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ABSTRACT

During the 2008 crisis the mainstream macroeconomics was unable to provide an adequate set of tools to combat the economic recession, triggering a debate on the theoretical basis of the dominant macroeconomic thinking and consequently on the kind of macroeconomic policy that should be implemented during and after a crisis. This discussion may lead to a fundamental change in the general approach to the use of fiscal and monetary policies as a tool for economic recovery. In this sense, the objective of this dissertation is to support this debate through the empirical study of the Brazilian and Chinese experiences before, during and after 2008. Both countries used unconventional measures to face the crisis and obtained relative success. The evaluation of the monetary and fiscal policies adopted by them shows the impossibility of maintaining macroeconomic stability aiming exclusively reasonable inflationary levels through the adjustment of interest rates. Rethinking the way macroeconomic policies are implemented is fundamental in order to adapt the macroeconomics thought to the current scenario of the world economy and to avoid the economic stagnation experienced by several developed economies today.

Keywords: macroeconomics, fiscal policy, monetary policy, financial crisis.

RESUMO

Durante a crise de 2008, a macroeconomia *mainstream* foi incapaz de fornecer um conjunto adequado de instrumentos para combater a recessão econômica, o que desencadeou um debate sobre as bases teóricas do pensamento macroeconômico dominante e, consequentemente, sobre o tipo de política macroeconômica que deve ser implementado durante e após uma crise. Essa discussão pode levar a uma mudança fundamental na abordagem geral do uso de políticas fiscais e monetárias como ferramenta de recuperação econômica. Nesse sentido, o objetivo desta dissertação é apoiar esse debate através do estudo empírico das experiências brasileira e chinesa antes, durante e após 2008. Ambos os países usaram medidas não convencionais para enfrentar a crise e obtiveram relativo sucesso. A avaliação das políticas monetária e fiscal por eles adotadas evidencia a impossibilidade de se manter a estabilidade macroeconômica buscando exclusivamente alcançar razoáveis níveis inflacionários por meio do ajuste das taxas de juros. Repensar a maneira de se implementar políticas macroeconômicas é fundamental para adequar o pensamento macroeconômico ao atual cenário da economia mundial e evitar a estagnação econômica hoje vivida por diversas economias desenvolvidas.

Palavras-chave: macroeconomia, política fiscal, política monetária, crise financeira.

RESUMEN

Durante la crisis de 2008, la macroeconomía *mainstream* fue incapaz de proporcionar un conjunto adecuado de instrumentos para combatir la recesión económica, lo que desencadenó un debate sobre las bases teóricas del pensamiento macroeconómico dominante y, en consecuencia, sobre el tipo de política macroeconómica que debe ser implementado durante y después de una crisis. Esta discusión puede llevar a un cambio fundamental en el enfoque general del uso de políticas fiscales y monetarias como herramienta de recuperación económica. En este sentido, el objetivo de esta disertación es apoyar este debate a través del estudio empírico de las experiencias brasileña y china antes, durante y después de 2008. Ambos países usaron medidas no convencionales para enfrentar la crisis y obtuvieron un relativo éxito. La evaluación de las políticas monetaria y fiscal por ellos adoptadas evidencia la imposibilidad de mantener la estabilidad macroeconómica buscando exclusivamente alcanzar razonables niveles inflacionarios por medio del ajuste de las tasas de interés. Repensar la manera de implementar políticas macroeconómicas es fundamental para adecuar el pensamiento macroeconómico al actual escenario de la economía mundial y evitar el estancamiento económico hoy vivido por diversas economías desarrolladas.

Palabras clave: macroeconomía, política fiscal, política monetaria, crisis financiera.

LIST OF ABBREVIATIONS AND ACRONYMS

ADF – AUGMENTED DICKEY FULLER

AIC - AKAIKE'S INFORMATION CRITERION

BB – BANCO DO BRASIL

BCB – BANCO CENTRAL DO BRASIL

BLUE – BEST LINEAR UNBIASED ESTIMATORS

BNDES – BANCO NACIONAL DE DESENVOLVIMENTO ECONÔMICO E SOCIAL

CDE – CONTA DE DESENVOLVIMENTO ENERGÉTICO

CEDEPLAR – CENTRO DE DESENVOLVIMENTO E PLANEJAMENTO REGIONAL

CIDE – CONTRIBUIÇÕES DE INTERVENÇÃO NO DOMÍNIO ECONÔMICO

CEF – CAIXA ECONÔMICA FEDERAL

COFINS – CONTRIBUIÇÃO PARA O FINANCIAMENTO DA SEGURIDADE SOCIAL

COPOM – COMITÊ DE POLÍTICA MONETÁRIA

CPC – COMMUNIST PARTY OF CHINA

CPI – CONSUMER PRICE INDEX

CPMF – CONTRIBUIÇÃO PROVISÓRIA SOBRE A MOVIMENTAÇÃO OU TRANSMISSÃO DE VALORES E DE CRÉDITOS E DIREITOS DE NATUREZA FINANCEIRA

CRI – CERTIFICADO DE RECEBÍVEIS IMOBILIÁRIOS

FDI – FOREIGN DIRECT INVESTMENT

FEVD – FORECAST ERROR VARIANCE DECOMPOSITION

FGC – FUNDO GARANTIDOR DE CRÉDITOS

FHC – FERNANDO HENRIQUE CARDOSO

FIDC – FUNDO DE INVESTIMENTO EM DIREITOS CREDITÓRIOS

FIES – FUNDO DE FINANCIAMENTO ESTUDANTIL

FIP-IE – FUNDO DE INVESTIMENTO EM PARTICIPAÇÕES-INFRAESTRUTURA

F.O.B. – FREE ON BOARD

FPE – FINAL PREDICTION ERROR

GDP – GROSS DOMESTIC PRODUCT

HQIC – HANNAN AND QUINN INFORMATION CRITERION

IOF – IMPOSTO SOBRE OPERAÇÕES DE CRÉDITO, CÂMBIO E SEGUROS

IMF – INTERNATIONAL MONETARY FUND

IPCA – ÍNDICE DE PREÇOS AO CONSUMIDOR AMPLO

IPI – IMPOSTO SOBRE PRODUTOS INDUSTRIALIZADOS

IRF – IMPULSE RESPONSE FUNCTION

IRPF – IMPOSTO DE RENDA DA PESSOA FÍSICA

LCI – LETRA DE CRÉDITO IMOBILIÁRIO

LH – LETRA HIPOTECÁRIA

LR – LIKELIHOOD-RATIO

MEI – MICRO EMPREENDEDOR INDIVIDUAL

MLF - MEDIUM-TERM LENDING FACILITY

MP – MEDIDA PROVISÓRIA

OECD - ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

PAC – PROGRAMA DE ACELERAÇÃO DO CRESCIMENTO

PASEP – PROGRAMA DE FORMAÇÃO DO PATRIMÔNIO DO SERVIDOR PÚBLICO

PBC – PEOPLE'S BANK OF CHINA

PEC – PROPOSTA DE EMENDA CONSTITUCIONAL

PIL – PROGRAMA DE INVESTIMENTOS EM LOGÍSTICA

PIS – PROGRAMA DE INTEGRAÇÃO SOCIAL

PLP- PROJETO DE LEI COMPLEMENTAR

PPI – PROGRAMA DE PARCERIA DE INVESTIMENTOS

PPP - PURCHASING POWER PARITIES

PRC - PEOPLE'S REPUBLIC OF CHINA

PRONATEC – PROGRAMA NACIONAL DE ACESSO AO ENSINO TÉCNICO E EMPREGO

PSI – PROGRAMA DE SUSTENTAÇÃO DO INVESTIMENTO

PSL – PLEDGED SUPPLEMENTARY LENDING

RET – REGIME ESPECIAL DE TRIBUTAÇÃO

RMB – RENMINBI

SBIC - SCHWARZ'S BAYESIAN INFORMATION CRITERION

SELIC – SISTEMA ESPECIAL DE LIQUIDAÇÃO E DE CUSTÓDIA

SEZ – SPECIAL ECONOMIC ZONES

SOE – STATE-OWED ENTERPRISE

SVAR – STRUCTURAL VECTOR AUTOREGRESSION

TVE – TOWNSHIP AND VILLAGE ENTERPRISE

UFMG – UNIVERSIDADE FEDERAL DE MINAS GERAIS

VAR - VECTOR AUTOREGRESSION

WTO – WORLD TRADE ORGANIZATION

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1. INTRODUCTION

During the 2008 crisis, the adversities overpassed the financial and the real estate markets' boundaries, and the world economy experienced a robust drop in aggregate demand in just a few months. Actions to repair the financial system, to increment the demand, and to restore the market's reliability were necessary to "push output back toward its pre-2008 trend and minimize the long-term damage from the Great Recession" (Ball et al., 2014, p. 8). In this scenario, the most reliable approach was to use macroeconomic policies to boost demand. The procedures adopted varied between the countries, which triggered the discussions about the role of these measures in fostering growth and development.

According to Ball et al. (2014), before 2008 the stimulus to the economy would usually be made through the adoption of accommodative monetary policies to support aggregate demand. In other words, central banks would take actions to increase money supply in order to reduce interest rates, which would mean lower borrowing costs and a probable debt-funded business expansion. The greater the growth of the productive sector, the greater the positive effect on the employment rate, which would directly stimulate consumption. However, most of the advanced economies found their interest rates near the zero bound at that time; that is, there was little room for monetary maneuvers.

In light of this situation, another way of strengthening the aggregate demand would be through an expansionary fiscal policy, which may take the form of increased public spending or reduced taxes. However, the public debate has always viewed this type of macroeconomic policy with considerable mistrust because of what became known as the crowding out effect. According to this theory, an increase in public spending discourages private investment in areas where the government is investing. In this case, the government not only provides a good or a service that could be offered by the private sector, but also indirectly influences the borrowing costs by increasing the

demand for loans and, consequently, allowing a rise in interest rates. If firms are not stimulated to invest, the productive sector and the labor market do not grow, that is, the effect on aggregate demand through consumption is practically non-existent. Furthermore, there are the costs related to the increase in government spending, which shall have an even more expensive amortization due to the higher interest rate. In other words, a fiscal stimulus would not only have little effect in the short run, but would also undermine the State's long-term financing capacity.

Based on this assumption, since the nineties there was a diffusion in the adoption of fiscal rules to keep the public budget balanced. An interest fact is pointed by Gobetti (2014), who asserts that the first experiences of fiscal rules in Europe (dated from the post-war period) identify with one of the key recommendations made by economist John Maynard Keynes at the time: separating the current budget from the capital budget with a view to constructing a public investment plan to reduce or cope with cyclical fluctuations in the economy. According to Keynes (apud Gobetti, 2014), the current budget should remain balanced, while capital expenditures (investments) could be financed in a self-sustaining way through indebtedness.

In practice, the rules that emerged in the 1990s imposed quantitative and rigid limits on the nominal deficit, such as the Maastricht Treaty in 1992, which restricted the deficit of EU member states to 3% of GDP. In addition to these limits, several countries have also started to impose restrictions on public indebtedness, expenses and even revenues (Gobetti, 2014). Any countercyclical movement - to face unexpected crises, for example - should be carried out by the monetary side of the economy.

In 2008, however, one detail was able to counter this theory: many economies had their interest rates near the zero bound, which reduced a lot the risk of crowding out private investment through a fiscal expansion. Well-designed and well-implemented policies, such as public investment policies (Ball et al., 2014), could generate direct benefits in job creation and consequently stabilize the level of consumption and investment in the economy. In other words, an expansionary fiscal policy could

prevent a negative shift in aggregate demand more directly than a monetary policy would do. Furthermore, concerning the debt problem, Ball et al. (2014) allege that:

> "In the presence of hysteresis, a one-time temporary cut in net taxes increases output into the distant future. A persistent output increase creates a persistent rise in tax revenue. These long-term fiscal benefits can more than amortize the initial rise in the deficit if the real cost of financing government debt remains low enough." (Ball et al., 2014, p. 9).

Remembering that in economics hysteresis refers to the prolonged effects of a current shock, what the author means above is that the results of a fiscal policy go beyond the short term because they influence not only current real GDP but also the potential GDP of the economy. A tax cut today can be offset in the long run because there is a prospect of positive GDP growth. At the very least, this means that the current loss of revenue will be financed at a low cost (as interest rates approach zero) due to the greater ability to pay taxes that the population will have in the future.

Considering also the fiscal multiplier effect, these benefits can be even greater. The fiscal multiplier measures the effect that a shift in government spending has on the income level of a country. According to Blanchard and Leigh (2013, apud Ball et al., 2014) these fiscal multipliers were larger than expected during 2009 and 2010 in advanced economies, which means that small changes in public spending created much larger changes in total output, whether negative or positive. That is, increases in spending led to even greater increases in GDP, just as reductions in spending led to even greater reductions in GDP. Therefore, contrary to what was imagined, fiscal austerity policies might be more damaging than beneficial to the economy in times of recession.

Indeed, during this last crisis "output fell short of IMF forecasts in countries that pursued fiscal austerity" (Ball et al., 2014, p. 8). By reducing its spending, the government contributed to the economic slowdown because it further reduced the demand for labor, prolonging the economic slump. Productivity is directly affected, and the problem of public indebtedness, the main reason for fiscal consolidation, becomes even worse. That is probably why Ball (2014) argues that for the hysteresis

effects to be reversible, policymakers must create a strong economic expansion through, for example, procyclical investments.

In another paper, Ball et al. (2013) showed that a policy of fiscal consolidation could also lead to worsening inequality and wage distribution rates, as well as perverse effects on the long-term unemployment rate. According to the authors, the government should take these conclusions into account when designing austerity policies in order to offset some of the negative effects. Moreover, the ideal would be a slower and more flexible policy, adaptable to short-term results, without disregarding the medium- and long-term objectives.

Since 2008 it has become clear that expansionary fiscal policies have a place in macroeconomics. For the first time in decades the adoption of countercyclical policies became so necessary that even the conservative International Monetary Fund (IMF) acknowledged the positive effects of public spending on infrastructure (IMF, 2014), a fact that was at least neglected by the institution over the past few years given its focus on recessionary fiscal management. This was an important milestone in economics, since it is obvious that this recession was not the last one by which the world economy will pass and the adoption of fiscal policies will probably become more frequent, which means that studying and understanding these policies will help make the coping of economic adversity faster and more effective in the future.

In this context, this work intends to discuss the relation between macroeconomic policies and economic activity based on the recent experiences from two countries that opted to adopt expansionary fiscal policies - mostly increased government spending - in the face of the crisis: Brazil and China. The choice of countries was due to the peculiarities of the growth trajectory of each of them since 2008. On one hand, the Brazilian economy, which had rapidly recovered already in 2009, is now experiencing a period of deep stagnation. On the other hand, China is a very interesting case of recovery with public debt of only little concern. After a brief recession, the Chinese economy resumed its high-profile performance in terms of GDP growth, trade balance, and currency reserves. Furthermore, the country has become a central player in economic development and has acquired a more active

role in international financial and foreign exchange markets (Cabestan, Di Meglio and Richet, 2012).

The aim here is to verify the reproduction of the measures adopted over the economic growth of the country in terms of GDP. Analyzing both cases is essential in order to improve the efficiency of macroeconomic policies in Brazil and in the world, and to foment the debate about the ideal objectives of these economic measures. Namely, the lessons taken from the experiences analyzed may help the determination of which macroeconomic policies are more favorable to economic growth. The analysis may change the actual predominant thought about the effect of monetary policies over the economic activity in the short term.

The rest of the document is organized as follows. This introduction chapter continues by presenting the literature, the methodology and the data used in the analysis. Chapter two addresses the Brazilian situation before and after the crisis. Economic and political aspects that have influenced Brazil's performance are included in the approach in order to better understand how macroeconomic policies have led the country to its current situation. China's experience is exposed in chapter three. The political and the economic history of China has much influence in this regard, so its most important aspects are presented throughout the text. The lessons we can draw from the two covered experiences will be brought together into chapter four. The financial crisis has caused economists around the world to rethink the way macroeconomic policies are made, and the analysis of earlier chapters of the work signs past mistakes and points to more efficient development paths.

1.1 LITERATURE

The policies adopted by many economies affected by the international financial crisis were first analyzed already in 2008, when some studies started to be published. According to Spilimbergo et al (2008), fiscal policies were the most recommendable at that time. In a paper for the IMF, the authors analyzed the historical use of fiscal policies in financial crisis to examine the economic problems faced by a major part of

countries in that moment, and advocate the adoption of a major, lasting, diversified, contingent, collective, and sustainable fiscal stimulus immediately.

Blanchard, Dell'Ariccia, and Mauro have also been publishing important studies concerning the need to rethink macroeconomic policies since the most recent international financial crisis. In 2010 the authors started a series of conferences aiming the examination of changes in their perceptions of macroeconomic policies. In one of their first publications, the authors state that the relation between inflation and growth has not been totally understood yet, which makes room for questioning the efficacy of inflation targeting policies and the necessity of controlling the volatility of capital flows (Blanchard, Dell'Ariccia and Mauro, 2010). What seems to be obvious for them, though, is the limited effectiveness of monetary policy as an instrument of overcoming the crisis and upholding the weakened national economies. Such a conclusion was already foreshadowed by the Japanese case, which after a crisis in the 1990s never again regained its economic strength, despite several attempts to use expansionary monetary policy to that end (Blanchard, Dell'Ariccia and Mauro, 2010). During this recent crisis, even the quantitative easing adopted by the American authorities was used in an unconventional way, which nonetheless was capable of only minimizing the devastating effects of the crisis.

In this context, Hailu and Weeks (2011) provide recommendations for the design of macroeconomic policies in groups of countries with special characteristics: resource-rich and conflict-affected economies. They argue in favor of a more heterodox macroeconomic policy, which would take each country's context and imperfections into consideration. According to them, the feasibility and success of macroeconomic policies will depend exactly on those adaptations to each economy's unique characteristics.

The authors warn the need to coordinate the different policies in order to at least prevent the policy instruments from conflicting with one another. The numerous policy instruments available are commensurate with the various government objectives at the macroeconomic level. And this is because Hailu and Weeks (2011) argue that governments have at least four macroeconomic objectives: "achieving potential

growth; maintaining sustainable internal and external accounts; preventing a destabilizing rate of inflation; and poverty reduction" (p. 2).

Considering a flexible exchange rate regime, it is argued that monetary policy under the Mundell-Fleming model would not be completely effective because of the price effect on the real money supply and the real exchange rate. Moreover, the effectiveness of monetary policy to manage the level of output depends on the marginal propensity to import and on the sum of the elasticities of export and import volumes with respect to the real exchange rate (Hailu and Weeks, 2011). The authors believe that these are important considerations when designing macroeconomic policies, because supply may be price inelastic and demand may be exchange rate inelastic in post-conflict and resource-rich countries respectively, which limits the usefulness of monetary policy for macroeconomic management.

The paper has also significant insights about the functioning of macroeconomics in countries belonging to the two groups being analyzed. It is perceived, for example, the importance of avoiding austerity measures in post-conflict countries in order not to exacerbate social tensions. Hailu and Weeks (2011) also remark that resource-rich countries experience frequent periods of dramatic foreign exchange inflows when worldly demand for resource-based goods explodes, which appreciates their currency and undermines the profitability of other tradable goods such as manufacturing. This peculiarity makes governmental intervention necessary to prevent the market distortions created by the resource boom. As a consequence, the authors argue that a free floating exchange rate regime is not likely to work in resource-rich countries, because it does not promote economic diversification into other non-resource tradable markets.

In another publication, Blanchard et al (2012) reanalyze macroeconomic thoughts pre and post crisis. The book is divided in six major themes: monetary policy, fiscal policy, financial intermediation and regulation, capital-account management, growth strategies, and the international monetary system. The authors' main goal is to understand how the crisis affected the economists' vision on each of the selected topics. Before the 2008 economic crisis, policies were managed to reach one target –

the inflation – through one tool – the interest rate. The crisis reveled the existence of many other goals and instruments whereby the first can be achieved. It was assumed that a stable inflation could guarantee the economic stability, that is, it could maintain relatively constant the gap between the potential GDP and the effective GDP. In practice, however, it was verified that the connection between this gap and the inflationary stability is weaker than it was believed to be. Blanchard et al (2012) assert that a consensus is emerging among central banks, according to which these institutions should not only maintain macroeconomic stability through monetary policy models already in use, but also maintain financial stability through macro prudential tools. Furthermore, the authors endorse the open use of exchange rate policies to control the currencies' value.

Indeed, this idea of exchange rate management is one of the most important topics that emerged in the macroeconomic debate post-crisis. Apparently, the exchange rate retook its central role in the process of economic development. It is evident that the fixed exchange rate policy was made impossible by the large circulation of speculative capital by the international financial markets, but it cannot and should not be replaced by a totally flexible exchange rate regime, particularly in the case of countries with relative weak currencies such as Brazil and China.

In fact, a known case of exchange rate management is the Chinese one. During the crisis China was able to manage its currency through the adoption of a dirty floating (or peg) exchange rate regime, but this does not mean that all countries are able to do the same. Exchange management in a world of broad capital mobility requires, among other factors, the accumulation of a strong currency, the maintenance of a surplus balance of payments and the maintenance of a competitive exchange rate for most of the productive sectors. In order to achieve these goals, the debate on capital flows control must be disinterested once and for all.

The Chinese experience is assessed by Cabestan, Di Meglio and Richet (2012) as well. The authors assert that China was one of the few countries that launched aggressive countercyclical fiscal measures without compromising its long-term fiscal sustainability. Even being less concerning than the measures taken by European

countries, for example, the fiscal stimulus adopted by the Chinese government raised questions about its potential negative effects in the next years (Cabestan, Di Meglio and Richet, 2012, p. 35). The public debt level and its consequences on economic growth are extremely important in this context. Notwithstanding, the Chinese experience confronted the usual thought which assigns an economically limited role to fiscal policies, and corroborates with the theory that monetary policies seems to have reached its limit (Blanchard, Dell'Ariccia and Mauro, 2010).

Breslin (2012) also studies the Chinese policies through the analysis of its expansionary fiscal policy implemented in response to the 2008 financial crisis. According to this author, there was a massive injection of funds by the Chinese government through official stimulus packages and expansion in bank lending services. The policy helped the country quickly overcome the fall in exports, but sparked a debate about the structure of economic power in China and the need to develop a new model of long-term growth promotion.

The performance of emerging countries was deeply studied, mainly because their economic recovery capacity surprised many academics and policymakers. Some authors even argue that the growth dynamics of these economies would have assumed considerable autonomy in relation to the developed economies. This hypothesis, known as decoupling, takes the financial crisis of 2007-2008 as a turning point, from which emerging economies acquire a greater role, characterizing a scenario of better equilibrium (Ferraz, 2013).

In a general manner, it is possible to state that the fiscal policy returned to the heart of the debate over the inability of monetary policy to account for the economic recovery. The European example is perhaps decisive in the evaluation of fiscal policy in mature and low-growth economies: the attempt to adopt fiscal surpluses by cutting the public budget deepened the crisis in vogue, raising unemployment, lowering income and wages, which in turn affected negatively the tax collection and generated new fiscal problems (Cabestan, Di Meglio and Richet, 2012). The cycle of fiscal adjustment has no end, increasingly pushing European economies to an economic and social crisis, rather than creating the conditions for overcoming it.

The Brazilian fiscal policy is discussed in the work of Márcio Holland published in 2015. Data from Brazil for the period between 1997 and 2014 are used in the construction of a VAR model with the objective of identifying the dynamic effects of fiscal policy on GDP. A model is estimated for the full sample (1997-2014), another is estimated for the pre-crisis period (1997-2008), and one more for the remaining period (2008-2014). Fiscal stimuli via public spending have positive and statistically significant impact on product growth, regardless of the model specification (Holland, 2015, p.21). The causality tests points out that government spending Granger-causes the benchmark interest rate, and rejects the hypothesis that the same expenditures do not Granger-cause GDP growth. According to the author, this means that fiscal policies seem to be very efficient in reviving growth in Brazil, although this is accompanied by tax increases and a higher short-term interest rate (Holland, 2015, p.22).

Following the same line of studies, Celasun et al. (2015) examine the lessons and the legacies of the financial crisis for fiscal policies in Latin America. The focus is on the experience of the six largest and most financially integrated economies in the region: Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. Expansionary fiscal policies implemented by the six countries already at the beginning of the crisis were essential to contain product losses, but they worsened the fiscal situation of governments, increasing the risks associated with the erosion of institutional structures (Celasun et al., p.5). According to the authors, many of the countries analyzed have exhausted the space for fiscal policies and should now lead to rapid fiscal consolidation, even if economic growth is still below potential. Institutional reforms should not only restore the pre-crisis fiscal framework, but also build mechanisms that promote more symmetrical, rapid, and effective responses to external shocks – both positive and negative (Celasun et al., p.5).

It is important to note that there are also several publications empirically evaluating the effectiveness of these macroeconomic policies in promoting growth of many countries. One example is a paper from Sen and Kaya (2015), which presents the methodology on which the model developed in this thesis is based, as will be

explained later. The authors use a SVAR model to empirically evaluate the relative efficacy of fiscal and monetary policies over growth using quarterly data from Turkey for the years between 2001 and 2014. The results show the importance of both policies, highlighting the greater effectiveness of monetary policy, since the interest rate figured as the most powerful tool to affect growth. As fiscal policy's instruments also were among the most powerful, the study concludes that the two types of macroeconomic policies are important in promoting growth, so they should be used together. The fiscal policy is the use of government spending and taxation to influence the economic performance. It can be expantionary, to stimulate economic growth; or contractionary, to slow economic growth and stamp out inflation. In the first case, an increase in public expenditure (or a tax cut) gives the consumer a greater amount of money to be spent in order to foster demand and, as a consequence, production and job creation in the economy are encouraged. The second type of fiscal policy is used exceptionally in situations of overheated economies registering hyperinflation. The idea is to withdraw money from market by reducing government spending (or increasing taxes) to discourage demand and production.

In addition, two situations directly related to the recent financial crisis are analyzed by Blanchard, Cerutti and Summers (2015): the low economic growth rate – well below pre-crisis levels – in many advanced economies; and the inflationary slowdown below market expectations. The authors analyze the possibility that recessions permanently affect the level of the product in relation to its tendency and the possibility that the relation between inflation and economic activity is weaker than the theoretical prediction. To do so, data from twenty-three advanced economies are examined over a period of almost fifty years, which evidences the presence of hysteresis and the reduction in the slope of the Phillips curve. Product's deviations from its optimal level are, therefore, more durable and more costly to the population. Hence, monetary policies should react more strongly to output's movements relative to inflation (Blanchard, Cerutti and Summers, 2015, p.25).

The Global Financial Stability Report – Potent Policies for a Successful Normalization (2016), a World Bank's publication, is also important for the understanding of the

current global macroeconomic scenario. It is a study of the risks faced by the global financial system, which have risen since the end of 2015 due to the deterioration of confidence in the advanced economies and the devaluation of commodities – accompanied by lower economic growth – in the emerging markets (Global Financial Stability Report – Potent Policies for a Successful Normalization, 2016, p. 9). The financial exposure of advanced economies to emerging market economies is measured, the spillovers between developed and developing economies before and after the crisis are assessed, and the international insurance market is thoroughly examined. There are numerous analyzes that show the interdependence between asset markets as a consequence of financial globalization and the greater participation of the insurance market in the composition of systemic risk. According to the IMF, economic and financial conditions will only normalize through a broad political agenda that includes stronger and more balanced fiscal and monetary policies. A well-structured financial reform is needed to restore confidence in the structure of macroeconomic policies (Global Financial Stability Report – Potent Policies for a Successful Normalization, 2016, p. 37-38).

Airaudo, Buffie and Zanna (2016) analyze the coordination between monetary and exchange rate policies for least developed countries followers of inflation targeting programs. The authors argue that, when central bankers let their exchange rate float freely, the inflation-targeting regime incurs high risk of indeterminacy. The solution to this problem is to get the targeting system strengthen through mechanisms to limit feedback effects between the inflation of non-tradable goods and currency devaluation. At this point, active policy is necessary, and the central bank may peg “the real exchange rate through sterilized purchases/sales of foreign exchange” (Airaudo, Buffie and Zanna, 2016, p. 7). The paper continues with the construction of “a two-sector model of a small open economy featuring imperfect substitution between domestic and foreign financial assets” (Airaudo, Buffie and Zanna, 2016, p. 1). Conclusions indicate a more effective inflation targeting system when exchange rates are managed.

Lastly, Abubakar (2016) contributed to the monetary policy debate by analyzing the effectiveness of inflation targeting regimes. The author admits that low and stable inflation is a prerequisite for the economic success of any country, regardless of its level of development. In this sense, the inflation-targeting regime is an important price stabilizer that has proven to be effective in several economies, since it preserves the benefits of previous disinflation strategies in the face of unexpected economic shocks (Abubakar, 2016, p.4). However, the use of flexible band targets and appropriate time lines to reach the values determined are essential to the success of the policy, according to Abubakar (2016).

Considering these studies, it is possible to state that the supposed consensus among economists about the ideal macroeconomic policy to promote development, which prevailed before 2008, is now under general reconsideration. On the monetary side, the relation between inflation, macroeconomic stability and growth does not seem to be as linear as it was thought to be, and many economists do not agree with the maintenance of a monetary policy totally focused on price stability. On the fiscal side, the use of countercyclical measures to overcome economic difficulties is for the first time widely defended.

The financial crisis has raised some important questions about these issues mainly because the analysis of each national case reveals that the adoption of macroeconomic policies in times of crisis may have different results depending on where and when it was implemented. The distinct reactions from each of the economies are probably due to differences in design, application, and transmission mechanisms of policies. It is known that in Economics nothing is definitive and certainly there is no economic panacea, but the empirical analysis of the experience of different countries may help to at least delineate some paths for the development with greater assertiveness.

1.2 METODOLOGY

The analysis will be based on the most relevant macroeconomic data from Brazil and China since the beginning of the 21st century, which shall allow a comparison between the scenarios pre and post crisis in each of the countries. Six variables were chosen: GDP growth, CPI inflation, Interest Rate, Real Effective Exchange Rate, Government Expenditure and Government Revenue.

Among these variables, the monetary policies are represented by inflation, interest rate, and exchange rate. Since this kind of policy is enacted by central banks by manipulating the money supply in an economy, the first variables to be affected are normally inflation and interest rates, thus the choice of the first two variables is well justified. The exchange rate is chosen as a third variable because of the side effects of monetary policies. Changes in the interest rate determine the flow of foreign exchange in the country, which ultimately represents the relationship between supply and demand that determines the price of the domestic currency. It is also a tactic to ascertain the existence of some type of capital control in the economy.

The remaining variables represent fiscal policies, based on the assumption that this type of procedure occurs through changes in public consumption and taxation. In that sense, the government's expenditure represents the first instrument and government's revenue represents the second one. Hence, the variables for fiscal policy represent the amount spent and collected by the government, respectively.

To evaluate the macroeconomic policies' efficacy, both fiscal and monetary, a SVAR (Structural Vector Auto Regression) model is constructed inspired by studies from Sen and Kaya (2015) and Haug et al. (2013). The methodology is chosen due to its ability to make unnecessary the construction of a structural model to describe "the economy in general and the mechanisms of fiscal and monetary policy design and transmission in particular" (Sen and Kaya, 2015, p.8). Furthermore, the SVAR model provides analytical tools such as impulse-response functions and variance decompositions that contain a lot of "information with regard to the effect and

transmission of macroeconomic shocks and policy innovations" (Aarle et al., 2003, apud Sen and Kaya, 2015, p.8). The variance decomposition indicates the amount of information each variable contributes to the other variables in the autoregression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables and therefore can be very useful in this analysis.

The starting point is a VAR model based on Narayan et al. (2008, apud Sen and Kaya, 2015, p. 10) as the following:

$$Y_t = AY_{t-1} + \cdots + A_p Y_{t-p} + \Psi Y_{t-p} + \Psi D_t + \mu_t$$

In which p is the model's order, Y is an nx1 vector of endogenous variables, and μ_t is an nx1 vector of residuals in its reduced form. Sen and Kaya (2015) ignore the deterministic component since "it is unaffected by shocks to the system", and the model becomes:

$$AY_t = A_1^* Y_{t-1} + \cdots + A_p^* Y_{t-p} + B\varepsilon_t$$

Where ε_t stands for an nx1 vector of structural disturbances, and $VAR(\varepsilon_t) = \Lambda$, which is "a diagonal matrix with the variance of structural disturbances making up the diagonal elements" (Sen and Kaya, 2015, p.10). Thus, the relation between structural disturbances and residuals in its reduced form can be rewritten as:

$$A\mu_t = B\varepsilon_t$$

Since it is not possible to directly observe the shocks, it is necessary to impose some restrictions. Note that there are $[\frac{n(n+1)}{2}]$ free parameters and $2n^2$ parameters in the A and B matrices. Therefore, the order condition for identification requires $[2n^2 - \frac{n(n+1)}{2}]$ restrictions to be placed on the elements of these matrices. Considering the six variables chosen to construct the model, the following contemporaneous zero-value restrictions are imposed in order to achieve identification of the structural parameters:

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_t^y \\ \varepsilon_t^{cpi} \\ \varepsilon_t^{int} \\ \varepsilon_t^{exc} \\ \varepsilon_t^{ge} \\ \varepsilon_t^{gr} \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & b_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & b_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & b_{66} \end{bmatrix} \begin{bmatrix} \mu_t^y \\ \mu_t^{cpi} \\ \mu_t^{int} \\ \mu_t^{exc} \\ \mu_t^{ge} \\ \mu_t^{gr} \end{bmatrix}$$

The principal diagonal of A matrix was restricted to unity and the elements above it were set to zero, while the elements below the main diagonal were allowed to be estimated. Meanwhile, only the elements on the main diagonal of the B matrix were allowed to be estimated, since the remaining entries were restricted to zero. Those restrictions of zeroes in rows and columns of A and B are standard ones in the literature on monetary SVARs, and the diagonal elements of the matrix A are also usually set to 1 in the literature (Haug et al., 2013). This model is exactly identified; if we impose additional restrictions on the parameters, it would be an over identified model, and the over identifying restrictions could be tested.

The form of the A matrix imposes the recursive structure, while the diagonal B orthogonalizes the effects of innovations. In other words, the A matrix represents the structural disturbances, or the shocks in GDP growth, CPI inflation, Interest Rate, Real Effective Exchange Rate, Government Expenditure and Government Revenue,

respectively. They represent the contemporaneous response of real GDP growth to variables shocks (Sen and Kaya, 2015). On the other side of the equation, the B matrix is composed by residues in reduced form, which represent unexpected disturbances from each of the variables (Sen and Kaya, 2015, p. 11).

The model was constructed over the recursiveness assumption, defined by Christiano et al (1999) as the orthogonality of the policy's shocks to the information set available for the policymaker to observe when taking any policy decision. The imposition of zeros in all the elements above the diagonal of A "is an implication of the uniqueness of the Cholesky factorization of a positive definite symmetric matrix" (Christiano et al, 1999, p.77). The assumption is sufficient to identify the response of Y_t to a macroeconomic policy shock.

Analyzing the estimations resulted from the SVAR model will help the identification of differences in design, application and transmission methods of macroeconomic policies in Brazil and China. It is going to contribute to the international literature claiming the requirement to rethink macroeconomic policies after the 2008 financial crisis.

1.2 DATA DESCRIPTION

Most data from both countries may be found at the OECD Main Economic Indicators (MEI) publication, which presents comparative statistics that provide an overview of recent international economic developments for the OECD countries, the euro zone and a number of non-member economies, including Brazil and China. The database covers about fifty countries and areas for the whole period being analyzed here. According to its own definition, it includes information from balance of payments, business tendency and consumer opinion surveys, composite leading indicators, financial statistics, industry, international trade, labor market statistics, consumer price indices, producer price indices, purchasing power parities (PPP), comparative price level, and quarterly national accounts.

The public finance, however, will be analyzed using data extracted from other statistical databases. The Brazilian numbers are from its Secretariat of the National Treasury, which is part of the Ministry of Finance of Brazil. China's data are from the Ministry of Finance of the People's Republic of China, provided by the Chinese National Bureau of Statistics.

The variables are converted into their natural logarithmic form before being analyzed. According to Wooldrigde (2006), this procedure can alleviate or even eliminate problems of heteroscedasticity or concentration in conditional distributions from strictly positive variables. The heteroscedasticity occurs when the variance of the errors is not constant, which provides non-BLUE (Best Linear Unbiased Estimators) estimators because their variance would not be the lowest of all other unbiased estimators. This would lead to suspected values of standard errors, and therefore inferences obtained from data analysis would not be reliable. Logarithmic estimators are less sensitive to extreme observations (outliers) because of the considerable narrowing that may occur in the amplitude of variable values (Wooldrigde, 2006, p.181).

The method of construction of the six variables is described below. A more detailed description of every variable is presented in the appendix, where it is possible to find the definition and source of all data used here.

The GDP growth is an index constructed using the seasonally adjusted variation of the quarterly amount of the expenditure-based gross domestic product, which is total final expenditures at purchasers' prices (including the f.o.b. value of exports of goods and services), less the f.o.b. value of imports of goods and services. To avoid negative numbers, it is measured as an index, using 2010 as the base year.

CPI inflation variables are the OECD Consumer Price Indices presented as an index where the year 2010 is the base year. It measures the average changes in the prices of consumer goods and services purchased by households.

According to the OECD definition, the interest rate is the official discount rates and call-money rates presented in percentage. Both are directly connected to monetary policies. The official discount rate is the rate at which central banks make advances to, or discount eligible bills of exchange for, selected banks and other financial intermediaries. Call money refers to secured or unsecured ‘at-call’ loans made by banks to money market dealers. It plays a predominant role in interbank money dealings and between banks and money market dealers.

Real effective exchange rate is the competitiveness-weighted relative consumer prices and unit labor costs for the overall economy in dollar terms presented as an index where the year 2010 is the base year.

Government expenditure and government revenue are both measured as a percentage of each country’s GDP and then transformed into index using 2010 as base year, in order to avoid negative values. The definition of expenditure and revenue vary a little between Brazil and China, but it should not compromise the analysis.

The data cover the period between 2000 and 2016 for both countries and the model is run considering the whole period. A structural break was taken into consideration, and there was an attempt to run the SVAR for two different subsamples – before and after the crisis. The period was divided into a) 2000-2008; and b) 2009-2016. The results, however, are not consistent. The subsample for the period before the crisis present multicollinearity, and the one for the period after the crisis does not satisfy the stability condition. The problems happen for the data of the two countries. Some of the results can be seen in the appendix.

2. THE BRAZILIAN MACROECONOMIC POLICY

2.1 THE BRAZILIAN ECONOMIC BACKGROUND

The Brazilian economy has gone through different phases in its history. After more than a decade of monetary destabilization and hyperinflation, the Real Plan was implemented in 1994, which managed to reach relatively low levels of inflation through the de-indexation of the economy, fiscal adjustment, economic opening, contingency measures and restrictive monetary policies. It was followed by a large sequence of structural reforms and public management needed to sustain economic stability.

During the entire government of Fernando Henrique Cardoso, president of Brazil between 1995 and 2002, the Brazilian Minister of the Economy was Pedro Sampaio Malan. He defended a process of reorganization of the State and of structural changes in order to consolidate the economic stability, which would later allow the reduction of interest rates and the balance of the exchange rate. With this goal in mind, he advocated the privatization of state-owned enterprises as a means of increasing the efficiency of the economy, reducing government spending as a producer and allowing the use of public resources in social areas. He has always prioritized public accounts to the detriment of the use of productive investments in the resumption of economic growth. In the face of the Asian crisis of the late 1990s, his main concern was to eliminate the apprehensions of foreign investors regarding the ability of the Brazilian government to honor its internal and external financial commitments. Therefore, he launched the Fiscal Stability Program for the 1999-2001 period. The program identified social security as the main cause of the fiscal crisis and adopted a series of emergency measures, such as spending cuts and tax increases. Additionally, he supported the creation of the Fiscal Responsibility Law (FRL), which established strict criteria for municipal, state and federal public indebtedness. After firming an agreement with the IMF, the fiscal regime changed to

comply with the obligation to maintain a high primary surplus that would guarantee a safe proportion between the public debt and the GDP. Even so, World Bank data shows that between 1995 and 2002 national public debt went from 30% to 60% of GDP.

As the price stability was consolidated in the late 1990s, the government began a process of reorientation of Brazil's economic policy. Movements in exchange, monetary and fiscal regimes were promoted, which are explained below by Oliveira and Turolla (2003):

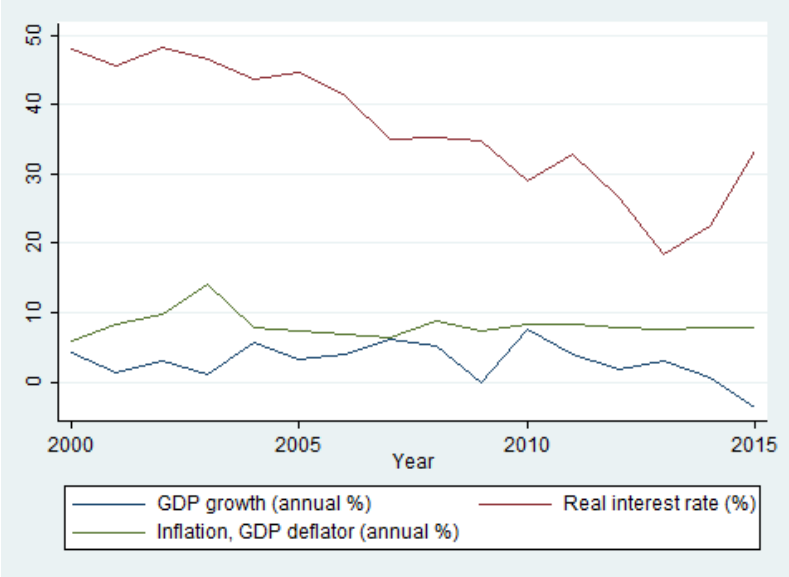
> "The fixed exchange regime, made more flexible by the exchange rate bands, was replaced by a dirty float, in which the Central Bank maintained its intervention in the form of a punctual sale of reserves and the supply of government bonds indexed to the exchange rate.
>
> The monetary regime, previously linked to the defense of exchange rate bands, was replaced by the inflation targeting system.
>
> The fiscal regime was changed by the introduction, at the end of 1998, of an economic policy commitment to maintain a primary surplus high enough to stabilize the ratio of public debt to Gross Domestic Product (GDP)." (Oliveira and Turolla, 2003, p. 197-198)

This set of economic policies was known in Brazil as *macroeconomic tripod*, since it is constituted of three elements: floating exchange, inflation targets and primary surplus. The FRL and the system of primary surplus goals permeate the process of elaboration and execution of the budget and fiscal policy of Brazil. The FRL establishes general principles and rules to be followed by public administrations, such as budget balance and limits for indebtedness and personnel costs, while the primary surplus targets regime is a specific and conceptually very rigid instrument based on goals completely independent of the economic cycle (Gobetti, 2014).

According to Mello (2015), it is difficult to interpret the results of the macroeconomic tripod's adoption, because the changes in the international scenario may also have influenced growth and inflationary control. In addition, the effect of internal policies of another nature, such as raising the minimum wage above inflation, increasing social spending and increasing credit through public and private banks (Mello, 2015), has also played an important role in the economy. Still, there is no denying that the

beginning of the 2000s was marked by relative maintenance of inflation at historically low levels and positive income growth in the country, as can be seen in the graph below, where it is also possible to observe the downward trend in interest rates:

GRAPH I – Brazil: GDP Growth (annual %), Interest Rate (annual %) and Inflation (GDP deflator – annual %) from 2000 to 2015



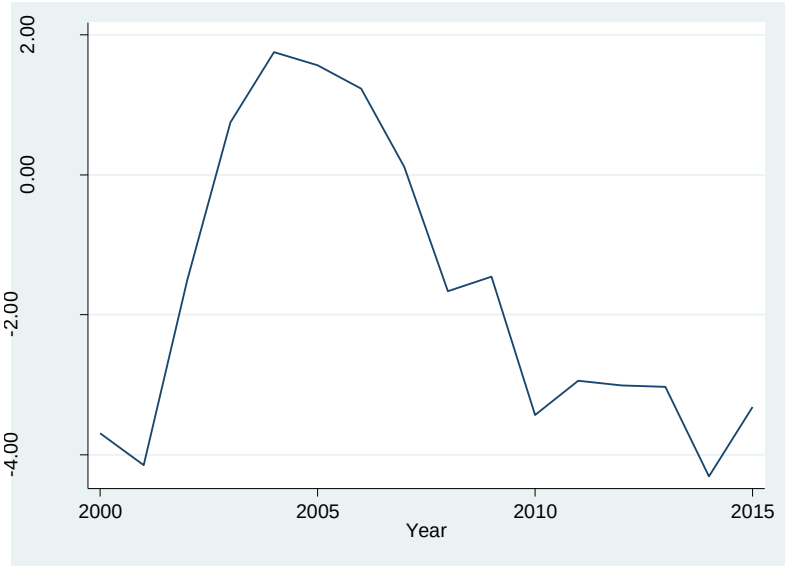
Graph I: chart prepared using Stata. Data: World Bank.

The proximity of the elections in 2002 complicated the picture of external insecurity and the fall in investments, contributing to the aggravation of inflationary pressures. The situation has seriously worried economic and financial authorities as well as investors because of the possibility of electing an opposition candidate who would radically reorient monetary policy. A compromise of the candidates and the first declarations of the new president, Luís Inácio Lula da Silva, however, undid the negative expectations. As a sign of his commitment, according to Gobetti (2014) in 2003 the new president extended the fiscal target from 3.75% of GDP to 4.25%, which was later further adjusted due to different factors such as the methodological revision of GDP and the exclusion of some companies (Petrobras and Eletrobras).

Between January 2003 and March 2006, the Ministry of the Economy was under the leadership of Antonio Palocci Filho, who assumed office by reaffirming the president's commitment to an economic policy based on controlling inflation and maintaining the general framework of the Real Plan. The new government maintained the

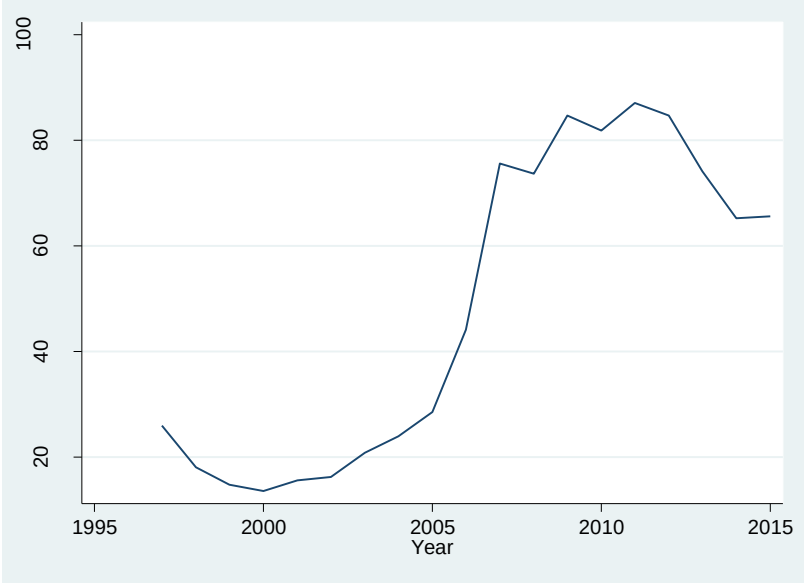
macroeconomic tripod during a period that was also marked by high demand for commodities, which culminated in an increase in prices that directly benefited the export sector of the Brazilian economy. The consequent inflow of foreign currency in the country increased international financial reserves and minimized the deficit in the current account already characteristic of previous years, as can be seen below:

GRAPH II – Brazil: Current Account Balance (% of GDP) from 2000 to 2016



Graph II: chart prepared using Stata. Data: World Bank.

GRAPH III – Brazil: Reserves (% of debt) from 1997 to 2015



Graph III: chart prepared using Stata. Data: World Bank.

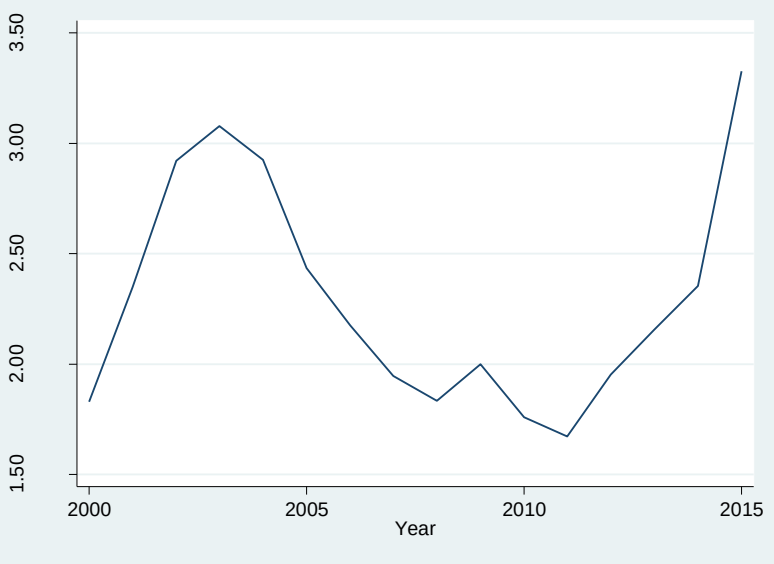
Palocci adopted measures to ensure stability and austerity of monetary policy, which was seen by many as a policy too close to neoliberal orthodoxy, concerned only with the improvement in the profile of public debt. At any rate, he managed to achieve lower inflation, strengthen the national currency against the dollar, and eliminate debt with the IMF. As a consequence, from 2003, the ratio between debt and GDP clearly reduces, which is also partially explained by the period of expansion of the international trade of commodities. In addition, the change in the debt profile contributed to the fall, which now has a greater participation of fixed-rate securities, reducing the influence of the nominal interest rate and the exchange oscillations.

GRAPH IV – Brazil: General Government Net Debt (% of GDP) from 2001 to 2016

Graph IV: chart prepared using Stata. Data: World Bank.

The exchange rate, as stated above, goes through a clear trend of appreciation during Palocci's term. As it is a floating rate, it reacted to the inflow of foreign exchange derived mainly from the increase in exports. Its trajectory is illustrated below.

GRAPH V – Brazil: Official Exchange Rate (R$/US$) from 2000 to 2015



Graph V: chart prepared using Stata. Data: World Bank.

Palocci left office on charges of involvement with corruption, and was replaced by Guido Mantega, who headed the Ministry of the Economy from the end of March 2006 until the end of the second term of then-President Dilma Rousseff, on December 31, 2014. Initially he did not promote abrupt changes in the conduct of economic policy, but after 2007 he tried to implement measures to stimulate the resumption of economic growth, which hit head-on with the austerity policy promoted by then Central Bank President, Henrique Meirelles.

The Central Bank continued to base its policy on high real interest rates to comply with the inflation targeting regime, ensuring market orthodoxy. These measures helped the country to gain the investment grade in risk assessment of some of the most renowned agencies in the international market, such as Standard & Poor's.

2.2 THE EFFECTS OF THE GLOBAL FINANCIAL CRISIS ON BRAZIL

According to Ferraz (2013), the high level of international reserves and the de-dollarization of public debt have, to some extent, shielded the Brazilian economy from the initial effects of the crisis. The country, however, did not remain immune to the changes taking place on the international scene. In September 2008, a process of

devaluation of the real against the dollar began, which may have been one of the main transmission channels of the external financial crisis into the domestic economic activity (Ferraz, 2013). This is probably because an increase in the exchange rate means increased foreign credit, inflation and deterioration of the terms of trade (Ferraz, 2013).

Ferraz (2013) also argues that the exchange rate devaluation caused by the 2008 crisis impacted the Brazilian economy through "imposing significant losses on a group of companies that had been speculating on foreign exchange derivatives".

When Brazil was hit by the crisis, a sharp drop in industrial production was observed, which led Mantega to follow President Lula's instructions to begin adopting a new economic policy based on countercyclical measures that would not let the reduction of liquidity lead to the tightening of credit. Brazil managed to get through the crisis without aggravating employment and maintaining essential investments.

2.3 BRAZIL'S RESPONSES TO FINANCIAL CRISIS: POLICIES ADOPTED BEFORE AND AFTER 2008

2.3.1 Descriptive Statistics

The economic policies adopted by the Brazilian government to confront the crisis initially had a heterodox bias. It sought to recover growth by encouraging consumption, mainly through policies to increase credit subsidized by public banks. There was also an increase in public spending, with special focus on infrastructure and social policies. But to understand all this it is necessary to revise the pattern of government behavior before the crisis.

In Brazil, the twenty-first century began with changes in the fiscal scope of the economy, since in 1998 a fiscal stability plan was approved, establishing rules for government spending. In 2000 the Fiscal Responsibility Law (FRL) was also approved by the Congress, creating new rules of transparency and fiscal discipline for

all the three levels of government. The FRL and the regime of primary surplus targets form the basis of the Brazilian fiscal remise. According to Gobetti (2014), the FRL establishes general principles and rules to be followed by public administrations, such as budget balances and limits on indebtedness and personnel costs, while the primary surplus target regime is a specific and rather rigid instrument to limit central government indebtedness. Initially it was established that the public accounts should reach a primary surplus equivalent to 3.75% of GDP. This value is independent of the economic cycle experienced by the country, which implies great difficulties in complying with it in times of crisis or deceleration, and tend to waste resources in times of economic expansion, due to the greater volatility of revenues in comparison to GDP (Gobetti, 2014). The is also no concern about the composition of public spending, so in times of economic boom there is room to increase any kind of expenditure. On the other hand, Gobetti (2014) asserts that in times of crisis, governments choose to suspend or delay public investments to meet the target, instead of intensifying spending that would foster growth.

Still in 2000, a reform in the social security system limited the contribution of the public sector as a sponsor of pension funds. After the adoption of these three contractionary policies, in December the national monetary authority opted for the reduction of the basic interest rate, since inflation was within the established target. Indeed, the annual IPCA ended 2000 slightly below the target and GDP growth was positive in all quarters.

The Brazilian economy suffered several shocks during 2001: the scarcity of electricity due to climatic factors; the deceleration of the world's economy, which was more pronounced than expected; the events of September 11 in the US; the worsening of the Argentinean crisis; the rise in risk premiums associated with emerging countries, with negative repercussions on external capital flows and pressures on the exchange rate; and the rise in agricultural prices due to the currency shock and adverse weather conditions. In response to the deterioration of the external scenario, the government reversed the downward trajectory of the interest rate (in January the monetary authority had reduced the SELIC) and started adopting a contractionary

monetary policy. The national congress approved a supplementary law altering the government's primary surplus targets in order to increase the public fiscal effort. Quarterly GDP growth was positive, but actual inflation exceeded even the upper limit of the established target.

In 2002, at the same time that a reduction in SELIC rate was conducted, the national congress positively contributed to the government’s revenue by approving the extension of CPMF tax until 2004. The inflation continued its upward movement and finished the year more than three times larger than the established target. The government attributed the price volatility to the intense exchange rate depreciation. Over the quarters, GDP growth was dwindling.

In 2003 the Brazilian economy underwent several changes, mainly due to the change of power in the Presidency of the Republic. The market, initially apprehensive at the entry of the left wing into the government, reacted positively after the new president signaled that he would maintain the fiscal stability of the economy as an important objective of the government. The commitment to fiscal adjustment was reaffirmed through the submission of proposals for social security and tax reform to the Congress, the launching of a government program of cuts and rationalization of expenses (Program of Optimization and Reduction of Costs), and the expansion of the fiscal surplus target to 4.25 percent of GDP. Early in the year COPOM raised the basic interest rate and reserve requirements on demand deposits. Still in 2003 the monetary authority opted to reduce both rates, which may have contributed to the non-compliance with the inflationary target of the year, even after increasing it from 3.25 percent to 4 percent of GDP in June. Another highlight of the year was the increase in government spending in terms of state investments. The government has created and expanded lines of credit for various sectors of the economy.

In 2004, in addition to maintaining the provision of credit in the market, the government also started to adopt relief measures to encourage consumption and investment. The Government reduced the IPI tax rate on a list of capital goods, extended the tax exemption on Mortgage Bonds (LHs), Letters of Real Estate Credit (LCIs) and Certificates of Real Estate Receivables (CRIs) held by individuals,

reduced the IOF levied on life insurance, decreased the rate for investments in shares in the spot market and in stock funds, and established a zero rate of COFINS and PIS/PASEP for certain products. The fiscal target of the public sector was once again expanded, which made it possible to achieve the established goal at the end of the year.

The year of 2005 was marked by the adoption of mainly expansionary fiscal policies. The government created support programs for agriculture, made available an R$ 1.0 billion residential financing line for the middle class by Caixa Econômica Federal (CEF), incremented public expenses through Public Investment Pilot Project (PPI), and increased its reserves allowing foreign resources to flow in the order of US$ 0.5 billion through swap operations. The country's fiscal situation was better, which allowed the non-renewal of the agreement with the IMF and the discharge of the debt with that organization. According to Gobetti (2014), the incompatibility between the fulfillment of fiscal targets and the public strategy to increase investments and income transfers led the government to adopt a new fiscal rule through the so-called Pilot Investment Project (PPI). The new rule was to exclude from the computation of taxable income profitable investments capable of being paid over time.

On the monetary side, inflation was not entirely controlled, especially in the first semester. This led the monetary authority to pursue the growth of interest rates until August, when, for the first time in the year, it was decided to cut the SELIC in 0.25 percentage points. In the following months the interest rate continued its downward path, reaching an effective annual inflation within the range established for the target. GDP growth varied between quarters, but remained positive throughout the year.

Macroeconomic policies in 2006 were also expansionary in general. The central bank acted to expand the Brazilian monetary base: it bought and repurchased bonds in the market, increased its reserves through the acquisition of dollars, and fully settled the Bradies bonds. The SELIC rate followed a downward trend, accumulating a fall of about four percentage points. For the first time since the adoption of the inflation targeting system, the IPCA ended the year more than one percentage point below the established target. The economy registered positive growth in all quarters, which may

be attributed to the government's adoption of policies to foment investment and consume. In this sense, legislation was created for micro and small companies, disbanding and debureaucratizing entrepreneurship in the country. At the same time, the IR rate of nonresident investors was reduced from 15% to zero for investments in federal public securities and investment funds in emerging companies, and the operations of public offering of shares of companies in the over-the-counter market became exempted from the collection of CPMF.

Already in 2007, in spite of maintaining the trajectory of falling interest rates and continuing to increase public spending, the government started to adopt measures to contain expenses. Limits were set for the commitment of advertising, daily, pass and locomotion expenses to the organs of the Federal Executive Branch, and the computer system used for public purchases and control of the social security system was improved. In this sense, the government intensified the use of electronic trading systems and price registration systems (which resulted in savings of around R$ 675 million), and recruited retirees and pensioners in a way that allowed them to cross-reference information from different databases to avoid frauds. In addition, the executive branch has proposed to the National Congress a Bill of Complementary Law proposing to limit the expenditure on servers for each Power and body of the Union to the amount settled in the previous year, adjusted by the accumulated variation of the IPCA, plus 1.5% per year for the years 2007 to 2016. At the same time, the Growth Acceleration Program (PAC) was implemented, which provided for investments in several infrastructure sectors in the country. The role of investments excluded from the calculation of the tax result was broadened according to the fiscal rules model adopted in 2005 (Gobetti, 2014) in order to include PAC expenditures. The aim was to allow public investment in infrastructure without surpassing fiscal targets. Gobetti (2014) states that with the passage of time the connection between the possibility of deduction and the profitability of the project involved became weaker, which meant that the deduction was progressively extended to almost all investments and some additional expenses indirectly linked to gross fixed capital formation (GFCF), such as the Minha Casa Minha Vida (MCMV) program.

Meanwhile, inflation was finally stable: continued cuts in interest rates did not prevent annual effective inflation from falling below the target set for the year.

As a result of these set of policies, in 2008 the country had a wide margin to use the monetary policy instruments (interest rate and bank reserves), which allowed the early adoption a series of measures to mitigate the effects of the crisis. The government tried to recompose the volume of credit supply, provide liquidity to spot and future foreign exchange markets, and minimize the decline in economic activity and investment without undermining the commitment to the guidelines of macroeconomic policy.

Before the crisis' outbreak, in the second semester of 2008, the government was adopting more expansionary policies. The monetary authority continued to cut interest rates until July, and the central bank was still buying dollars in the market. Investments within the PAC were raised 80 percentage points accumulated in twelve months until June 2008. In this same month the upward trend of interest rates started. After that, despite maintaining SELIC at 13.75 percent, the central bank started to record net sales in the dollar market. To face the crisis, the Government reduced the compulsory rates, raised the amounts to be deducted from the liabilities, changed the remuneration of the deposits, and changed the rules of rebates resulting from the acquisition of assets of small and medium-sized financial institutions. Furthermore, to mitigate the crisis' effects over the credit market, the government adopted the following measures: i) the loan of R$ 100.0 billion by National Treasury to the BNDES in order to regularize the offer of credit to the companies; ii) the increase, in R$ 10.0 billion, of the line of financing for working capital by BNDES; iii) the R$ 23.0 billion increase in CEF and BB financing lines, including automobiles, durable goods, construction financing, agriculture and microenterprises; iv) the authorization for smaller banks to access funds from the FGC, participate in the rediscount and sell their investment and credit portfolios to other banks; v) flexibilization of the guarantees for the rediscount, starting to accept securities of credit portfolios of banks in financial difficulty. The government tried to preserve economic activity, and already started to adopt tax relief measures. At the end of the year, inflation growth did not

exceed the target band and just the fourth quarter registered a negative growth in relation to its previous period.

It is important to note that the Brazilian fiscal policy would be restrained by the FRL and the primary surplus target regime during all the years affected by the crisis. The FRL does not foresee the easing of targets in case of recession. As Gobetti (2014) reminds us, there is only provision for the possibility that entities are exempted from meeting fiscal targets in the event of a public calamity recognized by the National Congress (in the case of the Union) or by Legislative Assemblies (in the hypothesis of States and Municipalities). In the case of low or negative real growth of national, regional or state GDP, the FRL only flexes the deadlines to suit the limits of indebtedness and personnel costs, and does not provide for any escape clause for the primary surplus targets (Gobetti, 2014).

The Brazilian macroeconomic policies during 2009 were essentially counter-cyclical. The accumulation of international reserves, the inflation targeting system and the floating exchange rate regime enabled the Central Bank to implement a countercyclical monetary policy in the face of the international crisis, eliminating the external vulnerability that abated the cycles of economic expansion. This meant expanding the monetary base by reducing the interest rate and the rates of compulsory deposits, as well as by raising the amounts to be deducted from liabilities, changing the remuneration of collections and changing the rules for the acquisition of assets of small and medium-sized financial institutions. In a complementary manner, the Federal Government created mechanisms to expand the performance of public banks, offsetting the decline of private banks and avoiding the lack of credit for micro and small enterprises and the purchase of durable goods by households Public investments have expanded through the following government programs: PAC; Minha Casa Minha Vida (R$ 28 billion in subsidies and R$ 60 billion in investment); agriculture plan Safra (R$ 107 billion); and minimum wealth program Bolsa Família (R$ 12 billion). At the same time, the government encouraged production by reducing the tax on industrial products (IPI), the financial transaction tax (IOF) to individual (50% reduction), and the social security tax (Cofins) on the production of small

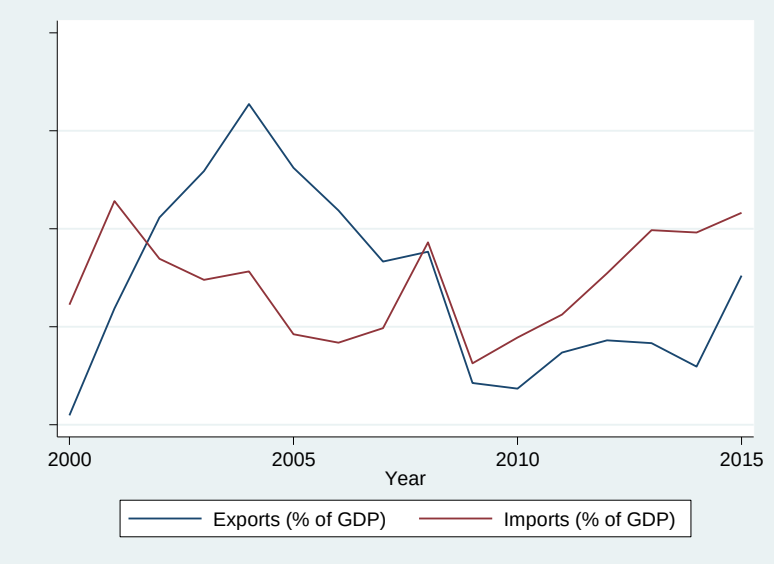
motorcycles. It has also changed the individual income tax (IRPF) brackets and established a special tax regime (RET) for Minha Casa Minha Vida housing program (tax rate reduction from 7% to 1% for real estate and from 7% to 6% to all others cases). As a result, quarterly GDP growth was increasing throughout the year and the inflation rate did not exceed the previously established target.

Another factor that helped Brazil overcoming the crisis was the possibility of redirecting the exports from developed countries, which were experiencing a period of economic slowdown, to emerging countries such as China, which was not so affected by the crisis and therefore could afford the Brazilian products.

> "Trading with China instead of the developed West has also been a key reason why resource-rich developing countries like Brazil have been able to recover from the impact of the crisis with apparent speed and ease (Whalley and Medianu, 2010), while developed economies like Spain, Greece, and Portugal have all benefited from increased investment and trade relations with China (Anderlini and Spiegel, 2010)." (Breslin, 2012, p.18)

Indeed, it is possible to observe in the graph below an upward trend in the Brazilian exports path around year 2009, after the sharp fall in 2008. Since it took more time for the developed countries to recover their economies (some are still struggling to achieve it), this is probably a sign that Brazil has sought other markets for its products.

GRAPH VI – Brazil: Exports and Imports as % of GDP (2000 – 2016)



Graph VI: chart prepared using Stata. Data: World Bank.

In 2010 the Brazilian economy signaled that it was recovered from the crisis' effects. Despite intensifying tax relief measures for the production of capital goods and creating a new credit line for machines and equipments within the BNDES PSI program, the government begun to phase out tax and liquidity incentives. In this sense, the capital requirement for loans with maturities of more than 24 months was increased for individuals; the IOF tax rates on foreign investments in fixed income securities and on credit and exchange operations were made bigger; and the reserve requirement for demand and term deposits was raised. The monetary authority also raised SELIC in two percentage points during the year. Furthermore, the government announced a fiscal consolidation package including cut of R$ 50 billion in the forecasts approved by the Congress for the 2011 budget, contingency of discretionary expenses (total of R$ 32 billion), and measures to increase efficiency and restructure public administration's expenses. Even so, the Federal government was able to recover public investment through PPI (Projeto Piloto de Investimentos) and PAC programs. The GDP grew satisfactorily keeping inflation within the target's limits.

The economy quickly responded to the policies adopted, and by this year the country has grown again. It was then decided to stay strict to the patterns of the macroeconomic tripod, using fiscal adjustments to reduce inflationary expectations

and interest rate. In 2011 government measures alternated between contractionary and relatively expansionary monetary and fiscal policies. During the first semester, the central bank raised interest rates, restated the IOF tax rate on consumer credit and instituted a compulsory non-interest-bearing deposit. However, after April the entity began to reduce SELIC, decided to withdraw part of the macro-prudential policies adopted in 2010, and reduced the daily rate of IOF on consumer credit operations. On the fiscal side of the economy, despite the fiscal consolidation plan with an R$ 50 billion cut in the 2011 Budget Law, the government expanded its investments within the PAC program and increased Bolsa Família conditional cash transfer program along with the Brasil Sem Miséria program. The government also announced new investments through the launch of programs granting scholarships abroad (Ciências sem Fronteiras - CsF) and technical and vocational qualification for workers (Pronatec).

According to Gobetti (2014), the adjusted primary surplus (result considering economic cycle and non-recurring events) has gradually fallen since 2004 or 2005. Between 2009 and 2011, for example, the government excluded its two largest state-owned companies (Petrobras and Eletrobras) from primary surplus targets, which implied a reduction of the consolidated public sector target of 3.8% to 3.1% of GDP. Although it did not change the goals of the central government and the regional governments themselves, this change had the important consequence of liberating the two state-owned companies to carry out investments without worrying about their primary result at the end of the year (Gobetti, 2014). Following these measures, the government earned space to implement countercyclical fiscal policies in the form of public investments' expansion until 2010, and tax relief policies between 2011 and 2013 (Gobetti, 2014). Changing the policy's focus from expenditures to revenues, however, did not have the expected result: already in 2011 there was a clear slowdown in the economy. The policies adopted to encourage supply were basically centered on the producer's exemption.

Starting in 2012, the government's strategy was to flexibilize the macroeconomic tripod, inaugurating what became known as the "new economic matrix". Among the

measures adopted, there were macro prudential measures of credit control to limit inflation, reductions in primary surplus targets to redirect money for public investments, and interventions in the foreign exchange market to hinder new currency's appreciations (Mello, 2015). Most of the policies adopted during 2012 intended to stimulate economic activity. The government promoted competitiveness in the industrial sector through payroll exemption for labor-intensive sectors heavily affected by external competition, cuts in interest rates and bank spreads, and reductions of Tax Rate on Industrialized Products (IPI) for the white line and for cars (especially the national ones). To encourage investments in infrastructure, three new financial tools were launched: the Brazilian Infrastructure Bonds and Credit Rights Investment Funds (FIDC: 0% rate in income tax applied to non-residents and individual and 15% rate to corporations; 0% rate in financial operation tax applied to non-residents); the Brazilian Infrastructure Investment Funds (same tax treatment as infrastructure bonds; conditions: investment of 67% of the Brazilian infrastructure investment funds portfolio in the first 2 years and 85% after that); and the Investment Fund in Infrastructure Quotas (FIP-IE: 0% rate applied to individuals' and non-residents' yields; 15% rate applied to corporations' yields). But this did not mean that the government has reduced its contribution in terms of investment: PAC has received more resources, contributing to the positive growth of public consumption. To support production and consumption, the government decreased electricity tariffs, established a zero percent aliquot of CIDE for gasoline and diesel, reduced to zero the term of appropriation of PIS/COFINS credits on the acquisition of capital goods, increased the limits of tax bands of SIMPLES and MEI, established a special regime for the reintegration of tax values for exporting companies, and dropped IOF taxes (from 3 to 1.5 percent on personal credit operations, and from 2.5 to 1.5 percent on consumer credit operations). In the money market there was a gradual reduction of interest rates, and in the exchange market, net inflows of US$ 16.8 billion were recorded. All stimulus measures did not result in a significant increase in inflation, nor did they prevent the slow but constant growth of GDP.

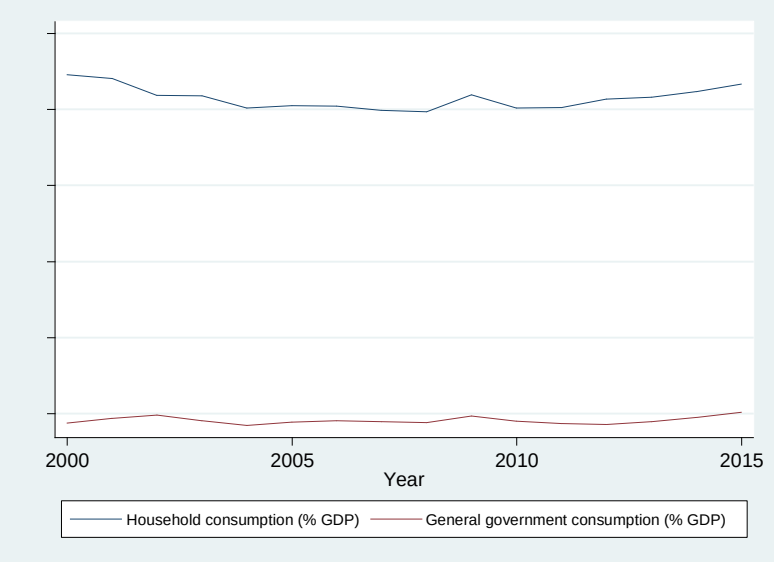
Nonetheless, the governmental economic policy's new direction did not please politicians, entrepreneurs and Brazilian investors. At the same time, there was a

severe worsening of the crisis internationally and the measures adopted in 2012 greatly affected the government's finances, because they were very concentrated on the collection side. The government tried to use measures known as creative accounting (goal rebates, extraordinary revenues and transfer of results from one year to another) to make the regime more flexible and to obtain a minimum countercyclical power of action in the face of different economic conjunctures (Gobetti, 2014), but then decided to abandon the process of flexibilization of the traditional macroeconomic tripod regime and to return to the old strategies of liberal development. Thus, part of the stimulus to increase the competitiveness of the industrial sector was reduced in 2013. However, the government continued to encourage private investment by reducing energy and tax costs. Government consumption also contributed positively to the growth of domestic demand. Furthermore, the payroll tax was increased and the devaluation of the Real encouraged the branches linked to the export of manufactured goods. Such devaluation was faced by the Central Bank in the foreign exchange market: in 2013 the institution recorded net sales of US$ 11.5 billion in operations with repurchase commitments. The monetary authority also established an upward path to interest rates throughout the year in order to combat increasing inflation. The IPCA rate closed the year slightly below six percent, but did not exceed the upper limit of the established range toward the target. At the end, the country registered slim growth of the national product.

The growth of the Brazilian economy in 2014 was again based on higher rates of consumption and investment. As can be seen in the graph below, the relative stable path of household and general government consumptions as a percentage of GDP began an upward trend after 2010. The expansion of income transfer programs and the expansion of the real credit volume contributed to keeping private consumption, and government consumption also contributed positively to the growth of domestic demand. In this sense, the role of the PAC was an important factor, since it has received even greater volumes of resources to face the bottlenecks in the country's infrastructure. The performance of the Central Bank of Brazil may be summarized as: net purchases of US$ 6.5 billion in lines with repurchase commitments in the foreign

exchange market; and contraction of the monetary base through the increase of interest rates. This was sufficient to ensure the maintenance of the inflation rate below the upper limit of the target and a still positive growth rate in terms of national product.

GRAPH VII – Brazil: Household Consumption (% of GDP) and General Government Consumption (% of GDP) from 2000 to 2015



Graph VII: chart prepared using Stata. Data: World Bank.

By the end of 2014, the Minister of the Economy advocated a transition to a new cycle, which would be marked by fiscal consolidation without further stimulus. Fiscal and monetary policies would be rearranged to gradually increase the primary surplus and converge inflation to the center of the target (Mantega, 2014).

Indeed, the beginning of Dilma Rousseff's second term was marked by the redirection of the country's economic policy. Soon after the elections, the president announced the change of the leader of the Ministry of the Economy and appointed Joaquim Vieira Ferreira Levy, in an attempt to please the demands of the market. The new minister represented the convergence of politics to neoliberal ideals, since he explicitly advocated the conduction of an austerity policy based on immediate fiscal adjustments. Already in the first months of the year, he launched two Provisional Measures (MP 664 and MP 665), modifying the rules for the granting of labor and

social security benefits. The MP 665 deals with salary bonuses and unemployment insurance, and MP 664 modifies rules on pension benefits for death and sickness benefits. Although displeasing different segments of society, the two measures were approved by the National Congress. Levy, meanwhile, continued to receive criticism over the adoption of the contractionary measures envisaged in the fiscal adjustment, and became the subject of a manifesto signed by more than a thousand economists who claimed that austerity aggravated recession, unemployment and inequality in developed countries that pursued this strategy, even when accompanied by extremely low interest rates and currency devaluation (Jornal GGN, 2015).

In addition to these social pressures, the Brazilian political environment was in an extremely unstable period with the request for impeachment sent to the Chamber of Deputies at the end of October 2015, which culminated in the resignation of Levy and his replacement by Nelson Henrique Barbosa Filho, who would remain in charge of the ministry in the period between December 21, 2015 and May 12, 2016. Barbosa was at the helm of the ministry during the whole impeachment process, which began in December 2015 and was authorized by the deputies in April 2016. The minister proposed the resumption of the increase in the supply of credit by public banks, but without increase of the financial subsidies by the government. He also presented a proposal for fiscal policy reform, replacing the strategy of fiscal contraction with a combination of fiscal easing in the short term and long-term fiscal reforms. In this sense, he proposed the extension of state debt with the federal government to alleviate fiscal constraint in the short term, in exchange for the adoption of measures to control spending in the medium term by these same state governments (PLP 257/16).

The government decision to follow a more neoliberal economic line by adopting measures of severe fiscal austerity did not result in greater growth rate. Monetary and fiscal policies were restrictive during 2015. Interest rates were raised until July and were kept unchanged in the remaining months. The Central Bank of Brazil also announced the interruption of the daily offer of US$ 100 million in foreign exchange swaps. In the area of expenditure control, the following should be highlighted: (A)

increase of interest rates in several credit lines to reduce the subsidies paid by the National Treasury; (B) rationalization of the expenses of several government programs, reviewing their goals; (C) end of the subsidy to CDE, in the amount of R$ 9.0 billion; (D) revision of the pension rules for death and sickness; (E) revision of the unemployment insurance and salary bonus; (F) contingency of expenses, in the initial value of R$ 69.9 billion and then more R$ 8.5 billion, totaling R$ 78.4 billion; (G) revision of the rules of the Student Financing Fund (FIES), with new limits of commitment, terms and interest rates with the objective of reducing the subsidy of this policy. Regarding revenue, the government resumed collection of IPI (for automobiles, furniture, laminates and wood panels and cosmetics), PIS/Cofins (on imports, fuels and financial income of companies), IOF (over credit operations for individuals), and CIDE (on fuels). The government also readjusted public fees and regulated prices. Confident in the results of these measures, the government reduced from 2 to 1.5 percent the tolerance interval of the fiscal target to be reached in 2017. Yet they had to revisit the primary outcome target to be achieved by 2015. The only countercyclical measure adopted during this year was the expansion of the concessions within the PIL program, which provided for greater investments in infrastructure. Despite the sluggish economy, inflation exceeded the target's upper limit by more than four percentage points and the country once again grew little in terms of GDP.

The year of 2016 continued to be political and economically unstable for Brazil. In May 2016, the Senate decided to install the impeachment process, which led to the removal of Dilma Rousseff from the position of president of the republic, and, consequently, to the replacement of Nelson Barbosa in the Ministry of the Economy. Vice-President Michel Temer was sworn in as interim president of Brazil on May 12, 2016. He appointed Henrique Meirelles to the Ministry of the Economy, who is more connected with orthodox neoliberal principles, as was already clear when he was the president of the Central Bank between 2003 and 2011. Proof of this was the prompt referral of a new Constitutional Amendment Proposal (PEC), limiting the growth of public spending by freezing primary spending in real terms for up to twenty years.

With the aim of reversing the country's poor fiscal situation, the government adopted even more restrictive measures. The year's fiscal target was changed when the government realized it was unable to save the promised amount. An adjustment of the public accounts was announced, which included the extinction of ministries and positions of the federal administration. The government also transferred for the private initiative much of its responsibility for investing in infrastructure, which may be evidenced through the expansion and improvement of the Concession Program through the Investment Partnerships Program (PPI). On the monetary side, the SELIC rate was reduced in October and November after being unchanged for more than one year. Without the public encouragement, the economy did not grow and inflation was close to its upper target band.

Meirelles argued that the origin of the crisis that Brazil lives is in the new economic matrix and the fiscal expansion policy, responsible for the public primary deficits that resulted in the problem of debt unsustainability. According to him, this raised the country risk and collapsed the confidence of the industry. The growth of industry and national output would be resumed with the withdrawal of fiscal incentive policies and the control of inflation through contractionary measures such as the imposition of the government spending ceiling (PEC 241/16) and the Pension Reform (PEC 287/16).

The PEC 241, proposed by the federal government, has the objective of limiting the growth of public expenses. Considered by the government Michel Temer as the first step to overcome the country's economic and financial crisis, the measure fixed an annual spending limit for the three political branches. According to the measure, the government, like the other spheres, will be able to spend the same amount that was spent in the previous year, corrected only for inflation measured by the 12-month IPCA variation of the period ended in June of the previous year. The text limits public expenses for twenty years and can be revised through a complementary law only as of the tenth year of validity of the new fiscal regime. With the approval of the spending limit, the trend is that in a few years public spending will have a smaller share in the economy and that resources that finance public services, such as education and health, will be limited. With the limited growth of expenditures in these areas, there

should be fewer resources available, which will limit the use of counter-cyclical measures through productive investment, for example. Few countries have adopted the limitation of public spending under these conditions and Brazil is one of the firsts to include the freezing of expenses rule in the Constitution – the practice has also been observed in some European nations.

The PEC 287/16, known as the Pension Reform, was presented by the Temer administration as the only alternative to balance the public accounts. The proposal amends several articles of the Constitution to provide for social security. The changes include increased contribution time and minimum retirement age setting, which should affect all taxpayers. According to Meirelles, the social security is the main reason for the increase in government spending (Meirelles, 2016), and the minister's main objective is to promote fiscal adjustment, that is, to reduce these expenditures.

In the words of Minister Meirelles himself, the government is committed to reducing the state's role in the economy and creating a business-friendly environment (Meirelles, 2017). This became the definitive economic policy of the government as of August 31, 2016, when impeachment was approved in the Senate and Temer definitively assumed the presidency of the country.

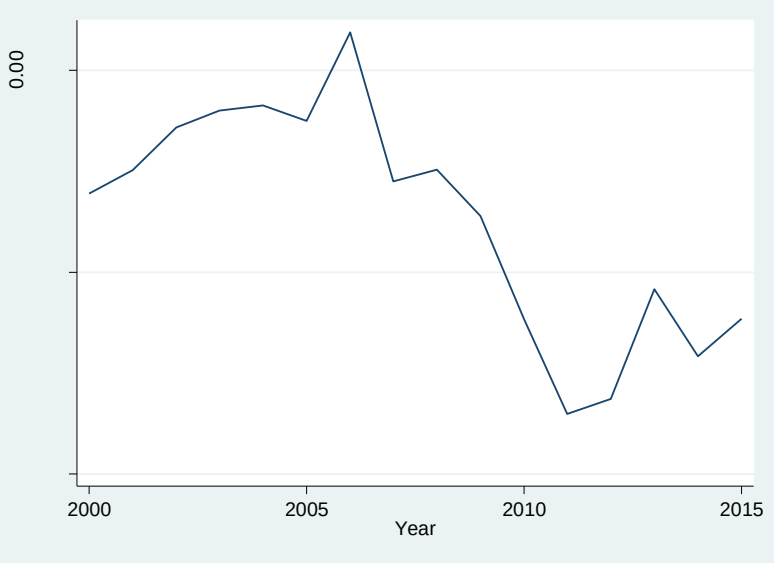
Nonetheless, it is possible to verify the positive correlation between public measures and growth in the twenty-first century Brazilian economy. The two graphs below illustrate it better. The first one represents the volume of foreign direct investment calculated in current dollars. The second shows the evolution of gross capital formation as a percentage of GDP. Both of them are based on World Bank annual data for the period between 2000 and 2015. What can be seen is very interesting: the two series behaved in opposite directions most of the time, which means that not all the Brazilian gross capital formation' support come from foreign direct investments.

Net foreign direct investment achieved a positive value just for a brief period right before the crisis. It was a phase of great expansion for the Brazilian economy, which obviously attracted investors. From 2006 to 2008, the inflow of foreign investment fell dramatically. In 2009 it is possible to observe that the investments increase, probably

because Brazil was one of the last economies to be affected by the crisis and, therefore, still represented a safe investment. When the economy signaled that it needed the government's help to recover, the market got fearful and withdrew its investments in the country. The downward trend in FDI was only reversed during the periods when the government adopted fiscal austerity measures. It is comprehensive, since the financial market usually interprets the adoption of this type of measure as a sign that the government is committed to paying off its debts, i.e. there is less risk of defaulting, making investments more secure.

For Gobetti (2014), the problem was that the government usually signaled its austerity profile to the market by setting fiscal targets that were clearly incompatible with the reality of the country's public finances. In practice, rather than attracting investment, it has stimulated the proliferation of the use of the aforementioned "creative accounting" to achieve fiscal results, which seriously undermines the credibility of the fiscal authority (Gobetti, 2014).

GRAPH VIII – Brazil: Net Foreign Direct Investment (current US$) between 2000 and 2015



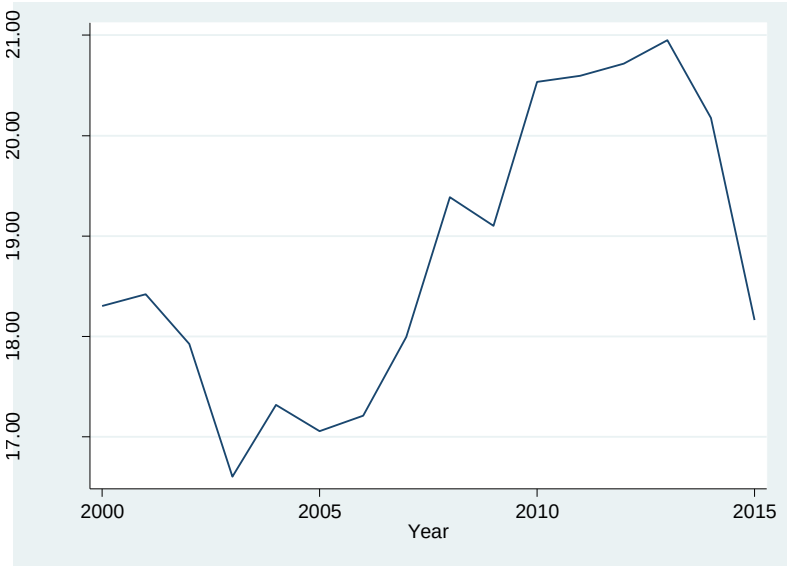
Graph VIII: chart prepared using Stata. Data: World Bank.

Still, what is perceived is that the fall of these investments does not in fact impact the gross fixed capital formation in Brazil. As can be seen in the graph below, this

indicator maintained an upward trend during practically the whole period between 2004 and 2013. Gross fixed capital formation in terms of GDP falls only shortly after the crisis and recently after 2014. This means that the country was able to maintain the growth of its production capacity even in periods of few foreign investments. The downturns were probably the result of the international crisis (2008) and the domestic political crisis (after 2014). Indeed, the last inflection point coincides with the government decision to redirect its economic policy by withdrawing its share in the economy. As stated by Joseph Stiglitz in an article to The Guardian:

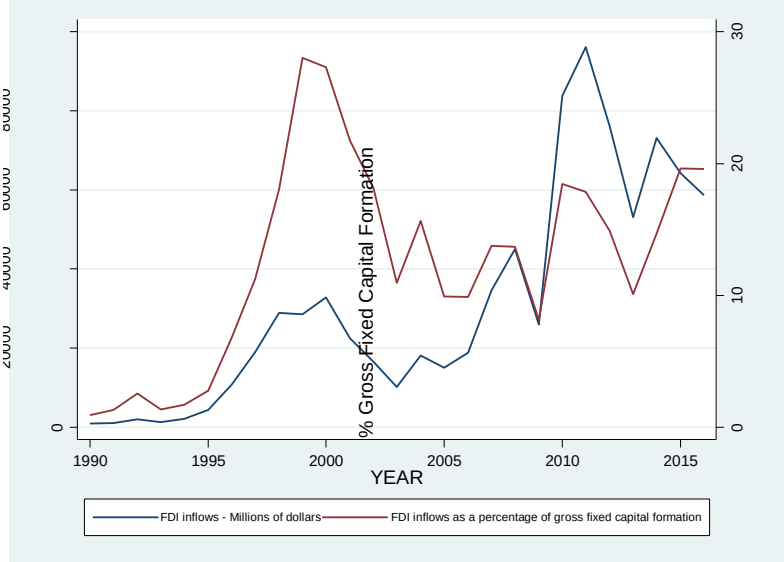
> "Austerity converts downturns into recessions, recessions into depressions. The confidence fairy that the austerity advocates claim will appear never does, partly perhaps because the downturns mean that the deficit reductions are always smaller than was hoped." (STIGLITZ, 2010)

GRAPH IX – Brazil: Gross Fixed Capital Formation (% of GDP) from 2000 to 2015



Graph IX: chart prepared using Stata. Data: World Bank.

GRAPH X – Brazil: Foreign Direct Investment (US$ and as % of Gross Fixed Capital Formation), 1990-2016

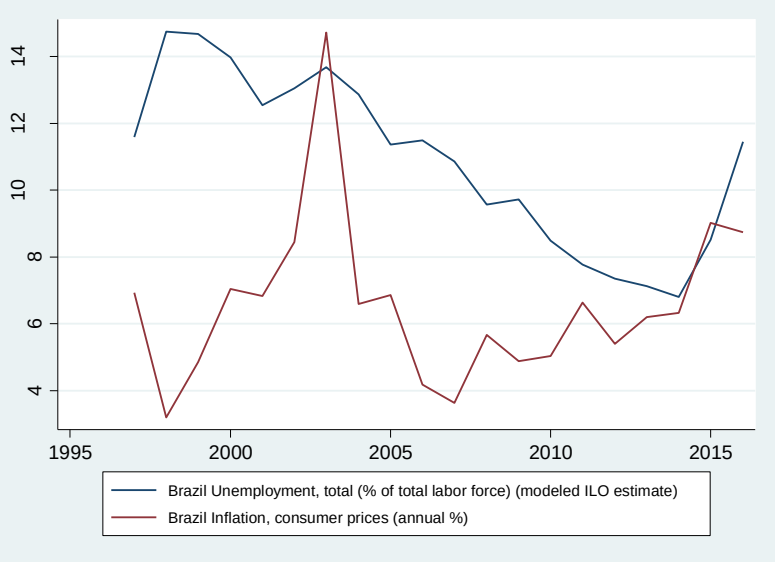


Graph X: prepared using Stata. Data: ©UNCTAD, FDIMNE database (www.unctad.orgfdistatistics).

Even if fiscal austerity measures increase investor confidence, and therefore intensify the flow of foreign capital, it seems like that these are not the measures that will promote the growth of the economy. The foreign capital may not be the main financier of the country's productive capacity: in the last years the gross formation of fixed capital was more intense in periods of greater participation of the government in the economy.

It is also interesting to note that pursuing price stability was not enough to achieve low unemployment rates. The graph below represents the evolution of unemployment and inflation rates using World Bank data for the period between 1997 and 2016. Its analysis provides evidence to doubt the accuracy of the Phillips Curve: the negative correlation between inflation and unemployment is not totally clear for the Brazilian economy.

GRAPH XI – Brazil: Unemployment versus Inflation (CPI annual %) from 2000 to 2016

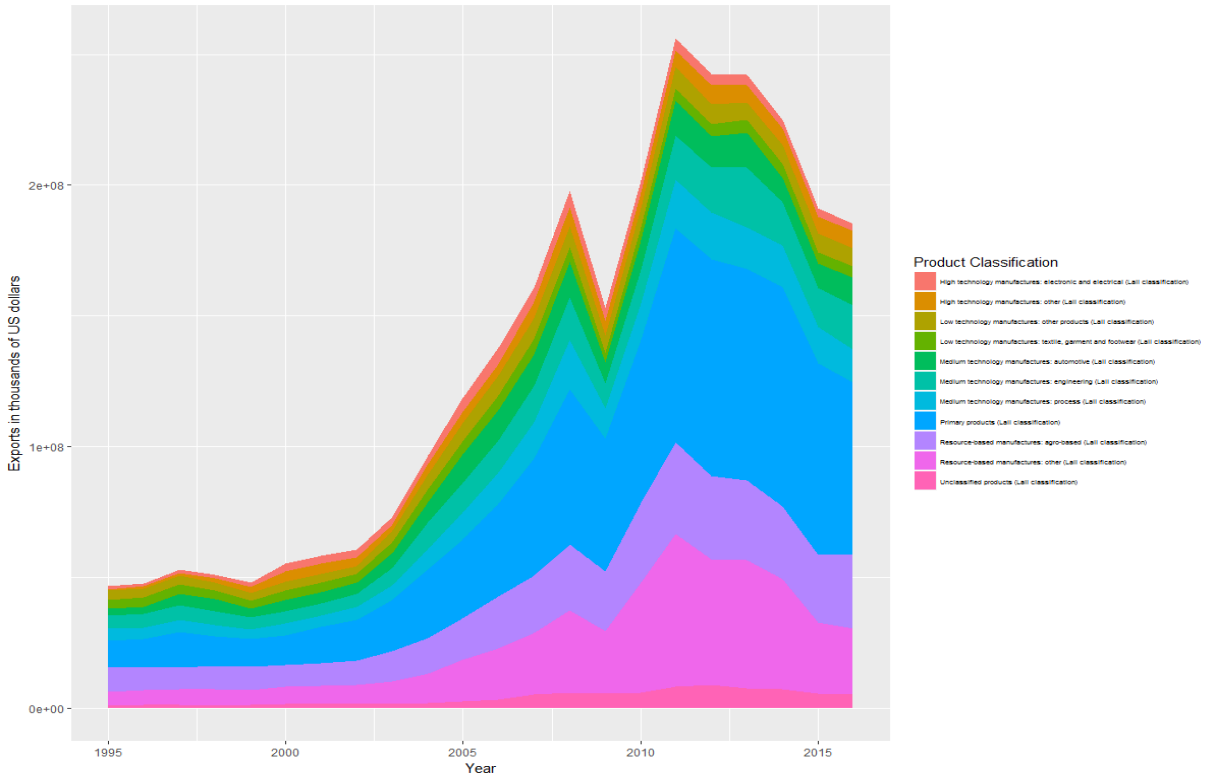


Graph XI: chart prepared using Stata. Data: World Bank.

Obviously the Phillips curve cannot be denied without considering the economic changes the country has undergone over the years, especially in the labor market. In fact, the Brazilian productive structure, like that of most other countries, is constantly changing. In this sense, the recent technological revolution is a great milestone. More technologically advanced sectors have become the focus of many public policies worldwide because of the high added value their products have, but at the same time these sectors are not labor-intensive. Therefore, the relationship between labor market and price level is certainly being affected by these processes.

In Brazil, however, high-tech sectors still do not play an important role in the economy. The graph below illustrates how the evolution of the Brazilian exports by technological intensity. The data are from UNCTAD and the classification follows the one proposed by Lall (2000).

GRAPH XII – Brazil: Diversification of Exported Products, 1995-2016



Graph XII:UNCTADSTAT Merchandise trade matrix – product groups, exports in thousands of dollars, annual, 1995-2016

The figure clearly endorses the statement from Romero et al (2015) about the permanence of the primary sector in a position of great importance in the Brazilian exports' portfolio since the 1990's. The share of primary products and resource-based manufactures (agro-based and other) accounted in 2008 for almost 70% of the country's total exports and remained high through 2016.

This may indicate that, although the government has been struggling to increase public investments during the period under review, these actions were more directed towards low technology-intensive sectors. Indeed, coincidence or not, many of the investment programs launched by the government focused especially on infrastructure, that is, they were not concerned with increasing the value added of Brazilian production. The correlation between the two variables would have to be proven econometrically to assert such a relationship and one should also consider that those were internal – and not export – programs. Yet, focusing on investment

relief measures in technology-intensive sectors may help reduce investment costs in these sectors vis-à-vis sectors in which the country has already high competitiveness (De Negri and Alvarenga, 2011).

Still, it is important to analyze the export production structure due to its effect over the country's economic performance. Ferrari Filho (2017) states that, on the supply side, the origin of the Brazilian recession is the deindustrialization and the low productivities of capital and labor. In this sense, the drop in exports observed from mid-2011 on the chart would be decisive for the country's current situation.

2.3.2 Econometric Analysis

The econometric analysis begins by introducing the series being used in the SVAR model. The following picture presents one graph for each of the six variables. All of them are in the form of natural logarithms, and none seem stationary at level.

Each of the series behaves in distinct ways. GDP index has a clear upward trend, and only between 2008 and 2010 the economy appears to slowdown. Recently, just before the beginning of 2015, it is possible to note that the growth trajectory has undergone a slight change of pattern, indicating the adaptation of the economy to the new direction given to the economic policies. There has been a decrease in the slope of the graph curve since the adoption of more severe austerity policies.

The fact that inflation has continuously increased throughout the period analyzed is not of great importance, since this is the default behavior of consumer price indices. The interesting thing is that the slope of the curve did not undergo major changes during those years, indicating relative price stability.

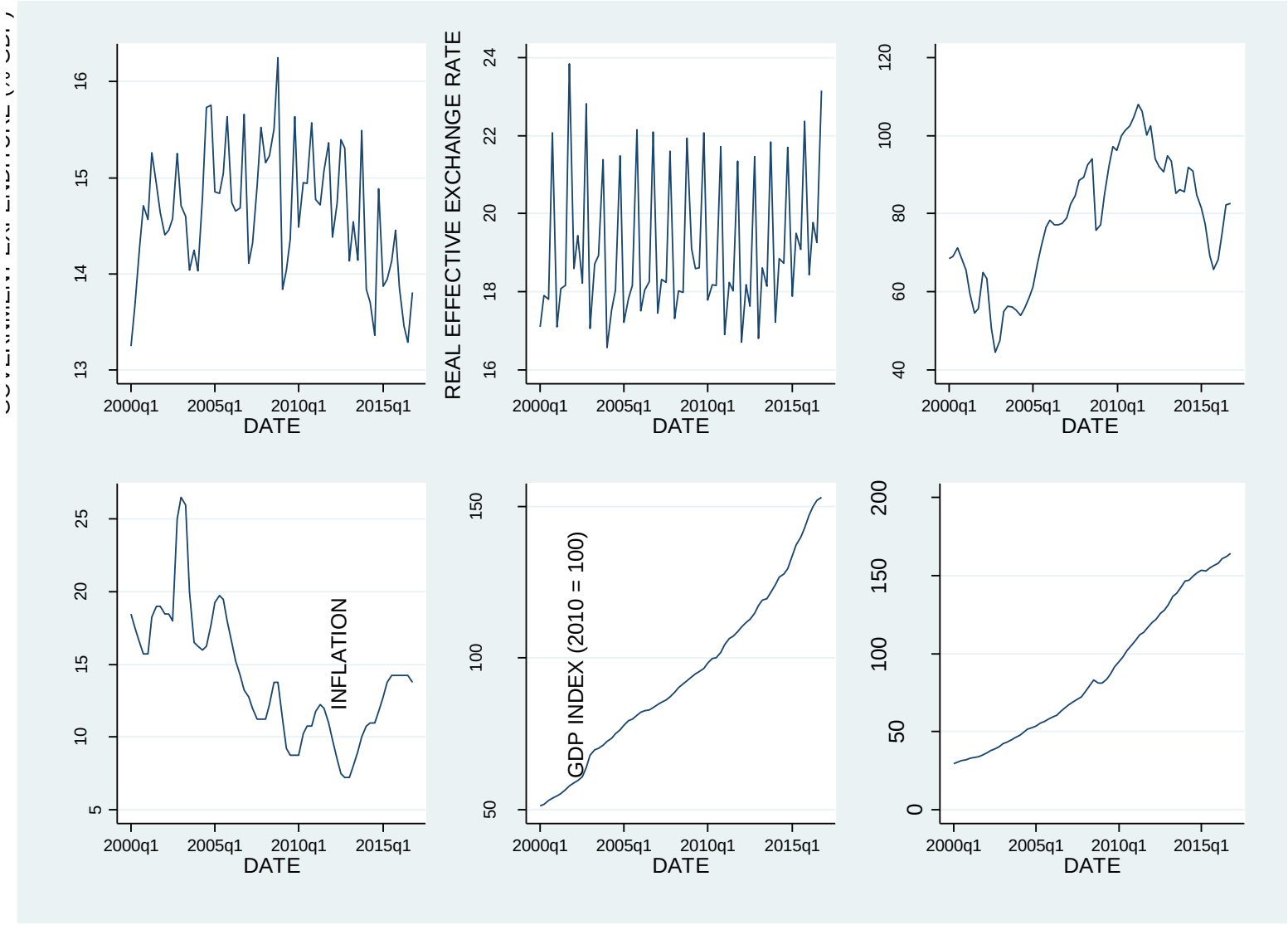
The trajectory of interest rates varies a lot, but presents a practically decreasing trend. It has achieved its highest point in the last quarter of 2002, a transition period in the highest republic office, when Lula replaced FHC. The market feared a redirection

of the economic policies adopted by the government because of the ideological differences between the two presidents, and interest rates were probably adjusted to retain investments in the country.

The path of exchange rate apparently does not have a particular pattern, but it is possible to observe a relative tendency of growth during the period analyzed. Once more, the end of 2002 and the beginning of 2003 were marked by destabilization, and the Real suffered a sudden devaluation. The last quarter of 2008 was also characterized by great devaluation, a direct consequence of the crisis. Since then, the Brazilian currency would only show a downward trend in the second half of 2014, once again during the presidential elections. A trend of appreciation is perceived since the end of 2015.

Government revenue and spending as a percentage of GDP appears to exhibit seasonal behavior. Apparently the government often increases its expenditure in the last quarter of the year. The revenue behavior, on the other hand, does not follow such a precise pattern. Public revenue reached its highest point in the last quarter of 2008, just after the crisis outbreak. The last year analyzed, 2016, was characterized by low revenue levels; only in the last quarter this trend outwardly reversed.

GRAPH XIII – Brazil: Linear representation of the variables in the model (2000Q1-2016Q4)



Graph XIII: chart prepared using Stata. Data: described in Appendix.

After analyzing these graphics, it is necessary to check the series for stationarity before estimating the SVAR model. The Augmented Dickey Fuller (ADF) test is ran and most of the variables are not stationary in level. Therefore, their first differences are generated and their stationarities are tested again. The results are shown below:

TABLE 1 – Brazil: Stationarity Test

Series	First Difference Constant	P-value
Gdp	-4.429 (1) ***	0.0003
CPI Inflation	-5.358 (1) ***	0.0000
Interest Rate	-4.891 (1) ***	0.0000
Real Effective Exchange Rate	-6.957 (1) ***	0.0000
Government Expenditure	-8.650 (1) ***	0.0000
Government Revenue	-7.933 (1) ***	0.0000

Source: estimated using Stata.

The numbers in parenthesis indicate the ADF's selected lag order. Knowing that the test's null hypothesis is the presence of unit root, it is possible to consider all the series stationary in first difference.

To identify the order of the SVAR model, it is used the Final Prediction Error (FPE), Akaike's Information Criterion (AIC), Schwarz's Bayesian Information Criterion (SBIC), and the Hannan and Quinn Information Criterion (HQIC), as well as the Likelihood-Ratio (LR) test statistics. As can be seen in the following table, FPE, AIC, SBIC and HQIC suggest a SVAR model of order three.

TABLE 2 – Brazil: Identifying the order of the model

Lag	LL	LR	P-value	FPE	AIC	SBIC	HQIC
0	704.9			1.1e-17	-219.968	-215.886	-218.363
1	782.69	155.58	0.000	3.0e-18	-233.235	-216.906	-226.813
2	832.933	100.48	0.000	2.0e-18	-237.756	-209.181	-226.518
3	943.651	221.44	0.000	2.0e-19*	-26.1477*	-22.0655*	-24.5421*
4	979.223	71.144*	0.000	2.5e-19	-261.341	-208.273	-240.469

Source: estimated using Stata.

In order to verify if the SVAR satisfies stability condition, the AR Roots test is implemented and the following graph is generated:

FIGURE A – Brazilian SVAR: Stability Test

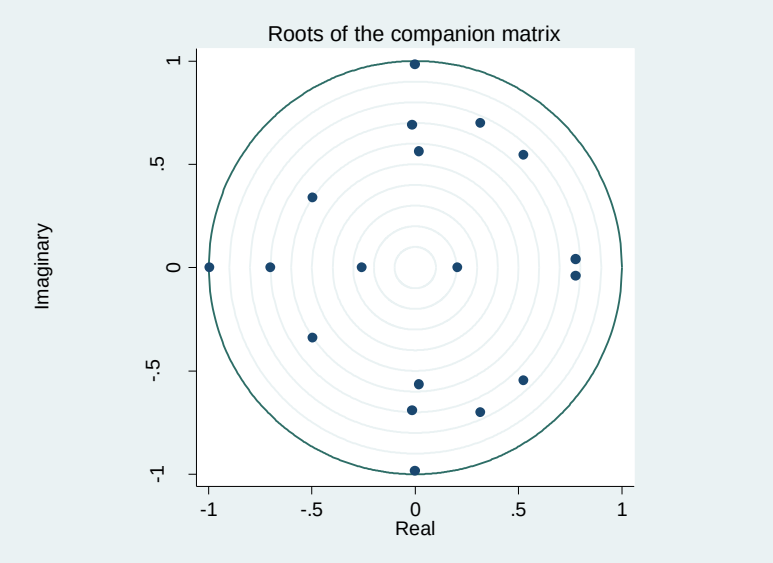


Figure A: Stata test result.

Based upon the figure, all the eigenvalues lie inside the unit circle, indicating that the model is stable. Then, it is safe to produce impulse-response functions and forecast error variance decomposition analyses, which is done next.

The analysis is centered in the response of GDP under a shock in each of the selected variables: CPI inflation, Interest Rate, Real Effective Exchange Rate, Government Expenditure and Government Revenue. In other words, it is going to reveal the compound effect of monetary and fiscal policy shocks on GDP growth rate.

The forecast error variance decomposition is presented first. It was calculated for the basic SVAR model for a period of zero to ten quarters. As expected, periods zero and one have no effect on GDP, since restrictions over matrix A specified no contemporaneous relations between variables. Shocks to interest rate appeared to be the most effective variable in explaining the variation in GDP growth rate, accounting for 11.42 percent of it. Shocks to government's expenditure and revenue explain 1.25 and 2.29 percent of changes in GDP growth rate, respectively. Meanwhile, price level explains 3.75 percent and exchange rate explains 1.54 percent of it.

TABLE 3 – Brazil: Forecast Error Variance Decomposition

Lag	CPI Inflation Impulse	Interest Rate Impulse	Real Effective Exchange Rate Impulse	Government Expenditure Impulse	Government Revenue Impulse
0	0	0	0	0	0
1	0	0	0	0	0
2	0.013073	0.000078	0.000184	0.004708	0.00243
3	0.012048	0.075772	0.005214	0.006077	0.014939
4	0.022891	0.102156	0.005293	0.006331	0.015184
5	0.037595	0.113764	0.005588	0.007012	0.016628
6	0.038028	0.11578	0.005654	0.011217	0.022085
7	0.038213	0.116096	0.006875	0.011297	0.023022
8	0.037906	0.115217	0.011823	0.011207	0.02285
9	0.037684	0.114602	0.015221	0.011808	0.022917
10	0.037585	0.114283	0.015442	0.012567	0.022913

Source: estimated using Stata.

It is interesting to note that apparently monetary police affects GDP more effectively than fiscal and cambial policies, since interest rate is the variable explaining the biggest part of variations in the national product. The impulse-response functions plotted in the following figure illustrates it better. It is noted that the confidence interval of all graphs includes the value zero, which raises doubts about the significance of the results. Still, it is important to analyze the images without disregarding this proviso.

The shock in each of the variables seems to result in a GDP response that lasts at least ten quarters. In none of the cases the GDP appears to have returned to its previous level. This indicates the long-term effect of macroeconomic policies over the economy.

On the fiscal side, the GDP growth rate responds very discreetly to impulses on government expenditure and government revenue. The shock in spending peaks only in the tenth quarter, and yet accounts for a very small proportion of national income growth. Meanwhile, a sharp increase in government revenues today would produce its maximum effect after seven quarters, and then would continue to explain approximately the same share of GDP growth rate until the last quarter.

The monetary side, on the other hand, appears to have a more intense effect over the GDP growth rate. A shock in inflation is more powerful after the fifth quarter, and until the last quarter it explains a relatively constant percentage of GDP growth rate. Something similar happens when considering an impulse on interest rates: in the fifth quarter the variable explains 11% of national income growth, a rate that is sustained almost constant until the last quarter analyzed. Lastly, the shock to the real effective exchange rate results in the weaker and less durable response of the GDP growth rate.

FIGURE B – Brazil: Impulse Response Functions

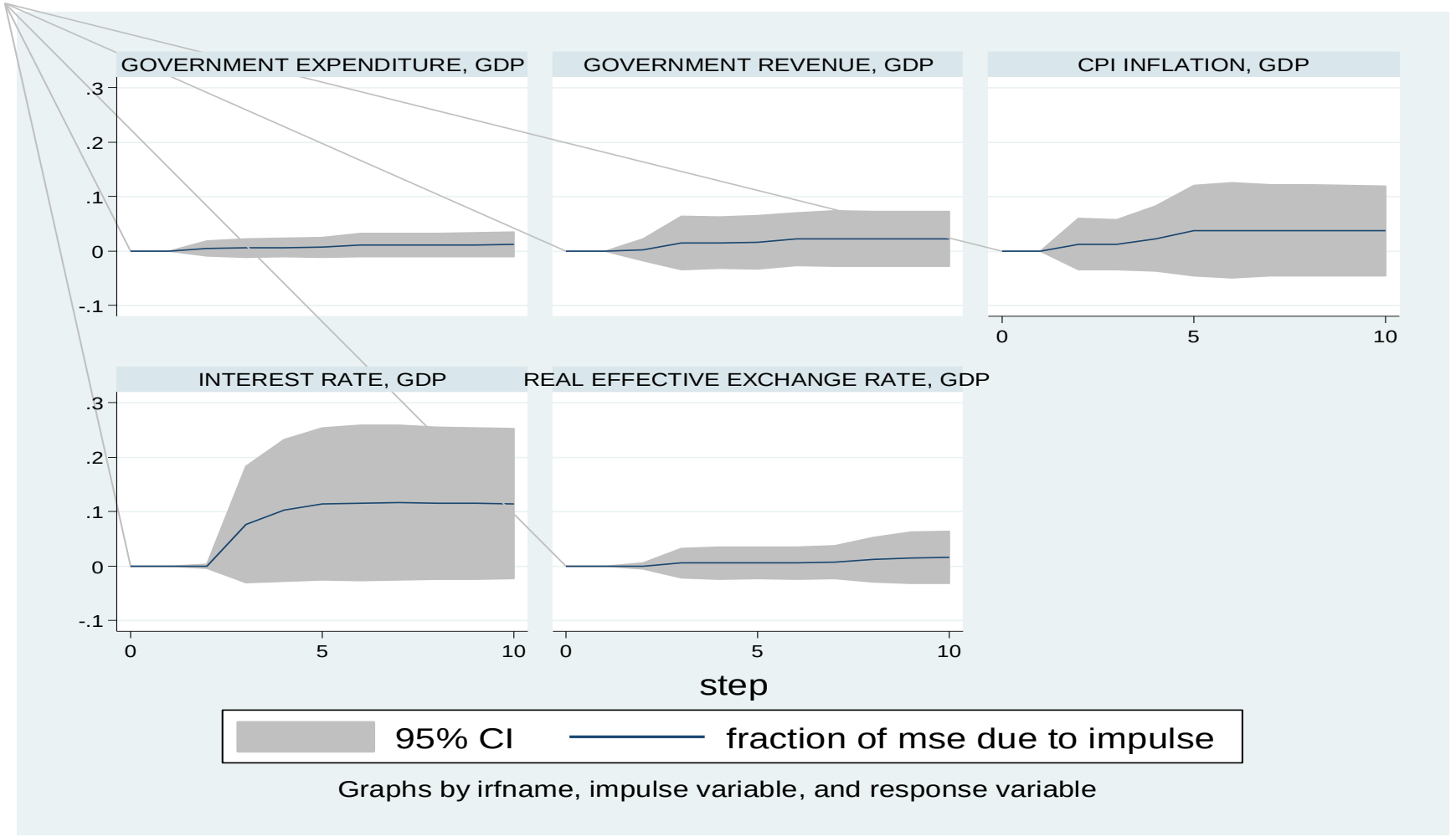


Figure B: Stata IRF results. Data: described in Appendix.

3. THE CHINESE MACROECONOMIC POLICY

3.1 THE CHINESE ECONOMIC BACKGROUND

The most populous country in the world, China displays a dynamic and complex economy that was able to sustain high levels of growth rate during more than three consecutive decades. The Chinese economy has many peculiar characteristics that are better understand after learning at least a little about its recent history.

The People's Republic of China (PRC) was established in 1949 under the command of Mao Tse Tung. During the 1950's the government launched "The Great Leap Forward." Program, which established collectivization and implemented rapid industrialization policies for economic growth. The collectivization was a state-sponsored system which transformed the national land into agrarian cooperatives in an attempt to bring Chinese society closer to socialism. The country was under a planned economy whose growth engine was the State-Owed Enterprises (SOEs), public companies through which the government was able to increase its influence in the market, provide goods and services for the population, and guide the economy in general.

The economy underwent a turnaround after 1978, when the Communist Party of China (CPC) launched reform programs that would bring China to the political and economic system known as "Socialism with Chinese Characteristics". After Mao's death in 1976, there was a consensus about the necessity of a reform to open up the economy and, for the first time, market-oriented enterprises – both public, as Township and Village Enterprises (TVEs), and private – were allowed to entry the Chinese market. The SOEs had "[…] lost their protected markets and their high profitability […]" (Naughton, 2007, p.430), the government budget had declined as a share of GDP, and the state had become "[…] less central in determining overall

macroeconomic balance" (Naughton, 2007, p.430). Bramall (2009) divides the period from 1978 to 1996 into four phases:

1) Between 1978-82, a readjustment policy was put in practice to liberalize the industry in some extent, establish fiscal priorities, change the state- set relative price structure (prices – including wages and interest rates - were determined by the government, not the market), and create what was called Special Economic Zones (SEZ). The SEZs are areas where the government exerts less power and the economic regulations are less rigid in order to attract a greater volume of foreign investments.
2) The market socialism begins in 1982 and theoretically lasts until 1989. During these years, the industry was even more liberalized, the decollectivization started, and a market-based price determination is gradually established for some products.
3) The period between 1989 and 1991 is known as *rectification* because it is marked by a pause in the policy of opening-up. A macro contraction is implemented through cuts in government spending.
4) In 1991 the transition to market socialism was relaunched and, between this year and 1996, price liberalization was completed, the pace of opening-up was accelerated, fiscal and monetary policies became expansionary, and stock markets were finally introduced in the economy.

In terms of the character of economic growth, for Lo (2016) the era of reforms can be divided into two periods: from 1978 to the mid-1990s, economic growth was associated with labor-intensive, consumption-led industrialization; since the end of this period, a process of capital-deepening, investment-led industrialization characterizes the Chinese economic growth.

Between 1978 and 1996, China's per capita GDP growth rate was remarkable. Comparing to other large developing and middle-income countries, the Chinese performance is by far the best, overcoming Brazil, India, and the average growth of each of these countries' regions (Latin America and East Asia, respectively), according to Bramall (2009). The author also asserts that the Chinese human

development profile increased significantly during this period, reaching a very good level for a country with a still low GDP per capita.

Bramall (2009) argues that during the 1990s the main concern was to open the economy to foreign trade and investment, and enhance the efficiency of the industrial sector. In 1991 and 1992, the government consumption expenditure provided a massive stimulus in the economy (fiscal policy). The growth process was also supported by monetary expansions, which was followed by a fiscal reform in 1994. These sorts of growth, though, were unsustainable towards the inflation scenario created by them (Bramall, 2009).

With declining fiscal revenues, the government could expand only a low share of its GDP to boost the economy, and that is why they decided to implement fiscal and tax reforms in 1994. According to Naughton (2007), the reform

> "[…] allowed enterprises to compete on a more equal footing, reduced the scope of government involvement in the productive sector, and allowed the government to focus more on the delivery of public goods and services. At the same time, fiscal reform has consistently sought a formula for an appropriate relationship between central and local government authorities" (Naughton, 2007, p. 431-432).

The new fiscal regime assigned different categories of taxes to central and local governments, designed a clearer sharing scheme between the various levels of public administration, established an uniform profit rule to equally treat enterprises profits (SOEs, TVEs, private firms), and created a new central government taxation agency to manage the new system. Now it was one of the central government's functions to first collect the bulk of revenues, and then share them with the provinces (Naughton, 2007).

The reform succeeded in increasing budgetary revenues and a change in the composition of the government's expenditure was also observed. The civilian economy was the most benefited by the increase of the expenses, that is, the governmental duties towards the society were being properly financed (Naughton, 2007). Notwithstanding, the"[…] recentralization of the fiscal system and contractionary monetary policy served to reduce the rate of inflation from about 20

percent in 1994 to 5 percent by 1996" (Bramall, 2009, p.470). The government's *Five Year Plan* for the period between 1996 and 2000 proposed a restructuration of the industry and a macroeconomic contraction to squeeze inflation out of the system. An overall price stability was achieved by the end of 1997, when inflation was brought down to virtually zero (Naughton, 2007). Still, both rate of job creation and growth rate of GDP declined.

The rising unemployment was a key factor in the decision to change China's fiscal policy by 1998. Faced with the outbreak of the Asian crises, the government attempted to boost domestic demand by stimulating the economy (Dunaway and Fedelino, 2006), since there were seemingly more robust budget revenues. The Chinese government has opted to implement expansionary fiscal policies and frustrate the historical trend of maintaining budget deficits of around one percent of GDP, as observed in most years of the 1980s and early 1990s (Naughton, 2007). Policy makers exposed the economy to deficits of over two percent of GDP from 2000 until the overheating of the economy, in 2002, when it was necessary to control debt again (Naughton, 2007). According to Dunaway and Fedelino (2006), fiscal policy was used to contain demand when concerns about possible overheating and excessive investment emerged in some sectors. Despite maintaining public debt at around eighteen percent (official number) by 2005, the government was concerned about the sustainability of its indebtedness growth, mainly because several types of government obligations capable of multiplying the debt were not taken into account in official statistics (Naughton, 2007).

Indeed, the late-1990s was marked by drastic transformations in economic policies. After allowing a greater deficit in its budget, which reached almost four percent of GDP in 1999, the government promoted strong growth in tax collections and was able to achieve a five percent of GDP increase in its revenue by 2005 (Dunaway and Fedelino, 2006). On the expenditure side, however, there was no concern to spare. According to Dunaway and Fedelino (2006), over the same period government spending grew at around three percent of GDP – focusing on areas targeted by public

development policies – and both revenue and expenditure have deviated by significant amounts from budget targets.

Although retaining the rhetoric of socialism, the government signalized to a more intensive transition towards the capitalism (Bramall, 2009), which is even more obvious at the beginning of the new millennium, when China joins the World Trade Organization (WTO). The Communist Party of China (CPC) adjusted its target growth rate to prioritize a macroeconomic stability policy. Based on the experience of the early 1990s, the policy makers established that the growth rate should remain below fourteen percent and that the investment rate as a share of GDP should not be as high as forty-three percent. The decision was "to ensure that the growth rate remained at around ten percent" (Bramall, 2009, p.470). According to the same author, with that in mind China was able to accelerate its growth without very high rates of inflation since 1999. The notion that an overly high investment share and an unduly contribution of the service sector is detrimental to the stability of economic growth is reinforced by the following speech:

> "We must keep to the new path of industrialization with Chinese characteristics, pursue the policy of boosting domestic demand, particularly consumer demand, and propel three transitions in the mode of economic growth: the transition from relying mainly on investment and export to relying on a well-coordinated combination of consumption, investment and export, the transition from secondary industry serving as the major driving force to primary, secondary and tertiary industries jointly driving economic growth, and the transition from relying heavily on increased consumption of material resources to relying mainly on advances in science and technology, improvement in the quality of the workforce and innovation in management." (Hu Jintao, 2007, apud Bramall, 2009, p.471).

The next five-year period was marked by the already mentioned China's WTO entry, which officially took place on December 11, 2001. The new *Five Year Plan* covered the period 2001-2005 and tried to fix flaws from previous plans, such as the lack of policies to improve agricultural performance and reduce the level of urban unemployment (Bramall, 2009). The government intended to promote growth while controlling the pace and pattern of development (Bramall, 2009). The price stability achieved by 1997 had become deflation between 1998 and 2002, but in 2003 a new

macroeconomic expansionist phase started and brought the consumer price inflation to modest levels already in 2005 (Naughton, 2007).

In the last decade, the government recognized that the Chinese rapid growth has negative effects in terms of environmental problems and social inequalities, according to Bramall (2009). Furthermore, Hu Jintao "[…] announced that the aim of policy was to quadruple per capita GDP between 2000 and 2020", which would imply "[…] an annual growth target of only around six percent between 2007 and 2020" (Bramall, 2009, p.481).

The whole market transition happened (and is still happening) leisurely. By the end of 1996 the Chinese international economic integration was still only partial (Bramall, 2009). The industrial sector remained in the hands of the state (Bramall, 2009), which was also still charging tariffs on imports, and controlling investments and labor migration, for example. Stock markets were weak and "property rights were vague and insecure" (Bramall, 2009, p.355). During the 1997 Asian financial crisis, for example, China was almost not affected, since "controls on the flow of foreign capital were still in place, and China's trade integration with the rest of the world economy were still quite limited" (Bramall, 2009, p.470).

In this sense, Naughton (2007) argues that both fiscal and monetary policies only progressively adapted to the needs of a market-economy throughout the transition. The author argues that the fiscal policy "has tended to only adapt to macroeconomic conditions in China […]" (p.441). Similarly, the expansionary monetary policy during the first fifteen years after the beginning of the reform was simply a consequence of the increased demand for money in a society that, for the first time, was being opened to the world. Later, it was used as instrument to moderate China's cyclical inflationary dynamic, but could not effectively restrain the cyclical process until 2007, especially because the Chinese interest rates had never been totally deregulated by the government (Naughton, 2007).

> "Neither fiscal nor monetary policy can be said to have effectively driven China's macro economy to a stable equilibrium. […] Thus far, China has been able to maintain a remarkable level of

> macroeconomic consistency, underpinning the high-investment, high-growth economy that has become so characteristic of China today." (Naughton, 2007, p.441)

3.2 THE EFFECTS OF THE GLOBAL FINANCIAL CRISIS ON CHINA

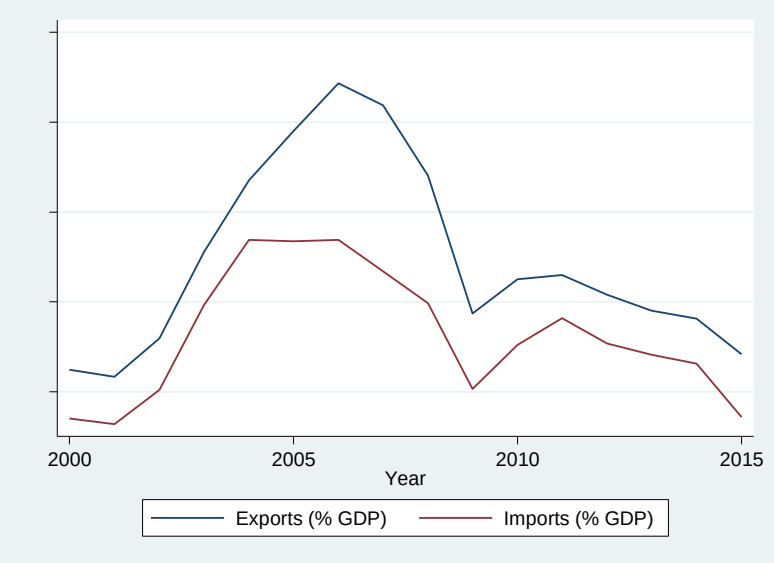
First of all, it is important to state that the Chinese economy was not directly exposed to the subprime mortgage problem, and, therefore, the global financial crisis had narrow effects in the country comparing to the overall damage that the event is still causing worldwide. According to Chow (2010), the restrictions on capital flows imposed by the Chinese government limited "the ability of Chinese citizens to invest abroad, thereby compelling many Chinese citizens and private firms to invest their savings domestically […]" (p.63). In other words, the negative effects on China could have been much larger if its citizens had greater access to foreign securities such as subprime mortgages. On the government side, it is safe to assume that its share of investments destined to speculative securities was small and insufficient to cause large financial losses to the country, even though China was the second largest holder of US debt securities by mid-2008 (Chow, 2010).

Nonetheless, the subprime crisis was harmful for most of China's trade partners, and the negative effects were inevitable for the Chinese economy. With a reduced budget, many countries stopped importing Chinese products, which culminated in a sharp decline in China's exports as early as August 2008. The whole world was trading a lower merchandise volume and cutting their expenses. In China, a drop on the influx of foreign direct investment (FDI) was soon observed. The country that had maintained an average growth rate of ten percent since 1978 saw its economy slowdown in 2009.

> "[…] the impact of the financial crisis on the Chinese economy occurs mainly through the second order transmission channel. The slowdown of economic growth in the main economies led to declining external demand for Chinese products, which in turn contributes to the Chinese economic slowdown." (Fang, Yang and Meiyan, 2009, p.97).

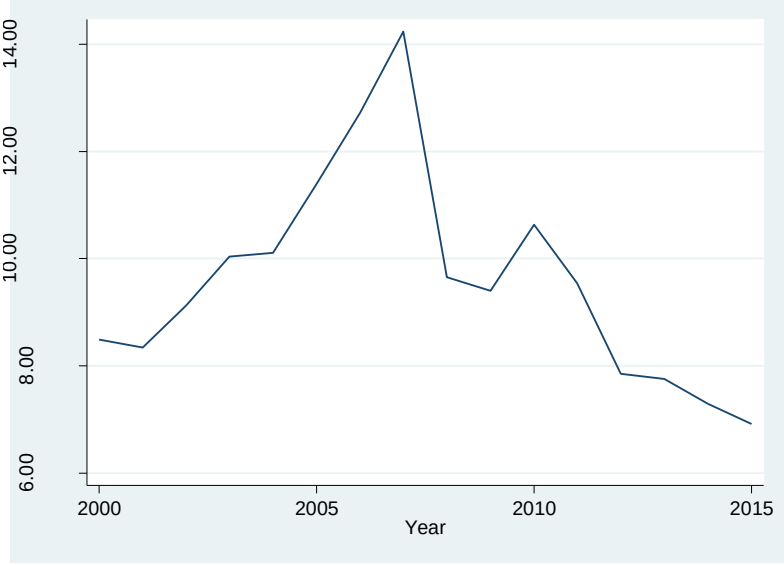
The decline in volume and value exported by China and its reflection on the country's growth rate are illustrated in the charts below.

GRAPH XIV – China: Exports and Imports as % of GDP (2000-2016)



Graph XIV: chart prepared using Stata. Data: World Bank.

GRAPH XV – China: Annual GDP Growth, 2000-2016



Graph XV: chart prepared using Stata. Data: World Bank.

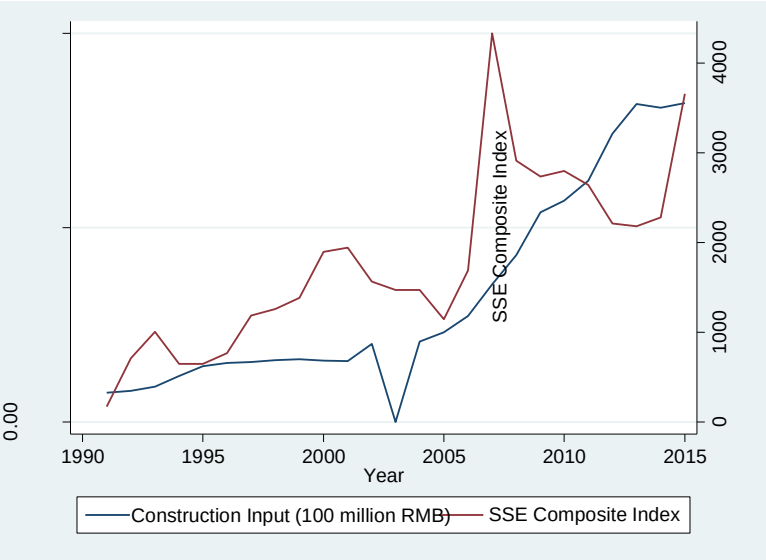
Indeed, current account sharply decreased after reaching its maximum value in terms of GDP in 2008. The chart below illustrates it.

GRAPH XVI – China: Current Account Balance (% of GDP) from 2000 to 2016

Graph XVI: chart prepared using Stata. Data: World Bank.

Chow (2010) states that the Chinese real estate market was also negatively affected: the pace of the construction sector fell, and so did the prices of properties and buildings for sale. The author reminds that the sharp decline in China's main stock market was another "indication of the impact of the global financial crisis on the overall health of the economy" (Chow, 2010, p.65). The Shanghai Stock Exchange Composite Index lost two-thirds of its value in one year (Chow, 2010). In the graphic below, it is possible to see the evolution of the Chinese stock market and its construction sector from 2007 to 2009.

GRAPH XVII – China: The Construction Market, 1992-2015

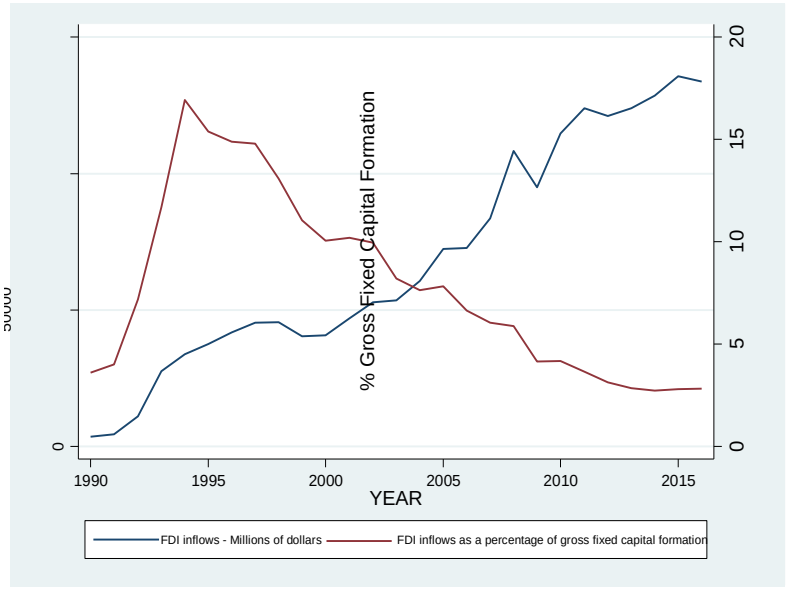


Graph XVII: chart prepared using Stata. Data: National Bureau of Statistics of China.

The Chinese labor market was damaged either, as the sector that employs most of the Chinese labor force is the one most affected by the crisis: the export-oriented sector (Fang, Yang and Meiyan, 2009). The employment shock was substantial; however, according to Cabestan, Di Meglio and Richet (2012) “the rise in unemployment triggered by the economic slowdown was temporary, coexisting with the scarcity of a cheap workforce, which has gradually overtaken it […]” (p.3).

Furthermore, the financial crisis was responsible for a drop in China’s net FDI, especially between 2008 and 2009. The investments, however, “rebounded to almost the pre-crisis level later on” (Li, Willett, and Zhang, 2012), as represented in the image below.

GRAPH XVIII – China: Foreign Direct Investment (US$ and as % of Gross Fixed Capital Formation), 1990-2016



Graph XVIII: chart prepared using Stata. Data: ©UNCTAD, FDIMNE database (www.unctad.orgfdistatistics).

The analysis of the graphs XII, XIII, XIV and XVI shows that Chinese growth has rebounded but has not returned to its best levels previously achieved. The country's economic growth rate no longer reaches double digit levels and even the government has lowered its growth expectations in recent years. This new behavior of the Chinese economy became known as "China's New Normal", indicating the trend of growth rates at levels lower than those registered before the crisis.

Some scholars argue that this new pattern of Chinese growth is a direct consequence of the economic policy adopted in the last decades, driven essentially by investments and with little focus on consumption. Moreover, with globalization, China has directed its economy to the export sector and as consequence has become very dependent on external demand. According to this theory, this development program is heavily reliant on state funding, which is detrimental to the stability of the country's balance of payments, so China's rapid trajectory of economic growth in recent years would not be sustainable anymore.

Moura (2015) attributes part of the unsustainability of the Chinese economic expansionism to the mismatch between over-investment and under-consumption,

which would have fueled restrictions on the diversification of the national productive regime. The author asserts the existence of an excess of productive capacity, which would be exacerbated by the relative lack of geographical and intersectorial mobility of domestic firms, increasing the propensity to invest in sectors and localities often already saturated (p.96). In addition, the low development of financial markets would hinder many companies to diversify their savings to invest in nascent sectors, thus restricting their choices to fixed asset investments in their own niches.

In relation to under-consumption, Moura (2015) compares China with the Asian Tigers, since in the past these countries adopted a model of growth similar to the Chinese. According to the author, these nations managed to reduce income disparities and increase the purchasing power of the poorer part of the population through distributive policies that allowed the transfer of the positive results of expansion to the less well-off people. Therefore, despite knowing that the success of these countries comes mainly from their export performance, domestic consumption played an indispensable role in the process of economic growth. The same does not seem to happen in China. Despite the visible attenuation of extreme poverty, Chinese society is marked by social polarization and asymmetric distribution of income, which hampers the expansion of a mass consumer market in the country (Medeiros, 2010 apud Moura, 2015). The accumulation of over-investment and depressed consumption accentuates China's dependence on the global market to export its capacity excess and pressures the fall in prices of final products (and, therefore, profit margins) in some major industrial sectors (Hung, 2009, pp. 194-5 apud Moura, 2015, p.97). The valorization of the Chinese labor force in recent years also contributes to this result, since the consolidation of China's economic growth demanded a higher qualification of the worker, who became better paid and therefore directly impacted one of the country’s strategy to attract foreign investment – cheap workforce.

Taken together, these factors make it difficult for China to maintain its growth strategy and have prompted President Xi Jinping to redirect the economy to the "new normal." The latest five-year plan of the Chinese party cites stabilization of growth rates from high to medium; improvement in living standards; environmental protection and

improvement of the national governance system (Hong et al., 2015, p.6-7 apud Moura, 2015, p.102) as strategic points to promote a reform to restructure and rebalance the Chinese economy. According to Lo (2016):

> “Restructuring implies policy measures of austerity and Market reforms, for coping with the accumulated financial risks. Rebalancing, meanwhile, is meant to sustain an acceptable pace of economic growth. This focuses on raising internal demands vis-à-vis external demands, and raising consumption at the expense of investment in internal demands” (Lo, 2016, p. 2).

From the above passage it is possible to conclude that the solution of this Chinese problem would be the adoption of measures in the direction of neoliberalism; exactly the opposite of the model followed by China in the last decades, based on expansionary government policies. Lo (2016) defends that this might not be the best path to pursue. Since the 1990s China has been stimulating economic growth by means of debt-financed government investment in infrastructure with great success, because this strategy was able to increase national GDP more than proportionate of debt growth, thereby leading to decreases in the debt-to-GDP ratio (Lo, 2016). From 2008 onwards, Chinese public investments have focused on building high-speed rail lines, and this may have been one of the factors responsible for maintaining growth in those years (Lo, 2016).

Indeed, the government struggled to cope with the adverse effects of the crisis by increasing its spending mainly between 2008 and 2014, a period in which public account deficits were recorded, albeit in small proportions when compared to the size of the Chinese economy. According to Lo (2016), however, China's fiscal expansion was much lower than that of the 2001 Asian crisis, for example. The author states that monetary and financial instruments played a more significant role this time around the country's economic performance. There was a large increase in the M2 money supply during this period, when a process of financial expansion and financial innovation were also observed. If the country was able to maintain its growth after the Asian crisis, when it was indebted to much greater proportions, there is no reason to doubt that this time will be different.

Additionally, in line with Lo (2016) and using international standards as a comparison, it is not possible to state that dependence on the external sector is a structural characteristic of the Chinese economy, since only in the period between 2004 and 2007 the country's trade surplus became really large as a proportion of its aggregate expenditure. In all other years China's economic growth was supported by domestic rather than external demand. Furthermore, in the course of the crisis, there was an increase in domestic demand to the detriment of external demand (Lo, 2016).

However, investment remained the main component of aggregate demand in China. According to Lo (2016) the ratio between consumption and aggregate demand has declined since 2008, but this does not justify the economic slowdown, since it only determines the type of growth, not its pace (the economy can grow rapidly without consumption). In addition, the statistics do not indicate a state of under-consumption in the Chinese economy: as stated by Lo (2016), consumption grew an annual average of 9.2 percent in real terms between 1978 and 2013, a high level when compared internationally. This means that the investment growth rate increased fast enough to more than offset the relative slowdown in consumption growth.

About the sustainability of this type of growth path, according to Lo (2016) it depends on the growth of technological progress at a rate fast enough to compensate for the tendencies to diminish the marginal productivity of capital and reduce the demands for the existing products. In China this is already a reality: according to Lo (2016), between 1978 and 2013 the product per worker grew by an average of 8.3 per cent per year in real terms, which was possible not only due to the process of transferring labor from rural to urban areas, but mainly because of productive investment in technological progress. The author states that throughout the period of reforms, the immediate force that has driven China's economic growth has always been the increase in productivity, not the growth in the supply of labor. Of course, the demographic structure of the Chinese population favored the nation's economic growth, as it could be handled in accordance with the availability of resources to meet the needs arising from trade liberalization over the years (Fang, Yang and Meiyan, 2009), but this was not the main driver of growth.

In the last instance, the strategy of growth through productivity allowed the growth of labor compensation. According to Lo (2016):

> "The trend of rising wage rates, in conjunction with the fast productivity and employment growth, suggests a healthy pattern of economic and social development. Achieving the twin targets of sustained rapid economic growth and compensation-enhancing employment expansion has always been the prime objective of China's state leadership and the demand of the society as a whole. From the analysis above, it is evident that the twin targets have been basically achieved since the turn of the century. This is in contrast to the situation in the first half of the reform era, where rapid economic and employment growth was associated with sluggish growth in labor compensation. The transition from labor-intensive growth to capital-deepening growth since the mid-1990s has substantially speeded up the growth in labor compensation, while sustaining – indeed accelerating – the rapid productivity and employment growth. This is a far cry from the dominant, neoliberal interpretation of the 'New Normal'." (Lo, 2016, p. 13).

3.3 CHINA'S RESPONSE TO FINANCIAL CRISIS: POLICIES ADOPTED BEFORE AND AFTER 2008

3.2.1 Descriptive Statistics

China has begun the twenty-first century worried about its fiscal consolidation. The Asian crisis at the end of the 1990s led authorities to take measures to stimulate demand so as not to hinder economic growth, especially by issues of construction bonds. In 1998 and 1999 the budget deficit widened by around one percent yearly, "the largest consecutive deficit increases recorded in the past two decades" (Dunaway and Fedelino, 2006).

From 2000 to 2002, the Chinese economy behaved fairly consistently in terms of GDP growth rate. Almost all quarters registered positive two digits growth in comparison to its previous period. Prices were maintained relatively stable, increasing less than one percent on average in relation to the same period of the previous year. Indeed, the year of 2002 was characterized by lower inflation in all quarters in comparison with the 2001 quarters.

In 2003 monetary policy was mainly restrictive. The People's Bank of China (PBC) raised deposits reserve ratio from six to seven percent, freezing RMB 150 billion yuan of excess reserves of commercial banks. The government promoted an interest rate reform in order to achieve a more marked-based instrument and improve international investors' confidence.

The Chinese economy in 2004 was marked by the adoption of a differentiated reserve requirement system. Reforms of interest rate and financial institutions continued to pursue the markets' confidence. During the year, the required reserve ratio was raised in order to contain inflationary pressures that increased the consumer price index in more than two percentage points in relation to the previous year. According to Dunaway and Fedeline (2006), fiscal policy was broadly contractionary during the year. Nonetheless, the GDP continued its upward trend, maintaining high quarterly growth rates.

After maintaining an average annual issuance amount of construction bonds of 0.5 percent of GDP between 1998 and 2004, in 2005 it was reduced to one third of this value, and the targeted budget deficit was lowered in nominal terms (Dunaway and Fedelino, 2006). The same authors state about the period between 1998 and 2005:

> "[…] spending has consistently exceeded budget targets. At the same time, these higher levels of spending have not led to a systematic deterioration in the fiscal position because revenue overperformance relative to the budget exceeded the increase in expenditure."(Dunaway and Fedelino, 2006, p.240)

A major sheer in the Chinese economy also happened in the monetary side, since the government adopted a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies. This signaled to the market the government's intention to intervene less in the economy. As can be seen in the chart below, 2005 is a year of inflection in China's exchange rate policy. By allowing the exchange rate to fluctuate more freely, the Chinese currency sharply appreciated.

GRAPH XIX – China: Official Exchange Rate (RMB/US$), 2000-2015

Graph XIX: chart prepared using Stata. Data: World Bank.

In 2006 monetary policy was definitely contractionary. In three occasions the PBC increased the reserve requirement ratio of financial institutions by 1.5 percentage points. The benchmark deposit and lending rates of the same institutions were also raised two times. Market operations were intensified with the intention of reducing monetary aggregate volume and containing the price increase. However, CPI inflation maintained a growth rate similar to that of the previous year, although it did not disturb the excellent trajectory that the Chinese GDP was already treading.

In terms of monetary policy, the year of 2007 was marked by a gradually shifted from “a sound policy” to “a tight policy”. The performance of the central bank was more intense and frequent. The requirement ratios were raised in ten occasions (cumulative increase of 5.5 percentage points), while the RMB benchmark deposit and lending rates were raised six different times. The Chinese GDP growth rate in relation to the previous period did not vary too much, but the inflation was clearly in an upward movement, especially in the last two quarters of the year, when the consumer price index grew 6.1 and 6.3 percent respectively (in relation to the same quarters of 2006).

At the beginning of 2008 the PBC adopted tight monetary policy, raising the required reserve ratios in five occasions just in the first half of the year (a cumulative increase of three percent was registered). This meant a freeze of seventy percent of the increased liquidity as a result of foreign exchange purchases.

The outbreak of the financial crisis in 2008 did not change the CPC political project; it only made its leadership "more determined to stick to its authoritarian, state-led and state-centered development strategy" (Cabestan, Di Meglio and Richet, 2012, p.4-5). The problems faced by the capitalist world, especially the United States and Europe, convinced the CPC that a nationalist and partially protectionist economy is more resistant to crisis (Cabestan, Di Meglio and Richet, 2012).

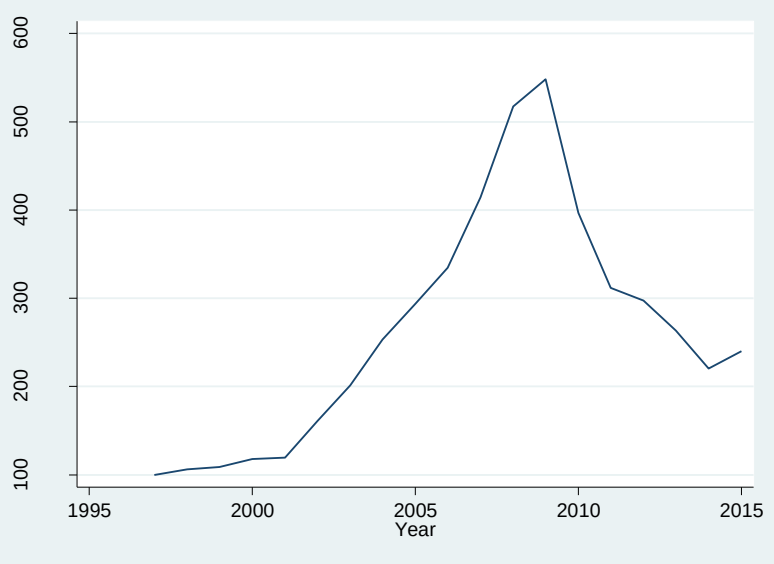
The government was almost indifferent to the crisis' advent because the Chinese concern about the sustainability of its rapid growth had already began in 2007, which paved the way for a more intense action of the government in combating the adverse effects of the crisis. The macroeconomic policy was designed to control inflation and slow the pace of growth in order to make it more manageable and sustainable and bring local authorities under closer central government control (Breslin, 2012). It was therefore not only a response to the international crisis.

> "In 2007 the authorities, fearing that domestic economic growth had become unsustainably rapid, took a number of tightening measures. Beginning in January the central bank repeatedly raised the required reserve ratio, the share of deposits that banks must place with the central bank. That reduced the funds that banks had available to lend to customers. To further reduce the flow of credit to the economy the central bank, starting in March, on five occasions in 2007 also raised the benchmark interest rates that guide banks' lending rates. Toward the end of the year these market-oriented steps were reinforced by the reintroduction of quantitative limits on bank lending. As a result of these policy initiatives, after the first quarter of 2007 China's economic growth began to gradually slow." (Lardy, 2012, p.6)

The government at first welcomed the moderation of domestic economic growth, but as the global financial crisis intensified, policy makers got worried about "the drag on China's growth caused by the sharp slowdown in global trade" (Lardy, 2012, p.7). Yet China was definitely more prepared to face an economic downturn: the country "went into the crisis in a strong fiscal position supported by massive foreign currency

reserves […]" (Breslin, 2012, p.14). The country accumulated a high volume of reserves in the early 2000s and just before the crisis China achieved the highest GDP reserves in recent years, as can be seen in the chart below. This accumulated amount was very important to finance the stimulus policies adopted by the government to face the crisis. The government was able to raise funds to finance a policy to stimulate the economy without putting the domestic system in danger, because its land (the Chinese government owns the country's land) and business assets more than guaranteed the investment.

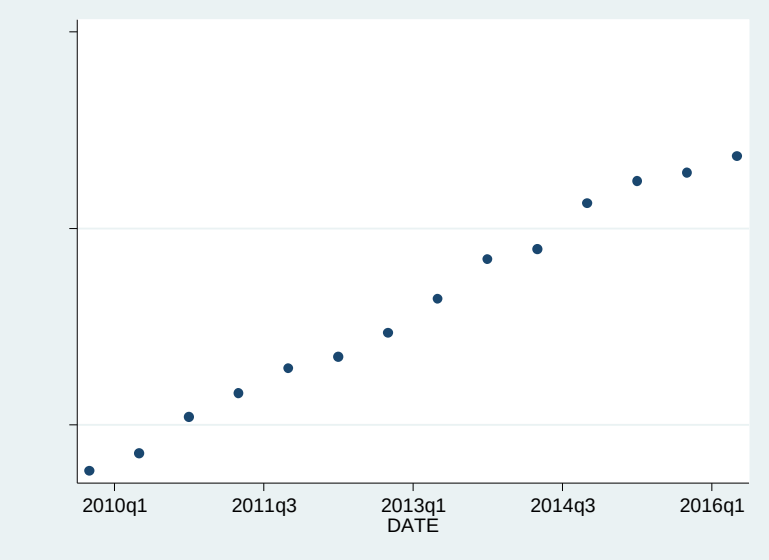
GRAPH XX – Chinese Reserves (% of debt) from 1997 to 2015



Graph XX: chart prepared using Stata. Data: World Bank.

Another Chinese peculiarity was its level of indebtedness right before the outbreak of the crisis, which was much lower than that of other major economies, especially in the financial sector (Lardy, 2012). Unlike what happened in the US and in Europe, "Chinese financial institutions […] were in a strong position to increase the supply of credit to sustain growth" (Lardy, 2012, p.14). The government debt in China during the period between 2009 and 2016 is shown below:

GRAPH XXI – China: Gross Central Government Debt (US$Mi), 2009Q4-2016Q2



Graph XXI: chart prepared using Stata. Data: World Bank.

All the above points led Breslin (2012) to state the following:

> "The crisis has shown the robustness of the Chinese economic system and the state's ability to mobilize resources to support national goals, has increased China's relative financial power, and has firmly established China at the center of global politics and as a key actor in any attempts to reform the structure of global governance." (Breslin, 2012, p.2)

Even with institutions little exposed to the lousy financial assets that triggered the bankruptcy of many firms in the western world, in 2008 the Chinese government quickly adopted large and well-designed anti-crisis policies, recognizing that its high dependence on exports could make the country vulnerable to a global economic recession (Lardy, 2012). With this in view, a policy of monetary easing was initiated in September 2008 by increasing the supply of loanable funds and raising the real demand for loans through reductions in benchmark interest rates and cuts in rates for mortgage loans (Lardy, 2012). In 2009, a great upsurge in bank lending was observed as a result, which contributed to keep the domestic market warm and softened the slowdown in economic growth caused by the crisis.

The increased bank lending was also crucial to finance part of a stimulus package launched in September 2008. The State Council rolled out a RMB 4 trillion (around

US$586 billion) stimulus program focusing on investment “expenditures on affordable housing, rural and other infrastructure (highways, railways, and airports), public health and education, the environment, and technical innovation” (Lardy, 2012, p.5). The program, which began in the fourth quarter of 2008 and extended through 2010, had impressive results over China’s growth from 2009 to 2011, according to Lardy (2012), who asserts that “China was the fastest growing emerging-market economy both during and immediately after the global financial and economic crisis” (p.11).

Unlike the stimulus package adopted in the U.S., for example, the Chinese program consisted overwhelmingly of increased expenditures, and no pure tax cuts at all (Lardy, 2012). According to Lardy (2012), it included only a tax expenditure component, in the form of tax cuts on certain durable goods. As a result, China managed to increase its aggregate demand more effectively, reducing the fall in its real output in 2009.

With the outbreak of the crisis, in the middle of the year the PBC announced the adoption of a moderately loose monetary policy. Five cuts in benchmark deposit and lending rates, as well as four cuts in required reserve ratios were made. Furthermore, quantitative ceilings for financial institutions’ credit lending were eliminated. The government was concerned about the crisis’ effects especially over its GDP growth, which dropped down to four percent in the third quarter of 2008 (in relation to the second quarter of the same year), when the Lehman Brothers Holdings declared bankruptcy. CPI inflation, which was in an upward trend until the third quarter of the year, declined considerably in the last quarter, probably as a consequence of the cooling of the world economy.

In 2009 the central bank decided for the maintenance of a proactive fiscal policy and a moderately loose monetary policy. Credit, consumption and investment were encouraged through government policies such as tax exemptions, especially in the property market. The growth of the quarterly price level in relation to the quarters of the previous year was negative in the first three periods.

The PBC maintained a moderately loose monetary policy in 2010. The economy re-emerged and prices increased again, so that the consumer price index registered a slight increase in relation to the previous year. On the fiscal side, the State Council raised down payment for investment properties to fifty percent, reintroduced penalty interest rates for mortgages on investment property, limited property purchases by foreign investors, and suspended mortgage lending to nonresidents. The real estate market was overheated and these measures sought to stabilize it again. GDP and inflation maintained the growth trend of the previous year.

In 2011 the monetary policy was characterized by the PBC as prudent. It went from restrictive at the beginning of the year to slightly expansionary in the final months. The deposit reserve requirement ratio was raised six times, accumulating an increase of three percentage points. Furthermore, three rises in benchmark lending and deposit rates were promoted (cumulative increase of 0.75 percentage points). On the opposite direction, the issuance of three-year central bank bills was suspended, reducing the contracting capacity of the government in the money market. In addition, a 0.5 percentage points cut on deposit reserve requirement ratio was conducted. GDP growth remained positive at the expense of a slight rise in price indices.

The expansionist trend of monetary policy continued in 2012, and two cuts in the reserve requirement ratio (0.5 percentage points each) as well as in the benchmark lending/deposit rates were made. In the second half of the year the monetary authority conducted repo operations to help control short-term interest rate. The ceiling of RMB deposit rates offered by financial institutions to their clients was adjusted to 1.1 times of the benchmark rates, the floor of the lending rates offered by financial institutions to their clients was adjusted to 0.7 times of the benchmark rates, and the floating bond of the US dollar to RMB exchange rate on inter-bank spot market was expanded from 0.5 percent to one percent. In 2012 GDP growth was accompanied by lower price changes in terms of inflation.

According to the PBC, in 2013 it was conducted a sound monetary policy. The financial system was strengthened through the enrollment of parameters of the dynamic adjustment mechanism of the differentiated required reserve ratio and

improvement of self-regulatory apparatus for market interest-rate pricing by financial institutions. The government turned its attention to weaker sectors of the economy such as agriculture, which was benefited by rises in central bank lending and discounts. Still in this sense, the government guided financial institutions to beef up support to those same key and weak parts of the economy, including not only the agriculture sector, but also rural areas and farmers, small and micro enterprises, and so forth. GDP growth and inflation maintained a trend of the previous year.

In 2014 the government introduced Medium-Term Lending (MLF) and Pledged Supplementary Lending (PSL) facilities to encourage financial institutions to provide low-cost financing for the real sector supported by national policies. The credit policy was a priority for the government, which introduced a new tool to support central bank lending and employed a mechanism for dynamic adjustment of the differentiated reserve ratio for counter-cyclical purposes and credit guidance. Furthermore, the upper limit of the floating range for deposit interest rates was raised to 1.2 times the benchmark level, the floating band of the RMB against the US dollar on the inter-bank spot foreign-exchange market was enlarged from one percent to two percent, and the limit on the spread between RMB/USD buying and selling prices offered by designated foreign-exchange banks to their clients was removed. As a result, GDP growth and inflation remained at relative good levels.

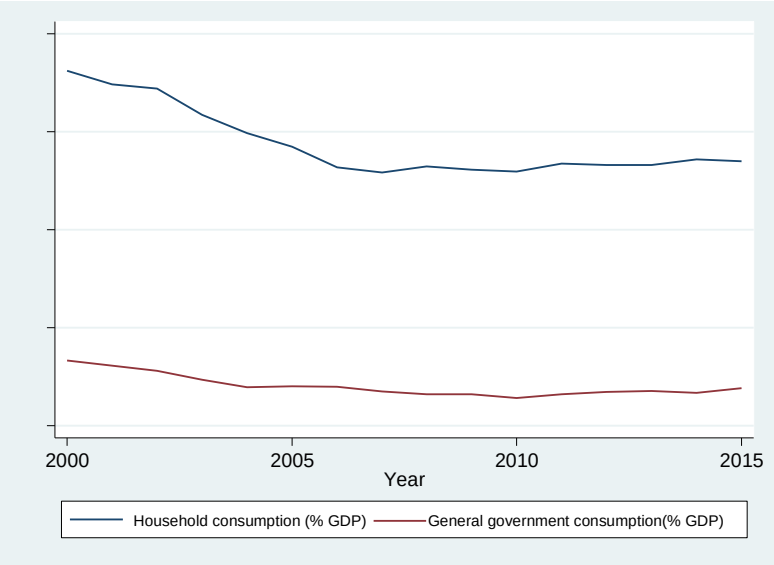
Sound monetary policy was implemented during 2015. The PBC decided to cut not only the benchmark interest rates of RMB deposits and lending (in five occasions during the year), but also the interest rates of credit policy supporting central bank loans, medium-term facility, and PLS. The monetary authority also guided the downward movement of the interest rates of open market repo operations on nine occasions and the quota for central bank lending and discounts was raised several times. The country was able to continue its path of economic growth while maintaining relative price stability.

Once more, in 2016 the Chinese monetary policy was clearly expansionist. The PBC defined it as prudent and sound. Deposit reserve requirement ratio was cut by 0.5 percentage points, medium-term liquidity operations were conducted on a regular

basis, and repo operations remained in use. The PBC continued to improve the RMB exchange rate regime, putting in place a USD/RMB central parity mechanism that features the movements of a basket of currencies. Exchange rate policies thus became more rules-based, transparent and market-based. Prices responded well to those policies, maintaining a relative stable growth path in relation to 2015. More importantly, China was able to sustain its economic growth during the whole year.

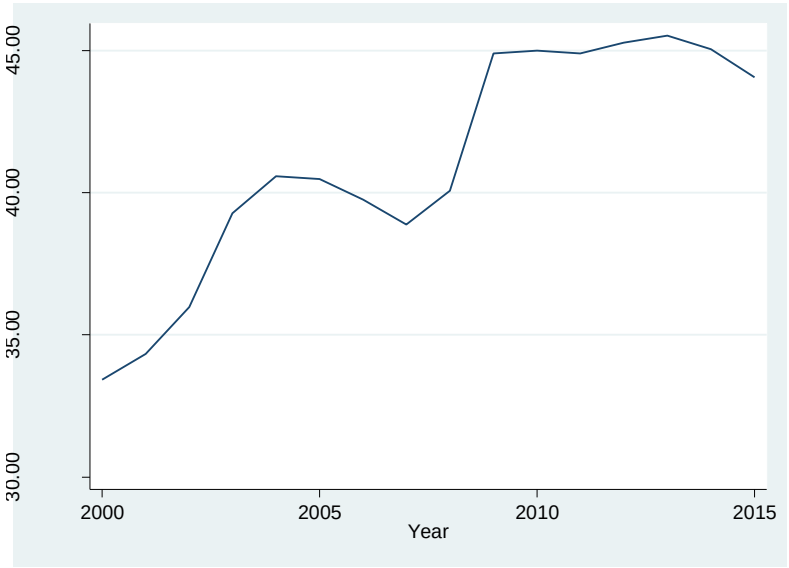
Unlike Brazil, the Chinese recovery was triggered essentially by investments. As can be seen in the graphs below, household consumption followed a decreasing path between 2000 and 2016, but did not vary too much after 2008. On the other hand, the crisis period was marked by increasingly gross capital formation, which can be interpreted as larger investments.

GRAPH XXII – China: Household Consumption (% of GDP) and General Government Consumption (% of GDP), 2000-2015



Graph XXII: chart prepared using Stata. Data: World Bank.

GRAPH XXIII – China: Gross Fixed Capital Formation (% of GDP) from 2000 to 2016



Graph XXIII: chart prepared using Stata. Data: World Bank.

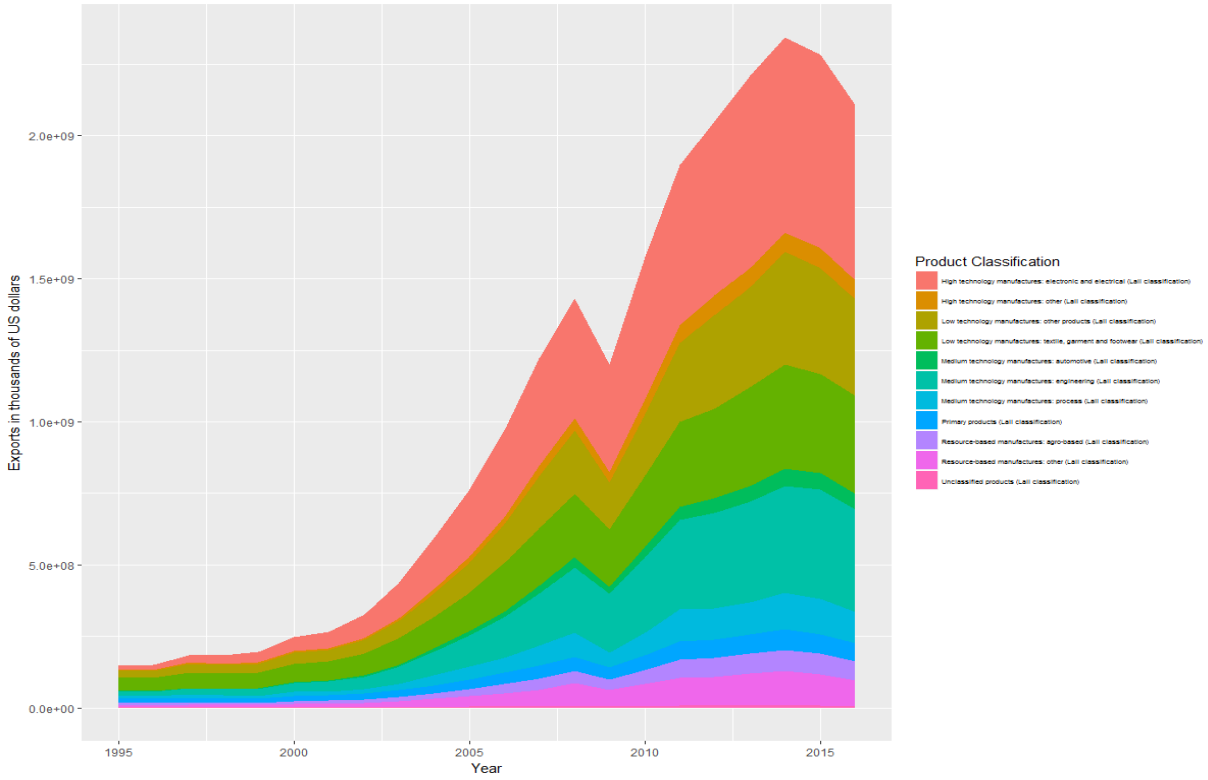
Indeed, the rapid growth of the levels of productive investment, measured by the ratio of investment to GDP, is a peculiar characteristic of the Chinese economy, which is evident when analyzing the spectacular rate of gross fixed capital formation (GFCF) in terms of GDP over the years. The acceleration of productivity growth seems to indicate the efficiency advantage of this trajectory of capital inflows (Lo, 2016).

Maintaining a positive growth path for investments (in terms of gross fixed capital formation) plays an important role in the recovery of the economy, as it opens new growth opportunities for the country. To understand how China has managed to maintain these levels of GFCF, it is necessary to go back to some of the interesting facts of its industrialization process mentioned earlier.

According to Nonnenberg (2010), Chinese industrialization was foster by attracting foreign investments into the Special Economic Zones, where companies received tax incentives, land and other infrastructure facilities such as energy and transport. Futhermore, the SEZs were located alongside suppliers and other industries, as well as research centers, business incubators and state-of-the-art laboratories, which

facilitated the emergence of technological spillovers and played a significant role in Chinese technological development and the change in the export agenda over the last 20 years. In addition, policies to encourage innovation and the transfer and generation of science and technology have been closely linked to incentives for foreign investors. The author asserts that for several years, the granting or encouragement of foreign companies was conditional on commitments to the transfer of technology or the opening of R&D centers in the country. After joining the WTO, these commitments are no longer legal. The grouping of industries, with spillovers, especially the most knowledge-intensive, played a significant role in Chinese technological development and the change in the export agenda (Nonnenberg, 2010).

GRAPH XXIV – China: Diversification of Exported Products, 1995-2016



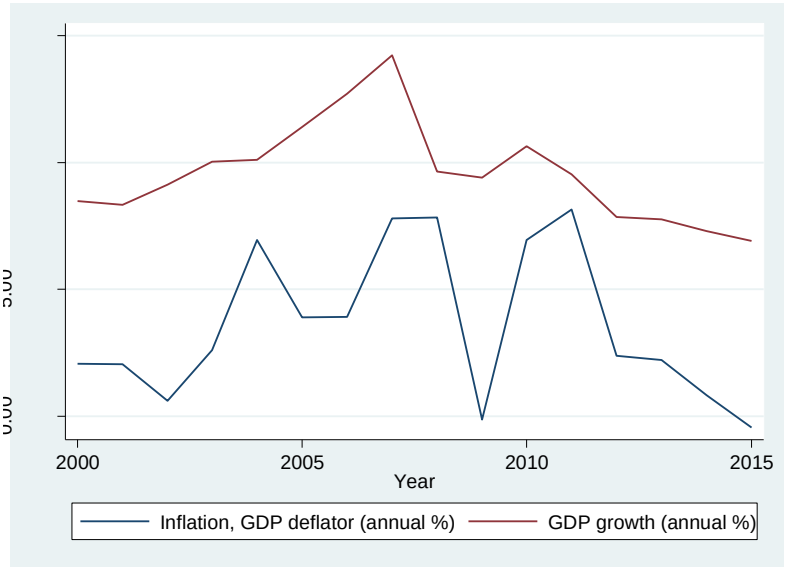
Graph XXIV:UNCTADSTAT Merchandise trade matrix – product groups, exports in thousands of dollars, annual, 1995-2016

It is interesting to note that technology was slowly getting importance in the Chinese exports. It was not an abruptly change. Apparently, the volume of exports of medium technology goods increased first, and then high-tech goods have taken greater

importance. Less complex products have occupied an increasingly smaller portion of the Chinese total exports. On the other hand, the share of high technology manufactures (electronic and electrical) more than doubled since 1995. The industrialization of Chinese exports has taken place over the years, not through a specific policy to deal with the crisis. This means that investments in the infrastructure needed to sustain more technology-intensive production were already underway as the crisis erupted. The higher diversity and complexity of products that China was already exporting in 2008 in comparison to Brazil enhanced it with better industrial capabilities and knowhow, enabling the country with new growth opportunities. This is the theory defended by Hausmann et al (2011) in *The Atlas of Economic Complexity*, which perfectly fits here (despite the fact that the link between the complexity of the country's productive base and its economic recovery during the 2008 crisis is not in the scope of this thesis).

However, it is important to note that “the response to the crisis was far from cost-free” (Breslin, 2012, p.15). One of its main consequences was to destabilize inflation. The graph below illustrates the behavior of inflation (GDP deflator) and GDP growth during the period between 2000 and 2015 using data from the World Bank. It shows that GDP deflator varied in the same direction of GDP growth rate, but its variations were more intense.

GRAPH XXV – China: GDP Growth (annual %) and Inflation (GDP deflator, annual %), 2000-2015

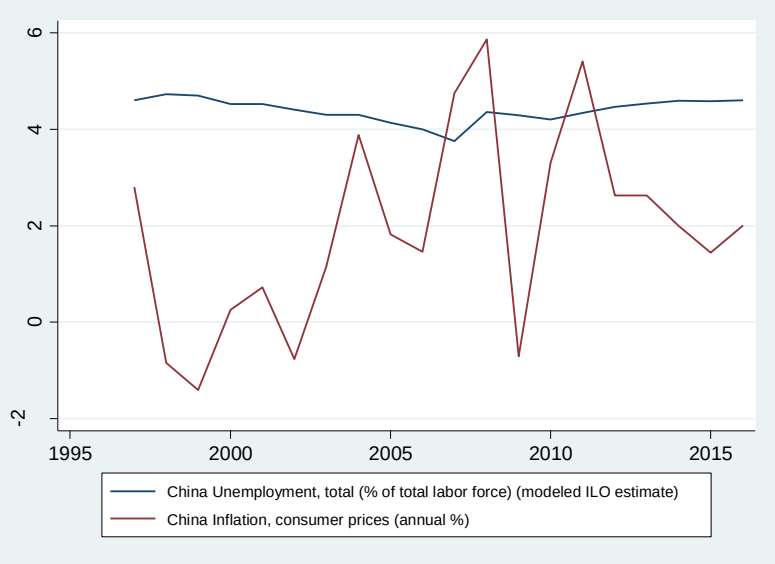


Graph XXV: chart prepared using Stata. Data: World Bank.

Indeed, Lo (2016) claims that the performance of price movements is what most concerns the Chinese state leadership and it is probably the main motivation for reorienting the country's economy toward a policy of austerity, following more neo-liberal principles. The author argues, however, that this is a short-term reaction, which will not necessarily be prolonged in the long run. The country has already experienced similar situations in other periods and has overcome all of them maintaining a policy of fiscal expansion; that is, Lo (2016) does not believe that this is enough to justify the redirection of the Chinese economy.

Likewise, despite the inflation's unstable path, the following graph shows that unemployment rate did not suffer great variations during the analyzed period. According to the information collected in the World Bank Database, the Chinese unemployment rate remained relatively constant between 1997 and 2016.

GRAPH XXVI – China: Unemployment versus Inflation (annual CPI), 1997-2016



Graph XXVI: chart prepared using Stata. Data: World Bank.

Analysts are also concerned about China's public debt. The state is highly indebted and there are signs of excessive investment and overcapacity in the economy. According to Breslin (2012), those are exactly the problems diagnosed before the crisis by the government itself, which attempted to migrate to a more developmental model, but was forced to return to the growth promotion model to counter the effects of the crisis. A slower and more sustainable growth path has found to be more difficult to achieve in practice, considering that the crisis required a rapid resumption of growth, which the Chinese model reached with satisfaction, at least in the short term.

A summary in chronological order of the main policies adopted by the Chinese government since 2007 is shown in the appendix, based on data from Lardy (2012, p. 8-9 *Box 1.1*) and on information collected from the official websites of The Central People's Government of the People's Republic of China, The People's Bank Of China, The State Council of the People's Republic of China, and The National Audit Office of the People's Republic of China.

3.2.2 Econometric Analysis

Following the procedure adopted in the Brazilian econometric analysis, first the variables are presented in level using their natural logarithmic form, as can be seen in the picture below. The graphs represent the path of GDP index, inflation, interest rate, real effective exchange rate, and government's expenditure and revenue during the period between 2000 and 2016. Those are the quarterly data for China. Series do not seem stationary and most of them present an upward trend.

The GDP index behaves in a seasonal way. During the whole period it was possible to observe that national income begins each of the years at a lower level when compared with the previous quarter, and throughout the year it only increases. GDP growth falls only between the last quarter of a year and the first of the following year.

Inflation presented a general upward trend between 2000 and 2016. Surprisingly, 2008 and 2009 represented the two most stable years in terms of price changes, despite the fact that these were the years of the peak of the international crisis.

The Chinese government controls the interest rate and has made few alterations in its level during the period analyzed. There were six adjustments in seventeen years: three increased the rate and the other three did the opposite. Interest rates closed the year 2016 at a very similar level to that of the beginning of the century.

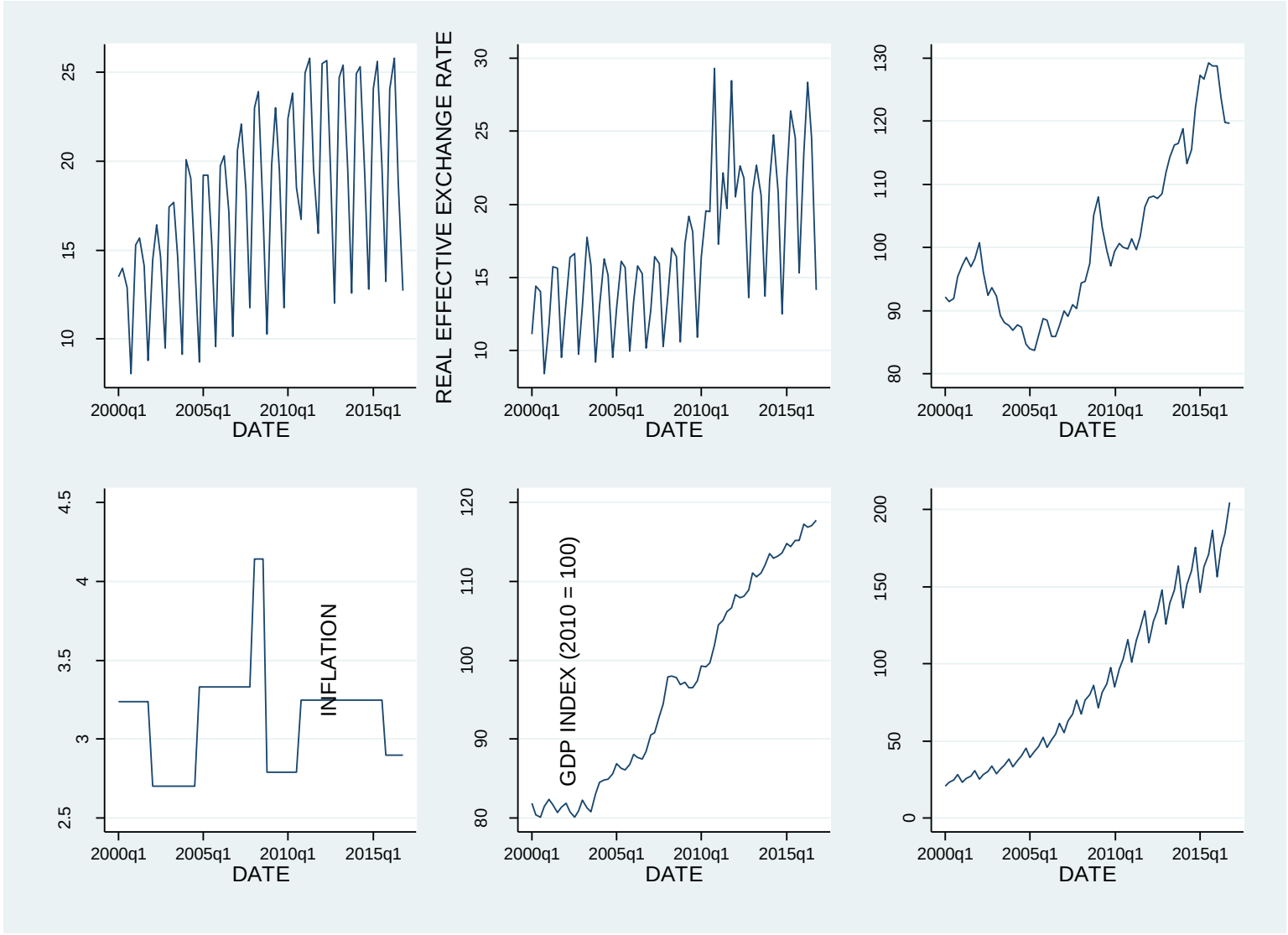
Real effective exchange rate varied a lot besides the government control of its official exchange rate. After 2005, when the exchange rate was made relatively flexible, the Chinese currency began a trajectory of appreciation that lasted until the middle of the crisis, when, in 2009, there was a sharp devaluation of the yuan. Since then small movements of devaluation were recorded, but only at the end of 2015 the currency actually began a process of devaluation that was sustained until the end of the period analyzed.

On the fiscal side, the Chinese economy behaves very seasonally. Government's expenditure and revenue seems to follow the same pattern: values virtually stable in

the first three quarters of each year and a sharp decline in the last quarter. The exceptions are the last quarters of 2010 and 2011, when the drop in revenues was lower than normal and government spending exceeded the amounts recorded in the previous quarters of each year. Indeed, uneven expenditure execution was already noted by Dunaway and Fedelino (2006), signaling that:

> "Generally, it takes about eight to nine months to execute half of the annual expeditures, and about twenty percent of recorded expenditures take place in December alone. This leads to accumulation of fiscal surpluses during most of the year, with a sharp reversal in December. The associated large swings in government deposits significantly complicate the conduct of monetary policy over the course of a year" (Dunaway and Fedelino, 2006, p. 238)

GRAPH XXVII – China: Linear representation of the variables in the model (2000Q1-2016Q4)



Graph XXVII: chart prepared using Stata. Data: described in Appendix.

The Chinese analysis follows the same procedure done in the Brazilian case. First of all, the stationarity of the six series are tested and it is not possible to reject the hypothesis of unit root in most of them. First differences are generated and the ADF test was run again. Based on the results presented below, it is possible to reject the presence of unit root and consider all the series stationeries in first difference.

TABLE 4 – China: Stationarity Test

Series	First Difference Constant	P-value
Gdp	-9.005 (1) ***	0.0000
CPI Inflation	-7.023 (1) ***	0.0000
Interest Rate	-5.573 (1) ***	0.0000
Real Effective Exchange Rate	-6.055 (1) ***	0.0000
Government Expenditure	-11.425 (1) ***	0.0000
Government Revenue	-11.914 (1) ***	0.0000

Source: estimated using Stata.

The SVAR model is going to be run using the number of lags selected using the following criteria: Final Prediction Error (FPE), Akaike's Information Criterion (AIC), Schwarz's Bayesian Information Criterion (SBIC), Hannan and Quinn Information Criterion (HQIC), and Likelihood-Ratio (LR). All of them are shown in the table below, where it is possible to see that LR, FPE, AIC, SBIC and HQIC statistics indicate a model of order four.

TABLE 5 – China: Identifying the order of the model

Lag	LL	LR	P-value	FPE	AIC	SBIC	HQIC
0	536.368			2.4e-15	-166.466	-162.384	-16.486
1	636.294	199.85	0.000	3.1e-16	-18.676	-170.431	-180.338
2	724.409	176.23	0.000	6.2e-17	-203.304	-174.729	-192.066
3	839.847	230.88	0.000	5.5e-18	-228.523	-187.701	-212.467
4	922.441	165.19*	0.000	1.5e-18*	-24.3315*	-19.0246*	-22.2443*

Source: estimated using Stata.

The SVAR's stability condition is checked using the AR Roots test. The results presented in the form of a graph shown below indicates that the model is stable, since all the roots lie within the unit circle.

FIGURE C – China: SVAR Stability Test

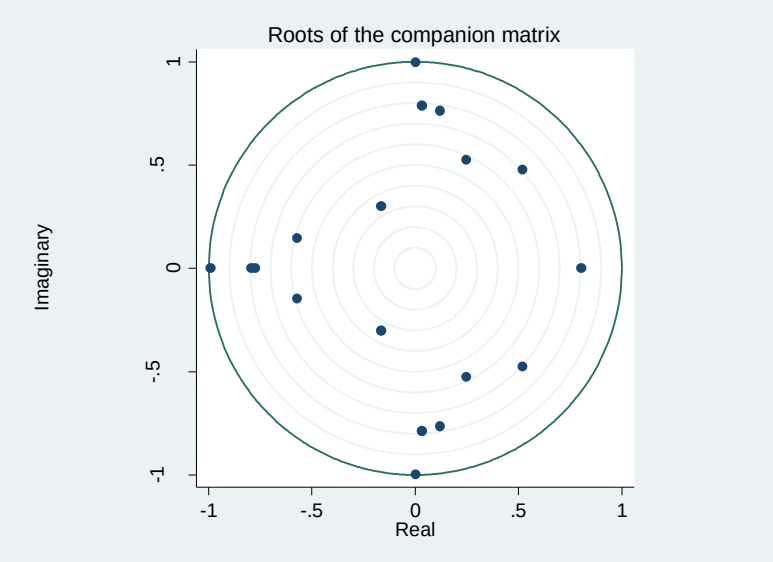


Figure C: Stata test result.

It is now possible to analyze the results from the estimated SVAR of order four. Following it is presented a table containing the forecast error variance decomposition calculated for a period of ten quarters. According to these results, the Chinese domestic product is more affected by macroeconomic policies than the Brazilian GDP. A great part of China's growth may be accounted for policies concerning price stability, interest rate, cambial management and government's finance.

A shock to real effect exchange rate or a shock to government's expenditure does not explain a big part of GDP's growth: only 1.93 percent and 2.69 percent respectively. On the other hand, a shock to interest rate explains 6.02 percent of GDP's growth and a shock to CPI inflation explains 11.37 percent of it. The greatest part of the GDP (almost 30 percent!) is explained by shocks to government revenue, which indicates a high sensibility of the domestic product on fiscal policies.

TABLE 6 – China: Forecast Error Variance Decomposition

Lag	CPI Inflation Impulse	Interest Rate Impulse	Real Effective Exchange Rate Impulse	Government Expenditure Impulse	Government Revenue Impulse
0	0	0	0	0	0
1	0	0	0	0	0
2	0.015027	0.000837	0.009811	0.024454	0.177501
3	0.016553	0.051868	0.009309	0.023535	0.176616
4	0.053753	0.071984	0.022871	0.021531	0.162151
5	0.096884	0.070952	0.018257	0.019883	0.15375
6	0.08924	0.068916	0.018805	0.017817	0.237635
7	0.09142	0.069067	0.018923	0.017804	0.243382
8	0.109761	0.06673	0.022837	0.02284	0.234974
9	0.123305	0.066178	0.020653	0.029394	0.237567
10	0.113686	0.060282	0.019319	0.026957	0.28955

Source: estimated using Stata.

The impulse-response functions are plotted in the following figure, which illustrates the same results. Only the confidence interval of the graph representing a boost in government revenue does not include the zero value and so can be considered significant with security. The other graphs will be analyzed considering this limitation. Indeed, observing the graph it is possible to note the importance that the government's revenue have in explaining the path of China's GDP growth between 2000 and 2016.

The results also reveal that the effect of a shock over the GDP does not disappear after ten quarters. The GDP does not return to its initial level, even if the change has been of small proportion, which corroborates with what was found in the Brazilian case and indicates that macroeconomic policies do impact the long term.

Government budget apparently have strong influence over the Chinese income growth, especially on the revenue side. An impulse in government revenue results in an increase in GDP growth in the first period analyzed, i.e. after two quarters. In addition, two other sudden increases in GDP growth are observed in the sixth and tenth quarters, that is, the shock spreads over the quarters.

The response of the GDP growth rate to a shock in inflation becomes more intense after four quarters. After peaking in the ninth quarter, the effects on GDP begin to decline.

In the case of an impulse on interest rate, the GDP growth rate responds positively especially after the third quarter. The effect reaches the highest point in the fourth quarter and then seems to be maintained at a relatively constant level until the tenth quarter, the last analyzed.

A shock in the real effective exchange rate causes a minimum increase in the GDP growth rate. The effect is slightly more intense in the quarters four, eight and nine.

FIGURE D – China: Impulse Response Functions

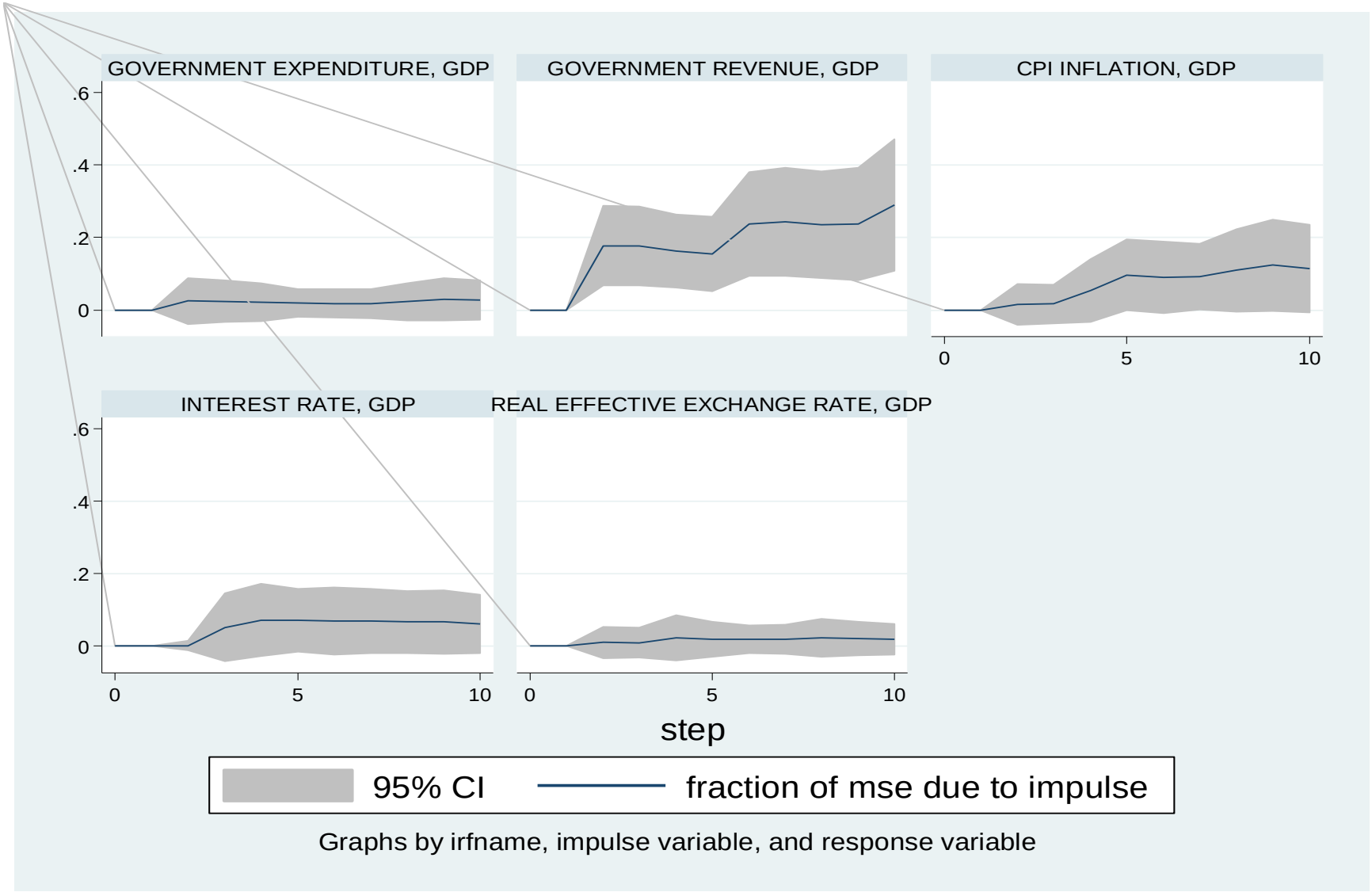


Figure D: Stata IRF results. Data: described in Appendix.

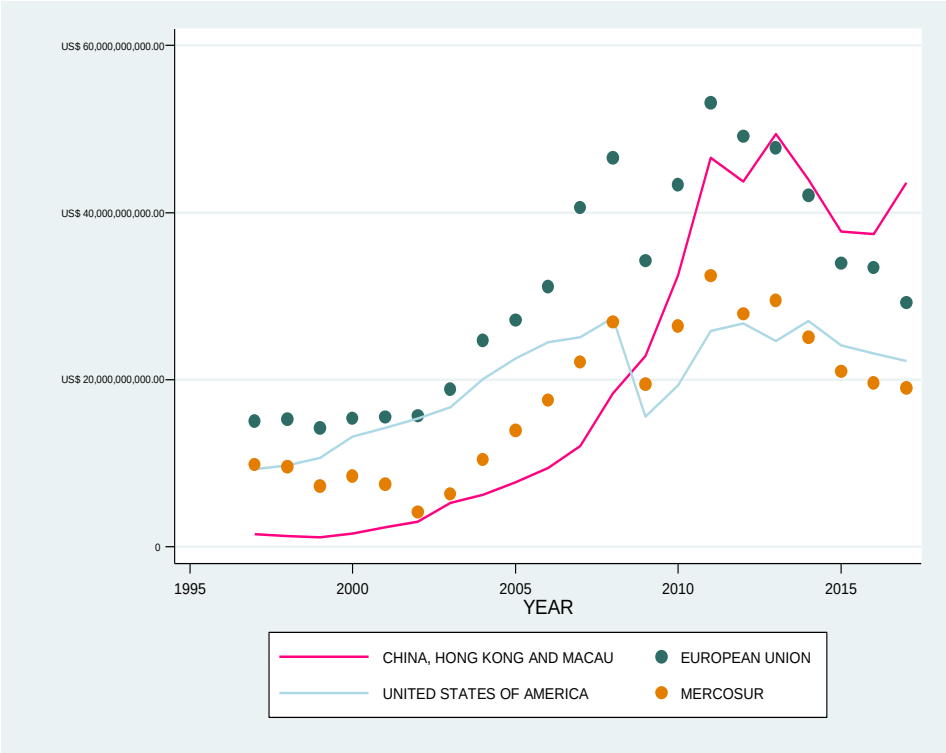
4. THE IMPACT OF CHINESE POLICIES ON THE BRAZILIAN ECONOMY

> “In relation to Brazilian exports, China is the main customer of Vale S/A. In 2011, iron ore accounted for 44.7% of national exports to the Asian country. In relation to the petroleum commodity, in July 2006, Petrobras signed its first export contract with a Chinese company, Sinopec. In 2011, the Brazilian state-owned company sold US$ 4.88 billion to China, up 802% over 2005. The increase in shipments is due to the US$ 10 billion financing granted by the China Development Bank to Petrobras, which is guaranteed to sell the company's oil to state-owned Sinopec. Brazilian agricultural exports to China are dominated by grains and soybean oil. In 2011, Brazil exported 22.1 billion tons of the product to the Chinese, accounting for 41.9% of the total imported by China." (Medeiros and Cintra, 2015, p.35)

The performance of the Brazilian economy in the pre- and post-crisis periods was directly and indirectly influenced by the Asian economy. Directly, by maintaining at reasonable levels the demand for Brazilian products. Indirectly, by influencing commodity prices in the international market, which were at high levels before the crisis (which enabled Brazil to accumulate trade surpluses that helped the country to obtain stronger external conditions to face the international recession), and did not fall so far abruptly as expected after 2008 (retaining the Brazilian advantage as a major commodity exporter).

In fact, as can be seen in the following chart, China reached the position of main export destination during the analyzed period, surpassing even the United States. According to Ferraz (2013), sales to China are highly concentrated in commodities, especially iron ore and soy products, which justify China's contribution to Brazilian growth through the maintenance of prices of primary products at advantageous levels.

GRAPH XXVIII – Brazilian Exports: Main Partners (1997-2017)



Graph XXVIII: chart prepared using Stata. Data: Brazilian Ministry of Industry, Foreign Trade and Services.

For Medeiros and Cintra (2015), the Chinese rise importance to the world trade stems from the intensification of urbanization and industrialization processes articulated by the government since the 1980s. As a country with a large population and low income per capita, the process of urbanization and modernization of Chinese consumption is heavily intensive in raw materials and energy, and it is the increasing demand for these goods that fuels the world economy. Thus, the Asian country functioned as a source of international demand before, during and after the financial crisis. According to Medeiros and Cintra (2015), the great Chinese demand for natural resources directly influenced the rise in the price of commodities, the change in the terms of trade and the strong external demand for primary goods, which led to positive results in the balance of payments of many Latin American countries. Due to the China effect, the demand for commodities after 2008 did not fall so significantly and their prices recovered after a brief period of decline, allowing the return of the Brazilian exports' growth.

Ferraz (2013) states, however, that the maintenance of international demand for commodities largely influenced by China has aggravated Brazil's specialization in

products with low technological content and its dependence on the Chinese market. What is observed is somewhat similar to the situation analyzed by Raul Prebisch in the 1950s, when the shift from the main economic center to the US made the Latin American growth model (based on exports of primary and complementary products to the English industrial production structure) unable to generate the rhythm of growth and investments previously observed in the region (Medeiros and Cintra, 2015). Today, there are two main differences: the new economic center is represented by China; and the deterioration of the terms of trade is relativized by the positive evolution of commodity prices.

In Brazil, the reprimarization of its exports is evident (see Graph XII), but Medeiros and Cintra (2015) assert that the Brazilian production of industrialized goods were also positively affected. Chinese demand for commodities has increased not only the exports of primary products but also those of industrialized products, since the main destination of manufactured and semi-manufactured Brazilian goods is Mercosul, which is composed of countries that are also producers of commodities and, therefore, were as benefited by growing Chinese demand as Brazil.

The greater expansion of the import capacity of the Mercosul (Southern Common Market) countries allowed Brazil to increase its industrial exports, but also increased the rivalry with the exports from China in the region. The signing of free trade agreements between China and countries in the region threatens economic spaces once occupied by Brazilian companies, and the relative or absolute loss of market share of domestic industrial producers for Chinese exports is a central challenge with important impacts on the exports structure (Medeiros and Cintra, 2015).

All this scenario of greater dependence on the Chinese economy poses an even greater challenge now that China apparently reorients its economy to the aforementioned "normal new" state. Traditional commodity exporters such as Brazil should be concerned with the diversification and structural adaptation of their production regimes as the relative decline of the Chinese manufacturing sector and the slowdown in construction and infrastructure investments in the country would mean a drop in demand for these products in the international market (Moura, 2015).

5. FINAL REMARKS

The stimulus programs adopted by the central banks after the crisis sought to stimulate the economy and accelerate growth through an increase in the monetary base and an acceleration of inflation. The strategy is known as quantitative easing, unconventional monetary policy adopted in the face of the ineffectiveness of traditional monetary policy to control inflation levels and stimulate economic growth. An increase in the monetary base - through the purchase of public debt securities and other financial instruments - implies an increase in the amount of currency in circulation. This reduces its currency value and stimulates the rise in prices. The quantitative easing was adopted in the 1990s in Japan, at the end of 2008 in the United States, in 2011 and in several other occasions until today in the Eurozone, and in 2009 in England. The objective was to reduce long-term interest rates to stimulate aggregate demand and promote economic growth. Pass these expansive policies, the recessionary bias of the world economy has prolonged more than anticipated, generating social tensions and increasing the questioning of globalization and the traditional economic model (ECLAC, 2016).

The situation reawakened the interest of scholars in the Keynesian model, and China soon caught the attention of economists who praised the country “for boosting domestic growth and stabilizing the global economy by taking swift, exemplary Keynesian stimulus measures” (Jiang, 2015, p.360). In this thesis, the Chinese case is studied in comparison with the Brazilian situation through the examination of the relative effectiveness of monetary and fiscal policies using a SVAR model. National quarterly data for the period between 2000 and 2016 were used with the intent to capture possible changes in the macroeconomic framework after the 2008 financial crises. The main findings show that the effectiveness of monetary and fiscal policies varies a lot across the two countries. However, both strategies seem to be effective in promoting economic growth, albeit with different intensities.

The Brazilian economic growth apparently responds more effectively to shocks in monetary policy. Analyzing the impulse response graphs, it is possible to observe

that it was the changes promoted by the monetary authority in the interest rate that have most driven the economy during the period analyzed when considering just the six variables in the model. Although there was no disruption of the inflation-targeting regime, which remained one of the central pillars of the government's macroeconomic policy, there were significant changes in the operationalization of monetary policy and in the use of its main instrument, the SELIC target rate. These changes had two important consequences: they enabled the BCB to increase its degree of freedom of action in the face of fluctuations in economic activity and produced a better coordination of monetary policy with other macroeconomic policies (Cagnin et al., 2013).

On the fiscal side, Brazilian policies appear to be limited by fiscal rules established for more than ten years, which no longer fit the needs of the country's economy. The fiscal rules follow the parameters of the Fiscal Responsibility Law (FRL) and the primary surplus targets regime, which are simple but very rigid. Thus, in the face of extraordinary events such as the crisis of 2008, the capacity of governmental maneuvers on the fiscal side does not reach its full power. Although initially able to use countercyclical fiscal policies to stimulate economic growth, as early as 2009 the government faced limited funding capacity from fiscal targets. This may be one of the reasons why the SVAR model gives monetary policies most of the GDP growth over the period analyzed. Therefore, it is extremely important to review the paradigm of Brazilian fiscal policies, in order to make the primary surplus targets more flexible, at least in times of crisis.

As stated by Gobetti (2014), the transparency and credibility of public accounts must be restored, the fiscal goals of flexibility must be set over the economic cycle in order to avoid pro-cyclical policies, to stabilize current expenditure growth so as to reduce the tax burden and expand public investment without jeopardizing debt sustainability. With this objective the author proposes the adoption of a "structural" concept in the definition of surplus targets. According to Gobetti (2014), cyclical effects would be expurgated from the current account balance of the public accounts (i.e. the nominal result excluding the investments), giving the fiscal policy more flexibility and transparency. This would be a first step towards an economy more prepared to face adversities, but to make such a decision it is essential to first understand the significant role the state has in the economy. The path

adopted by the current administration definitely does not recognize the importance that the central government has had in the economic growth of the country in the last decades and seeks to reduce the state's performance in this area. This seems not to be the solution, taking into account what has been presented in this thesis.

In China, it is the government revenue that played a central role in explaining the path of the country's GDP growth between 2000 and 2016. Since the 1990's the government's revenue has been increasing rapidly, especially because of fast economic growth, tax-for-fee reforms, reinforcement of tax laws, strengthened collection of tax and non-tax revenue (Lin, 2011). As a consequence, the government revenue share in GDP has grown, which justifies its importance as a growth promotion factor in China.

Contrary to what many economists and scholars point out, Chinese exchange rate policies seem to have little effect on the country's GDP. Shocks in China's real effective exchange rate responds to the manor part of its GDP growth between 2000 and 2016. Indeed, during this period the government implemented several measures to strengthen the exchange market, including the adoption of a managed floating exchange rate regime in 2005. Since then the Chinese exchange rate is based on market supply and demand with reference to a basket of currencies.

Both countries reacted promptly after the crisis, which they were able to do especially because of their relatively low debt ratios. Brazil and China were trying to manage their macroeconomic structure before 2008, when they endorsed measures to promote economic stability. Furthermore, they were adopting structural adjustment policies, which brought in "more foreign funding, […] and this has a beneficial effect on short-term (Keynesian) growth" (Corden, 1990, p. 73). This has resulted in favorable fiscal and monetary positions when the crises broke out.

Indeed, Brazil and China used countercyclical measures to face the crisis. The main difference between the two experiences was the way through which each country attempted to promote fiscal expansion. The Chinese government's reserves were large enough to finance productive investments in infrastructure

and foster economic growth. In Brazil, however, whether for lack of money or differences in the government economic vision, fiscal expansion was largely due to fiscal incentives. In practice this meant waiving public revenue, which may have complicated the balance of government accounts in the short and medium term.

Still, another affinity between the countries' experiences concerns the behavior of unemployment and inflation rates during the last twenty years. According to the Brazilian and Chinese experiences, it was not possible to affirm that inflation and unemployment are negatively correlated as predicted in theory by the Phillips curve. This is an important result because it signals the lesser importance of price stability. In other words, the pursuit of a low inflationary level may be less important to the real side of the economy than previously thought. However, one must consider the changes in the relationship between labor market and inflation introduced mainly with the advent of the recent technological revolution. The redirection of the economy to less labor-intensive sectors definitely affects the Phillips curve, especially in China, where there has been an increase in the production of technology-intensive products.

The similarities between Brazil and China are probably limited to these points. Differences between countries are natural considering that their policymakers not only had different tools and resources available, but they might also have had different objectives. It is also noted that the policies adopted by the Chinese government were much more microeconomic than those adopted by Brazil, since the former promoted more structural reforms in the economy. This may have influenced the effectiveness of economic policies, since the transmission of such measures to the real side of the economy is much clearer and more transparent in a well-structured environment.

Briefly summarizing, China was not afraid of hiking its government expenditure and issuing more debt to fund infrastructure projects, especially because it had been promoting those kinds of policies since the Asian crisis in the late 1990's. On the other hand, the Brazilian government was more cautious in its countercyclical measures, perhaps because of its troubled history of fighting inflation and the limitations imposed by the model of fiscal rules adopted in the country. Brazil has also experienced a period of political instability that has not been experienced by

China. Since mid-2014 the Brazilian political class has been very disjointed, which makes it difficult to adopt macroeconomic measures that require parliamentary authorization, for example. This has influenced the government to redirect the direction of economic policies in the country on several occasions. In practice, this means that it is very challenging to analyze the medium and long-term effects of the actions taken since the outbreak of the crisis. As evidenced by IRF charts, macroeconomic policies have long-lasting effects, and changing their steering so often can reduce their potentials. Unlike Brazil, China has maintained the ideology of its policies throughout the whole period under review, and perhaps this is why it has achieved better results.

In this sense, the crash revealed that there are limits to what even omniscient policymakers can do to stabilize the economy in the face of shocks with the levers at their disposal (Barwell, 2016, p. 457). Much of the growth trajectory of Brazilian and Chinese products was directly influenced by the international scenario, especially the European crisis, under which the two national governments being analyzed have no control.

One of the main consequences of the crisis has been to discredit Western views of development (Williamson, 2010 apud Breslin, 2012). The Chinese model gained notoriety after the crisis, because it represents an alternative to these visions.

> “[...] the China model has become a standard bearer for what it is not; it is not big bank shock therapy liberalization, it is not economic liberalization accompanied by political democratization, and it is not doing what the international liberal global order wants—for example, liberalizing financial sectors and allowing free-floating market exchange rates.” (Breslin, 2011 apud Breslin 2012, p.18)

Of course, this does not mean that all developing countries are in a position to simply copy what China has done. But China’s experiences through not just this crisis but also through the late Asian crisis have served to give succor to those who prefer various forms of stronger state controlled versions of capitalism over more neoliberal forms. (Wade, 2010; Stubbs, 2011 apud Breslin 2012, p.18).

For Brazil, this may be the signal that the exit from the crisis is not in the New Macroeconomic Consensus, based on the regime of inflation targets and the

neutrality of fiscal policy to ensure price stability and the solvency of public debt, in addition to flexibility of wages and the labor market to boost the total-factor productivity (TFP), capital mobility and floating exchange rate. In an economy with a state component directly involved in growth, it is reasonable to consider a discretionary monetary policy model, central bank as lender of last resort, countercyclical fiscal policy, floating (but managed) exchange rate, and control of capital flow (Ferrari Filho, 2017). In sum, the idea is to recover the regulatory and stabilizing capacity of the state, implement structural and institutional reforms, and coordinate fiscal, monetary and exchange policies. This is the post-Keynesian solution proposed by Ferrari Filho (2017), which would be conditional on the stabilization of the economy, that is, a situation of controlled inflation, sustainable growth and fiscal and external equilibriums. For this objective to be achieved, the main challenge for Brazil is to strengthen its own institutions, which will be responsible for ensuring the applicability of the policies adopted. The quality of institutions is definitely a determining factor for the political and economic prosperity of a country (Acemoglu and Robinson, 2012).

The issue of the use of macroeconomic policies in overcoming financial crises is an extensive topic that was only partially addressed in this thesis. It is necessary to analyze several other aspects such as the degree of influence of each of these policies on GDP growth through the calculation of monetary and fiscal multipliers, for example. It is also possible to verify the effects of macroeconomic policies on other spheres of the economy, such as poverty and inequality, following the analysis of Ball et al. (2013). Finally, it is possible to analyze the economic sectors that most drive growth and, therefore, determine which of them should be the focus of public investments when adopting countercyclical fiscal policies. These studies can be of great help in determining a path towards economic development.

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APPENDIX

TABLE 7A – Description of Basic Data

(to be continued)

VARIABLE	DESCRIPTION	SOURCE
Brazilian GDP	Expenditure-based gross domestic product, which is total final expenditures at purchasers' prices (including the f.o.b. value of exports of goods and services), less the f.o.b. value of imports of goods and services. Data are seasonally adjusted growth based on Brazil's own system of national accounts.	OECD - Main Economic Indicators Publication
Brazilian GDP Growth (Index, 2010 = 100)	Variation of the quarterly amount of the national product, according to the values in domestic currency of the index from the OECD Main Economic Indicators Publication. Measured as an index, using 2010 as the base year.	Author's calculation based on OECD - Main Economic Indicators Publication
Brazilian CPI Inflation (Index, 2010 = 100)	Consumer Price Indices presented as an index where the year 2010 is the base year. Measures the average changes in the prices of consumer goods and services purchased by households.	OECD - Main Economic Indicators Publication
Brazilian Interest Rate	Official discount rates and call-money rates presented in percentage. The official discount rate is the rate at which central banks make advances to, or discount eligible bills of exchange for, selected banks and other financial intermediaries. There are often strict rules regarding the quality of securities which will be accepted as collateral for the advances and regarding the eligibility of bills of exchange to be discounted. In the case of the latter, normally they must be of limited duration to maturity, commercial and not financial paper, and guaranteed by parties known to be solvent. Additionally, there are limits on the amount of credit available. Call money and day-to-day loans play a predominant role in interbank money dealings and between banks and money market dealers. Day-to-day loans usually refer to operations on the money market between banks to balance temporary surpluses and shortages of liquidity. These operations are sometimes conducted through the central bank. Call money generally refers to secured or unsecured 'at-call' loans made by banks to money market dealers. It is occasionally used for the flow of funds from financial institutions with an excess of their own funds and deposits (in relation to customers' demands) to institutions with a shortage.	OECD - Main Economic Indicators Publication

Source: Prepared by the author based on the literature.

TABLE 7B – Description of Basic Data

(to be continued)

VARIABLE	DESCRIPTION	SOURCE
Brazilian Real Effective Exchange Rate (Index, 2010 = 100)	Competitiveness-weighted relative consumer prices and unit labor costs for the overall economy in dollar terms presented as an index where the year 2010 is the base year. Competitiveness weights take into account the structure of competition in both export and import markets of the goods sector of 49 countries. An increase in the index indicates a real effective appreciation and a corresponding deterioration of the competitive position. Quarterly data are averages of monthly figures.	OECD - Main Economic Indicators Publication
Brazilian Government's Expenditure	Total of primary expenditure incurred by the federal administration. It is subdivided into expenditures of the National Treasury (personnel and charges, costs and capital, transfers to Central Bank), Social Security expenditures (social security benefits) and Central Bank expenses.	Ministry of Finance of Brazil - Secretariat of the National Treasury
Brazilian Government's Expenditure as % of GDP (Index, 2010 = 100)	Using the Brazilian GDP and the Brazilian's Government Expenditure data from OECD and the Secretariat of the National Treasury, respectively, it is measured as (expenditure/GDP)*100. The results are then transformed into index using 2010 as base year, in order to avoid negative values.	Author's calculation based on data from Ministry of Finance of Brazil - Secretariat of the National Treasury
Brazilian Government's Revenue	Total tax collection, taxes and contributions, and other revenues collected by the Federal Public Administration. To a large extent, they consist of current revenues and are composed of taxes, social and economic contributions, concessions, dividends, donations, covenants and arising from the own collection effort of each budget unit.	Ministry of Finance of Brazil - Secretariat of the National Treasury
Brazilian Government's Revenue as % of GDP (Index, 2010 = 100)	Using the Brazilian GDP and the Brazilian's Government Revenue data from OECD and the Secretariat of the National Treasury, respectively, it is measured as (revenue/GDP)*100. The results are then transformed into index using 2010 as base year, in order to avoid negative values.	Author's calculation based on data from Ministry of Finance of Brazil - Secretariat of the National Treasury
Chinese GDP	Expenditure-based gross domestic product, which is total final expenditures at purchasers' prices (including the f.o.b. value of exports of goods and services), less the f.o.b. value of imports of goods and services. Data are seasonally adjusted growth based on China's own system of national accounts.	OECD - Main Economic Indicators Publication
Chinese GDP Growth (Index, 2010 = 100)	Variation of the quarterly amount of the national product, according to the values in domestic currency of the index from the OECD Main Economic Indicators Publication. Measured as an index, using 2010 as the base year.	Author's calculation based on OECD - Main Economic Indicators Publication
Chinese CPI Inflation (Index, 2010 = 100)	Consumer Price Indices presented as an index where the year 2010 is the base year. Measures the average changes in the prices of consumer goods and services purchased by households.	OECD - Main Economic Indicators Publication

Source: Prepared by the author based on the literature.

TABLE 7C – Description of Basic Data

(to be continued)

VARIABLE	DESCRIPTION	SOURCE
Chinese Interest Rate	Official discount rates and call-money rates presented in percentage. The official discount rate is the rate at which central banks make advances to, or discount eligible bills of exchange for, selected banks and other financial intermediaries. There are often strict rules regarding the quality of securities which will be accepted as collateral for the advances and regarding the eligibility of bills of exchange to be discounted. In the case of the latter, normally they must be of limited duration to maturity, commercial and not financial paper, and guaranteed by parties known to be solvent. Additionally, there are limits on the amount of credit available. Call money and day-to-day loans play a predominant role in interbank money dealings and between banks and money market dealers. Day-to-day loans usually refer to operations on the money market between banks to balance temporary surpluses and shortages of liquidity. These operations are sometimes conducted through the central bank. Call money generally refers to secured or unsecured 'at-call' loans made by banks to money market dealers. It is occasionally used for the flow of funds from financial institutions with an excess of their own funds and deposits (in relation to customers' demands) to institutions with a shortage.	OECD - Main Economic Indicators Publication
Chinese Real Effective Exchange Rate (Index, 2010 = 100)	Competitiveness-weighted relative consumer prices and unit labor costs for the overall economy in dollar terms presented as an index where the year 2010 is the base year. Competitiveness weights take into account the structure of competition in both export and import markets of the goods sector of 49 countries. An increase in the index indicates a real effective appreciation and a corresponding deterioration of the competitive position. Quarterly data are averages of monthly figures.	OECD - Main Economic Indicators Publication
Chinese Government's Expenditure	The distribution and use of the funds the government finance has raised, so as to meet the needs of economic construction and various causes.	Chinese National Bureau of Statistics - Ministry of Finance of the People's Republic of China
Chinese Government's Expenditure as % of GDP (Index, 2010 = 100)	Using the Chinese GDP and the Chinese's Government Expenditure data from OECD and the Ministry of Finance of the People's Republic of China, respectively, it is measured as (expenditure/GDP)*100. The results are then transformed into index using 2010 as base year, in order to avoid negative values.	Author's calculation based on data from Chinese National Bureau of Statistics - Ministry of Finance of the People's Republic of China

Source: Prepared by the author based on the literature.

TABLE 7D – Description of Basic Data

(end)

VARIABLE	DESCRIPTION	SOURCE
Chinese Government's Revenue	The revenue of the government finance by means of participating in the distribution of the social products, which is the financial resources for ensuring the government to function. Includes various taxes revenues, special revenues, other revenues and planned subsidies for the losses of the state-owned enterprises.	Chinese National Bureau of Statistics - Ministry of Finance of the People's Republic of China
Chinese Government's Revenue as % of GDP (Index, 2010 = 100)	Using the Chinese GDP and the Chinese's Government Revenue data from OECD and the Ministry of Finance of the People's Republic of China, it is measured as (revenue/GDP)*100. The results are then transformed into index using 2010 as base year, in order to avoid negative values.	Author's calculation based on data from Chinese National Bureau of Statistics - Ministry of Finance of the People's Republic of China
US GDP	Expenditure-based gross domestic product, which is total final expenditures at purchasers' prices (including the f.o.b. value of exports of goods and services), less the f.o.b. value of imports of goods and services. Data are seasonally adjusted growth based on United States' own system of national accounts.	OECD - Main Economic Indicators Publication
US GDP Growth (Index, 2010 = 100)	Variation of the quarterly amount of the national product, according to the values in domestic currency of the index from the OECD Main Economic Indicators Publication. Measured as an index, using 2010 as the base year.	Author's calculation based on OECD - Main Economic Indicators Publication

Source: Prepared by the author based on the literature.

TABLE 8A – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2000	· Four cuts of benchmark interest rate (SELIC) · Pension reform limits the contribution of the public sector as a sponsor for pension funds · Approved the Fiscal Responsibility Law: institutionalization of a policy of transparency and fiscal discipline at the three levels of government · IMF agreement: early repayment of loans granted under the 1998 agreement
2001	· The benchmark interest rate (SELIC) was lowered in one occasion (January) and raised in five occasions, beginning in March · A first adjustment was made to the fiscal targets at the time of the Budget Guidelines Bill for 2002. A consolidated public sector fiscal surplus target of 3 percent for the period 2002-2004 was adopted instead of the previous 2.7 percent for 2002 (which should decrease in the subsequent years) · Change in fiscal surplus targets from 2001 to 2004. The target for the consolidated public sector in 2001 went from 3 percent to 3.35 percent of GDP, while for the period 2002-2004 the target was set at 3.5 percent Of GDP, representing an additional 0.5 percentage point · IMF agreement: US $ 2007 billion withdrawal from the 1998 agreement (28/6); Announcement of the release of another US $ 15 billion in preventive (03/08); Cancellation of the 1998 agreement and request for a new agreement (23/8); Stand-by agreement until December 2002 (09/09)
2002	· By September, the benchmark interest rate (SELIC) had already been cut three times · The Central Bank raised it two times later, one in October and one in November · Extension of the Provisional Contribution on Financial Transactions (CPMF) until the end of 2004 · IMF agreement: revision of the 2001 stand-by agreement, which released an additional $ 5 billion (25/3); Release of another tranche of US $ 10 billion from the September 2001 agreement (21/6); Approval of the 15-month stand-by agreement in the amount of US $ 30 billion (6/9); First review of the last stand by agreement (9/12)
2003	· Two rises in benchmark interest rate (SELIC) until May and seven cuts after · Expansion of the fiscal surplus target of 2003 to 4.25 percent of GDP · Government forwarded to the National Congress proposals for Social Security and Tax Reforms

Source: Prepared by the author based on the literature.

TABLE 8B – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2003	· Decline in discount and lengthening of the issuance of Financial Treasury Bills (LFT) · Fixed income securities (National Treasury Bills - LTN) start to be issued again · Raise in the participation of fixed-rate securities in public debt, which increased from 1.9 percent in January 2003 to 6.3 percent in July 2003 · Redefinition of the inflation target to 5.5 percent and 4.5 percent in 2004 and 2005, respectively, both with a tolerance interval of 2.5 percent to accommodate the possibility of unexpected shocks · At its February 2003 meeting, the Monetary Policy Committee (COPOM) raised the compulsory reserve requirements on banks' demand deposits to 60 percent · At its meeting in August 2003, the Monetary Policy Committee (COPOM) reduced reserve requirements to 45 percent · The government announced a set of measures aimed at expanding credit and access to other financial products for the low-income population: Free Admission Credit Cooperatives; Simplified Special Accounts for Demand Deposit; Simplified Microloan; Expansion of the Resources of the Worker Support Fund (FAT) for Working Capital for Micro and Small Enterprises and for the purchase of construction material · National Bank for Economic and Social Development (BNDES) releases R$ 3 billion for micro, small and medium enterprises · Cuts and rationalization of expenses (Program of Optimization and Reduction of Costs) · Issued BRA-2007N bonds in the amount of US $ 1 billion and maturing in January 2007 · Issued Global BRA-2013 bonds in the amount of US $ 1.25 billion and maturing in June 2013 · Agriculture was included in the scope of the 2003/2004 Harvest Plan (Plano Safra) with R$ 27.2 billion · The Plan for Family Farming (Plano Safra para Agricultura Familiar) 2003-2004 was launched, with resources of R$ 5.4 billion · Approved a credit line in the amount of R$ 220 million for application in technological innovation projects, and R$ 517.4 million in lines of credit for research projects financed through the Financing Agency for Studies and Projects (FINEP)

Source: Prepared by the author based on the literature.

TABLE 8C – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2003	· BNDES released R$ 830 million to the "Malhas Sudeste e Nordeste" project, designed by Petrobrás, to expand the natural gas transportation network in these regions · BNDES approved the financing of R $ 144.7 million for the construction of a hydroelectric plant in the Paraguaçu River, Bahia · BNDES released US$ 1.2 billion for two exploration platforms destined for Petrobrás and financed US$ 45 million for the construction of two maritime support vessels for oil platforms · In the transportation sector, R$ 116.1 million were released for the restoration of 967 km of highway; R$ 52.9 for the restoration and decentralization of 293 km of federal highways and R$ 108 million for the maintenance of 2,589 km of highways under outsourced management · In the first half of 2003, the Constitutional Financing Funds injected R$ 1.0 billion in the North, Northeast and Central West regions · Rationalization of public resources through the unification of income transfer programs · IMF agreement: letter of intent of the second revision of the standby agreement of 2002 (28/2); Letter of intent for the third revision of the 2002 standby agreement (13/6); Letter of intent of the fourth revision of the 2002 standby agreement (28/8); Letter of intent concerning new agreement (15/12)
2004	· In the first semester, the Central Bank lowered the benchmark interest rate (SELIC) in two cuts occasions. During the rest of the year, it was raised four times · Implemented by BNDES, with funds from the Bank and FAT, a program in favor of the modernization of the National Industrial Park, providing R$ 2.5 billion at fixed interest rates · Reduction of the IPI levy on a list of capital goods, from 5 percent to 3.5 percent. The list of products was subsequently expanded and the tax rate reduced from 3,5 percent to 2,0 percent · Extension of the calculation period and collection of IPI from fortnightly to monthly · Expansion of the tax exemption on Mortgage Bonds (LHs), Real Estate Credit Letters (LCIs) and Real Estate Receivables Certificates (CRIs) maintained by individuals · Reduction of IOF on life insurance from 7 percent to 4 percent in September 2004. The rate should be reduced to 2 percent in September 2005 and zeroed in September 2006

Source: Prepared by the author based on the literature.

TABLE 8D – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2004	· New income tax rates were adopted for variable income and fixed income investments in the country: rate for investments in shares in the spot market and in stock funds was lowered from 20 percent to 15 percent; a decreasing taxation criterion was adopted for investment funds and other fixed income investments · Implementation of zero rate of COFINS and PIS / PASEP for certain products · Public-Private Partnerships Program (PPP), governed by Law No. 11,079 of December 30, 2004, which establishes rules of transparency, competitiveness, efficiency and fiscal responsibility in the contracting of administrative and sponsored concessions · IMF agreement: letter of intent of the sixth revision of the standby agreement of 2002 (26/3) letter of intention of the seventh revision of the standby agreement of 2002 (3/6); Letter of intent of the eighth revision of the standby agreement of 2002 (23/9); Letter of intent of the ninth revision of the standby agreement of 2002 (15/12)
2005	· Five rises in benchmark interest rate (SELIC) until August and four cuts during the rest of the year · Creation of the Proagro Mais program, which performs the insurance function of production and (partial) income for family farmers · Availability of a housing credit line of R$ 1.0 billion, directed to the middle class, the Federal Savings Bank (CEF) · Approved the Bankruptcy and Recovery of Companies Act to stimulate the credit market by reducing the risk of the borrower · Phase out of the exchange exposure of public debt through the placement of reverse currency swaps and the repurchase of sovereign debt securities · Unification of foreign exchange markets and new foreign exchange regulations on exports · Launch of the Public Investment Pilot Project (PPI), designed under the last IMF agreement, with the intention of making public investments of high economic impact feasible. The amounts corresponding to PPI can be deducted from the primary surplus target, equivalent to 0.5 percent of GDP in the period 2005-2007

Source: Prepared by the author based on the literature.

TABLE 8E – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2005	· The Commission of External Financing (COFIEX) approved the first credit operation with the World Bank, through the modality Focus Sector Wide (SWAP), directed to the Bolsa Familia program, which allowed the entry of US$ 0.5 billion in foreign funds and contributed to the increase of Brazilian reserves · There was no renewal of the agreement with the IMF, which had been extended since 1998 and soon thereafter the existing debt was paid in advance
2006	· Eight cuts of benchmark interest rate (SELIC) · Announced measures partially relaxing the requirement of exchange coverage of exports, enabling the regularization of foreign capital registers in reais and allowing the purchase of products in freeshops with payments in national currency · International reserves recomposition policy: BACEN acquires US$ 14.5 billion in the market in the first half of 2006 · Launched a program of anticipation of amortization of interest by the National Treasury, initially contemplating the bonds issued by the Republic with maturity expected until 2010 and thereafter until 2020. The acquisition of securities in the secondary market totaled US$ 5.9 billion in face value · Early settlement of the debt with the Paris Club in the amount of US$ 2.6 billion · Repayments of US$ 5.9 billion in secondary market sovereign debt, including US$ 1.3 billion of the repurchasing operation (Tender Offer) · Settlement of Bradies bonds in the amount of US$ 6.5 billion, including anticipated payments and anticipation per exercise of call option · Net purchases of US$ 42.8 billion in the domestic exchange market and settlements of US$ 31.4 billion in external commitments of the National Treasury · Sanctioned the Complementary Law 123, known as the General Law of Micro and Small Enterprises or the National Statute of Micro and Small Enterprises (MPE), bringing together, in a single legal document, all the themes of incentives, debureaucratization and dismissal related to MPEs · Law No. 11,312 of June 27, 2006:reduced the IR rate of nonresident investors from investments in federal public securities and investment funds in emerging companies from 15 percent to zero, and exempted the charge of CPMF in the operations of public offerings of shares of companies in the over-the-counter market (the legislation in force already provided for the non-incidence of this tax on transactions made on stock exchanges)

Source: Prepared by the author based on the literature.

TABLE 8F – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2006	· Central Bank acquires, in the market, US$ 34.3 billion in 2006
2007	· Six cuts of benchmark interest rate (SELIC) · Implemented the Growth Acceleration Program (PAC) to improve the country's infrastructure through a set of strategic projects focused on transportation, energy, sanitation, etc. · Published the Decrees No. 6,244 of June 13, 2007 and No. 6,183 of August 8, 2007, which impose limits on the commitment of advertising, daily, pass and locomotion expenses in 2007, to the Federal Executive Branch · The Federal Government intensified the use of electronic trading systems and price registration systems, which resulted in a saving of approximately R $ 675 million in public purchases made in the first half of 2007 · The Executive forwarded to the National Congress the Complementary Law No. 1 of 2007, which proposes to limit the expenditure on servers, for each power and body of the Union, to the amount settled in the previous year, adjusted by the cumulative variation of the IPCA, plus Of 1,5 percent per year for the years 2007 to 2016
2008	· Four rises of benchmark interest rate (SELIC) · Sale of US$ 500 million in repurchase agreements to financial institutions in order to finance the Brazilian exports · Easing of reserve requirement rules related to leasing transactions and additional liabilities (term deposits) to facilitate operations of smaller financial institutions · Creation of international credit line using the Central Bank's international reserves to finance exporters · Broadening the scope of Central Bank action to facilitate the acquisition of loan portfolio of financial institutions · Stepping up the performance of Brazilian Central Bank in the foreign exchange market, with sales of foreign currency and new changes in reserve requirements · CMN regulation on the granting rules from Brazilian Central Bank to financial institutions · Full release schedule of compulsory deposits in the amount of R$ 100 billion for term deposits, interbank deposits (leasing) and spot and term deposits' additional liability (additional compulsory)

Source: Prepared by the author based on the literature.

TABLE 8G – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2008	· Extension of possibilities by Brazilian Central Bank for financial institutions to increase their resources through the sale of other assets in its portfolio. CMN also agreed to allow resources to foreign trade in foreign loan operations. Central Bank authorization to receive debentures of non-financial companies in rediscount operations · Discount on compulsory spot deposits for institutions which anticipate contributions to the Credit Guarantee Fund - FGC · US Federal Reserve and Brazilian Central Bank announced swap line of real for U.S. dollar amounting to US$ 30 billion · Expansion of civil construction lines offered by Caixa Economica Federal. · New rules for payment of term deposits, reducing reserve requirements share in securities and increasing cash share · New rules for US dollar auctions by Brazilian Central Bank for institutions which participate without providing collateral in securities · New rules for collection of additional requirement compulsory, allowing deposits in government securities since December 01st, 2008 · International reserve use to finance foreign trade for debts expiring between January 10th, 2008 and December 31st, 2009 · Fund release from Credit Guarantee Fund since December 19th, 2008 · For income tax calculation, accelerated depreciation of capital goods, such as machinery, equipment, appliances and instruments, all purchased between May 1st, 2008 and December 31st, 2010 · PIS/COFINS relief on wheat, wheat flour and french bread from July 1st, 2009 to December 31st, 2011

Source: Prepared by the author based on the literature.

TABLE 8H – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2008	· IOF tax exemption (zero rate) in the following operations: i) resource transfers to and from abroad by foreign investors for application in financial and capital markets; ii) interest remittance on capital and dividends received by foreign investors; iii) foreign currency purchases and concurrent sales by institutions authorized to operate in the exchange market; and iv) inflow and outflow of resources in the country related to funds raised in external loans and financing since October 23th, 2008 · Deadline extension of tax collection of IRRF, IPI, PASEP, COFINS and Social Security Contribution from October 1st, 2008 · IOF relief on the financing of motorcycles, scooters and mopeds from November 20th, 2008 · IPI-Automobiles relief from December 12th, 2008 to March 31th, 2009. The benefit was extended five times until March 31th, 2010 for ethanol/flex cars and until December 31th, 2011 for trucks, trailers and tractors, vans and pickups · IOF relief for the loaned principal on consumer credit during 2009 · IRPF relief and creation of lower intermediate rates (7.5 percent and 22.5 percent) since January 1st, 2009
2009	· Five cuts of benchmark interest rate (SELIC) · Term deposits with special guarantee from Credit Guarantee Fund since April 1st, 2009 · Expansion of the Guarantee Fund for Shipbuilding since May 15th, 2009 · Creation of two Credit Guarantee Funds in 2009 · Reduction of TJLP from July 1st, 2009 · IPI reduction on construction material from April 1st, 2009 to June 30th, 2009. The benefit was extended five times until December 31st, 2011 · Reduced rates of the Special Taxation Regime - RET from March 31st, 2009 to December 31st, 2013, for projects under the My Home My Life low-income housing program. The benefit was extended until December 31st, 2014 · COFINS reduction on the sale of up to 150 cc motorcycles from April 1st, 2009 to June 30th, 2009, which was extended in two other occasions until March 31st, 2010 · IPI reduction on the white line for home appliances from April 17th, 2009 to July 15th, 2009. The benefit was extended twice until Januay 31st, 2010

Source: Prepared by the author based on the literature.

TABLE 8I – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2009	· Tax relief on the scope of REPETRO (special customs regime on export and import of goods for oil and natural gas research and mining) · IPI reduction on capital goods from July 1st, 2009 to December 31st, 2009. The benefit was extended on three occasions until December 31st, 2011 · IPI reduction for furniture and wood panels used in the furniture construction from November 27th, 2009 to March 31st, 2010 · IPI relief on the wind energy sector (wind turbines) from July 1st, 2009 to December 31st, 2009, with permanent effect since January 1st, 2010 · PIS/COFINS relief in the IT sector from January 1st, 2010 to December 31st, 2014 · IPI, PIS / COFINS and Import Tax relief on the computer purchases for public schools from December 16th, 2009
2010	· Three rises of benchmark interest rate (SELIC) · Reduced rates of CIDE-Fuels from February 4th, 2010 to April 30th, 2010, with consequent reduction of the gasoline final price · Federal government has recovered public investment through PPI (Projeto Piloto de Investimentos) and PAC (Plano de Aceleração do Crescimento) programs · Measures adopted by the Government to encourage the resumption of investment: tax relief for the production of capital goods and the BNDES PSI credit line, with lower interest rates for machinery and equipment (interest rate of 4.5 percent until June and 5.5 percent as of that date) · Growth Acceleration Program (PAC): increase in value paid between 2009 and 2010 (23.1 percent) · In the first semester the Government began to gradually withdraw the incentives to consumption (tax and liquidity) · Fiscal consolidation: announcement of a cut of R $ 50 billion in the forecasts approved by Congress for the 2011 budget, contingency of discretionary expenses (total of R$ 32 billion); Measures to increase efficiency and restructuring related to the staffing of public servants and the granting of salary bonuses and unemployment insurance · Increase in the capital requirement for loans to individuals with maturities of more than 24 months

Source: Prepared by the author based on the literature.

TABLE 8J – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2010	· Increase in the reserve requirement on demand and time deposits · Expansion of the guarantee limit provided by the FGC and establishment of a schedule for the extinction of the DPGE · Increase in the IOF tax rate on loans to individuals prior to the crisis · Increase in the IOF rate on exchange transactions from 2.38 to 6.38 percent · Increase to 6 percent of the IOF tax rate on foreign investments in fixed income securities traded in the country as of October 2010 · Creation of the Brazil Sovereign Fund to promote investments in assets in Brazil and abroad, form public savings, mitigate the effects of economic cycles and foster projects of strategic interest of the country located abroad · Institution of the obligation to register the hedge transactions · Regulation of foreign capital in the country · Compulsory and compulsory matching daily collection
2011	· Until July, the benchmark interest rate was raised five times. After that, it was cut in three occasions · Central Bank of Brazil decided to partially reverse the macroprudential measures adopted in December 2010, maintaining only the prudential discouragement to contracting credit with maturities of more than 5 years · Recomposition of the IOF tax rate on consumer credit · Institution of compulsory deposit in cash, unpaid, as of April this year, and with stricter conditions since July · The Government reduced the daily rate of IOF on consumer credit operations from 3 percent a year to 2.5 percent a year in December 2011 · Expansion of the Bolsa Família conditional cash transfer program along with the Brasil Sem Miséria program · New industrial policy in the Brasil Maior plan · Expansion of the Simples tax regime for microenterprises · Pronatec program aiming technical and professional qualification of workers · Crescer, a productive-oriented microcredit program · Investment of R$ 3.2 billion (until 2015) through the institution of a program granting scholarships abroad

Source: Prepared by the author based on the literature.

TABLE 8K – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
	· Seven cuts of benchmark interest rates(SELIC)
	· As part of the measures to stimulate investment and economic activity, the Government changed BNDES financing lines: (A) extended the equipment financing program (PSI) until 2013, reducing interest rates, increasing the term and its maximum share level of funding; (B) improved conditions for supporting innovation; (C) launched measures to stimulate the competitiveness of the manufacturing sectors (Programa Revitaliza); and (D) increased access to resources from the Support Program to Strengthen the Capacity to Generate Employment and Income (Progeren), which provides working capital
	· Increase in domestic demand through the expansion of transfers of income to families, such as the Bolsa Família, and higher government consumption
	· Payroll exemption from labor-intensive sectors heavily affected by external competition
	· Drop in interest rates and bank spreads
	· Lower rate of Industrialized Products Tax (IPI) for the white line and for cars, especially the national ones
2012	· Concessions program at airports, highways and ports
	· Increase in investments under the PAC 2: 40.3 percent increase in 2012
	· Incentives to investments in infrastructure: Brazilian Infrastructure Bonds and Credit Rights Investment Funds (FIDC: 0 percent rate in income tax applied to non-residents and individual and 15 percent rate to corporations; 0 percent rate in financial operation tax applied to non residents); Brazilian Infrastructure Investment Funds (same tax treatment as infrastructure bonds; conditions: investment of 67 percent of the Brazilian infrastructure investment funds portfolio in the first 2 years and 85 percent after that); Investment Fund in Infrastructure Quotas (FIP-IE: 0 percent rate applied to individuals' and non-residents' yields; 15 percent rate applied to corporations' yields)
	· Reduction of electricity tariffs
	· Reduction of CIDE to zero for gasoline and diesel
	· Reduction to zero of the term of appropriation of PIS / COFINS credits on the acquisition of capital goods
	· Increase in the limits of the tax bands of SIMPLES and MEI

Source: Prepared by the author based on the literature.

TABLE 8L – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2012	· REINTEGRA - special regime for the reintegration of tax amounts for exporting companies · Reduction of IOF on personal credit operations from 3 percent to 1.5 percent · Zero rate of PIS / COFINS on wheat and pasta · Increase in presumed profit limit
2013	· Six rises of benchmark interest rate (SELIC) · Part of the stimulus to increase the competitiveness of the industrial sector was reduced, but, on the other hand, the payroll exemption was widened · Important auctions took place in the area of electric energy, as well as new rounds of oil field concessions, as is especially the case in the Libra field · The performance of the Central Bank in the foreign exchange market in 2013 resulted in net sales of US $ 11.5 billion in line operations with repurchase commitments · The Monetary Authority has, since June 2013, resumed the foreign exchange swap placements, in which it assumes a passive position in exchange rate variation and active in domestic interest rate · The Government extended the credit by modifying BNDES financing lines, such as the extension of the Investment Sustainability Program (PSI) until 2013, with a reduction of interest rates, increasing the term and maximum funding participation levels · The Government reduced the cost of energy and the tax cost by exempting the payroll of several sectors and extending the Special Regime for Incentives for Infrastructure Development (Reidi), the Tax Regime for Incentives to Modernize and Enlarge the Port Structure (Reporto) and the Special Customs Regime for the Exportation and Importation of goods destined for the exploration and production of oil and natural gas (Repetro) · The Government expanded financing mechanisms such as the creation of Debentures and Debentures Funds encouraged for infrastructure and guarantees such as the Brazilian Agency for Guarantee and Guarantee Funding (ABGF) · Improved regulatory frameworks in the infrastructure sector, such as the port sector, which aims to stimulate investments to increase transport capacity

Source: Prepared by the author based on the literature.

TABLE 8M – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2014	· Five rises of benchmark interest rate (SELIC) · Expansion of the real credit volume, which went from 50 percent of GDP in 2012 to 55 percent in 2014 · Increase in income transfers to families, such as those incurred in connection with the Bolsa Família Program and the Organic Law on Social Assistance (LOAS) · Expansion of the benefits granted by the General Social Security System (RGPS) · Higher government consumption · The performance of the Central Bank of Brazil in the foreign exchange market, in 2014, resulted in net purchases of US$ 6.5 billion, in lines with repurchase commitments · In June 2014, the Central Bank announced the continuation of the exchange protection offer program, through repurchase lines and foreign exchange swaps, at least until December of the same year
2015	· Five rises of benchmark interest rate (SELIC) · In 2015, the Brazilian Central Bank's performance in the foreign exchange market resulted in net sales of US$ 1.8 billion, in lines with the commitment to repurchase · Change in the criterion of performance in the foreign exchange market in March 2015, when the Central Bank of Brazil announced the interruption of the daily offer of US$ 100 million in foreign exchange swaps, announcing that the maturities as of May 1 would be fully renewed, considering demand and market conditions · Government consumption, whose behavior is more stable and less susceptible to conjunctural shocks, contributed to the contraction of domestic demand, which fell by 5.4 percent in 2015 · Expenditure control: (A) increase of interest rates in several lines of credit to reduce the subsidies paid by the National Treasury; (B) rationalization of the expenses of several government programs, with revision of the goals; (C) end of the subsidy to CDE, in the amount of R$ 9.0 billion; (D) revision of the pension rules for death and sickness; (E) revision of the insurance, unemployment insurance and salary bonus; (F) contingency of expenses, in the initial value of R$ 69.9 billion and then more R$ 8.5 billion, totaling R$ 78.4 billion; (G) revision of the rules of the Student Financing Fund (FIES), with new limits of commitment, terms and interest rates with the objective of reducing the subsidy of this policy

Source: Prepared by the author based on the literature.

TABLE 8N – Highlights of Brazilian Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2015	· New revenues: (A) IPI for automobiles, furniture, laminates and wood panels and cosmetics; (B) PIS / Cofins on imports; (C) IOF-Credit for individuals; (D) PIS / Cofins and CIDE on fuels; (E) PIS / Cofins on companies' financial income; (F) correction of public fees and prices · The government had to revise the primary result target to be achieved in 2015. In nominal terms, the primary surplus target for the consolidated non-financial public sector for 2015 was set at R$ 8.7 billion, equivalent to 0.15 percent of the GDP. The targets for 2016 and 2017 were also revised, with the primary result gradually increasing to 0.7 percent and 1.3 percent of GDP, respectively. Subsequently, the Government sent a Notice to the Mixed Budget Commission requesting the amendment of the 2016 PLDO Replacement to reduce the primary result target of 2016 to negative R$ 21.1 billion (equivalent to -0.34 percent of GDP). From then on, the target is raised year after year, reaching 2.0 percent of GDP in 2019 · The government extended the concessions program and thus set an additional boost for growth. At the beginning of June 2015, the government announced the new stage of the PIL, with projected investments of R$ 198.4 billion (approximately R$ 70 billion by 2018). Investments are divided into highways, airports, railways and ports · The Government created the Employment Protection Program (PPE), which allows the reduction of working hours, with a reduction of wages, but preserving the employment and qualification of the worker obtained after a long period of training and knowledge acquired in the practice of the day to day. The program has a fixed term of six months, which may be extended for up to a further half year. Among the measures of the EPP, the following stand out: (A) the reduction of expenditure on the unemployment insurance, layoff and labor intermediation program; (B) the reversal of the resources saved in policies for the most vulnerable workers; (C) the maintenance of jobs in times of crisis, preserving the balance in the FGTS and access to unemployment insurance; (D) the preservation of human capital by companies and the improvement in cash flow, reducing their costs with dismissal, hiring and training
2016	· Two cuts of benchmark interest rate (SELIC) · Change in the target for the year 2016, according to the Draft Law sent to Congress (converted into Law 13,291, dated May 25, 2016)

Source: Prepared by the author based on the literature.

TABLE 8O – Highlights of Brazilian Macroeconomic Policies

(end)

DATE	HIGHLIGHTS OF BRAZILIAN POLICIES
2016	· Initiated the process of structural adjustment of the public accounts, by sending to the National Congress the Proposal of Amendment to the Constitution (PEC) nº 241, of 2016, that proposes the New Fiscal Regime, establishing limit for growth of primary expenses of the Federal Government of According to past inflation · Reduction in the number of ministries · Additional cut of 4.3 thousand Senior Management and Advisory (DAS) positions in the ministries · Transformation of 10,460 free-entry positions (DAS) into commissioned functions, which can only be filled by contested servants (Provisional Measure - MPV 731, June 10, 2016) · A new Law on the legal status of public companies and mixed-capital companies, establishing technical criteria for investiture in the decision-making positions of these companies (Law 13303, June 30, 2016) · Strengthening of the Committee for Monitoring and Evaluation of Public Policies (CMAP), whose purpose is to institutionalize the review and Evaluation of the main public expenditures and federal tax expenditures. It is composed by the Ministry of Planning, Development and Management; Ministry of Finance; Ministry of the Civil House of the Presidency of the Republic; and Ministry of Transparency, Inspection and Control. · Proposed improvements in the governance of the Benefício de Prestação Continuada (BPC), sickness benefits and disability retirement. Together, these three programs account for about 26 percent of the total expenditure of the National Social Security Institute (INSS) with payment of benefits · Approval by the Legislative Branch of Union Unbundling of Revenues (DRU) to allow better management of the Union Budget, which presents a high degree of rigidity due to its related revenues · The Government has expanded and improved the Concession Program through the Investment Partnerships Program (PPI), which, through concessions, aims at the private sector to invest in the country's priority projects on highways, railways, ports and airports · The National Monetary Council (CMN) reduced the inflation band range of the inflation target by 0.5 percentage points from 2017, reducing the upper limit to 6.0 percent

Source: Prepared by the author based on the literature.

TABLE 9A – Highlights of Chinese Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF CHINESE POLICIES
2003	· PBC raised deposits reserve ratio from 6 to 7 percent, freezing RMB 150 billion yuan of excess reserves of commercial banks · Promotion of market-based interest rate reform · Enlargement of the floating band of lending rates of financial institutions · Decrease in the interest rate on excess reserves of the financial institutions
2004	· Improvement of flexibility of open market operations · Rise in required reserve ratio · Adoption of a differentiated reserve requirement system · Advance of market-based interest rate reform · Deepening in foreign exchange administration reform · Advance of financial institutions' reform
2005	· Adoption of a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies
2006	· Three increases in the reserve requirement ratio of financial institutions by 1.5 percentage points · Intensification of market operations · Two rises in benchmark deposit and lending rates of financial institutions
2007	· Monetary policy stance gradually shifted from "a sound policy" to "a tight policy" · Ten rises in reserve requirement ratios (cumulative increase of 5.5 percentage points) · Six rises in RMB benchmark deposit and lending rates · Down payment for investment properties increased to 40 percent · Interest rate penalty for mortgages on investment properties raised to 10 percent premium over benchmark lending rate · Property ownership tax-exemption period lengthened to five years
2008	· At the beginning of the year the PBC adopted tight monetary policy · Interest rate policy unchanged in the first half of the year · 5 rises on required reserve ratios (cumulative increase of 3 percentage points) in the first half of the year, freezing 70 percent of the increased liquidity as a result of foreign exchange purchases · In the middle of the year, the PBC adopted moderately loose monetary policy · Five cuts in benchmark deposit and lending interest rates · Four cuts in required reserve ratios

Source: Prepared by the author based on the literature.

TABLE 9B – Highlights of Chinese Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF CHINESE POLICIES
2008	· Elimination of quantitative ceilings for financial institutions' credit lending · State Council unveils RMB 4 trillion stimulus plan · Mortgage loan discount from benchmark interest rate increased · Minimum down payment for all mortgages cut to 20 percent
2009	· Maintenance of a proactive fiscal policy and a moderately loose monetary policy · Property ownership tax-exemption period shortened to two years · 40 percent down payment for mortgages on investment properties reinstated
2010	· Maintenance of a moderately loose monetary policy · State Council raises down payment for investment properties to 50 percent, reintroduces penalty interest rates for mortgages on investment property, limits property purchases by foreign investors, and suspends mortgage lending to nonresidents
2011	· The PBC implemented a prudent monetary policy · Six rises in deposit reserve requirement ratio (cumulative increase of 3 percentage points) · Three rises in benchmark lending and deposit rates (cumulative increase of 0.75 percentage points) · Adoption of a mechanism for dynamic adjustments of differentiated deposits required by the reserve ratio · Suspension of the issuance of three-year central bank bills · 0.5 percentage points reduction on deposit reserve requirement ratio · Adjustment and optimization of parameters for the dynamic adjustment of the differentiated reserve requirement · Down payment for mortgages on investment properties increased to 60 percent · Property tax pilot program begins in Shanghai and Chogqing
2012	· Sound monetary policy · Two cuts of reserve requirement ratio of 0.5 percentage points each · Flexible open market operations in both directions · Two cuts of benchmark lending and deposit rates · Counter-cyclical adjustment through dynamic adjustment of differentiated reserve requirement · Conduction of repo operation in the second half of the year · The ceiling of RMB deposit rates offered by financial institutions to their clients was adjusted to 1.1 times of the benchmark rates

Source: Prepared by the author based on the literature.

TABLE 9C – Highlights of Chinese Macroeconomic Policies

(to be continued)

DATE	HIGHLIGHTS OF CHINESE POLICIES
2012	· The floor of the lending rates offered by financial institutions to their clients was adjusted to 0.7 times of the benchmark rates · The floating bond of the US dollar to RMB exchange rate on inter-bank spot market was expanded from 0.5 percent to 1 percent
2013	· Sound monetary policy · Adjustment of parameters of the dynamic adjustment mechanism of the differentiated required reserve ratio · Strengthening of coordination between credit policy and industrial policy · Rises in central bank lending and discounts for the agriculture sector · Guidance to financial institutions to beef up support to key sectors and weak links in the economy, such as the agriculture sector, rural areas and farmers, small and micro enterprises, and do forth · Lifting of controls on lending interest rates offered by financial institutions · Creation and improvement of self-regulatory mechanism for market interest-rate pricing by financial institutions · Launch of centralized quotations and release mechanisms for loan prime rates and interbank certificates for deposit
2014	· Sound monetary policy · Introduction of Medium-Term Lending (MLF) and Pledged Supplementary Lending (PSL) facilities to encourage financial institutions to provide low-cost financing for the real sector supported by national policies · PBC asymmetrically lowed the benchmark lending and deposit interest rates and increased the flexibility of the interest rates for open market operations to reduce the financing costs for the overall society · Two targeted reserve ratio cuts · Improvement of management of desirability lending · Employment of a mechanism for dynamic adjustment of the differentiated reserve ratio for counter-cyclical purposes and credit guidance · Introduction of a new tool of credit policy supporting central bank lending · Increase of the quotas of central banking and discounts · The upper limit of the floating range for deposit interest rates was raised to 1.2 times the benchmark level · The floating band of the RMB against the US dollar on the inter-bank spot foreign-exchange market was enlarged from 1 percent to 2 percent · The limit on the spread between RMB/USD buying and selling prices offered by designated foreign-exchange banks to their clients was removed

Source: Prepared by the author based on the literature.

TABLE 9D – Highlights of Chinese Macroeconomic Policies

(end)

DATE	HIGHLIGHTS OF CHINESE POLICIES
2015	· Sound monetary policy · Five cuts of benchmark interest rates of RMB deposits and lending · The PBC guided the downward movement of the interest rates of open market repo operations on nine occasions · Cut of interest rates of credit policy-supporting central-bank loans, medium-term facility, and Pledged Supplementary Lending (PLS) · Reduction in the targeted deposit reserve requirement ratio · Expansion of the pilot program of central-bank loans against credit-asset pledges and internal ratings · The quota for central-bank lending and discounts was raised on several occasions · The scope of recipients of the PLS was enlarged
2016	· Prudent and sound monetary policy · Cut of deposit reserve requirement ratio by 0.5 percentage point · Establishment of a mechanism of daily open market operations · Conduction of medium-term liquidity operation on a regular basis · Continuation of operations through 7-day repo · Introduction of 14-day and 28-day repo · The PBC continued to improve the RMB exchange rate regime, putting in place a USD/RMB central parity mechanism that features “previous close + movements of a basket of currencies”. Exchange rate policies thus became more rules-based, transparent and market-based

Source: Prepared by the author based on the literature.

FIGURE E.1 - SVAR Brazil: subsample 2009-2016

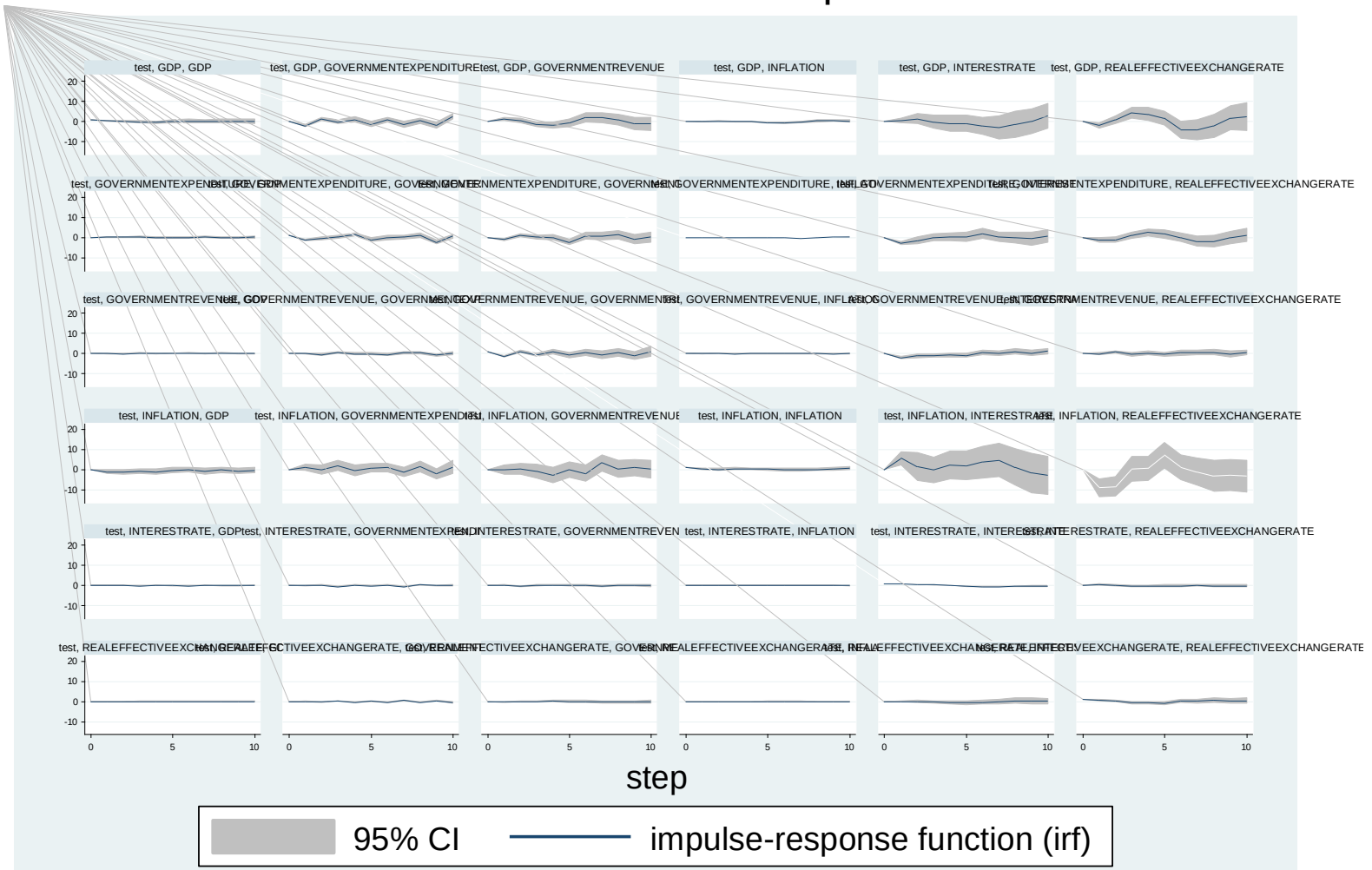

Figure E.1: prepared by the author using Stata

FIGURE E.2 - SVAR Brazil: subsample 2009-2016

```
. varstable

Eigenvalue stability condition
```

Eigenvalue	Modulus
-1.046755	1.04675
.7671302 + .6674031i	1.01682
.7671302 - .6674031i	1.01682
-.0191613 + .9904098i	.990595
-.0191613 - .9904098i	.990595
-.9666497 + .1048469i	.972319
-.9666497 - .1048469i	.972319
.3625945 + .8971194i	.967625
.3625945 - .8971194i	.967625
.8148 + .4306963i	.921628
.8148 - .4306963i	.921628
-.7361006 + .5498332i	.918782
-.7361006 - .5498332i	.918782
.5558862 + .7265505i	.914814
.5558862 - .7265505i	.914814
-.5364591 + .7130486i	.892315
-.5364591 - .7130486i	.892315
.8553672 + .2284782i	.885356
.8553672 - .2284782i	.885356
-.1256172 + .8275537i	.837033
-.1256172 - .8275537i	.837033
-.4844032 + .6273396i	.792592
-.4844032 - .6273396i	.792592
-.5023478	.502348

```
At least one eigenvalue is at least 1.0.
VAR does not satisfy stability condition.
```

Figure E.2: Stata results for stability test

FIGURE F.1 - SVAR China: subsample 2009-2016

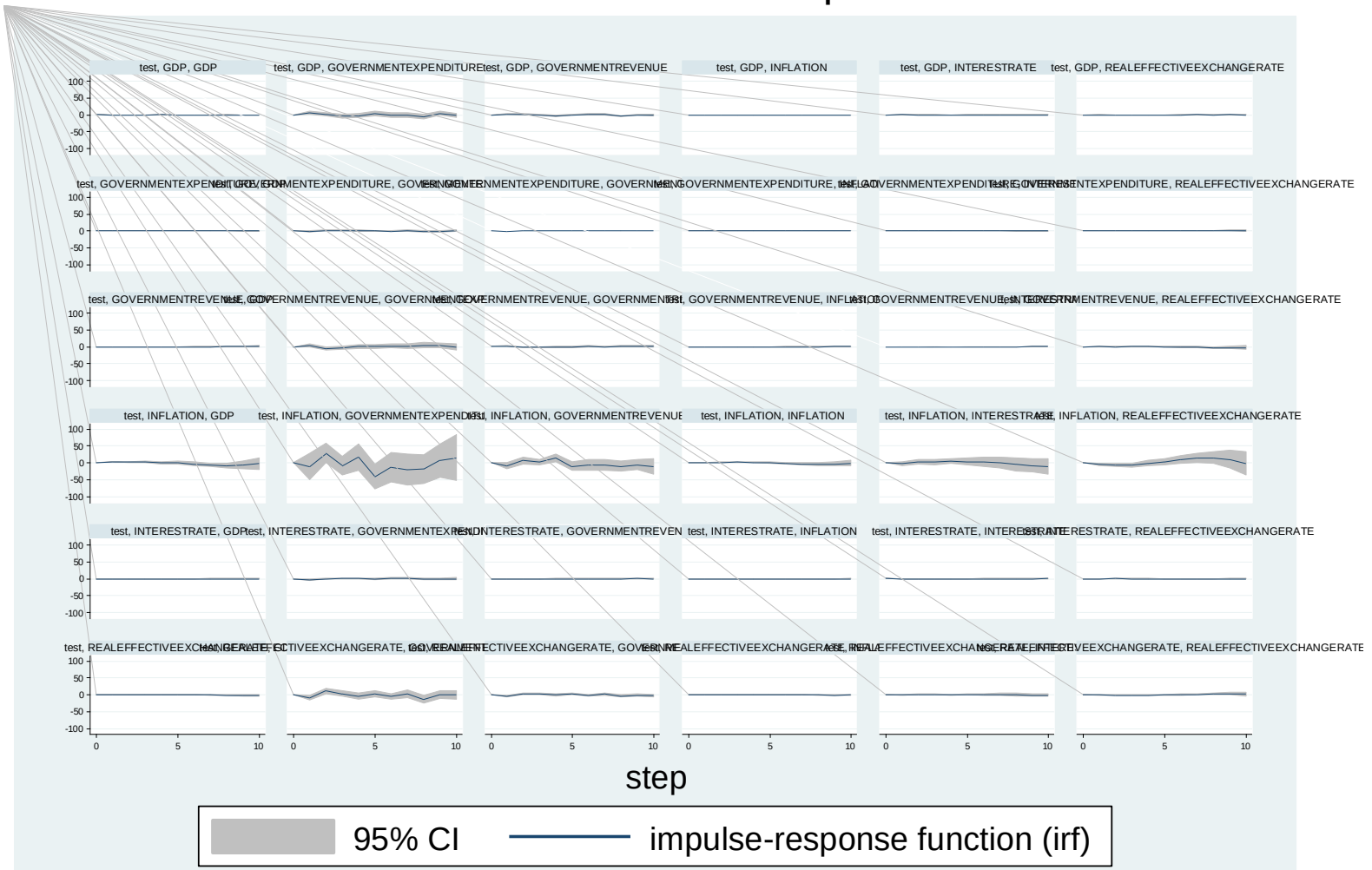

Figure F.1: prepared by the author using Stata

FIGURE F.2 - SVAR China: subsample 2009-2016

```
. varstable

Eigenvalue stability condition
```

Eigenvalue	Modulus
.9773791 + .6352916i	1.1657
.9773791 - .6352916i	1.1657
-1.004506	1.00451
.00747583 + .9925704i	.992599
.00747583 - .9925704i	.992599
-.8676176 + .4525489i	.97855
-.8676176 - .4525489i	.97855
-.4883675 + .8325366i	.965205
-.4883675 - .8325366i	.965205
-.9541572	.954157
-.09890673 + .9325283i	.937759
-.09890673 - .9325283i	.937759
.7029556 + .5812611i	.912146
.7029556 - .5812611i	.912146
.3701122 + .7906535i	.872993
.3701122 - .7906535i	.872993
.8341549 + .06944816i	.837041
.8341549 - .06944816i	.837041
-.560011 + .2367698i	.608007
-.560011 - .2367698i	.608007
.08780931 + .5915733i	.598055
.08780931 - .5915733i	.598055
.3305745	.330575
-.3279936	.327994

```
At least one eigenvalue is at least 1.0.
VAR does not satisfy stability condition.
```

Figure F.2:Stata results for stability test