crises. Thus, for that purpose, in 2008 and 2009, and in 2020, policymakers adopted countercyclical macroeconomic policies in such a way as to (i) operationalize fiscal policies designed to stimulate effective demand and reduce social inequalities, (ii) make for more flexible monetary policy so as to galvanize levels of consumption and investment, and (iii) coordinate and regulate financial and foreign-exchange markets in order to stabilize capital flows and exchange rates. In short, following Minsky (2008), there was a need for State intervention and regulation through 'Big Government' and 'Big Bank'.

In line with this analysis, in Brazil and in other countries around the world, State intervention in the two recent crises – IFC and GR, and COVID-19 – has sparked a timely debate around which policies should be prioritized and why.

In the Brazilian case, at the time of the IFC, the response of the Brazilian Economic Authorities (BEAs) was swift and involved important monetary, credit, financial, exchange rate and, especially, fiscal policy measures. Among these, there were transfer payments and social assistance, a broad public investment program, and tax exemptions on the purchase of durable consumer goods. Such actions led to a rapid economic recovery. Moreover, in the context of the current COVID-19 pandemic, the BEAs, though not as swiftly, resorted to monetary policy, mostly to provide liquidity and capital to the financial system, but predominantly to fiscal policy, with an emphasis on financial assistance to affected families and transfers to states to cover the health expenditures necessary for confronting the pandemic. Measures aimed at the productive sector, whether for floating capital or for investment in capital goods and/or infrastructure, were of secondary importance.

This situation leads us to Keynes' lessons about the centrality of State interventionism, in particular, of the effectiveness of monetary and, especially, fiscal policies, and the importance of these to drive expectations in a context of uncertainty. By the way, these Keynes' lessons go against

to the ongoing austerity agenda of the Brazilian economy, in effect since 2015, whose consequence has been its prolonged depressive effects.

Given the above, the objective of this article is to analyze the countercyclical economic policies, specifically the fiscal and monetary policies, implemented by the BEAs in response to the IFC, and COVID-19 crisis, as well as to evaluate the impact of them on the Brazilian economy. In particular, this article seeks to investigate the effectiveness of the economic policies in different contexts — expansion and economic crisis — under the assumption that economic policy actions are fundamental to mitigate the recessive effects of shocks.

To achieve this aim, this article is divided into following sections. Section 2 briefly presents the Keynesian macroeconomic policies. Section 3 presents, analyzes, and compares the countercyclical macroeconomic policies implemented in Brazil in both crises – the IFC, and COVID-19. Section 4 empirically evaluates the effects of shocks on fiscal and monetary policies in the Brazilian economy in the period 1996 to 2019, paying close attention to the impacts of these economic policies in times of crisis and normality. The empirical strategy chosen is a Switching Vector Autoregressive Model (MS-VAR), generally used to capture the effects of shocks on economic variables, incorporating the possibility of regimes changes. In other words, it allows us to take in account the non-linearity in the relationship between the variable studied. Finally, section 5 summarizes and concludes the article, stating that the main results obtained by the empirical analysis suggest that the effects of monetary and fiscal policies are more pronounced in recessive contexts than in normal situations. This result asserts the centrality of activism in monetary policy and, principally, in fiscal policy in reversing the scenario of uncertainty as was the case in the IFC, and COVID-19 crisis, supporting the Keynes' ideas.

2. Keynesian macroeconomic policies

As is well known, in short, in the Keynesian theory investment is the key variable to determine the trajectory of the economic system. Entrepreneurs base their investment decision-making on expectations about real outcomes in the future. However, if the outcomes of these future prospects are uncertain, money is preferred to capital goods. Evidently, the entrepreneurs' preference is for liquidity, and, as a result, there is insufficient effective demand which cools economic activity down, culminating in recession and unemployment.

To avoid this scenario, Keynes (2007: 379) states that, "the central controls necessary to [expand aggregate demand and] ensure full employment will, of course, involve a large extension of the traditional functions of the government." The main component of these central controls is macroeconomic policies, since they serve as an anchor to the entrepreneurs' expectations by signaling the general tendency the government is pursuing.

Macroeconomic policy is thus the true 'market signal' in Keynesian economics, serving as the basis upon which entrepreneurs can formulate well thought out expectations to make sound investment decisions. However, the success of the macroeconomic policies is not assured, considering the uncertainty that prevails. As Keynes (1971: 35) warned, "even if such a policy were not wholly successful, either in counteracting expectations or in avoiding actual movements, it would be an improvement on the policy of sitting quietly." Hence, Keynes (2007: 378) argued that, "a somewhat comprehensive socialization of investment will prove the only means of securing an approximation to full employment."[3]

2.1. Fiscal policy

Fiscal policy has direct impact on aggregate demand – more specifically on consumption and investment – and constitutes the main instrument of State economic intervention. It is anchored in tax policy, on the one hand, and in public expenditures, on the other hand.

As Keynes (1972, 2007) pointed out, tax policy, on the one hand, serves to increase available income, thus fostering expansion of effective demand, and, on the other hand, it can also be used to improve income distribution.

According to Keynes (1980), public expenditures are related to the funds necessary to maintain the basic services the State provides to its population, as well as the resources necessary to stabilize, automatically, the economic cycles.[4]

Given the Keynes' idea regarding the fiscal policy as an instrument of State intervention, Minsky (2008) argued that private investment deficiencies need to be balanced by public spending, called 'Big Government'. In his words, 'Big Government' must be big enough to ensure that swings in private investment lead to sufficient offsetting swings in the government's deficit so that profits are stabilized" (Minsky, 2008: 297).

In summary, for Keynes, fiscal policy has a strong macroeconomic role to pursue economic growth and income distribution. It must be implemented over time to prevent both peaks and slumps, avoiding entrepreneurs' lack of confidence.

---

[3] According to Ferrari-Filho and Conceição (2005), the idea of 'socialization of investment' concerns the creation of endogenous institutional mechanisms, such as the State, its regulation and intervention, and, mainly, its macroeconomic policies, specifically fiscal, monetary and exchange rate policies. In the same vein, Marcuzzo (2010: 190) argues that Keynes proclaimed what needed to be done in order "to sustain the level of investment, but it should be interpreted more in the sense of 'stabilizing business confidence' than a plea for debt-financed public works."

[4] For Keynes, the main task of the automatic stabilizer is to prevent wide fluctuations by means of a stable, ongoing program of long-term investments originating in the capital budget. Keynes argued that, for the State to be an automatic stabilizer entailed "a long-term investment program of a stable character that should be capable of reducing the potential range of fluctuation to much narrower limits than formerly" (Keynes, 1980: 322).

2.2. Monetary policy

For Keynes, monetary policy should be conducted by managing the base interest rate in the economy to promote economic growth as its ultimate objective, instantaneously bringing investment and employment levels under the central bank's surveillance.

Moreover, in addition to its ultimate objective, monetary policy has four additional goals. First, it aims at keeping inflation under control, mainly because inflation affects expectations inasmuch as it devalues wealth, shortens the long run, and unleashes liquidity preference, all of which are likely to lead the economy to an insufficient effective demand. Second, according to Arestis and Sawyer (2013), it has to be focused on financial stability. Third, it supervises and controls the liquidity of the economic system. This means that monetary policy needs to avoid a shortage of liquidity, as well as prohibiting banks from creating money in excess. Fourth, monetary policy has to stabilize the exchange rate, mainly because exchange rate movements have a vast influence not only on expectations, but also on a firm's financial and operational stances.

Given those multiple goals, a question arises: How does monetary policy, that is the base interest rate, affect the economy? In other words, what are transmission channels of the base interest rate?

The base interest rate has various transmission channels into effective demand and, consequently, economic growth and employment. These channels are portfolio, credit, wealth, exchange rate and expectations. The portfolio channel is important because it shows how economic agents and banks allocate their portfolios, based on the assets' expected return, cost of carrying it all, and liquidity (Keynes, 2007: chapter 17). The credit channel is related to how financial institutions set the interest rate to charge their customers, which is a mark-up over the central bank's base interest rate. The wealth channel that relies on the impact that interest rate shifts have on the market price of financial assets and depends on the degree that households use this changed price to finance their consumption. The exchange rate channel describes the effect of interest rate on the exchange rate.[5] The last transmission channel of the interest rate is expectations. If expectations are as stable as required for conducting monetary policy, the difference of judgments that economic agents have about the future interest rates would set their liquidity preference in different degrees, motivating them to negotiate debt contracts.[6]

---

[5] In addition to the expected variation in the exchange rate level, the differential between domestic and foreign interest rates is the variable that external capital investments seek when deciding which assets to buy. Hence, modifications of the local interest rate in relation to world interest rates change capital flows and thereby the exchange rate, impacting conjointly the cost of inputs, foreign attractiveness of domestic production, and the financial position of firms with external liabilities.

[6] It is important to mention that the diversity of individual expectations only happens if the central bank is able to maintain a safe state of expectations in the economy as a whole. Otherwise, if the central bank fails in this attempt, conventions in the financial system would be disorganized, driving expectations towards a strong liquidity preference.

To emphasize the importance of monetary policy in the Keynesian view, Minsky (2008) proposed that a permanent 'Big Bank' must, on the one hand, regulate the activities of monetary and financial institutions and, on the other hand, at the first sign of loan defaults, act as lender of last resort.

In view of these summarized ideas, according to Keynes, if the monetary authorities wish to expand the volume of capital, they should lower the interest rate to stimulate productive investments. This would, as a result, keep the interest rate at levels compatible with eliminating capital scarcity, a scarcity which would result in 'euthanasia of the rentier', a class that is not remunerated for its "risk and exercise of skill and judgment," but for "exploiting the scarcity value of capital" (Keyes, 2007: 375-376).

3. The Brazilian countercyclical macroeconomic policies during the IFC, and COVID-19 crisis
3.1. The BEAs' response to the IFC

Between the last quarter of 2008 and the first quarter of 2009, the Brazilian economy was sharply affected by the IFC. More specifically, GDP shrank by 4.5 percent (Ipeadata, 2020).

In this context, the Government responded to the contagion effect of the systemic crisis with a broad variety of countercyclical macroeconomic measures, whose objective was to mitigate this effect both on the Brazilian financial system and on economic activity. Accordingly, the Central Bank of Brazil (CBB) and the Ministry of Finance spearheaded the IFC response which involved important fiscal, monetary, credit, finance and exchange rate measures.

Because the first effects of the IFC were felt in the Brazilian financial system, it was the CBB that had to respond first. Therefore, the CBB eased monetary policy by lowering the policy rate target[7] and by increasing liquidity in the interbank market.

Along with the measures of monetary policy by the CBB, the Brazilian government decided to use the three major federal public banks (Banco do Brasil (BB), Caixa Econômica Federal (CEF) and the National Bank for Economic and Social Development (BNDES)) to expand credit and to play a countercyclical role in a context of tightening credit conditions by private banks.[8]

The countercyclical fiscal policy included the stimulus package adopted by the Ministry of Finance to mitigate the negative impact of the external crisis on economic activity and the labor market. The stimulus package, equivalent to 1.3 percent of Brazil's GDP in 2009,[9] was based on

---

[7] The base interest rate, called Selic, was lowered by 5 percentage points, from 13.75% in December 2008 to 8.75% in September 2009.

[8] The countercyclical action of the federal public bank was very important to maintain the supply of credit to individuals and companies in a context of high liquidity preference by private banks and, thus, to avoid a sharp drop in economic activity.

[9] It is important to mention that the stimulus package was small due to the Fiscal Responsibility Law (FRL), introduced in 2000, that was implemented to provide rules to establish fiscal equilibrium at the three levels (federal, state and

government spending, tax cuts – mainly on industrial products – and subsidies, especially to the agricultural sector.

Moreover, the increase on social assistance, with the expansion of the program *Bolsa Família*, the expansion of the *Programa de Aceleração do Crescimento*,[10] the start up of a program of government incentives and subsidies for housing construction called *Minha Casa, Minha Vida,* targeted at low and middle-income households, and the extension of unemployment insurance benefits, all represented an expenditure measure.

As a result of these measures, at the end of 2009 the Brazilian GDP decreased only 0.2%, while Brazil's economic recovery was strong in 2010 – GDP increased 7.5%. In its turn, the unemployment rate trajectory was the following: it increased from 7.1% (2008) to 8.1% (2009), and in 2010 it dropped to 6.7%. Thus, the Brazilian economy showed remarkable resilience and became one of the less affected economies by the IFC.

3.2. The BEAs' response to the COVID-19 crisis

At the beginning of 2020, the world economy faced a serious health problem with the COVID-19 pandemic crisis. Unlike other crises, the COVID-19 pandemic represented a double adverse shock of both supply and demand, triggering an economic collapse in the world economy. On the supply side, companies and informal and self-employed workers were unable to work and offer their goods and services, halting or reducing the number of hours worked. This was due to the partial lockdown measures that were adopted, since social distancing was advised by World Health Organization to be the most effective means of curbing the progress of the disease. On the demand side, the effects on the deferment of consumption and investment decisions were also amplified, in view of the uncertainty, either due to the fear of economic conditions or due to restrictions on the movement of people imposed by local authorities.

It was in this scenario that the world economy, which had not yet fully recovered from the IFC, and from the GR that followed, had a complete reversal of current expectations. According to data released by the International Monetary Fund (IMF), the GDP of the world economy is expected to fall by 4.9% in 2020, with a -8% decline predicted for developed countries and a -3% in developing and emerging countries. For the Brazilian economy, the estimated drop is much more acute: -9.1%.[11]

The responses to the pandemic were swift in developed countries. As occurred during the IFC, in the current context of COVID-19, governments and central banks have implemented

---

municipal) of government and in the three branches (Executive, Legislative and Judiciary). Despite the FRL, the Government reduced the public-sector primary surplus target from 3.8% of GDP, in 2008, to 2.5% of GDP, in 2009.

[10] *Bolsa Família* (Family Grant Program) was created in October 2003 and provides financial aid to poor Brazilian families, while *Programa de Aceleração do Crescimento* (Growth Acceleration Program) was launched in 2007 and consists of a set of investments, public and private, in the infrastructure sectors.

[11] See IMF (2020a).

countercyclical policies to mitigate the recessive impact, with an emphasis on fiscal expansions via increases in public deficits and national public debts. This has been in addition to monetary policy, with which the central banks' base interest rate has been reduced.[12]

With regard to Brazil, on the eve of the pandemic, the country was in obvious stagnation, a situation that the health crisis would worsen. In fact, after the two-year recession of 2015-2016 that led to an accumulated drop of 7% of GDP, in the years between 2017 and 2019, the average annual growth rate was only 1.2%. This produced a general worsening in labor market indicators, along with the heightened social vulnerability of a significant portion of the population.[13]

Unlike in the IFC, in which the BEAs quickly implemented countercyclical economic policies to mitigate the impact of the crisis on the Brazilian economy, the Minister of the Economy, Paulo Guedes, believed that the liberal reforms and the 'expansionary fiscal austerity' – that is, the idea that fiscal adjustment stimulates a sustainable economic growth in the long run – approach were the appropriate responses to tackle the COVID-19 crisis.

However, the National Congress and the Supreme Court of Justice forced the Bolsonaro government to change the course of economic policy in the short term. Thus, countercyclical fiscal and monetary policies were implemented in the beginning of March 2020.

Starting with actions in the area of fiscal policy,[14] a first point to mention was the approval on May 7, 2020 of the Constitutional Amendment Project (PEC) of the "War Budget," which authorized the CBB to buy national treasury bonds (NTB) and private bonds to cope with pandemic spending. Such approval was necessary because, in addition to the prohibition by law of the CBB to directly finance NTB, the country has also found itself since 2016, under the legal imposition of the so-called "spending cap" that determines the real freeze of public spending on primary expenditures, including health and education, for a period of 20 years (until 2036).

After this action, the measures that were implemented in the scope of fiscal policy by the Brazilian government can be organized around five main axes: (i) social protection measures, (ii) employment protection measures, (iii) company relief measures, (iv) measures to directly combat the pandemic, and (v) sub-national entity assistance (states and municipalities).

---

[12] According to the IMF, the US announced a first package of USD 2 trillion, about 10% of GDP, the European Union created a €100 billion fund and other fiscal stimuli totaling 16.7% of the region's GDP, and in Japan a contribution of 108 trillion Yen totaling about 20% of GDP, leading to an expansion of public debt as a result of efforts to confront the pandemic. See IMF (2020c).

[13] For instance, according to data from the Brazilian Institute of Geography and Statistics (IBGE, 2020), in February 2020, the number of unemployed in Brazil represented 12.3 million people: 11.6% of the workforce. The number of employees with precarious employment was also high: (i) workers without a formal contract totaled 16.1 million, of whom 4.5 million were domestic workers; (ii) employers without a National Register of Legal Entities (CNPJ) and the self-employed accounted for 25 million people; and (iii) more than 2 million were classified as "workers who help their own family". Thus, when the pandemic started, the number of people in a situation of potential vulnerability was high, constituting a challenge for policymakers in the adverse context.

[14] For more details see Brasil (2020b).

In the area of social protection, the main measure was the approval of financial aid in the amount of R$ 600.00 (approximately USD 110.00), which is about half the minimum monthly salary in Brazil. The aid, which was paid for five months to around 66 million beneficiaries, covered the unemployed, the self-employed, and those registered in social programs such as *Bolsa Família.* However, the poor management of the health crisis, which meant the prolongation of the pandemic and the differentiated impact in the Brazilian regions, led to the extension of this aid for another three months, but with the amount cut in half (R$ 300.00 or USD 55.00), extending until December 2020.

The employment protection measures, in turn, were intended to reduce the costs of maintaining jobs, preventing further layoffs. In this regard, employers were allowed to reduce hours or temporarily suspend employment contracts, having the government counterpart pay part of the monthly salaries. A program was also created to finance the payroll of small and medium-sized companies for a period of four months. The loans would be guaranteed by the National Treasury for 85% of the contracted amount, offering a 6-month grace period and a 36-month payment period, at an interest rate of 3.75% p.a.

Among the measures to assist companies, the deferment or temporary exemption from the payment of taxes are noteworthy. These included the suspension for three months of the installment of the *Simples Nacional* (the tax applicable to small and medium-sized companies) and of the Guarantee Fund for Length of Service (FGTS). There was also a temporary exemption from the Tax on Financial Operations (IOF), also for three months.

Regarding the measures to directly combat the pandemic, the federal government made transfers directly to the states responsible for confronting the pandemic, via the Unified Health System (SUS), in addition to strengthening the budget allocations of some ministries, such as the Ministries of Health, Defense and Science, Technology and Innovation. It also zeroed import tax rates and the Industrialized Products Tax (IPI) on some products for medical and hospital use.

Finally, on measures to assist sub-national entities, a project was approved in early June for the negotiation of loans, the suspension of debt payments by the states to the federal government (estimated at R$ 65 billion or USD 12 billion), and a transfer of R$ 60 billion (about USD 11billion) for actions to combat the pandemic. This was offset by the ban on readjusting civil servant salaries until 2021.[15]

In short, the total amount of all fiscal measures implemented represented 7% of the Brazilian GDP.

Moving on to the field of monetary policy, the main actions taken by the BEAs aimed at providing liquidity to the National Financial System (SFN), allowing the resources to reach the firms

---

[15] See Brasil (2020a).

and consumers, to avoid the "pooling of liquidity" typical in periods of uncertainty like the current one.

The first aspect to be mentioned is the significant cut in the base interest rate (Selic), which reached its lowest historical level. As mentioned, the stagnation in the pre-pandemic scenario allowed for a relatively long cycle of reductions in the Selic that, after remaining 15 months at 6.5% p.a., started a steady downward trend, reaching 4.5% p.a. in December 2019. When the pandemic started, the pace of decline intensified and, after nine consecutive falls, reached the historic mark of 2% p.a. at the beginning of August 2020. This scenario was made possible both by the deflationary context brought about by the crisis and by the low growth that had already come from previous years.

Finally, in addition to cuts in the Selic rate, according to information from the CBB (2020), monetary policy measures were categorized into two groups: measures for the release of liquidity and for the release of capital. Included in the first group is a reduction in the rate on mandatory deposits of term deposits – these went from 31% to 25% and then to 17% –, and the creation of the Term Deposit with Special Guarantees (DPGE), allowing financial institutions to capture deposits guaranteed by the Credit Guarantee Fund (FGC). In the field of capital provision, the reduction of the capital requirement for credit operations to small and medium-sized companies was allowed, in addition to the institution of a specific line of credit for financing the floating capital of micro, small and medium-sized companies.[16]

The impact of these measures mitigated the Brazilian recession caused by the COVID-19 crisis: in 2020 the GDP dropped, as recently the CBB released, 4.1%. The unemployment rate, however, increased from 11.9% (2019) to 13.5% (2020).

3.3. A brief comparative analysis

Following this compilation of the main fiscal and monetary policy measures adopted in face of the IFC, and COVID-19 pandemic crisis in Brazil, the aim of this subsection is, based on the fiscal and monetary indicators of the Ipeadata (2020), to briefly compare the existing scenarios in each event, in the light of the measures adopted and the observed effects.

First, the IFC reached the Brazilian economy in a context in which, from 2004 to 2008, the economic growth was sustainable (the average GDP growth rate was 4.9% per year), mainly due to the huge increasing of the trade balance and the social programs implemented by the Lula da Silva's administration to stimulate the domestic consumption. Moreover, the main fiscal and monetary indicators were comfortable: the inflation rate was moderate (the average inflation rate was 5.2% per year); the base interest rate was stable but very high; and the primary fiscal result was 3.4% of GDP,

---

[16] According to the estimates of the CBB (2020), these measures would have the potential to expand the credit supply from 55.0% to, approximately, 72% of GDP.

as well as the net domestic debt as a percentage of GDP was 38.8%, both, respectively, registering an increasing and declining performance.

Due to the IFC and the BEAs responses, the fiscal and monetary economic situation changed. In 2009 and 2010, the inflation increased lightly, mainly because the devaluation of the exchange rate and its pass-through mechanism to domestic prices, the base interest rate dropped almost 3 points, the average ratio primary fiscal surplus/GDP declined to 2.2%, and the net domestic debt increased a little bit (39.1% of GDP).

Unlike in the IFC context, when the COVID-19 reached Brazil, the Brazilian economy, from 2015 to 2019, was in a process of stagnation, after facing a huge recession in 2015-2016 (GDP dropped 7.1%). According to Arestis, Ferrari-Filho, Resende and Terra (2019), this economic situation was associated with the following factors: (i) the orthodox economic policies, mainly fiscal policy, explicitly recessive, adopted by the governments of both Dilma Rousseff (from January 2015 to August 2016) and Michel Temer (from September 2016 to 2018), and Jair Bolsonaro (2019); (ii) political and institutional crisis;[17] (iii) huge fiscal deficit and high public debt; and (iv) a process of de-industrialisation and commodity-dominated exports (it is also called as 're-primarization'). As a result of this scenario, in 2019, if the inflation and interest rates were low – mainly due the stagnation process –, the fiscal results deteriorated: the relationship between primary fiscal deficit and GDP was 1.9%, and the net domestic debt reached 55.7% of GDP.

With the countercyclical fiscal and monetary policies implemented in 2020, the fiscal results deteriorated dramatically: the public deficit increased to almost 10% of GDP, and the net domestic debt reached 70% of GDP.

4. An empirical analysis of the effects of shocks on fiscal and monetary policy in times of normality and economic crises

The purpose of this section is to analyze the effects of shocks on macroeconomic policies, in particular, on fiscal and monetary policies on the economy. The impacts in times of low economic growth and high economic growth are analysed. The empirical exercise is inspired by articles that investigated the possibility of different results for economic policies when considering regime changes, in other words, the distinction between periods of economic crisis and stability. The effects of the possible non-linearity of shocks on fiscal policy were investigated by Auerbach and Gorodnichenko (2017), Jordà and Taylor (2016) and Gorodnichenko (2014), while the non-linearity of shocks on monetary policy was investigated by Artis et al. (2003) and Krolzig (2003), among others.

---

[17] The political and institutional crisis led, in April 17, to Dilma Rousseff's suspension and finally, in August 31, the Senate removed President Rousseff from office, considering her guilty of breaking the Brazilian fiscal laws.

The empirical strategy of the research, therefore, consists of estimating a Markov-switching vector autoregressive (MS-VAR) model, which is generally used to capture the effects of monetary and fiscal shocks on the economy, considering the possibility of regime changes. For a K set of time series variables, $y_t = (y_{1t},..., y_{kt})$, a VAR model captures the dynamic interactions between these variables.[18] Its basic form with an order p (VAR (p)) can be represented as follows:

$$y_t = A_1 y_{t-1} + \cdots + A_p y_{t-p} + u_t,$$

where A_is are matrices of coefficients (K×K) and $u_t = (u_{1t},...,u_{kt})$ are the error terms, supposedly with zero mean and independent.

There are several advantages to using VAR models. First, the approach allows for the estimation of models with many parameters and does not impose restrictions on the shape of the impulse-response functions. Second, these models can be easily extended to estimate the effects of potential non-linearities of shocks, as is the case in this research. Third, the model is suitable for dealing with correlated error terms over time.

The empirical analysis will be developed for the Brazilian economy, between 1996 and 2019, with quarterly data. The variables used in the econometric analysis are as follows: the effective Selic interest rate (annualized); P is the inflation measured by the consumer price index (IPCA); *y* is the GDP (seasonally adjusted and deflated); and G is the deflated government expenditures. The description of the variables and their sources are available in the Appendix Table. The order of the estimated VAR begins with the shock variables on economic policy, interest rates and government expenditures, followed by the GDP and inflation variables.

The estimated model uses variables in level with two lags, which guarantees robustness and avoids the problem of over parameterization. Regarding the use of variables in level, instead of using the results of unit root tests, Sims (1990) emphasizes that the series should not be differentiated if the purpose of the estimation is to understand the interrelationships between the variables, given that the differentiation process leads to the loss of such relationships.

Given that the objective of this section is to estimate the impacts of shocks on fiscal and monetary policies on the economy in times of growth and recession, the model is divided into two regimes. Regime 1 refers to moments of economic growth, measured by rises in GDP, while regime 2 represents moments of economic crisis, measured by falls in GDP.

The data are used to estimate and analyze an unrestricted MS-VAR model, with intercept, variance and parameters varying according to the regime. Thus, an MS(2)-VAR(2) was estimated.

---

[18] For more information on the methodology, see Enders (2010).

The justification for the use of the MS-VAR model comes from the possible non-linearity in the parameters of the model, due to significant changes of these parameters between the regimes. The investigation of this hypothesis is performed by the LR Test, under the null hypothesis that the model is linear in its parameters, as shown in Table 1.

Table 1. LR linearity test

Null hypothesis of the test (H0): The model is linear		
Linearity LR-test Chi^2(16)	165.91	Prob. [0.0000]***

Source: Author's own elaboration based on research data.

As shown in Table 1, it is possible to reject the null hypothesis of linearity with a 99% confidence level in relation to the alternative hypothesis that the tested model is non-linear. This result corroborates the use of the MS-VAR methodology.

The convergence of the EM algorithm occurred after two interactions, with a probability of change of 0.0001. Figure 1, below, shows a good adjustment of the model in each estimated regime and indicates the occurrence of two regimes, demarcated by the GDP variable (Y).

Figure 1. Adjustment of the model
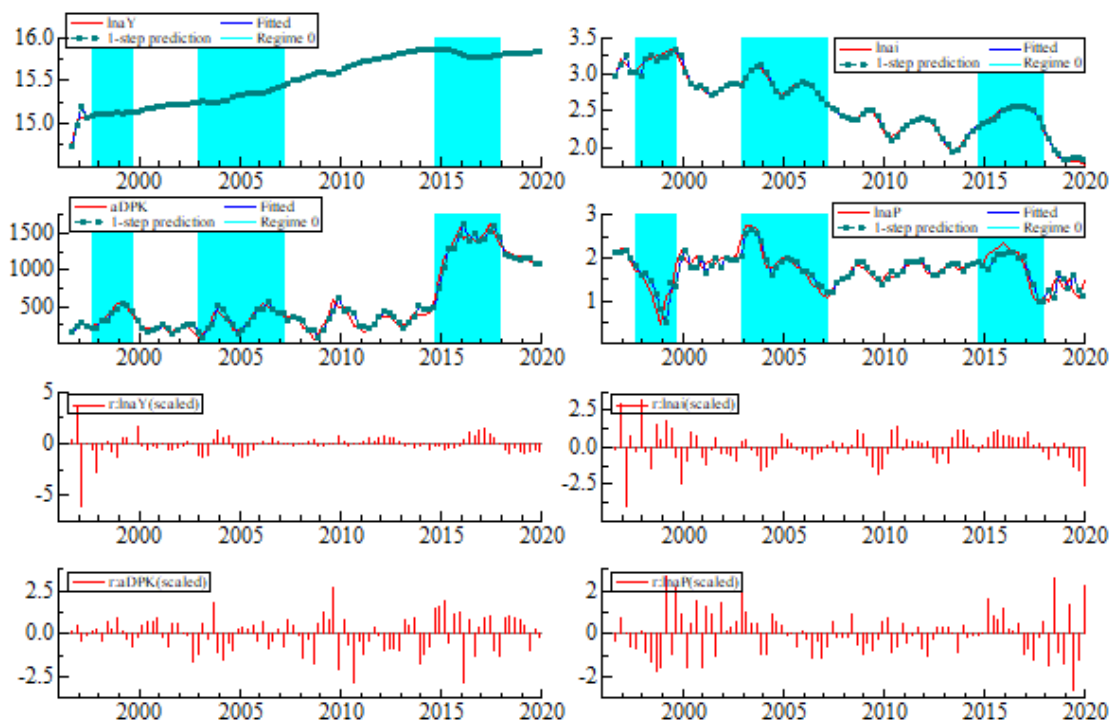
Source: Author's own elaboration based on research data.

The MS(2)-VAR(2) model, estimated for the period 1996 to 2019, showed the following transition matrix of the regimes:

$$\hat{T} = \begin{bmatrix} 0.88476 & 0.07021 \\ 0.11524 & 0.92978 \end{bmatrix}$$

It can be seen through this matrix that the estimated regimes are persistent, that is, once we are in a regime, the probability of staying in it is high: Once we are in the first regime, the probability of switching to the second regime is only 11%, while, to stay in it, the probability is 88%. The same occurs in the second regime, once in it, the probability of change is only 7%, while permanence is 93%.

In line with the estimated probabilities, the two regimes can be classified over time, resulting in Table 2 below:

Table 2. Classification of estimated regimes

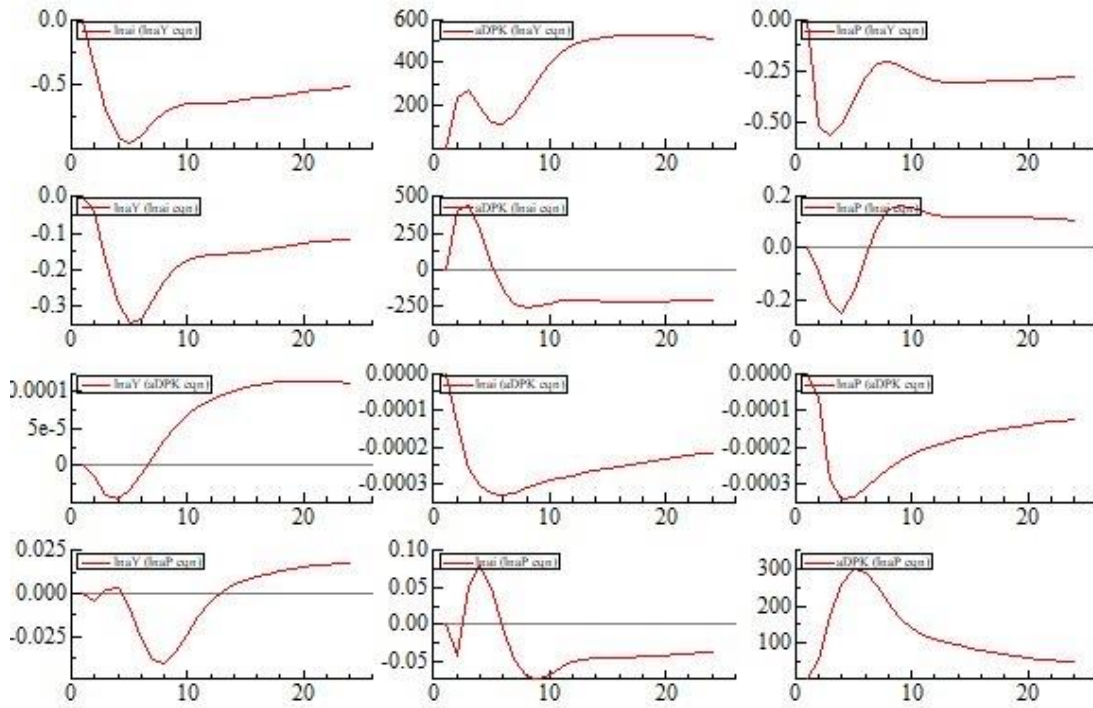| Regime 1	Regime 2
09/1997 - 01/1999 (0.943)	09/1996 - 06/1997 (0.908)
12/2002 - 03/2007 (0.745)	12/1999 - 09/2002 (0.858)
09/2014 - 12/2012 (0.961)	06/2007 - 06/2014 (0.884)
Total: 41 quarters	Total: 53 quarters
Representing 43.62% of the estimated period with an average duration of 13.67 quarters.	56.38% of the estimated period with an average duration of 13.25 quarters.

Source: Author's own elaboration from OxMetrics 7.2.
Note: Probabilities are between parentheses.

Regime 2 is more persistent, totaling 53 quarters of the analyzed period with an average duration of approximately 13.25 quarters. Regime 1 is less persistent, totaling 41 quarters of the analyzed period and having an average duration of 13.7 quarters.

In order to further analyze the relationships between endogenous variables within the MS-VAR model, impulse response functions are usually constructed. They summarize the effects of shocks on a model variable on itself and on the other hand included variables. Figure 2 summarizes the results of the model in Regime 1 and Figure 3 summarizes the results for Regime 2.

Figure 2.- Impulse-response function for Regime 1

Source: Author's own elaboration based on research data.

Figure 3. Impulse-response function for Regime 2
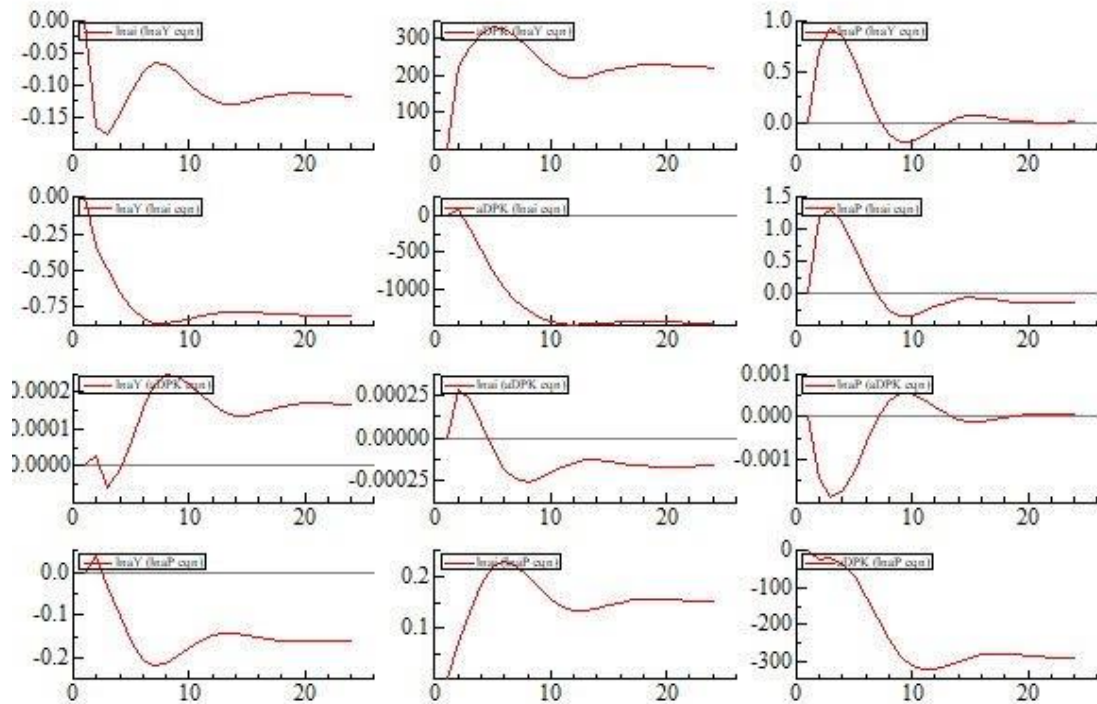
Source: Author's own elaboration based on research data.

Figures 2 and 3 bring interesting results for the purposes of this research. The first column of Figure 2 summarizes the effects of the following variables on GDP: interest rates, government expenditures and prices. Specifically, the second and third graphs from top to bottom synthesize, respectively, the effects of monetary and fiscal policy on GDP.

Regarding the effects of shocks on monetary policy, represented by changes in the interest rate, it is worth noting that, initially, the responses of the variables refer to a positive shock in the interest rate. Therefore, an increase in the interest rate in regime 1, that is, in the economy's growth regime (first column, second graph) implies a reduction in GDP that begins to dissipate from the sixth quarter onwards. In regime 2, an economic recession regime, an increase in the interest rate has a higher negative effect on GDP than in regime 2, an effect that does not dissipate quickly as occurred in regime 1.

As the effects of the shocks are symmetrical, we can conclude that the effects of an expansionary monetary policy, namely a reduction in the interest rate in the Brazilian economy, in times of economic growth has a lesser effect than in times of economic recession. Thus, it can be said that, during the analyzed period, the monetary stimulus has more important effects in times of recession than in times of economic growth in Brazil.

Regarding the effects of an expansionary fiscal policy on GDP, more specifically, of increases in government spending, the results of the impulse-response function in regime 1 (first column, third graph) show that the effects of an increase in government spending are lower in regime 1, when compared to regime 2. The important implication of this result is that the effects of fiscal policy on the Brazilian economy in the period studied tend to be greater in times of recession (regime 2) than in moments economic growth (regime 1).

The final conclusion that can be drawn from this empirical analysis is that fiscal and monetary stimuli are important for a weak economy, that is to say, one which is going through moments of economic recession. The effects of monetary and fiscal policies on GDP are also positive in an economy with an economic growth regime; however, they are not as intense as in a weak economy.

Analyzing these results in the light of the recent trajectory of the Brazilian economy, the conclusion reached is that the country gave up important tools to stimulate its growth when it opted for the austerity agenda as a permanent policy of the State. In addition, the weak performance of monetary and fiscal policies in face of the current pandemic may be one of the reasons for the extremely recessive impact observed here. It is worth mentioning that Brazil is probably among the countries that have lost the most in the context of the current pandemic — both in terms of lives taken by the disease and in terms of the opportunity to resume a long-forgotten development agenda.

5. Final remarks

The objective of this article was to analyze countercyclical economic policies, in particular, fiscal and monetary policies, implemented by the Brazilian Economic Authorities in response to the IFC, and the current COVID-19 crisis. The effectiveness of both policies was analyzed in different contexts, under the assumption that such measures are even more important in times of severe shocks.

To achieve its purpose, first it was outlined the Keynesian macroeconomic policies. Afterwards, it presented, analyzed and compared the policies implemented in Brazil in both crises, the IFC and COVID-19, highlighting the different scenarios existing at the time of each crisis and the emphasis of the policies adopted at each time, as well as their results. Finally, the empirical part of the article assessed the effects of shocks on fiscal (government spending) and monetary (the interest rate) policies on the Brazilian economy in the period between 1996 and 2019, using an MS-VAR model. This model considered the possibility of regime changes – of high and low growth – as a fact that could influence the nature of the relationship between the studied variables, namely, non-linearity.

An important observation to be made involves to the differences in scenarios at the time when the two crises reached Brazil. In the first (the IFC), the country was growing and there was relative stability (inflation, interest rates, and public debt), while on the eve of the pandemic, the context was one of obvious stagnation, with high unemployment and a high public deficit, a situation that the health crisis worsened. The actions of the BEAs were also different: in the first shock they acted quickly and effectively, focusing on transfer payments and investments in economic and social infrastructure. During the pandemic crisis, however, action was slow and inconsistent, in such a way that fundamental policies were no longer implemented. This contributed to the advance of the health crisis and the worsening of the economic scenario.

Finally, in the empirical part of the article, it was observed that the effects of fiscal and monetary policies, in the observed period, proved to be more pronounced in the recessive context than in a situation of greater economic growth. This is in line with the above and points to the importance of a central authority – 'Big Government' and 'Big Bank' – to act effectively to drive expectations in a scenario of increased uncertainty. In addition, it provides substance for the necessary reevaluation of the austerity agenda, in effect since 2015, and its prolonged depressive effects.

References

ARESTIS, P.; FERRARI Fº, F.; RESENDE, M.F.; TERRA, F.H.B. (2019). "Brazilian monetary and fiscal policies from 2011 to 2017: Conventions and crisis". *Challenge: The Magazine of Economic Affairs*, 62(3): 187-199.

ARESTIS, P.; SAWYER, M. (2013). "Policies for full employment and low inflation. In P.Arestis and M.Sawyer (eds.). *Economic and Monetary Union Macroeconomic Policies: CurrentPractices and Alternatives*. Basingstoke: Palgrave Macmillan, 144-167.

ARTIS, M.; CANOVA, F.; GALI, J.; GIAVAZZI, F.; PORTES, R.; REICHLIN, L.; UHLIG H.; WEIL P. (2003). "Business cycle dating committee of the Centre for Economic Policy Research". *CEPR*, 22 September.

AUERBACH, A. J.; GORODNICHENKO, Y. (2017). "Fiscal stimulus and fiscal sustainability". *NBER Working Paper No. 23789*. Avaiable at: http://www.nber.org/papers/w23789. Accessed in December 5.

BANCO CENTRAL DO BRASIL (CBB) (2020a). *Acompanhamento de medidas de combate ao Covid 19*. Avaiable at: https://www.bcb.gov.br/acessoinformacao/acompanhamento_covid19. Accessed in December 5.

BRASIL (2020a). *Agência Senado. Sancionada ajuda de R$ 125 bilhões para estados e municípios com veto a reajuste. 28/05/2020*. Avaiable at: https://www12.senado.leg.br/noticias/materias/2020/05/28/sancionada-ajuda-de-r-125-bilhoes-para-estados-e-municipios-com-veto-a-reajuste. Acessed in December 5.

BRASIL. (2020b). *Ministério da Economia. Nota Informativa - Medidas de combate aos efeitos econômicos da Covid-19. 17/04/2020*. Avaiable at: https://www.gov.br/economia/pt-br/centrais-de-conteudo/publicacoes/notas-informativas/2020/nota-informativa-medidas-fiscais-coronavirus-final-17_04.pdf/view. Acessed in December 5.

ENDERS, W. (2010). *Applied Econometric Time Series*. New York City: John Wiley.

FERRARI-FILHO, F.; CONCEIÇÃO, O.A.C. (2005). "The concept of uncertainty in Post Keynesian theory and in Institutional Economics". *Journal of Economic Issues*, 39(3): 579-594.

FUCS, J. (2020). *Governo só gastou 53,7% da verba liberada na pandemia*. Avaiable at: https://economia.estadao.com.br/noticias/geral,governo-so-gastou-53-7-da-verba-liberada-na-pandemia,70003392701. Accessed in December 5.

GORODNICHENKO, Yuriy. (2014). "Discussion of government spending multipliers in good times and in bad imes: Evidence from U.S. historical data by Valerie Ramey and Sarah Zubairy". *NBER Economic Fluctuations and Growth Summer Meeting*, Cambridge, MA.

INSTITUTO NACIONAL DE GEOGRAFIA E ESTATÍSTICA (IBGE). (2020). *Pesquisa Nacional por Amostra de Domicílio Contínua (PNAD Contínua)*. Disponível em: https://www.ibge.gov.br/estatisticas/multidominio/condicoes-de-vida-desigualdade-e-pobreza/9171-pesquisa-nacional-por-amostra-de-domicilios-continua-mensal.html?edicao=27233&t=destaques. Avaiable at: Accessed in December 2.

INTERNATIONAL MONETARY FUND (IMF) (2020a). *Data and Statistics*. Available at: http://www.imf.org. December 5.

_____. (2020b). *World Economic Outlook Update June 2020*. Washington: IMF. Available at: https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune20. Accessed in December 5.

_____. (2020c). *Fiscal Monitor: Policies to support people during the covid-19 pandemic*. Avaiable at: https://www.imf.org/en/Publications/FM/Issues/2020/04/06/fiscal-monitor-april-2020. Accessed in December 5.

IPEADATA (2020). *Séries Históricas*. Available at: http://www.ipeadata.gov.br. Accessed in December 5.

JORDÀ, O.; TAYLOR, A.M. (2016). "The time for austerity: Estimating the average treatment effect of fiscal policy". *Economic Journal* 126(590): 219-255

KEYNES, J.M. ([1936] 2007). *The General Theory of Employment, Interest and Money*. London: Palgrave Macmillan.

_____. (1980). *Activities 1940-1946: Shaping the Post-War World - Employment and Commodities (The Collected Writings of John Maynard Keynes, Volume XXVII)*. London: Macmillan.

_____. (1972). *Essays in Persuasion (The Collected Writings of John Maynard Keynes, Volume IX)*. London: Macmillan.

KROLZIG, H.M. (2003). "Constructing turning point chronologies with Markov Switching Vector Autoregressive Models: The Euro-Zone business cycle". *Discussion Paper in Economics*, University of Oxford.

MARCUZZO, M.C. (2010). "Whose Welfare State? Beveridge versus Keynes." In R.E. Backhouse and T. Nishizawa (Eds.). *No Wealth but Life - Welfare Economics and the Welfare State in Britain, 1880-1945*. Cambridge: Cambridge University Press. Available at: http://dx.doi.org/10.1017/CBO9780511750649.010. Accessed in December 5.

MINSKY, H. (2008). *Stabilizing an Unstable Economy*. New York: McGraw-Hill.

SIMS, C. A. (1990). *Macroeconomics and reality. Modelling Economic Series*. Oxford: Clarendon.

WORLD TRADE ORGANIZATION (WTO) (2020). *Statistics*. Available at: http://www.wto.org. Accessed in December 5.

Appendix

Table A1. Description of variables used in estimations

Variables	Description	Source
P	Inflation – IPCA – (%)	IBGE, System of Quarterly National Accounts
G	Government social spending on health, pensions, assistance and other transfers	IBGE, System of Quarterly National Accounts
Y	GDP – market prices – R$ (million), deflated by the IPCA.	IBGE, System of Quarterly National Accounts (SCN104_PIBPMG104)
i	Interest rate – Selic – set by Copom – (% p.a.)	Central Bank of Brazil, Financial and Capital Market (BM366_TJOVER3660