

INTERACTION OF THE FISCAL AND MONETARY POLICY IN BRAZIL DURING THE FIRST GOVERNMENT DILMA 2011 – 2014

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ABSTRACT

The present paper aimed to analyze, through the macroeconomic variables, whether there was a price control by the public sector, which directly influenced the increase of the inflation rate. Therefore, a regression model with error correction (VEC) was adopted. The period of analysis comprised from 2011 to 2014 during the first Dilma Rousseff government. Therefore, the results indicate a high explanatory power of the NFSP and DIVPIB variables on the dynamics of inflation. However, the estimated model showed that the variables managed to correctly capture the effects of fiscal dominance on the price level of the Brazilian economy in such period. Finally, it is understood that the adjustment of administered prices could have happened gradually and that the increase in the interest rate did not have a great impact on the inflation, since this was caused by the control of prices and not by acceleration of the consumption, since that these prices do not change with the conduct of the monetary policy.

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INTRODUCTION

The lack of balance between monetary and fiscal policies may be a probable cause of the imbalances in the Brazilian macroeconomic environment. Between the years of 1994 (implementation of the Real Plan, with the rise of the Real Value Unit - URV), until the years 2000, there were several economic moments, which, for their part, have impressed moments between the dominance of fiscal and monetary policy in Brazil. After the Real Plan was implemented, both the evolution of the public debt and the Brazilian monetary policy have been issues that became evident in the academic environment and by the monetary authorities (TEIXEIRA; VIANNA, 2013). Studies that combine fiscal and monetary policy have always been prominent in the macroeconomic debate. Blanchard (2004) argues that monetary policy can be ineffective in fighting inflation if fiscal policy is not sustainable. Today, there is a growing link between fiscal policy, monetary policy and economic growth in theory and practice.

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The experience with the financial crisis of 2008, boosted by the US real estate sector, whose influence has brought negative repercussions for almost all world markets, we adopted an economic policy in Brazil, the main measures were the implementation of credit and consequent increase in public spending, with a marked reduction of taxes. With these measures, aggregate demand was expected to generate an increase in investments at the macro level and a consequent increase in economic growth over the years. However, the results fell short of expectations in the Brazilian economic scenario, since factors such as high production costs, due to, among other things, the lack of physical capital structure (industrial parks suitable for expansion of production and distribution structures), and (labor with a specialized level of training), cooled the market and discouraged, at least under projected expectations, investment in the diverse sectors of the national economy, which dragged down the economic growth charts, from the second half of the first decade of the 2000s (PAULO, 2017). It is based on the premise that the balance between monetary and fiscal policies is desirable, which in turn is controlled by the Central Bank (Bacen). In this sense, through movements in fiscal policy, the agency is able, under

ideal conditions and in the most appropriate influence on the trade balance, to produce the financial surplus, which has as immediate consequences, the reduction of the debt on Gross Domestic Product (GDP). In this scenario, aggregate growth is not completely tied to aggregate supply, which allows fiscal policy to remain neutral in relation to inflation in certain periods of time (BELCHIOR, 2013). Brazil, in 2011, ranked 6th in the ranking of the world's largest economy; with the United States ranked first, China second, Japan third, Germany and France fourth and fifth. This Brazilian position is due to a GDP of R \$ 4,143 trillion in 2011, a per capita income of R \$ 21,252 per year, according to data from BACEN (2017). In addition, it is considered an emerging country, which is contradictory, since it ranked 84th in the HDI ranking in 2011 (PNUD, 2017). The Brazilian economy has a population of approximately 200 million inhabitants and is part of the global globalization process. This population obliges the State to promote actions that constantly promote the conflict between fiscal and monetary policies, since both forms of economic management affect social reality (TESOURO NACIONAL, 2017). At the beginning of the first decade of the year 2000, the Brazilian economy pointed to the adherence to a constant growth rate, resulting from the application of the economic-fiscal policy modality. The analysis of the data for the year 2010 reveals that in that year the trade balance obtained a surplus of US \$ 29.790 billion in 2011, corresponding to an increase in relation to the year of 2010 of 4.78%. Export rates for that year (2011) totaled US \$ 256.041 billion and the balance of imports totaled US \$ 226.251 billion in 2011. Much of this growth is due to domestic production policy. Between the years 2000-2010, Brazil defined itself as a major producer and exporter of commodities of various types, mainly commodities, minerals and manufactured goods (TESOURO NACIONAL, 2017).

Inflation control is an aspect that has been taken as a priority since the 1990s. Since the Real Plan, the economy has been controlling its inflation. After its implementation in 1994, when Brazil was headed by President Fernando Henrique Cardoso in the years 1994-1998 and 1998-2002, the period of highest inflation was concentrated in 1995, when it reached 22.41%, falling years, remaining with the accumulated average heat of 1.66% in 1998. Since it has been monitoring inflation, in the years 2000, for example, Bacen registered important inflation indices in the country, with emphasis on data from 2001, when the entity registered an average of 7.67% (BACEN, 2017). Another issue to be raised was the Fiscal Responsibility Law (LRF) created in 2000. This law has as its main objective the fiscal balance, which we want to achieve by imposing restrictions on the growth of expenditure and by setting limits on expenses with: personnel, third-party services and indebtedness. As well as to have credibility in front of other economy and government institutions like the International Monetary Fund (IMF). At the end of FHC's mandate, Brazil was suffering from the increase in public debt / GDP, the dollar was close to the level of R \$ 4.00, inflation accelerated rapidly in the second half of 2002; and GDP, which grew by 4.3% in 2000, grew at an average of 2% in the period 2001-2002 (OLIVEIRA, 2008). After government Fernando Henrique Cardoso (FHC) in 2002, the government of Luís Inácio da Silva (Lula) began. This period had good macroeconomic indicators. The Broad Consumer Price Index (IPCA), which is the main indicator of Brazilian inflation, went from 12.53% in 2002 to 3.14% in 2006 after Lula's inauguration. This was the lowest rate, ending its government

with 5.9% a year, still lower than it had begun in his government, according to the BACEN (2017). Until 2010, Brazil maintained the concept of an emerging and dynamic country and exhibited it abroad; as reported by Rolland and Lessa 2010; Cervo and Bueno 2011. The internal perception and external image were structured on solid foundations, operationalized by strong ideas. Its pillars corresponded to economic and political stability, to the inclusion of dozens of poor people in a minimum welfare society, and finally to an assertive foreign policy that replaces the nation in the world, in addition to the internationalization of Brazilian companies.

As mentioned, each state manager plays a relevant role in the definition of economic policies and how they will be presented or how they will be applied in the internal market, as well as interact with the international economy. It is noticeable, as Cervo (2008) points out, that during his term of office (2003-2011), President Luís Inácio Lula da Silva (Lula) was more concerned (even by its populist aspect) to show its economic policies, both domestically and internationally, to some extent increasing the interest and security of international investors, using resources of considerable importance for the protection of the stable economic image that the executive of the time intended to move to the world. On the other hand, the following ages, also delimited by the head of State Dilma Rousseff (2011-2016) were marked by the same tact as its predecessor, with the financial market, population and the establishment of an economic and political dynamic that foreign trade and the necessary innovation so that the Brazilian market recovers and maintains competitiveness. Proof of these aspects is that the Dilma government's, as it became known, systematically moved away from the neoliberal steps, which her predecessor had implemented, given the knowledge that "(...) fiscal balance is essential for a balanced growth trajectory and long term" (CURADO, 2017, p.136). So the high tax burden, the infrastructure, in general, uninteresting with what was practiced in the world in the period of the PT governments in Brazil, the conduct of the State by President Dilma Rousseff, in a way increased damages, especially in the tax layer, which served as a framework for maintaining the new state structure, given that the public machinery at all levels presented itself with an excess of personnel, at the same time that it hampered the dialogue with agribusiness industrialists and entrepreneurs, sectors exceptionally important for the equilibrium of the Brazilian trade balance (CERVO *et al.*, 2014). These factors gradually increased the capacity of absorption of the intended investments in the country, since it lacked the Brazilian State, as it had not been detected in the country in the democratic age.

The results of the fall of efficiency of the paradigm of state - society alliance are concrete and focus on the internal foundations of the emergence in the international scenario: fall of the percentage of the industry in the GDP, economic reprimarization, fall of the exports, especially of manufactured goods, fall of the economic growth and the breakdown of confidence in the country of national and foreign businessmen (MANKIW, 1998). Based on the premise that there is good coordination between monetary and fiscal policies, and that BACEN has administrative autonomy to conduct monetary policy and the National Treasury through the primary surplus, an adequate primary surplus generation policy is created which results not only in a downward trend in GDP debt, but also in aggregate demand growth, which results in fiscal policy neutrality in relation to inflation (BLANCHARD, 2011). This

article aimed to discuss the existence or not of dominance of fiscal policy on economic policy during the administrative age known as the "Dilma government" in its first term.

Theoretical Reference

Monetary policy: It is appropriate, as an understanding of the subject under discussion, to know the concept of monetary policy. Assaf (2016) bases the idea that monetary policy is a set of actions that are put into practice in order to control the liquidity of the economy. In this context, monetary policy acts as the set of practical and regulatory actions that allow the Executive to become liquid in its expenses, but also can convince the market in the Globalized Economy of this liquidity, a premise that will ensure the promotion of economic growth through surpluses. Carneiro and Wu (2004) explain that currently, the monetary policy of all the developing countries has focused efforts to assure control of inflation. For this purpose, a number of instruments are used, including compulsory deposit, liquidity financial assistance (rediscount operation) and securities purchase and sale (repo operations) (ASSAF, 2016). As a competent institution, the Central Bank (Bacen) establishes the control of actions that may succeed in controlling inflation. Montes (2009) points out that this control is based a) on setting inflation control targets; b) in the manipulation (among others) of the interest rate for the market; c) the creation of intermediate targets for inflation control; d) the creation of transparency instruments in setting the national monetary policy; e) the autonomy of central banks (or any independent bank); f) the complete focus on inflation control as the main objective of economic policy. This allows the state to establish complete control of its accounts, minimizing social damages that reflect the economic sphere, that is, controls the liquidity of the economy, maintaining the stability of the price level (BLANCHARD, 2011). According to the economic literature used, it is known that the money supply is exogenous. That said, it is understood that the interest rate is an endogenous variable, since it is determined by the supply and demand for money. This classic monetary authority policy persisted in Brazil until 1998 (MOREIRA, *et al.*, 2013).

This process of inflation control intensified in Brazil in the 1990s (1990) and had as main action the interest control. We opted for the perception of market development, which, as Costa (2018) clarifies, has as its main characteristic the "centered and uncoordinated" supply, the money supply is endogenous (...) created by market forces, according to the economic needs, expressed by the demand for money "(p.92). State control of this dynamic achieves goal setting through the Special System of Settlement and Custody (Selic) rate, which is the condensation of all efforts to control the average interest rate practiced by financial institutions in the country. The Selic rate is quoted daily. In this respect, inflation control tends to be better developed by Bacen interpreting market demands more precisely. In summary, the monetary authority adjusts the liquidity of the economy through compulsory collection, rediscount operations and through repo operations, with the objective of maintaining the interest rate determined by the Copom, which is used to maintain the inflation rate around of the inflation target (ASSAF, 2011). The inflation targeting system as a parameter for the establishment of the monetary policy regime was established by Decree No. 3,088 of 1999. The targets and respective tolerance intervals are set, in accordance with said decree, by the National Monetary Council, by means of a proposal of the Ministry of Finance,

and it is up to the Central Bank to execute the necessary policies to meet the inflation targets (BRAGA, 2013). It is considered that the target was met when the cumulative inflation variation, for the period from January to December of each year, is within the respective tolerance interval.

Fiscal Policy: Fiscal policy is the set of actions that are related to the Government's expenditure, and the resources that it obtains to finance them, as well as the influence that these expenses have on the contraction and / or expansion of economic activity. In this way, fiscal policy should be used to mitigate economic cycles, reducing taxes and / or increasing public expenditures in periods of low economic activity; it may also do the opposite in periods of economic expansion. Thus, fiscal policy acts countercyclically. The expected behavior of the fiscal authorities is that of demonstrating the duty to be attentive to the trajectory of the public debt and, with the fiscal adjustment, to promote the necessary changes or improvements. When fiscal policy is implemented, one of the critical factors mentioned is precisely the discretionary nature of the measures, which oscillate according to the moment or with the political philosophy that assumes control of the State at a given historical moment (MOREIRA *et al.* 2013). It is evident that, since 1999, Brazil is supported by the tripod of economic policy, associated to three bases: inflation target system, fiscal adjustment, and flexible exchange rate. Therefore, the two authorities must seek balance; the Central Bank must have an active monetary policy, that is, only monetary policy can affect and determine the trajectory of price levels or the rate of inflation. As a result, fiscal policy should adopt a passive stance, adjusting public revenues and expenditures so that public debt is solvent and sustainable in the long run (BOGDANSKI, *et al.*, 2011). However, if fiscal policy adopts an active stance, such as by taking post-cyclical stances, it may influence the path of the economy's price level and, in this sense, fiscal policy may be in disarray with monetary policy, compromising stability economic (MANKIW, 2007).

Foreign Exchange Policy: Exchange rate policy is the set of events and guidelines developed by the Central Bank to achieve certain objectives, notably the balance of external counts and the reduction of exchange rate volatility through the purchase and sale of foreign currency (BOGDANSKI, *et al.*, 2011). It should be noted that in a perfectly fluctuating exchange system, ie without any intervention by the monetary authority in the exchange rate, through the purchase and sale of foreign currencies, the exchange rate will function as a means of adjustment for the balance of payments; so that it will tend to the point of equilibrium. When the inflow of foreign currency is greater than the outflow, the balance of payments will become a surplus, because supply is higher than demand, then the prices of currencies tend to fall, if the reverse happens, the balance of payments will become deficit (MOREIRA, *et al.*, 2013). The exchange rate also works by smoothing the external shocks in ways that minimize the effects on the real side of the economy. For example, when there is a capital flight in a fixed exchange system, the Bank seeks to sell reserves to meet the excess demand for foreign currency. When this occurs, the agents exchange national currency for foreign currency, which represents a liquidity in the economy. This leads to a rise in the interest rate, negatively impacting the level of economic activity in the country. If the country adopted a perfectly flexible exchange rate system, any initial impact from capital flight would not have a damaging

impact on production and employment levels, only on the exchange rate, with likely effects on the inflation rate (MOREIRA, *et al.*, 2013). However, it is common for countries to adopt a dirty flotation system where Bacen operates by buying and selling foreign currencies to avoid strong exchange rate volatility and, in addition, the purchase of foreign exchange can be used to generate a stock of international reserves which would serve as a kind of insurance for the country to protect itself from possible misfortunes generated by the external sector. External shocks can cause the flight of foreign capital, and may lead to a devaluation of the national currency, if the Bank does not intervene through the sale of foreign currencies. On the other hand, where there are strong inflows of foreign capital, the exchange rate could be highly valued, which could greatly reduce the competitiveness of the country's export sector. In this case, Bacen will act by buying foreign currencies (MOREIRA, *et al.*, 2013).

Monetary and fiscal policy interactions: Fiscal and monetary policies are conceptually distributed in different scopes of integration. Fiscal policy tends to be the sum of the efforts that the State proposes, through binding measures, with the objective of a) achieving macroeconomic stabilization; b) allow the redistribution of income, and c) allocate resources in strategic areas. This triad of objectives consolidates the premise of rights that compete with all citizens, and which, in turn, must be promoted by the State (BRAZIL, TESOURO NACIONAL, 2018). Monetary policy, in turn, can be defined as the activity of the entities that maintains control over the monetary units. It is, in a way, the core of the financial market, since these entities (in general, independent) regulate, in a broader definition, the control of the supply and demand of currencies in the country, thus defining other important concepts in the macroeconomic analysis: the concept of hard currency or weak currency, as well as the perception of good state for investments or not, both medium and long term. In parallel, the monetary policy entities also establish the control over interest rates (like Selic), the credit operations, thus substantiating the size of the liquidity of the economic system of a given country (BALBINO *et al.* 2011). Fiscal and economic policies, as can be said, have disparate fields of action in relation to their objectives. While fiscal policy aims to promote progress through interest control, but with the autonomy given to the State, not to an institution such as the Central Bank, thus conferring basic rights on citizens as a result of economic aspects, monetary policy is aimed at speculation on the currency, in order to allow the economic ballast feasible so that the State can develop and maintain its administrative activity in general scope. It is this form of policy that, in most developed countries, asserts the respect and sovereignty of the state in the economic perspective in the globalized market (CLARK, 2008).

However, between the two modalities of economic policies, it is necessary to understand that their application has its own economic consequences, and that in model data, explored below, both do not become, in isolation, positive choices. Thus, fiscal and economic policy must converge from the perspective of the economy in the State and the historical moment in which it is approached. This means that the administrator should contain his autonomy, in order to explore more of the economic or fiscal aspect, in its political base, or in the control and formation of entities, with the objective of establishing the necessary aspects to achieve the objectives,

especially in the control of inflation, and in relativizing the autonomy of these entities to discretionally and normatively extend their influence on the economic bias. It is in the context of this objective that both policies have specificities. Sargent & Wallace (1994) point out that the traditional form of inflation control (monetary control by authoritative and independent authority acting directly on the market) per se is insufficient, due to several factors, including the liquidity of the currency in the time (as happened with the crisis in 2008), being essential that the economic and fiscal modality can act together. A proposal of work that contemplates this perception would be the partnership between the economic and fiscal policy because each acts on the state economic dynamics in its own way: when it acts in a sense of dominance, fiscal policy allows the State can exert influence over the existence (or not) of financings, their expression and form, since this activity is essential to guarantee the operation of the State; when, on the contrary, a central bank, or another bank, since what is important is the independence criterion of the institution in the face of state influence (CLARK, 2008), the budgetary control of financing for this organ is changed, subverting the control, and the State is subordinate, to a certain extent, to the policies defined by the Central Bank. This model of economic-monetary dominance allows the control of direct inflation at the source, and has an important advantage, that is, to confer more reliability in the eyes of the market from the perspective of attracting investments (CALDEIRA, 2016).

Fiscal dominance has aspects that control particularities of administrative activity. It is characterized by the limitation of the activity of the monetary authority (the central bank has relative independence), the seigniorage works as an envelope to cover the difference between fiscal revenue (given by collection) and market demand for securities, a theme in constant discussion in the current context. Everything is, from this perspective, centered in the context of the debt-to-GDP ratio. When there is fiscal dominance, following the example given by Sargent and Wallace (1994), when the real interest rates practiced by the state (in fiscal dominance) are greater than the economic growth rate, the result is an increase in the ratio given between the debt and the Gross Domestic Product (GDP), a non-positive scenario, since it tends to collapse, with a tour of interest control and a possible inflationary increase. What the dominant fiscal policy proposes - and this is outlined very clearly, analyzing the performance of the PT governments between the years 2003 to 2016) - and simply postponing the inflationary imbalance, thus creating supposedly positive economic times, when analyzed only by the political bias (GADELHA & DIVINO, 2008). In addition, the increase in the debt / GDP ratio encourages monetary entities to raise prices on their currencies in the short term or even in the present tense. This scenario is designed without the independent influence in the country. Another sensitive flaw in the aforementioned Tax Level Theory (TFNP) is its lack of belief in the ability of the Bacens' autonomy to ensure the necessary price stability. For the supporters of the TFNP, price control has in fiscal policy a sine qua non for the protection of the solidity of the prices practiced in the State, still under external influences, being not relevant the aspect of independence of the Central Bank in relation to the State. The supporters of this theory believe that there are no links between the deterioration of the public sector conditions and the monetization of the public deficit, which is an independent effect, which exempts the Central Bank from establishing price controls under these conditions (BASTIAN, 2010).

However, the relationship between the fiscal situation and private sector investments has a decisive influence on price policy. Consumption is a fundamental determinant in this process, since its practice, beyond what the economy can offer, triggers the increase of prices to levels that tend to balance the nominal assets held by households, which are interpreted as nominal obligations of the government itself, and projected public surpluses. This process promotes economic balance. It is clear from the analysis of the conditions presented that the economic equilibrium is clearly related to the price and interest rate practiced by the market to the extent that it preserves equality between government bonds and projected surpluses. This definition of the scenario, where there is a frank incentive to consumption, is not ideal for the predominance of monetary policy, since interest directly impacts on government assets, which means that the time to return to economic equilibrium is greater, of the so-called fiscal shock, with negative social consequences (CARVALHO *et al.*, 2013). For Blachard (2004), the fiscal approach supports the thesis of the feasibility of influence on the real interest rate as inflation control is only feasible if the real interest rate does not effectively negatively influence the sustainability of public debt, since this measure tends to alienate investors, promote evasion of foreign capital and, of course, currency depreciation and inflationary rise. The increase of real interest in monetary dominance, linked to inflation targets, compromises the viability, because it can become a factor of increase of this, instead of control, thus breaking with the logic of the national financial system.

The fiscal perspective could have positive effects, since it could serve as a set of targets for intertemporal adjustment of public accounts, which is the focus of economic policy, avoiding the possibility of default, allowing to improve the country's image against foreign capital (BLANCHARD, 2004). Arestis (*et al.*, 2009) explains that the new monetary policy, basically delimits to propose inflationary targets. In turn, Bogdanski *et al.* (2011) argues that this aspect tends to convey an image of credibility vis-à-vis foreign investors, which highlights monetary policy in relation to economic policy. In this, the discretion of the rules proposes an irregularity and legal insecurity that does not please the international market. Monetary policy, because it is centralized in the activity of the Central Bank, ensures a greater unity of action, and is therefore, in macro aspect, active, in relation to fiscal policy. Monetary policy has been reported positively in some of the world's major economies, and the arguments for this acceptance are mainly due to the credibility of the Bank's control, the lack of agility in correcting the consequences of legal movements that influence the economy in the fiscal model and the inability to promote full legal security, thereby driving away investment. However, fiscal economic policy does not become useless at all: it can be efficient if applied concurrently with monetary policy, with its bias directed towards future effects, in the medium and long term, thus ensuring practicable practical chains of action. However, especially in countries with an emerging economy, the careful application of fiscal policy is observed, since the states in this situation do not have the necessary economic security to dissociate political and economic models, based on their projection of surplus (Gavin *et al.* 1996).

MATERIALS AND METHODS

This study is based on time series. This type of data is defined as "(...) a set of observations about a variable, ordered in time"

(INF, 2018). Its use is justified because in causal series, the main premise is the existence of influences that act on the data collected over time, existing in the past and going to the future, so that, if it's possible to identify the pattern, it's possible to identify the aspects that guide the given problem more precisely. Such a set can be obtained through periodic observations of a relevant event (LÜTKEPOHL, 2004). Such data must be parallel to time, showing a strong serial dependency. Represented as follows:

$$X_1, X_2, X_3 \text{ ou } X_t, t = 1, 2, 3, \dots, n.$$

Thus, (n) represents the size of the series (X_t) is a set of correlated observations, which follow a chronological order of time; can be continuous or discrete, multivariate or univariate and time (T) can be multidimensional or one-dimensional (GUJARATI, 2011). The objective of the time series in certain situations is to make predictions of future values, while in others, quantify the interaction of two or more variables (EHLERS, 2007). After evaluating the alternatives and formulating the mathematical model for representation and estimation of its parameters, we can test some hypothesis or theory according to the stochastic process generating method; in order to predict future values (ENDERS, 1995). Time series, in spite of practices, do not suffice as a solution to the problem. However, they are based - unlike other data sources - on constant foundations, events that can be predicted, and that can have a positive effect in the medium and long term. In time series, one works with the concept of "prediction" (Morentin, 1981), which is, the analysis that allows, in a given time interval, to define a pattern that points to decision making with greater chances of success. Working with the hypothesis, the data fluctuation along the time series provides a specific control over the conditions that one wishes to interfere with, because it is based on the premise of continuous movements that will be repeated, with greater or lesser intensity. Gujarati (2011) classifies the data tracks in univariate, transfer functions and multivariate intervals. However, the methodology does not exclude other forms of action on the type of data to be explored in the time series. In Graph 1, we expose a temporal sequence, where is the instant in time and h, the course of the time space to be analyzed. From the observation of data behavior in this variable interval, it is possible to construct forecasts with greater or lesser effectiveness:

In the analysis model, from the values that are defined from the forecast horizon, values classified between short, medium and long term are defined. The techniques of Wheel Wright (1985) and Gujarati (2011) point out the main types of analysis within the statistical time series: the simple prediction, which has no connection with the following predictions, presenting isolated results in time for short series. Therefore, short series are able to issue prognoses based only on a short time interval. Another way of working with the forecast horizon is defined by the multi-step forecast. This model of analysis has as main specialty, the understanding of patterns and the formation of trends and relevant aspects in the analyzed time series. The values are applied taking as reference a certain moment in time, using previous information to forge results at a subsequent time in time (GUJARATI, 2011). The most efficient way of assessing the safety of a time series includes the systematic analysis of the time instant subsequent to the initial time, defined as t. Applying this aspect to the empirical series, a mathematical model that efficiently adapts to the

given time series where it is desired to interfere is generated and conformed (GUJARATI, 2011). In Methods of forecasting time series there is eventually there is a time interval between the perception of Event or necessity and occurrence of that event. This deadline is the main reason for planning and forecasting. A forecasting method is the clustering of techniques used in the development of a given forecast. The time series prediction method, classified as quantitative, has its predictions based on extrapolation of characteristics of past observations and on the interrelation between these observations, providing accurate predictions if the future presents similar behavior to the past (LÜTKEPOHL, 2004).

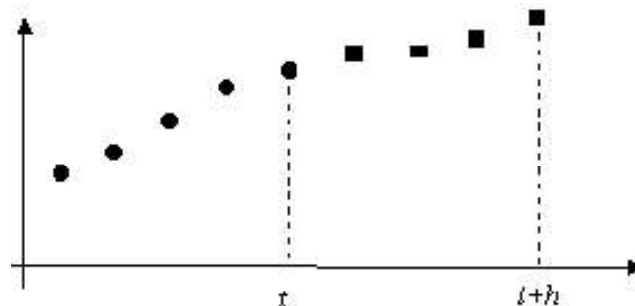
According to this author, most time-series methods are based on the assumption that past observations contain all the information about the pattern of a time series and that pattern is recurrent in time. The purpose of forecasting methods is to distinguish the pattern of any noise that may be contained in the observations and then use that pattern to predict the future values of the time series. Thus, due to the identification of this component, the forecast for subsequent time periods can be developed (GUJARATI, 2011). Most of the time series prediction methods are based on the assumption that the observations of a given series to specify a model that describes such observations, other forecasting procedures seek to explain the behavior of a time series by the evolution of observed phenomena of other series. Thus, according to the number of series involved in the model, Enders (1995) classifies forecasting methods into univariate, transfer functions and multivariate. The univariate method, the data analysis system based on only a single time series, is defined. This is considered the most common method among the available forecasting methods, and a feature of this type of method is the possibility to work with only one data series presented related to a period of interest, implying in additional information to confirm the security of the prediction. These series are complemented with the so-called transfer functions. These functions associate not only the information contained in the analyzed historical series, but are able to infer data present in other time series, but which confirm or assist in the confirmation of elements of the series in question (Wheelright, 1985). The multivariate nuclei, on the other hand, incorporate elements of several time series, being a very prolix perspective in the formation of time series methods. These series are flexible, but not versatile, which is why, there are several limitations in their elaboration and application, which, however, does not exclude them as a data analysis tool, which raises a greater imminence in the analysis, the establishment of solid criteria of choice, based on the characteristics of the phenomenon to be analyzed. From the 1980s, based on the studies of Sims (1980), the concept of autoregressive method, known by the acronym VAR, emerged. this method is able to correlate several functions, of several variables, except under the influence of some identification conditions. this method is characterized by its ability to generate several response impulses from a well-established complex of variables. This capacity made him a reference for economic studies. One of the main applications of this method is the experience proposed by Enders in the study of variance decomposition and impulse-response function. In the first case, we show the variables from their common root, and their correlation with other variables in the same model analyzed; the second case allows observing the reaction of the variables when in the same model, counterposing a given variable in a time line, thus

fostering an analysis of the relationships established between variables at different time periods (ENDERS, 1995).

Data and identification of the model: Eviews8 software will be used to obtain the model results. With the purpose of identifying the most used policies in Brazil, in the period of 2011-2014, with a total of 300 observations. In general, according to the model proposed in this paper, five variables are identified as determinant of the economic policies employed during this period in Brazil: i) primary surplus (% GDP); ii) net internal public sector debt (% GDP); iii) over-elastic interest rate (% a.m); iv) exchange rate (effective - real - NCPI); IPCA (% a.m). In order to estimate the model, the given variables were used, in brackets the name of the software.

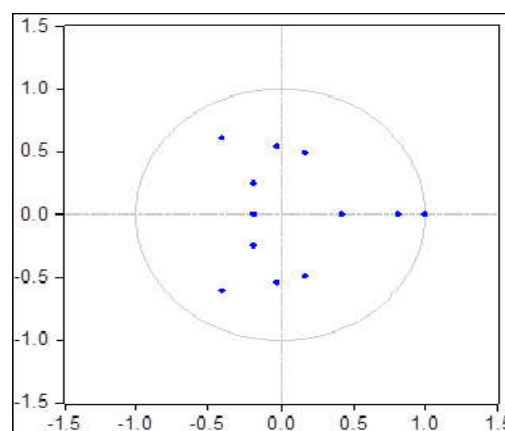
RESULTS AND DISCUSSION

Descriptive price analysis: The descriptive analysis of the data indicated the series that presented higher average value, greater data variability, maximum value, minimum value, etc. Such information is of substantial importance when comparing those with the other macroeconomic variables. It was observed that the variables with the highest standard deviation were NFSP and DIVPIB with percentages of 0.94% and 0.99%. The coefficient of variation of the variables NFSP and INFLA are noteworthy because they have very similar values - 45.07% and 45.22%. The null hypothesis of data normality for all variables was rejected by the Jarque-Bera test (Table 1).



Source: Granger (1974).

Figure 1. Observations of a temporary series with forecasts of origin t and with horizon h



Source: Search result.

Figure 2. Characteristic roots of the VEC estimated

Unit root tests: The results of the Generalized Dickey-Fuller (ADFGLS) tests presented in Table 2, where the variables are level, indicate that the time series are integrated in the first order.

Table 1. Macroeconomic series statistics (jan/2011 – dez/2014)

	NFSP	SELIC	CAMBIO	DIVPIB	INFLA
Average	-2,08	0,78	2,03	3,52	0,50
Median	-2,03	0,82	2,03	3,54	0,52
Maximum	0,56	1,07	2,64	3,65	0,92
Minimum	-3,57	0,49	1,56	3,32	0,01
Standard Deviation	0,94	0,14	0,28	0,99	0,23
Coefficient of variation (%)	-45,07	18,21	13,86	28,08	45,22
Asymmetry	0,60	-0,25	-0,01	-0,32	-0,18
Curtose	3,18	2,14	2,07	1,69	2,61
Jarque-Bera	2,96 (-0,2271)	1,96 (-0,3752)	1,73 (-0,4212)	4,23 (-0,1208)	0,56 (-0,7563)

Source: Elaboration based on data from the Ipeadata

Note: p-values between parenthesis

Table 2 Unit root teste DF-GLS

Serie	I (d)	teale	Critical value		
			1%	5%	10%
NFSP	0	1,6508	-2,6151	-1,9480	-1,6124
	1	-5,7994	-2,6162	-1,9481	-1,6123
SELIC	0	-2,0100	-2,6212	-1,9489	-1,6119
	1	-1,8812	-2,6212	-1,9489	-1,6119
CAMBIO	0	0,1369	-2,6162	-1,9481	-1,6123
	1	-4,3569	-2,6162	-1,9481	-1,6123
DIVPIB	0	-1,1887	-2,6162	-1,9481	-1,6123
	1	-3,9997	-2,6162	-1,9481	-1,6123
INFLA	0	-2,7978	-2,6151	-1,9480	-1,6124
	1	-7,5646	-2,6162	-1,9481	-1,6123

Source: Search result.

Table 3. Information criterion for optimal number of lags

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4	NA	4,73E-06	1,9267	2,1295	2,0019
1	160,6784	342,1153*	1,83E-09*	-5,9399*	-4,7234*	-5,4888*
2	181,1206	30,6633	2,35E-09	-5,7328	-3,5025	-4,9057
3	208,4426	34,7736	2,39E-09	-5,8383	-2,5943	-4,6353
4	232,7164	25,3771	3,16E-09	-5,8053	-1,5476	-4,2263

Source: Search result.

However, the unit root hypothesis was not rejected for all level variables. In the first difference, on the other hand, the series were strongly stationary, except for the "SELIC" variable, which will not affect the stationarity of the model.

Johansen Cointegration Test: Before performing the Johansen cointegration test, it is necessary to establish the number of lags to be implemented in the VAR model (SOARES *et al.*, 2008). This number of lags is defined by the information criterion. The information criteria chosen in this study were the test statistic (LR); the final prediction error (FPE); or Akaike (AIC); Schwarz (SC) and Hannan-Quinn (HQ) indicated that the model should be estimated with 1 lag (represented by the "*" in Table 3). However, when performing the Johansen cointegration test, it was noticed that the 1 lag model was not cointegrated. To enable the realization of the autoregressive vector with error correction (VEC), it was decided for the usage of the model with 2 lags. Using the Trace and Max statistics and for both statistics, the number of cointegration equations is greater than zero, with a significance

level of 5% (Table 4). This long-term interaction confirmed in the Johansen test indicates that the variables will not move independently of each other over time. Since it was verified in the test that the number of cointegration vectors is greater than zero and less than the number of variables, the model used will be the VEC. The VEC analysis will only be satisfied and reliable if the stability condition is satisfied, that is, all the eigenvalues of the matrix of coefficients $At-i$ in modulus, smaller than 1, thus becoming within the circle. This model has 6 variables, counting with the cointegration term of the model ($n = 6$) and the order of the ECV (p) was 2 lags ($p = 2$), we have 12 eigenvalues ($n \times p$). As Figure 2 shows above, the estimation of VEC is stable. All eigenvalues (characteristic roots) were smaller than 1, thus, remained within the unit circle. It also indicates that the choice of the number of lags in the model did not affect its stability. Given the stability of the VEC model, we proceed to the analysis of the impulse response function and the variance decomposition of the prediction error. The first expresses the effect that an unexpected shock on a variable has on all system variables.

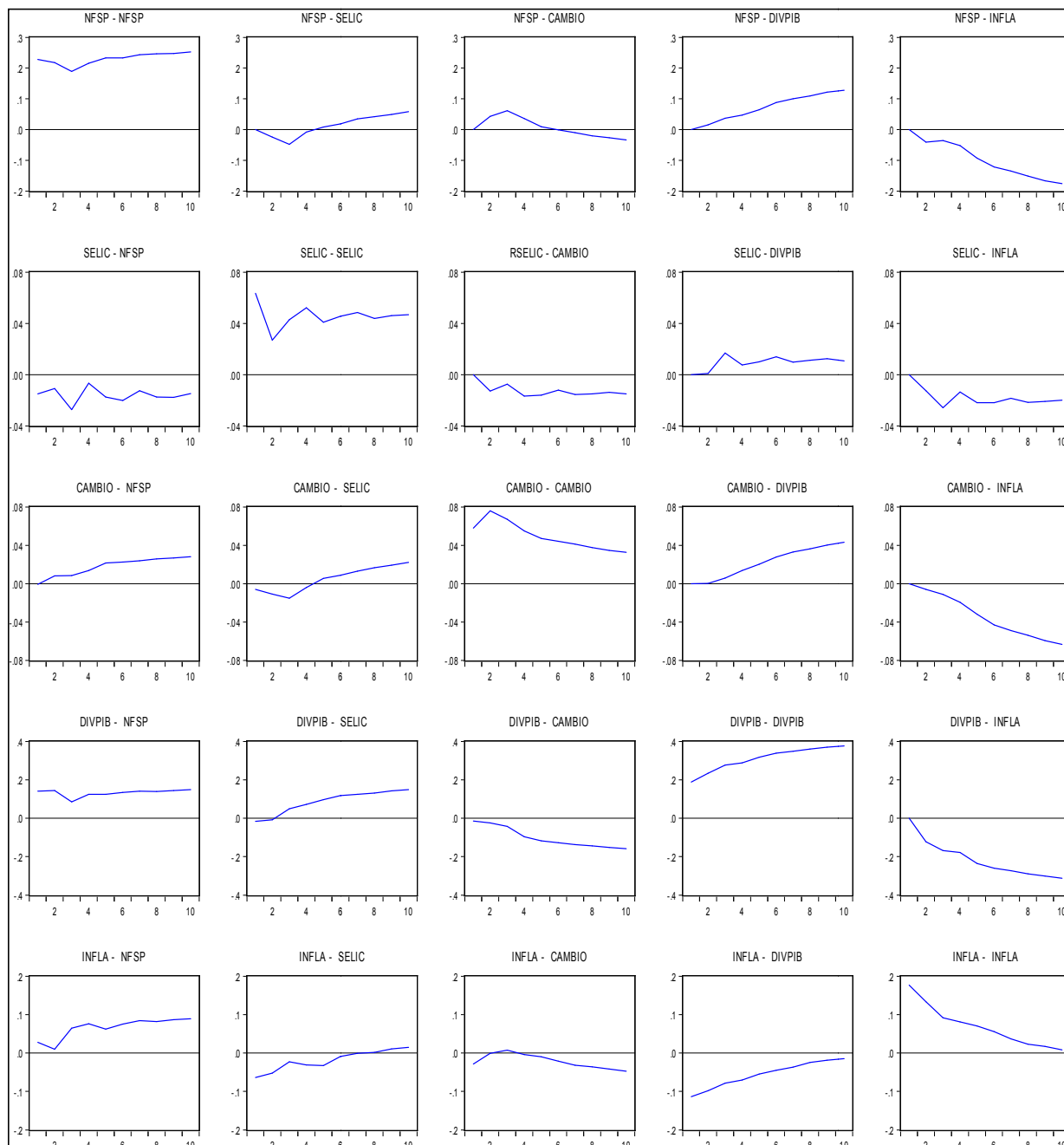
Table 4. Johansen cointegration test

Trace test					
H	H	Eigenvalue	Calculated statistic	Critical value 5%	Prob.**
r = 0	r > 0	0,605295*	90,78899	69,81889	0,0005
r < 1	r > 1	0,386507*	48,95620	47,85613	0,0393
r < 2	r > 2	0,367263	26,96981	29,79707	0,1024
r < 3	r > 3	0,129761	6,373259	15,49471	0,6514
r < 4	r > 4	0,002637	0,118812	3,841466	0,7303

Maximum eigenvalue test					
H	H	Eigenvalue	Calculated statistic	Critical value 5%	Prob.**
r = 0	r = 1	0,605295*	41,83278	33,87687	0,0046
r = 1	r = 2	0,386507	21,98640	27,58434	0,2210
r = 3	r = 3	0,367263	20,59655	21,13162	0,0593
r = 3	r = 4	0,129761	6,254447	14,26460	0,5808
r = 4	r = 5	0,002637	0,118812	3,841466	0,7303

Source: Search result.

Table 5. Impulse function answer



Source: Search result.

Table 6. Decomposition of variance

INFLA período	S.E.	NFSP	SELIC	CAMBIO	DMP/B	INFLA
1	0,222603	1,583869	8,140321	1,615247	25,92011	62,74045
2	0,282424	1,095204	8,465007	1,003822	28,21736	61,21860
3	0,314745	5,136479	7,348219	0,860031	28,91613	57,73914
4	0,342566	9,278477	7,034283	0,739188	28,65892	54,28913
5	0,361029	11,28831	7,158790	0,738933	28,11371	52,70026
6	0,376417	14,38002	6,637624	0,992614	27,30177	50,68797
7	0,390552	18,03262	6,166699	1,605899	26,23810	47,95668
8	0,402087	21,14840	5,820316	2,326583	25,13535	45,56934
9	0,414349	24,29097	5,551150	3,198385	23,88133	43,07816
10	0,427068	27,24510	5,348879	4,224575	22,59479	40,58665
11	0,439619	29,83658	5,223174	5,277343	21,36066	38,30224
12	0,452924	32,24172*	5,176743	6,351631	20,13684*	36,09306

Source: Search result.

However, the decomposition of the variance shows how much the prediction error of a variable is influenced by itself in the past and by other variables (MELO *et al.*, 2016).

Impulse Function Answer: When analyzing the impulse response function, it can be seen that the primary surplus strongly influences GDP Debt, Selic and inflation. Debt GDP is influenced by itself and strongly affected by the variables Change and primary surplus. The strong influence of the DIVPIB and NFSP variables on the variable INFLA is clearly visible. We can see the divergence with the theory, where the NFSP should negatively influence the DIVPIB, which does not happen in the analyzed period.

Decomposition of Variance: After analyzing the variance decomposition, we can see that the inflation variable was directly affected by the variables: Primary Surplus and GDP Debt. In the twelfth month NFSP and DIVPIB together account for approximately 52% of the variable INFLA. Therefore, according to the presented in this section, there was a strong dominance of fiscal policy, overlapping monetary policy, generating a rise in the general level of consumer prices.

Conclusion

This article aimed to analyze the relationship between fiscal policies and economic monetary policies adopted in the first Dilma Rousseff government (2011 - 2014). According to the database and the econometric regressions and analyzes carried out, it was noticed that there was a rise in the interest rate to obtain an inflation control, caused by administered prices (controlled), at the same time the industrial sector was suffering from fall in their profit rates. This consequently led to a drop in investment, which led to a fall in employment and consumption levels; flattening the GDP. Due to the lack of harmony between the economic policies, the increase in the interest rate led to a depreciation of the exchange rate and increased the value of the interest to be paid by the investments in government bonds, reducing the results of Public Sector Net Debt. This resulted in a slowdown in economic growth, a deterioration of the primary result, which now has a deficit in public accounts, necessitating the need for financing, in addition to a currency devaluation caused by capital flight due to the increase in risk parents.

Technical and political measures should have been taken in an efficient and impartial manner so that this crisis scenario would have been mitigated or avoided as: tax reform. The taxes are collected progressively and that mainly affects the income, thus the collection does not become dependent on the consumption, so that it is highly affected by the crisis, susceptible to falls. This form of taxation makes the financing of public debt more effective. Thus, the premise that the crisis was the result of government spending does not hold up, so that the breakdown of the primary result was due to falling revenues. A fall in the primary result raises the net debt of the public sector. It was evident that the adjustment of administered prices could have happened gradually and that the increase in the interest rate did not have a great impact on the inflation, since this was caused by the control of prices and not by acceleration of the consumption, since these prices did not change with the conduct of monetary policy.

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