

THE FED'S MONETARY POLICY IMPACT ON BRIC COUNTRIES

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**THESIS SUBMITTED FOR THE DEGREE OF MASTER OF SCIENCE
IN BANKING AND FINANCE**

EPOKA UNIVERSITY

JUNE, 2016

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THE FED'S MONETARY POLICY IMPACT ON BRIC COUNTRIES

ABSTRACT

The aim of this thesis is to study the impact of Fed's monetary policy on Brazil, Russia, India and China. The global financial crisis of 2008 emphasized once more the importance of US on world economy. Since then this has been a much debated topic for many analysts and scholars around world. The impact of Federal Reserves' decisions on developing countries has been widely studied by many scholars, but less has been studied on Brazil, Russia, India and China. Being the fastest and largest growing emerging markets in the world the impact of Federal Reserves' monetary policy would be more prevalent in BRIC compared to other developing countries.

To study this effect VAR models and impulse-response tests are employed. Variables which are being studied in this research are interest rate of US, interest rate of each country, consumer price index, purchasing power parity, import/export, exchange rate and stock market price for each country. Data used are monthly and correspond to the period from 2000 to 2015, retrieved from International Financial Statistics of International Monetary Fund and Yahoo Finance. Using VAR models eight simultaneous equations have been derived. The impact is studied separately for each country. Data are studied and divided into three sub-sections: 2000-2015 monthly; Crises Period, corresponding to monthly data from April 2007 until December 2008; and Crises free period, removing crises time period.

The results show that Brazil is the country which is affected mostly by changes in interest rates of US and this effect is faster compared to other countries. This effect is

valid for all sub-periods used in this study, from 2000-2015, crises free period and crisis period. Fed's monetary policy resulted to have an impact on all countries in our study, regardless degree of significance and the variable influenced the most.

Keywords: *FED; BRIC; interest rates; monetary policy;*

IMPAKTI I POLITIKAVE MONETARE TË BANKËS QËNDRORE TË AMERIKËS NË BRAZIL RUSI INDI DHE KINË

ABSTRAKT

Qëllimi kryesor i kësaj teze është studimi i impaktit që politikat monetare të ndjekura nga Banka Qëndrore e Amërikës ka në shtetet si Brazili, Rusia, India dhe Kina. Kriza financiare e 2008 nxorri dhe njeherë në pah rëndësinë që Shtetet e Bashkuara kanë në ekonominë botërorë. Që nga ai moment, kjo është kthyer një ndër temat më të diskutuara ngas humë analistë dhe studiues nga e gjithë bota. Shtetet që bëjnë pjesë në BRIC janë shtetet me zhvillimin më të shpejtë në botë, kjo është dhe arsyeja që impakti i politikës monetare të zbatua rnga Banka Qëndrore e Amërikës mendohet të jetë më i qartë dhe më i shpejtë në këto vende.

Studimi i kësaj teme është bazuar në teknikën VAR si dhe testet e impulseve dhe përgjigjeve ndaj këtyre impulseve. Variablat e përdorura në këtë studim janë normat e interesit të SHBA si dhe shteteve të tjera, vlerat e importit dhe eksportit, norma e këmbimit valutor, cmimet e aksioneve në tregjet financiare, CPI dhe PPP për secilin shtet. Të dhënat e përdorura janë marrë nga Fondi Monetar Ndërkombëtar si dhe Yahoo Financë. Periudha e studimit i përket viteve nga Janari 2000 deri në Dhjetor 2015. Nga metoda VAR janë nxjerrë tetë ekuacione. Studimi është bërë specifikisht për çdo shtet më vete dhe është ndarë në tre periudha, përkatësisht: Janar 2000- Dhjetor 2015; Periudhën e Krizës Financiare Prill 2007- Dhjetor 2008; Periudha para dhe pos krizës duke përjashtuar të dhënat që i përkasin viteve të krizës financiare.

Rezultatet tregojnë që shteti i cili ndikohet më së shumti nga ndryshimet në normat e interesit në SHBA është Brazili. Ky efekt është i vlefshëm për të gjitha periudhat e studimit të përdorura në këtë punim. Politikat monetare të ndjekura nga Banka Qëndrore e Amërikës rezultojnë të ketë një efekt në të gjitha shtetet e marra në shqyrtim, pavarësisht normës së impaktit dhe variablës së ndikuar më së shumti.

FjalëKyçët: *Banka Qëndrore Amërikës; BRIC; norma e interesit; politikamonëtare;*

DEDICATION

I would like to dedicate this thesis to my family, my parents and my two brothers, for their unconditional support and love. The support and encouragement of my father has been my biggest strength, the unconditional love of my mother my greatest motivation and trust of my brothers on me my biggest inspiration.

ACKNOWLEDGMENTS

There are a very few people who I would like to thank for helping and assisting me in the preparation of my master thesis. I owe my special thanks to my thesis supervisor, associate professor Ugur Ergun. Having the opportunity to work with him was intellectually rewarding and fulfilling. His contribution, suggestions and expertise starting from the early stages of this work until today helped me write and finish this thesis successfully.

DECLARATION

I hereby declare that this Master's Thesis titled "The FED's Monetary Policy Impact on BRIC countries" is based on my original work except quotations and citations which have been duly acknowledged. I also declare that this thesis has not been previously or concurrently submitted for the award of any degree, at Epoka University, any other University or Institution.

Jonada Tafa
June 20, 2016

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LIST OF ABBREVIATIONS

BRIC	: Brazil, Russia, India, China
BRL:	: Brazilian Real
CNY:	: Chinese Yuan Renminbi
CPI:	: Consumer Price Index
FED	: Federal Reserve Bank
GDP:	: Gross Domestic Product
IS-LM-BoP:	: Investment & Savings - Liquidity Preferences-Balance of Payment
PPP:	: Purchasing Power Parity
US:	: United States
USD	: United States Dollar
VAR:	: Vector Autoregressive Model

CHAPTER 1

INTRODUCTION

The aim of this paper is to study the effect of FED's Monetary Policy on BRIC countries. BRIC countries include Brazil, Russia, India and China. They are developing countries, but the pace of their developing classifies them as the world's most fast developing countries. This section consists on an overview of whole thesis, starting with a presentation FED and how does it conduct monetary policy, which is affecting the economies of the countries across globe. The paper is organized as follows. The first chapter consists on an introduction of Federal Reserve Bank, its objectives and role on US monetary policy. The next chapter includes the literature review part, divided into sections, the Fed's monetary policy and emerging countries and the Fed's monetary policy and developed countries. The third chapter includes the methodology and data. The following chapter is the empirical analysis of the study and the last chapter is the conclusion, including concluding remarks, implications and further studies.

1.1 Federal Reserve Bank

Before the creation of the Federal Reserve by U.S Congress in 1913, the States were lacking a formal entity for formulation and implementation of monetary policy. FED operates as an independent organization, but is under the supervision of the American Congress. The governing body of this entity is the Board of Governors, which functions as government agency located in Washington D.C. The board is composed of seven presidential appointees with 14 year terms allocated to each of them. Janet Yellen is the current chairman of FED, appointed in 3rd of February 2014. The FED has 12 regional

banks spread all over the US, which are supervised by the Board of Governors. Federal Open Market Committee is one of the most important parts of FED system and it is responsible for the policy making. FOMC takes the most important decisions regarding monetary policy and more specifically interest rate determination.

1.1.1 The FED's Monetary Policy

The main objectives of monetary policy are sustainable economic growth, stable prices and full employment. In order to achieve these goals Fed has three main tools at its disposal to manipulate monetary policy.

1. **Open-Market Operations:** These kind of operations are the most used tool of monetary policy in US. The Fed trades U.S government securities in the financial markets, influencing reserves in the banks. These movements affect also the loans and the interest rates.
2. **Setting the Discount Rate:** The discount rate serves the market as a signal of the changes in monetary policy in the future. This is the rate, which banks pay to FED when taking short-term loans. It is lower than the federal funds rate.
3. **Setting Reserve Requirements:** The reserve requirement required by FED is approximately 10%. This means that banks should hold 10% of their deposits as reserves in bank accounts. Through these reserves it is determined the volume of loans and investments a bank can provide.

1.1.2 The Federal Funds Rate

As it is mentioned above, open-market operations is the most important tool Fed has in its disposal to achieve its monetary policy goals. By buying and selling U.S securities, Fed affects the federal funds rate, which is the price banks pay for borrowing from each other. This rate is the rate which is usually reported in news. Federal funds rate is very important

because through this rate, Fed eventually affect all other interest rates charged by banks in the States.

1.2 BRIC Countries

BRIC countries took this name in 2011 by Jim O'Neill, who is the chief economist at Goldman Sachs. The BRIC countries consist of Brazil, Russia, India and China. All these countries are both the fastest growing and largest developing economies in the world. Their population makes up almost half of world total population. Recently, they have largely contributed to GDP growth in the world. BRIC countries besides the speed of their growth, have little or almost nothing in common. The reason why this study is made about BRIC countries is exactly the fact that they are the fastest growing emerging markets in the world. There are a lot of studies conducted for other developing countries, but it is believed that the effect of Fed's monetary policy would be better observed in countries like those in BRIC.

1.3 Objective of the Study

The objective of this study is to analyze the effect that the FED's Monetary Policy on developing countries' economies, specifically on BRIC countries. This impact on other countries' economies is studied by examining the changes that occur on interest rate, inflation rate, exchange rate, stock market indices and import/export level of the selected countries.

1.4 Motivation

The recent global financial crisis of 2007/08, proved once more the impact that US economy has on the world economy. The bankruptcy of JP Morgan brought the world to the situation it is today. This latest crisis and others before arose my interest in conducting a research on this topic. As BRIC countries are the world's fastest growing and largest emerging economies the effect of Fed's would be better observed in these countries.

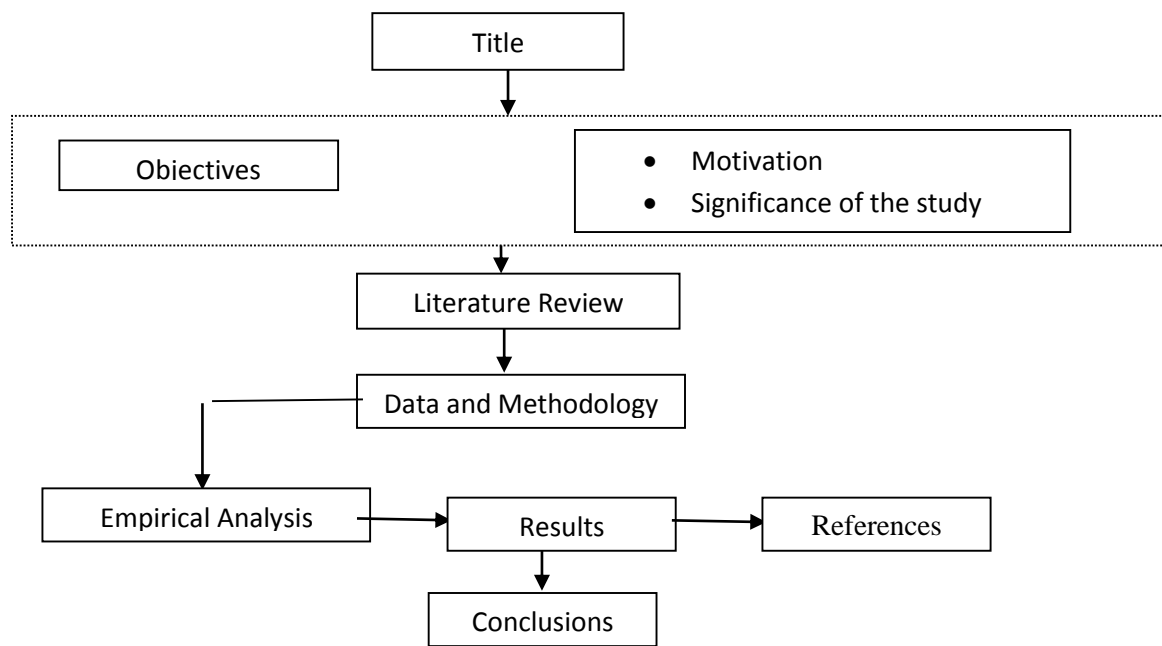
1.5 Significance of the Study

The recent global financial crisis of 2008, proved once more the impact that US economy has on the world economy. The bankruptcy of JP Morgan brought the world to the situation it is today.

This research focuses on studying the effect US interest rates changes on BRIC countries. This study is significant because it will help in distinguishing between different countries characteristics which make the difference in the relationship with US economy. The results of this study may be significant because countries having common characteristics with the ones in our study, can take precautions to avoid any discrepancy in the future in the course of economic and financial relationship with US.

Also, this paper may be significant in the literature of these studies for BRIC countries. There is a vast of literature regarding the impact of US monetary policy on developing countries but not much on BRIC countries, which makes this thesis a contribution in enriching literature on these countries.

1.6 Analytical Framework Flowchart



1.7 Theoretical Framework Flowchart

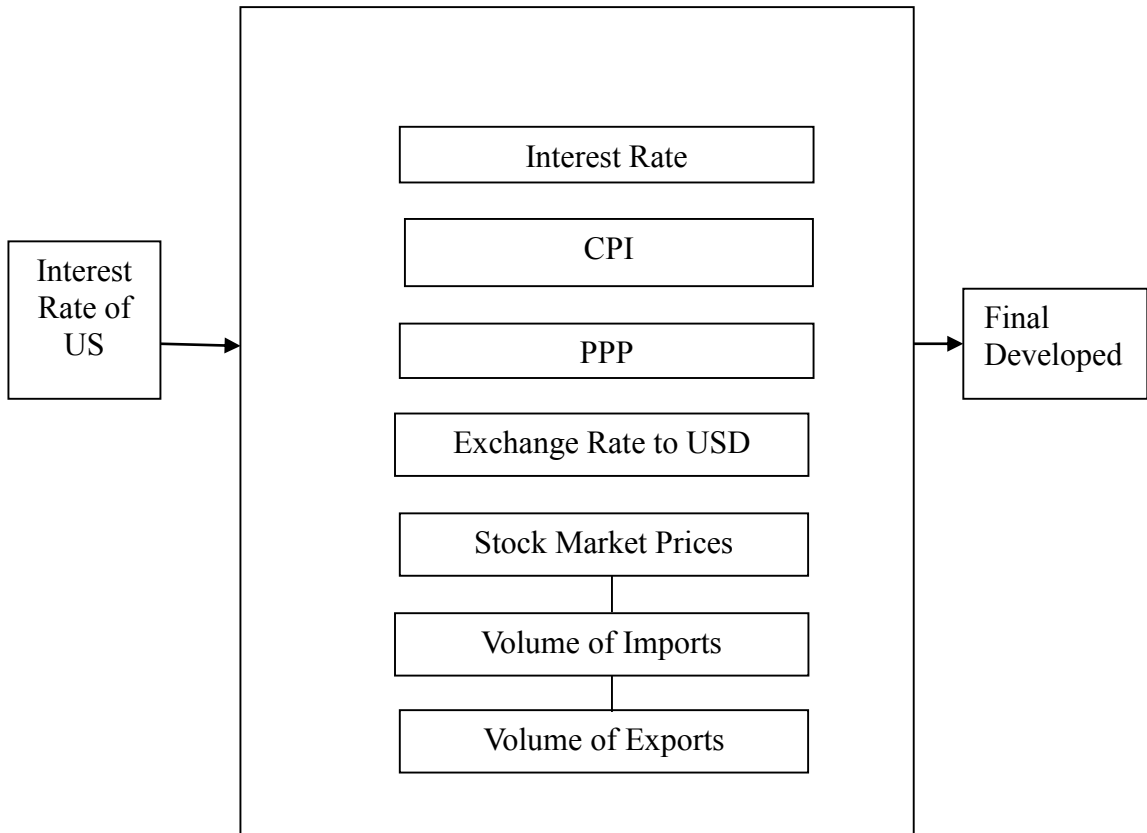
Theorie s/Theoretical Background	Authors
IS-LM-BoP	Robert Mundell and Marcus Fleming
International Capital Asset Pricing Model(CAPM)'	William Sharpe
Purchasing Power Parity (PPP)	

IS-LM-BoP known as Mundell-Fleming model gives the relationship between a country's interest rate, output and exchange rate. It suggests that a country cannot achieve free movement of capital, fixed exchange rate and monetary policy independence at the same time.

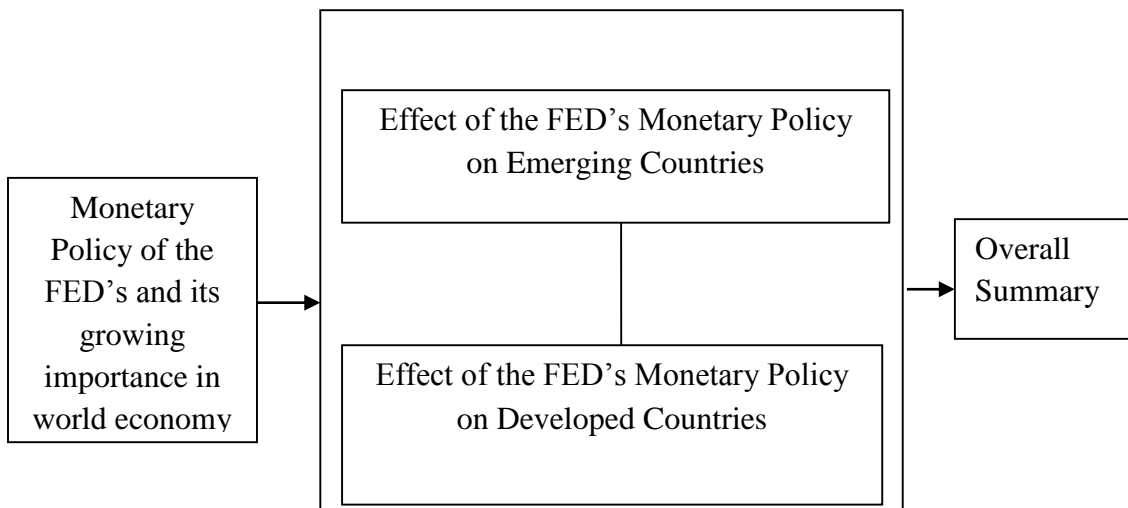
CAPM theory implies that in order to get higher returns, one should take more risk. International CAPM takes in account foreign exchange risk as well when dealing with international investments.

Purchasing power parity refers to the idea that the same basket of goods in one country should cost the same in another country, adjusting for exchange rates.

1.8 Research Model Flowchart



1.9 Literature Review Flowchart



CHAPTER 2

LITERATURE REVIEW

Monetary policy of the FED's has shown to be very decisive for the economies of many countries across the globe. The size of spillover depends on the economic and financial characteristics of the countries and differs for emerging and developed ones. Monetary policy in the US seems to be that important as to determine financial and economical conditions worldwide (Bekaert et al., 2013; Rey, 2013). Generally the countries which are involved more on capital markets than in trade, have not developed domestic financial markets and whose most of their output is yield by manufacturing industries tend to be affected more by the changes in US monetary policy. Developed economies which use fixed and not flexible exchange rates are affected more than other countries that do employ a flexible exchange rate regime. Regarding developing countries those which are financially open experience larger spillovers from the changes in US monetary policy. Most of these spillovers in either developed or developing countries arises from the changes in interest rates.

2.1 The FED's Monetary Policy and Developing Countries

As literature suggest, there are significant differences in the impact that US monetary policy has on developing and developed countries. This section presents a summary of the impact US monetary policy on developing countries based on the results of different studies conducted by other scholars.

Macroeconomic variations in emerging countries are highly affected by external shocks as it is explained by structural VARs. Canova(2005) studied the effect of US monetary policy shocks in Latin American emerging countries, concluding that interest rates in these countries respond sharply to these shocks. He found that the impact of US monetary policy shocks is much more relevant than US supply and demand shocks in Latin countries.

Arora and Cerisola (2001) analyzed the effect of monetary policy shock of US monetary policy in bond spreads in emerging countries. The relationship between interest rates of US and bond spreads resulted to be positive.

Mackowiak (2007) estimates the effect of US monetary policy shocks in emerging countries, assuming that these countries operate as a small open economy. Shocks in US monetary policy quickly and significantly affect both interest rates and exchange rates in a developing country. When the currency in a developing country depreciates due to a contraction on US monetary policy, inflation will increase. Net exports will also rise, but on the other hand consumption and investments will decrease. The response of the prices and output level in these countries is even higher than the response of these of these variables in US itself. These results are in line with the idea that when US sneezes, emerging countries catch a cold.

The results of the previous study are in line with the results of the Calvo et. al. back in 1993. They concluded that a considerable amount of the fluctuations in exchange rates in Latin America from 1998 to 1991 is caused due to external shocks.

Neumeyer and Perri (2005) and Uribe and Yue (2006) in their studies in emerging countries have employed dynamic stochastic models compelled by external interest rates shocks. The results have shown that these shocks play an important role in shaping markets in emerging economies. According to the study it is suggested that the main goal of these emerging countries is to find an optimal solution to stabilize the economy in such cases when external shocks appear. An increase in interest rates of US would firstly cause

the spreads in emerging countries to fall, and then show a postponed overshooting reaction (Uribe & Yue, 2006).

Emerging countries which do not use a flexible exchange rate regime are more responsive to US monetary policy shocks. Besides the regime of exchange rate, equity market capitalization owned by US and the trade relationship with US do as well explain the spillovers arising from these shocks. Exports and imports level will increase with a depreciation in exchange rates, while on the other hand increases in interest rates will decrease investments and outputs (Hausman & Wongswan, 2006).

Recently, the effect of announcements or news related with US monetary policy actions on emerging countries is getting large attention by many scholars. Financial openness is far more important than economic relationship in determining the reaction of the Brazilian asset value to announcements of US monetary policy. An increase in interest rates of US leads to a decrease in stock prices and increase in bond spread in Brazil (Robitaille & Roush, 2006).

An important role in stabilizing capital markets in emerging countries is the attitude and the predictability of the monetary policy movements and decisions in US (Arora & Cerisola, 2001). Unpredictability of US monetary policy plays a significant role in explaining the spread in bond markets in developing countries (Alper, 2006).

Emerging markets bond index spreads respond systematically to US announcements and interest rate imposed by FED. However, this response depends mainly on the conditions of US economy (Ozatay, Ozmen & Sahinbeyoglu, 2009).

Hayo, Kutan and Neuenkirch (2012) based their analysis in examining the effect of informal communication channels on emerging countries stock market, as they are more exposed to news from US. The main aim of the study was to find if there is a significant economical effect on stock returns in response to US communication and is there a difference in affecting these returns based on the communication channels, let them be

informal or formal. The results showed that interest rate shocks and communications of US FED do have a significant effect on returns of equities in emerging countries and that an informal communication, such as speeches of different people, exert a greater impact on these returns.

2.2 The FED's Monetary Policy and Developed Countries

Kim (2001) estimates the spillover effect of an expansion of US monetary policy on non-US, G-6 output. This analysis was made by employing VAR models and countries in this study were using a flexible exchange rate. An expansion of US monetary policy leads to a decrease to interest rates in the developed countries, rising world aggregate demand on goods and services. According to these results, G-6 countries in such cases experience large growths. Regarding the trade balance, in the short run it was negatively affected, but this impact diminishes and turns sign in the mid – and long term.

Faust and Rogers (2003) study the impact of monetary policy shocks on exchange rate in Germany and United Kingdom. A VAR model with 7 variables including US and foreign country production, CPI of US, US and foreign short term interest rates and exchange rate of foreign currency to USD is employed. A second VAR model with 14 variables, adding commodity prices, non-borrowed US reserves, total reserves, money supplies and the existing variables from the 7-variable model. The results showed that that in the 7-variable model shocks in the monetary policy play a significant role in exchange rate variability, while in the second model this impact lower to only one third of the variability. These results suggest that the impact of US monetary policy in exchange rate is lower than generally accepted.

Neri and Nobili(2006) examines the effect of monetary policy shocks of US in euro-area. They employed a VAR model analysis imposing the uncovered interest rate parity conditions on exchange rates and interest rates. They found out that firstly euro depreciates and then appreciates against USD when US monetary policy contracts. Output

level in the euro-area is positively affected in the short time, but then this effect becomes negative and even larger in the medium run.

Bluedorn and Bowdler (2011) aimed at understanding the impact of US monetary policy in an open economy. The results found were ambiguous and difficult to interpret due to omitted relevant variables such as inflation expectations, not included in the model. A contractionary shock of monetary policy of US by increase free market rate makes USD to appreciate and output of the foreign countries reacts negatively.

2.3 Overall Summary

To summarize, it is important to say that monetary policy of US has impact on the economies of other countries, let them be developed or developing ones. The pace and the size of that impact depends on countries specific characteristics such as inflation; financial openness of the countries and the degree of relationship it has with US.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Data

This research is a quantitative study that studies the impact of FED's Monetary Policy on BRIC Countries. BRIC countries include Brazil, Russia, India and China, which are fast developing and emerging countries.

Interest rate of the corresponding country is the dependent variable, while US interest rates, exchange rate, CPI, PPP, stock prices, exports and imports are the independent variables of this study. The data are monthly corresponding to the period of January 2000 until December 2015 and are accessed from IFS database of IMF and Yahoo Finance Database.

Data used in the study are as follows:

1. Interest Rate: is given in percentage terms and corresponds to the lending interest rate of each country included in the study. Data are monthly.
2. Exchange Rate: corresponds to the exchange rate of the domestic currency of each corresponding country with US dollar. Data are monthly.
3. CPI: reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as monthly as in this study.

4. PPP: Purchasing power parity reflects CPI of the corresponding country divided by CPI of USA.
5. Exports and Imports: reflect monthly data of total exports and imports levels of each country in US dollars, Billions.
6. Stock Prices: reflect the monthly stock prices of each country in this study in USD

3.2 Methodology

This research employs Vector-Autoregressive Model and Impulse-Response test in order to examine the impact of FED's monetary policy on BRIC countries. Data are studied and divided into three sub-sections: 2000-2015 monthly; Crises Period, corresponding to monthly data from April 2007 until December 2008; and Crises period, removing crises time period.

3.2.1VAR

Vector Autoregressive models were firstly used by Sims (1980) instead of multivariate equations for macroeconomic analysis. He stated that these models would be appropriate only for stationary variables without time trend. However, these models are able to capture even variables exhibiting stochastic trend (Engle & Granger, 1987). A VAR has more than one dependent variable and has more than one equation. Each equation uses its explanatory variables lags of all the variables under study (and possible a deterministic trend).

The VAR used in this paper is made of 8 variables, forming eight different equations where each explanatory variable is regressed till its fourth lag. VAR equations derived from this study are listed below.

The main equation of this study is as below:

$$\begin{aligned}
& \text{Int. Rate}_{Country} \\
& = \alpha + \beta * \text{Int. Rate}_{US} + \gamma * \text{Exch. Rate}_{Country} + \delta * \text{CPI}_{Country} \\
& + \varepsilon * \text{PPP}_{Country} + \theta * \text{Exports}_{Country} + \vartheta * \text{Imports}_{Country} \\
& + \omega * \text{Stock Prices}_{Country}
\end{aligned}$$

EQUATION 3.1

3.2.1.1VAR Equations

$$\begin{aligned}
& \Delta \text{Int. Rate}_{Country} \\
& = \alpha_1 + \delta_{11} \Delta \text{Int. Rate}_{Country}_{t-1} + \delta_{12} \Delta \text{Int. Rate}_{Country}_{t-2} + \delta_{13} \Delta \text{Int. Rate}_{Country}_{t-3} \\
& + \delta_{14} \Delta \text{Int. Rate}_{Country}_{t-4} + \theta_{11} \Delta \beta * \text{Int. Rate}_{US}_{t-1} + \theta_{12} \Delta \beta * \text{Int. Rate}_{US}_{t-2} \\
& + \theta_{13} \Delta \beta * \text{Int. Rate}_{US}_{t-3} + \theta_{14} \Delta \beta * \text{Int. Rate}_{US}_{t-4} + \omega_{11} \Delta \text{CPI}_{Country}_{t-1} \\
& + \omega_{12} \Delta \text{CPI}_{Country}_{t-2} + \omega_{13} \Delta \text{CPI}_{Country}_{t-3} + \omega_{14} \Delta \text{CPI}_{Country}_{t-4} \\
& + \delta_{11} \Delta \text{PPP}_{Country}_{t-1} + \delta_{12} \Delta \text{PPP}_{Country}_{t-2} + \delta_{13} \Delta \text{PPP}_{Country}_{t-3} \\
& + \delta_{14} \Delta \text{PPP}_{Country}_{t-4} + \gamma_{11} \Delta \text{Exports}_{Country}_{t-1} + \gamma_{12} \Delta \text{Exports}_{Country}_{t-2} \\
& + \gamma_{13} \Delta \text{Exports}_{Country}_{t-3} + \gamma_{14} \Delta \text{Exports}_{Country}_{t-4} + \varepsilon_{11} \Delta \text{Imports}_{Country}_{t-1} \\
& + \varepsilon_{12} \Delta \text{Imports}_{Country}_{t-2} + \varepsilon_{13} \Delta \text{Imports}_{Country}_{t-3} + \varepsilon_{14} \Delta \text{Imports}_{Country}_{t-4} \\
& + \varphi_{11} \Delta \text{Stockprices}_{Country}_{t-1} + \varphi_{12} \Delta \text{Stockprices}_{Country}_{t-2} \\
& + \varphi_{13} \Delta \text{Stockprices}_{Country}_{t-3} + \varphi_{14} \Delta \text{Stockprices}_{Country}_{t-4}
\end{aligned}$$

EQUATION 3.2

$$\begin{aligned}
& \Delta \text{Exch. Rate}_{Country} \\
& = \alpha_2 + \delta_{21} \Delta \text{Int. Rate}_{Country}_{t-1} + \delta_{22} \Delta \text{Int. Rate}_{Country}_{t-2} + \delta_{23} \Delta \text{Int. Rate}_{Country}_{t-3} \\
& + \delta_{24} \Delta \text{Int. Rate}_{Country}_{t-4} + \theta_{21} \Delta \beta * \text{Int. Rate}_{US}_{t-1} + \theta_{22} \Delta \beta * \text{Int. Rate}_{US}_{t-2} \\
& + \theta_{23} \Delta \beta * \text{Int. Rate}_{US}_{t-3} + \theta_{24} \Delta \beta * \text{Int. Rate}_{US}_{t-4} + \omega_{21} \Delta \text{CPI}_{Country}_{t-1} \\
& + \omega_{22} \Delta \text{CPI}_{Country}_{t-2} + \omega_{23} \Delta \text{CPI}_{Country}_{t-3} + \omega_{24} \Delta \text{CPI}_{Country}_{t-4} \\
& + \delta_{21} \Delta \text{PPP}_{Country}_{t-1} + \delta_{22} \Delta \text{PPP}_{Country}_{t-2} + \delta_{23} \Delta \text{PPP}_{Country}_{t-3} \\
& + \delta_{24} \Delta \text{PPP}_{Country}_{t-4} + \gamma_{21} \Delta \text{Exports}_{Country}_{t-1} + \gamma_{22} \Delta \text{Exports}_{Country}_{t-2} \\
& + \gamma_{23} \Delta \text{Exports}_{Country}_{t-3} + \gamma_{24} \Delta \text{Exports}_{Country}_{t-4} + \varepsilon_{21} \Delta \text{Imports}_{Country}_{t-1} \\
& + \varepsilon_{22} \Delta \text{Imports}_{Country}_{t-2} + \varepsilon_{23} \Delta \text{Imports}_{Country}_{t-3} + \varepsilon_{24} \Delta \text{Imports}_{Country}_{t-4} \\
& + \varphi_{21} \Delta \text{Stockprices}_{Country}_{t-1} + \varphi_{22} \Delta \text{Stockprices}_{Country}_{t-2} \\
& + \varphi_{23} \Delta \text{Stockprices}_{Country}_{t-3} + \varphi_{24} \Delta \text{Stockprices}_{Country}_{t-4}
\end{aligned}$$

EQUATION 3.3

$$\begin{aligned}
\Delta CPI_{Country} = & \alpha_3 + \delta_{31} \Delta Int. Rate_{Country_{t-1}} + \delta_{32} \Delta Int. Rate_{Country_{t-2}} + \delta_{33} \Delta Int. Rate_{Country_{t-3}} \\
& + \delta_{34} \Delta Int. Rate_{Country_{t-4}} + \theta_{31} \Delta \beta * Int. Rate_{US_{t-1}} + \theta_{32} \Delta \beta * Int. Rate_{US_{t-2}} \\
& + \theta_{33} \Delta \beta * Int. Rate_{US_{t-3}} + \theta_{34} \Delta \beta * Int. Rate_{US_{t-4}} + \omega_{31} \Delta CPI_{Country_{t-1}} \\
& + \omega_{32} \Delta CPI_{Country_{t-2}} + \omega_{33} \Delta CPI_{Country_{t-3}} + \omega_{34} \Delta CPI_{Country_{t-4}} \\
& + \delta_{31} \Delta PPP_{Country_{t-1}} + \delta_{32} \Delta PPP_{Country_{t-2}} + \delta_{33} \Delta PPP_{Country_{t-3}} \\
& + \delta_{34} \Delta PPP_{Country_{t-4}} + \gamma_{31} \Delta Exports_{Country_{t-1}} + \gamma_{32} \Delta Exports_{Country_{t-2}} \\
& + \gamma_{33} \Delta Exports_{Country_{t-3}} + \gamma_{34} \Delta Exports_{Country_{t-4}} + \varepsilon_{31} \Delta Imports_{Country_{t-1}} \\
& + \varepsilon_{32} \Delta Imports_{Country_{t-2}} + \varepsilon_{33} \Delta Imports_{Country_{t-3}} + \varepsilon_{34} \Delta Imports_{Country_{t-4}} \\
& + \varphi_{31} \Delta Stockprices_{Country_{t-1}} + \varphi_{32} \Delta Stockprices_{Country_{t-2}} \\
& + \varphi_{33} \Delta Stockprices_{Country_{t-3}} + \varphi_{34} \Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.4

$$\begin{aligned}
\Delta PPP_{Country} = & \alpha_4 + \delta_{41} \Delta Int. Rate_{Country_{t-1}} + \delta_{42} \Delta Int. Rate_{Country_{t-2}} + \delta_{43} \Delta Int. Rate_{Country_{t-3}} \\
& + \delta_{44} \Delta Int. Rate_{Country_{t-4}} + \theta_{41} \Delta \beta * Int. Rate_{US_{t-1}} + \theta_{42} \Delta \beta * Int. Rate_{US_{t-2}} \\
& + \theta_{43} \Delta \beta * Int. Rate_{US_{t-3}} + \theta_{44} \Delta \beta * Int. Rate_{US_{t-4}} + \omega_{41} \Delta CPI_{Country_{t-1}} \\
& + \omega_{42} \Delta CPI_{Country_{t-2}} + \omega_{43} \Delta CPI_{Country_{t-3}} + \omega_{44} \Delta CPI_{Country_{t-4}} \\
& + \delta_{41} \Delta PPP_{Country_{t-1}} + \delta_{42} \Delta PPP_{Country_{t-2}} + \delta_{43} \Delta PPP_{Country_{t-3}} \\
& + \delta_{44} \Delta PPP_{Country_{t-4}} + \gamma_{41} \Delta Exports_{Country_{t-1}} + \gamma_{42} \Delta Exports_{Country_{t-2}} \\
& + \gamma_{43} \Delta Exports_{Country_{t-3}} + \gamma_{44} \Delta Exports_{Country_{t-4}} + \varepsilon_{41} \Delta Imports_{Country_{t-1}} \\
& + \varepsilon_{42} \Delta Imports_{Country_{t-2}} + \varepsilon_{43} \Delta Imports_{Country_{t-3}} + \varepsilon_{44} \Delta Imports_{Country_{t-4}} \\
& + \varphi_{41} \Delta Stockprices_{Country_{t-1}} + \varphi_{42} \Delta Stockprices_{Country_{t-2}} \\
& + \varphi_{43} \Delta Stockprices_{Country_{t-3}} + \varphi_{44} \Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.5

$$\begin{aligned}
\Delta Exports_{Country} = & \alpha_5 + \delta_{51} \Delta Int. Rate_{Country_{t-1}} + \delta_{52} \Delta Int. Rate_{Country_{t-2}} \\
& + \delta_{53} \Delta Int. Rate_{Country_{t-3}} + \delta_{54} \Delta Int. Rate_{Country_{t-4}} + \theta_{51} \Delta \beta * Int. Rate_{US_{t-1}} \\
& + \theta_{52} \Delta \beta * Int. Rate_{US_{t-2}} + \theta_{53} \Delta \beta * Int. Rate_{US_{t-3}} + \theta_{54} \Delta \beta * Int. Rate_{US_{t-4}} \\
& + \omega_{51} \Delta CPI_{Country_{t-1}} + \omega_{52} \Delta CPI_{Country_{t-2}} + \omega_{53} \Delta CPI_{Country_{t-3}} \\
& + \omega_{54} \Delta CPI_{Country_{t-4}} + \delta_{51} \Delta PPP_{Country_{t-1}} + \delta_{52} \Delta PPP_{Country_{t-2}} \\
& + \delta_{53} \Delta PPP_{Country_{t-3}} + \delta_{54} \Delta PPP_{Country_{t-4}} + \gamma_{51} \Delta Exports_{Country_{t-1}} \\
& + \gamma_{52} \Delta Exports_{Country_{t-2}} + \gamma_{53} \Delta Exports_{Country_{t-3}} + \gamma_{54} \Delta Exports_{Country_{t-4}} \\
& + \varepsilon_{51} \Delta Imports_{Country_{t-1}} + \varepsilon_{52} \Delta Imports_{Country_{t-2}} + \varepsilon_{53} \Delta Imports_{Country_{t-3}} \\
& + \varepsilon_{54} \Delta Imports_{Country_{t-4}} + \varphi_{51} \Delta Stockprices_{Country_{t-1}} \\
& + \varphi_{52} \Delta Stockprices_{Country_{t-2}} + \varphi_{53} \Delta Stockprices_{Country_{t-3}} \\
& + \varphi_{54} \Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.6

$$\begin{aligned}
\Delta Imports_{Country} = & \alpha_6 + \delta_{61} \Delta Int. Rate_{Country_{t-1}} + \delta_{62} \Delta Int. Rate_{Country_{t-2}} \\
& + \delta_{63} \Delta Int. Rate_{Country_{t-3}} + \delta_{64} \Delta Int. Rate_{Country_{t-4}} + \theta_{61} \Delta \beta * Int. Rate_{US_{t-1}} \\
& + \theta_{62} \Delta \beta * Int. Rate_{US_{t-2}} + \theta_{63} \Delta \beta * Int. Rate_{US_{t-3}} + \theta_{64} \Delta \beta * Int. Rate_{US_{t-4}} \\
& + \omega_{61} \Delta CPI_{Country_{t-1}} + \omega_{62} \Delta CPI_{Country_{t-2}} + \omega_{63} \Delta CPI_{Country_{t-3}} \\
& + \omega_{64} \Delta CPI_{Country_{t-4}} + \delta_{61} \Delta PPP_{Country_{t-1}} + \delta_{62} \Delta PPP_{Country_{t-2}} \\
& + \delta_{63} \Delta PPP_{Country_{t-3}} + \delta_{64} \Delta PPP_{Country_{t-4}} + \gamma_{61} \Delta Exports_{Country_{t-1}} \\
& + \gamma_{62} \Delta Exports_{Country_{t-2}} + \gamma_{63} \Delta Exports_{Country_{t-3}} + \gamma_{64} \Delta Exports_{Country_{t-4}} \\
& + \varepsilon_{61} \Delta Imports_{Country_{t-1}} + \varepsilon_{62} \Delta Imports_{Country_{t-2}} + \varepsilon_{63} \Delta Imports_{Country_{t-3}} \\
& + \varepsilon_{64} \Delta Imports_{Country_{t-4}} + \varphi_{61} \Delta Stockprices_{Country_{t-1}} \\
& + \varphi_{62} \Delta Stockprices_{Country_{t-2}} + \varphi_{63} \Delta Stockprices_{Country_{t-3}} \\
& + \varphi_{64} \Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.7

$\Delta Stock Prices_{Country}$

$$\begin{aligned}
&= \alpha_7 + \delta_{71}\Delta Int. Rate_{Country_{t-1}} + \delta_{72}\Delta Int. Rate_{Country_{t-2}} + \delta_{73}\Delta Int. Rate_{Country_{t-3}} \\
&+ \delta_{74}\Delta Int. Rate_{Country_{t-4}} + \theta_{71}\Delta\beta * Int. Rate_{US_{t-1}} + \theta_{72}\Delta\beta * Int. Rate_{US_{t-2}} \\
&+ \theta_{73}\Delta\beta * Int. Rate_{US_{t-3}} + \theta_{74}\Delta\beta * Int. Rate_{US_{t-4}} + \omega_{71}\Delta CPI_{Country_{t-1}} \\
&+ \omega_{72}\Delta CPI_{Country_{t-2}} + \omega_{73}\Delta CPI_{Country_{t-3}} + \omega_{74}\Delta CPI_{Country_{t-4}} \\
&+ \delta_{71}\Delta PPP_{Country_{t-1}} + \delta_{72}\Delta PPP_{Country_{t-2}} + \delta_{73}\Delta PPP_{Country_{t-3}} \\
&+ \delta_{74}\Delta PPP_{Country_{t-4}} + \gamma_{71}\Delta Exports_{Country_{t-1}} + \gamma_{72}\Delta Exports_{Country_{t-2}} \\
&+ \gamma_{73}\Delta Exports_{Country_{t-3}} + \gamma_{74}\Delta Exports_{Country_{t-4}} + \varepsilon_{71}\Delta Imports_{Country_{t-1}} \\
&+ \varepsilon_{72}\Delta Imports_{Country_{t-2}} + \varepsilon_{73}\Delta Imports_{Country_{t-3}} + \varepsilon_{74}\Delta Imports_{Country_{t-4}} \\
&+ \varphi_{71}\Delta Stockprices_{Country_{t-1}} + \varphi_{72}\Delta Stockprices_{Country_{t-2}} \\
&+ \varphi_{73}\Delta Stockprices_{Country_{t-3}} + \varphi_{74}\Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.8

$\Delta Interest Rate_{US}$

$$\begin{aligned}
&= \alpha_8 + \delta_{81}\Delta Int. Rate_{Country_{t-1}} + \delta_{82}\Delta Int. Rate_{Country_{t-2}} + \delta_{83}\Delta Int. Rate_{Country_{t-3}} \\
&+ \delta_{84}\Delta Int. Rate_{Country_{t-4}} + \theta_{81}\Delta\beta * Int. Rate_{US_{t-1}} + \theta_{82}\Delta\beta * Int. Rate_{US_{t-2}} \\
&+ \theta_{83}\Delta\beta * Int. Rate_{US_{t-3}} + \theta_{84}\Delta\beta * Int. Rate_{US_{t-4}} + 8\Delta CPI_{Country_{t-1}} \\
&+ \omega_{82}\Delta CPI_{Country_{t-2}} + \omega_{83}\Delta CPI_{Country_{t-3}} + \omega_{84}\Delta CPI_{Country_{t-4}} \\
&+ \delta_{81}\Delta PPP_{Country_{t-1}} + \delta_{82}\Delta PPP_{Country_{t-2}} + \delta_{83}\Delta PPP_{Country_{t-3}} \\
&+ \delta_{84}\Delta PPP_{Country_{t-4}} + \gamma_{81}\Delta Exports_{Country_{t-1}} + \gamma_{82}\Delta Exports_{Country_{t-2}} \\
&+ \gamma_{83}\Delta Exports_{Country_{t-3}} + \gamma_{84}\Delta Exports_{Country_{t-4}} + \varepsilon_{81}\Delta Imports_{Country_{t-1}} \\
&+ \varepsilon_{82}\Delta Imports_{Country_{t-2}} + \varepsilon_{83}\Delta Imports_{Country_{t-3}} + \varepsilon_{84}\Delta Imports_{Country_{t-4}} \\
&+ \varphi_{81}\Delta Stockprices_{Country_{t-1}} + \varphi_{82}\Delta Stockprices_{Country_{t-2}} \\
&+ \varphi_{83}\Delta Stockprices_{Country_{t-3}} + \varphi_{84}\Delta Stockprices_{Country_{t-4}}
\end{aligned}$$

EQUATION 3.9

3.2 Impulse- Response

The second method used in this paper is the impulse-response test. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables.

As the data are analyzed in to three different time periods, this test is employed to each country in our study for the three periods. A shock is caused to US interest rates and the response of interest rates in BRIC countries for all period of study, crises free period and crises period is studied.

CHAPTER 4

EMPIRICAL RESULTS

This section represents the empirical results of the thesis based on the methodology employed. It includes unit root test results, VAR models analysis and Impulse-Response result analysis.

4.1 Unit Root Test

This section of the paper represents the unit root test results of each variable included in this model.

TABLE 4.1 Unit Root Test

Variables	ADF		PP	
	Level	First Diff.	Level	First Diff.
Interest Rate US	-2.22	-5.6*	-1.78	-5.43*
Interest Rate Brazil	-1.58	-10.71*	-1.6	-11.39*
Interest Rate Russia	-5.92*		-5.63*	
Interest Rate India	-1.967	-13.07*	-1.967	-13.08*
Interest Rate China	-2.16	-6.40*	-1.74	-9.63*
Exchange Rate Brazil	-0.82	-9.49*	-0.83	-9.56*
Exchange Rate Russia	3.90	-9.17*	3.44	-7.42*
Exchange Rate India	0.05	-10.15*	0.37	-10.12*
Exchange Rate China	-1.12	-2.98*	-0.58	-8.21*
CPI Brazil	2.34	-5.089*	3.36	-5.11*
CPI Russia	1.87	-6.00*	2.89	-6.11*
CPI India	4.97	-1.87*	3.92	-9.97*
CPI China	0.77	-10.48*	0.86	-10.47*

CONTINUES...

PPP Brazil	1.42	-6.58*	1.94	-6.45*
PPP Russia	1.30	-7.15*	1.59	-5.55*
PPP India	4.09	-9.81*	3.23	-9.79*
PPP China	-0.53	-13.59*	-0.537	-13.59*
Exports Brazil	-1.41	-3.74*	-1.71	-22.6*
Exports Russia	-1.65	-3.33*	-1.76	-18.4*
Exports India	-1.09	-3.62*	-1.11	-1.65*
Exports China	-0.59	-3.50*	-0.92	-20.5*
Imports Brazil	-1.65	-2.61*	-1.58	-19.88*
Imports Russia	-2.03	-3.3*	-1.98	-21.00*
Imports India	-1.09	-20.8*	-1.19	-20.5*
Imports China	-0.80	-5.72*	-0.97	-27.39*
Stock Prices Brazil	-1.37	-11.87*	-1.47	-11.89*
Stock Prices Russia	-1.26	-12.28*	-1.41	-12.35*
Stock Prices India	-0.20	-13.59*	-0.342	-13.6*
Stock Prices China	-1.57	-12.55*	-1.65	-12.56*

* Indicates significant at 5% significance level

Unit root test is employed and the result is reported in Table 4.1. The result shows that all variables are non-stationary in level and stationary in first difference, except interest rates of Russia which are stationary in levels.

4.2 VAR Model Analysis

As it has been stated above, the objective of this paper is to see the effect of changes in monetary policy of US in monetary policy, trade and stock market of BRIC countries. Based on this objective, the following analysis has been made.

4.2.1 VAR Model Analysis 2000-2015

TABLE 4.2 VAR Analysis Results (2000-2015) in Brazil

	DINTUS	DINTBRA	DEXCBR	DEXPBRA	DIMPBRA	DPPPBRA	DSTOCKB	DCPIBRA
DINTUS(-1)	0.594563 [7.45521]	1.515531 [1.75868]	0.052125 [0.83074]	1108.737 [1.17412]	1208.462 [1.70602]	0.001326 [0.52550]	-994.8183 [-0.51362]	0.232542 [1.67116]
DINTUS(-2)	0.039978 [0.42715]	0.526407 [0.52051]	-0.004475 [-0.06078]	-75.68801 [-0.06830]	-794.4938 [-0.95572]	0.000398 [0.13456]	1067.401 [0.46959]	-0.051076 [-0.31277]
DINTUS(-3)	0.198433 [2.14880]	-2.244336 [-2.24920]	-0.044575 [-0.61351]	-2271.880 [-2.07773]	-1106.254 [-1.34873]	0.002523 [0.86390]	-2789.550 [-1.24381]	-0.090929 [-0.56434]
DINTUS(-4)	-0.089651 [-1.1275]	-0.075270 [-0.08761]	0.003564 [0.05697]	813.4545 [0.86402]	281.5181 [0.39862]	-0.001536 [-0.61077]	3684.661 [1.90811]	0.054990 [0.39638]

As it can be seen from the above VAR model output, a change in interest rate of US affects interest rates in Brazil. The effect of any change in US interest rate is seen immediately after one month in interest rate of Brazil. However, this effect is positive in the first month, but after the third month this effect becomes negative. So, monetary policy of US does affect the monetary policy of Brazil.

Regarding the impact of changes in US interest rate on Exports of Brazil, a negative and significant effect is seen after the third month. So, when US changes its interest rates, the effect of this change in exports of Brazil is seen observed after three months. Regarding the effect of this change in Imports, when US changes its interest rates, the effect on imports of Brazil is seen immediately after the first month.

Our last objective is to see the effect of US monetary policy on Stock Market of the Brazil. From the above table we can see that a change in US interest rates exhibits its effect on Brazil stock prices after the fourth month. This effect is statistically significant and positive.

Besides the effect that US interest rates might have on determination of Brazil interest rates, other factors such as exchange rate of BRL/USD, Exports/Imports of Brazil, PPP, Brazil Stock Prices and CPI, do as well effect interest rates of Brazil. From the VAR output table it is observed that a change in the exchange rate of BRL/USD affects positively interest rates of Brazil and exhibits its impact immediately in the first month. The same effect is seen with the exports as well. They positively affect interest rates since the first month. Regarding the stock prices of Brazil, a change in the price affects the interest rates of Brazil negatively in the first month of the change and it exhibits a positive effect the third month. Regarding Imports, PPP and CPI do not see to have any significant effect on the determination of the interest rates of the Brazil.

TABLE 4.3 VAR Analysis Results (2000-2015), Russia

	DINTUS	DEXC	DEXP	DIMP	DPPP	DSTOCK	DCPI	INT_RATE
DINUS(-1)	0.593287 [7.3306]	0.285095 [0.33511]	-1572.554 [-0.89971]	-2187.540 [-1.32664]	-0.000922 [-0.30594]	-38.90228 [-0.65454]	0.002062 [0.00841]	-0.877318 [-1.59260]
DINUS(-2)	0.048439 [0.5204]	0.195325 [0.19980]	-1197.460 [-0.59621]	-576.2660 [-0.30413]	-0.003355 [-0.96872]	72.38224 [1.05983]	-0.303049 [-1.07528]	-0.126395 [-0.19967]
DINUS(-3)	0.106820 [1.1546]	-0.963781 [-0.99106]	-317.6915 [-0.15901]	-82.22465 [-0.04362]	0.002110 [0.61253]	-117.6660 [-1.73194]	-0.173356 [-0.61834]	0.034437 [0.05469]
DINUS(-4)	-0.02565 [-0.3311]	0.458701 [0.56326]	-257.7707 [-0.15407]	803.2356 [0.50888]	0.002943 [1.01999]	107.0327 [1.88129]	0.356848 [1.51994]	-0.069180 [-0.13119]

Regarding the impact of US monetary policy on Russia, it can be seen from the above table that it has a significant effect only on the stock market of Russia. It does not exhibit significant effect on monetary and trade policy of the country. A change in US interest rates negatively affects Russian stock prices three months after the change, then in the fourth month it changes to a positive and more significant impact. From our analysis of determination of Russian interest rates, it seems that only a change in exchange rate of Russian Ruble to USD has a positive and significant effect on interest rates. This effect is observed immediately in the first month of the change.

TABLE 4.4 VAR Analysis Results (2000-2015), India

	DINTUS	DEX	DEXP	DIMP	DPPP	DSTOCK	DCPI	DINT
DINUS(-1)	0.632323 [7.96209]	-0.093721 [-0.18592]	407.0079 [0.45294]	2267.136 [1.64478]	-0.002620 [-0.58810]	628.6305 [1.11746]	-0.029251 [-0.06963]	0.189428 [0.84765]
DINUS(-2)	0.015995 [0.17118]	0.451700 [0.76156]	-1891.404 [-1.78894]	-3855.391 [-2.37724]	-0.000861 [-0.16420]	-17.26342 [-0.02608]	-0.171316 [-0.34658]	0.057902 [0.22021]
DINUS(-3)	0.189024 [2.01577]	-0.689665 [-1.15866]	435.8514 [0.41078]	181.6303 [0.11160]	0.000341 [0.06484]	-291.3686 [-0.43865]	-0.186655 [-0.37628]	-0.049701 [-0.18836]
DINUS(-4)	-0.04631 [-0.5812]	-0.126778 [-0.25064]	930.9003 [1.03245]	455.4693 [0.32932]	-0.000528 [-0.11821]	557.5652 [0.98778]	0.009150 [0.02171]	-0.072256 [-0.32224]

From the output of the VAR model, it is observed that US monetary policy has a significant effect on just trade policy of India, while it does not seem to significantly impact monetary policy and stock market of this country. A change in US interest rates affects the exports of India negatively and this effect is seen in the second month of the change of US interest rates. It also has a significant impact on imports. It affects imports positively since the first month of the change and negatively in the second month of the change.

Regarding the determination of India's interest rates, it is observed that only the level of exports and imports do have a significant effect on determination of India's interest rates, even though this effect is relatively low. A change in exports of India negatively affect interest rates, and this effect is observed immediately the first month of the change. While imports on the other hand affect positively interest rates. A change in imports of India exhibits its effect on interest rate after the third month. Regarding exchange rate, PPP, Stock price and CPI seem to not significantly affect the interest rates of India.

TABLE 4.5 VAR Analysis Results (2000-2015), China

	DINTUS	DEXCH	DEXP	DIMP	DPPP	DCPI	DSTOCK	DINT
DINUS(-1)	0.616099 [7.48523]	0.006946 [0.54401]	6813.358 [0.88185]	5622.175 [0.91326]	-0.002388 [-0.64818]	0.142151 [0.46251]	574.2897 [0.73991]	0.104502 [1.36422]
DINUS(-2)	0.049102 [0.51967]	0.026742 [1.82452]	-1227.413 [-0.13839]	-612.4993 [-0.08667]	0.002795 [0.66086]	0.151142 [0.42837]	101.4837 [0.11390]	-0.105382 [-1.19839]
DINUS(-3)	0.169373 [1.80021]	-0.033689 [-2.30834]	-6438.027 [-0.72897]	-8000.339 [-1.13690]	0.003220 [0.76455]	-0.025891 [-0.07369]	-172.7572 [-0.19472]	-0.048464 [-0.55349]
DINUS(-4)	-0.070516 [-0.86924]	0.013453 [1.06904]	-2840.313 [-0.37299]	-1433.879 [-0.23632]	-0.001706 [-0.46992]	-0.152734 [-0.50420]	693.8152 [0.90697]	0.093460 [1.23791]

From the output of VAR model, it is observed that none of the variables, except Exchange rate of CNY/USD is significantly affected by the changes in the interest rates of US. A change in interest rates of US has a positive effect on the exchange rate of CNY/USD after

the second month of the change, while after the third month the effect becomes negative. According to the results, it can be said that monetary policy of US does not have significant effect on either monetary policy, trade policy or stock market in China.

However, interest rate in China is affected by Exchange rate of CNY to USD. A change in CNY/USD negatively affect China's interest rates since the first month. A change in imports of China immediately in the first month affect positively the interest rates. PPP also has a significant but negative effect on China's interest rates observed in the third month after the change. Both CPI and Stock Prices positively affect interest rates in China. The effect of CPI in China on interest rates is seen in the first and the third month after a change in CPI has occurred, while effect of Stock Prices changes is observed in the first and the second month after any change in stock prices of China occurs. From the output table, no significant impact of exports on China's interest rates is observed.

4.2.2 VAR Analysis Crises Free Period

TABLE 4.5 VAR ANALYSIS RESULT IN CRISES FREE PERIOD IN BRAZIL

	DCPI	DEXC	DEXP	DIMP	DINT	DPPP	DSTOCK
ACTINTUS(-1)	0.159324 [0.94377]	0.012144 [0.16715]	579.7067 [0.51541]	1046.901 [1.24197]	1.690327 [1.74175]	0.001618 [0.56271]	-543.7935 [-0.26868]
ACTINTUS(-2)	-0.026218 [-0.13643]	0.008599 [0.10396]	-637.3585 [-0.49781]	-1430.941 [-1.49129]	1.278718 [1.15751]	-0.002620 [-0.80041]	2068.427 [0.89780]
ACTINTUS(-3)	-0.056562 [-0.29249]	-0.082006 [-0.98531]	-1401.002 [-1.08737]	-432.4874 [-0.44790]	-3.680202 [-3.31044]	0.003145 [0.95462]	-1135.612 [-0.48982]
ACTINTUS(-4)	0.153731 [0.89087]	0.024518 [0.33013]	803.2567 [0.69866]	598.0974 [0.69414]	0.829683 [0.83636]	-0.001683 [-0.57250]	270.8551 [0.13092]

VAR analysis in crises free period of Brazil is employed and the results are shown in Table 4.2.2.1. The results show that in normal conditions a change in interest rates of US affect the interest rates of Brazil. This impact is exhibited in the first month and has a positive effect on Brazil interest rates, while in the third month this effect becomes negative and

highly significant. However, the results imply that a change in US interest rate does affect only interest rates of Brazil and not the other indicators.

TABLE 4.6 VAR ANALYSIS RESULT IN CRISES FREE PERIOD IN RUSSIA

	DCPI	DEXC	DEXP	DIMP	INT	DPPP	DSTOCK
ACTINTUS(-1)	-0.011471 [-0.03552]	0.076141 [0.07268]	1749.963 [0.82314]	172.7017 [0.08481]	-0.382514 [-0.26275]	-0.000582 [-0.15546]	-31.63042 [-0.56367]
ACTINTUS(-2)	-0.019363 [-0.05342]	0.468232 [0.39816]	-1281.260 [-0.53690]	-221.9718 [-0.09711]	-0.207342 [-0.12688]	-0.003223 [-0.76744]	81.00820 [1.28606]
ACTINTUS(-3)	-0.108838 [-0.29717]	-0.712191 [-0.59940]	990.8774 [0.41096]	-166.9534 [-0.07229]	-0.036854 [-0.02232]	0.001990 [0.46905]	-6.280149 [-0.09868]
ACTINTUS(-4)	0.362609 [1.17012]	0.159611 [0.15876]	-1650.119 [-0.80884]	31.19235 [0.01596]	0.138536 [0.09916]	0.003029 [0.84362]	0.452084 [0.00840]

VAR analysis in crises free period of Russia is employed and the results are shown in Table 4.2.2.2. The results indicate that in crises free period, a change in US interest rates does not have any effect in monetary policy, trade policy or stock market conditions in Russia.

TABLE 4.7 VAR ANALYSIS RESULT IN CRISES FREE PERIOD IN INDIA

	DCPI	DEX	DEXP	DIMP	DINT	DPPP	DSTOCK
ACTINTUS(-1)	-0.052351 [-0.10799]	0.154564 [0.28169]	1094.523 [1.15059]	2054.632 [1.38090]	0.073353 [0.27619]	175.8991 [0.32585]	0.560414 [6.92637]
ACTINTUS(-2)	-0.071988 [-0.13093]	-0.396161 [-0.63659]	-930.9482 [-0.86288]	-893.2078 [-0.52931]	-0.017547 [-0.05825]	741.0943 [1.21046]	0.041036 [0.44719]
ACTINTUS(-3)	-0.233026 [-0.42209]	0.474195 [0.75887]	201.2287 [0.18575]	-1402.874 [-0.82794]	0.062253 [0.20583]	-521.8564 [-0.84889]	0.190386 [2.06626]
ACTINTUS(-4)	-0.068514 [-0.14090]	-0.407019 [-0.73952]	90.76481 [0.09512]	390.3166 [0.26153]	-0.021860 [-0.08206]	-125.2134 [-0.23125]	-0.008513 [-0.10489]

VAR analysis in crises free period of India is employed and the results are shown in Table 4.2.2.3. The results indicate that in crises free period, a change in US interest rates has a

highly significant positive impact in stock prices of India. When US change its interest rates its impact is seen since the first month and again in the third, with a relatively lower impact, but still positive.

TABLE 4.8 VAR ANALYSIS RESULT IN CRISES FREE PERIOD IN CHINA

	DCPI	DEXC	DEXP	DIMP	DINT	DPPP	DSTOCK
ACTINTUS(-1)	0.036920 [0.10865]	-0.005842 [-0.48109]	10819.91 [1.20336]	5566.200 [0.79187]	-0.063661 [-0.96755]	856.3693 [1.21787]	0.530822 [6.32213]
ACTINTUS(-2)	0.338513 [0.90128]	0.012090 [0.90067]	-2477.438 [-0.24927]	-1782.076 [-0.22936]	-0.002258 [-0.03105]	670.9623 [0.86324]	0.077622 [0.83636]
ACTINTUS(-3)	-0.217733 [-0.57867]	-0.017988 [-1.33757]	-6165.880 [-0.61927]	-7772.318 [-0.99852]	-0.008296 [-0.11386]	-712.4749 [-0.91501]	0.186005 [2.00056]
ACTINTUS(-4)	-0.088165 [-0.26099]	0.003811 [0.31564]	-1618.038 [-0.18101]	736.2871 [0.10536]	0.148048 [2.26325]	473.4457 [0.67724]	-0.039881 [-0.47777]

VAR analysis in crises free period of China is employed and the results are shown in Table 4.2.2.4. The results show that changes in US interest rates in crises free period affects both interest rates and stock prices of China. The impact in stock prices is faster, highly significant and positive. On the other hand, the impact in interest rates of China is slower and less significant compared to stock prices, but still positive.

4.2.3 VAR Analysis Crisis Period

TABLE 4.9 VAR ANALYSIS RESULT IN CRISIS PERIOD IN BRAZIL

	DCPI	DEXC	DEXP	DIMP	DINT	DPPP	DSTOCK
DINTUS(-1)	-1.132152 [-1.09848]	-0.291635 [-0.57305]	-353.0426 [-0.04041]	-1490.912 [-0.20025]	-4.975843 [-1.63946]	-0.002515 [-0.09348]	11091.53 [0.49601]
DINTUS(-2)	0.131049 [0.25854]	0.180724 [0.72207]	-4805.884 [-1.11853]	1291.736 [0.35279]	6.572092 [4.40297]	0.000846 [0.06394]	-23976.78 [-2.18022]

VAR analysis in crisis period (04/2007-12/2008)in Brazil is employed and the results are shown in Table 4.2.3.1. The results imply that a change in US interest rates during crisis affects both interest rates and stock prices of Brazil. The impact on interest rates is

observed in the second month, which is positive and highly significant. The effect on stock prices seems to be negative and significant, and exhibited in the second month as well.

TABLE 4.10 VAR ANALYSIS RESULT IN CRISIS PERIOD IN RUSSIA

	DCPI	DEX	DEXP	DIMP	DINT	DPPP	DSTOCK
DINTUS(-1)	-0.068865 [-0.03685]	-0.112953 [-0.10171]	10264.25 [1.04013]	4623.617 [0.27994]	0.460108 [0.75134]	0.000203 [0.01014]	-783.7344 [-1.20545]
DINTUS(-2)	-1.091017 [-0.96889]	0.482698 [0.72142]	-1869.637 [-0.31447]	-4689.829 [-0.47130]	0.042405 [0.11493]	-0.005900 [-0.48882]	381.6041 [0.97421]

VAR analysis in crisis period in Russia is employed and the results are shown in Table 4.2.3.2. The results suggest that US monetary policy does not have any effect on Russian monetary policy, trade or stock market.

TABLE 4.11 VAR ANALYSIS RESULT IN CRISIS PERIOD IN INDIA

	DCPI	DEXC	DEXP	DIMP	DINT	DPPP	DSTOCK
DINTUS(-1)	-0.533836 [-0.41592]	-843.2116 [-0.28580]	-2.385721 [-0.99364]	-1569.468 [-0.57674]	0.930253 [1.46371]	-0.004034 [-0.35291]	-801.2134 [-0.28411]
DINTUS(-2)	0.894002 [0.80694]	-3565.523 [-1.40009]	0.638798 [0.30823]	-8391.126 [-3.57229]	-0.056653 [-0.10327]	0.017915 [1.81566]	2899.150 [1.19101]

VAR analysis in crisis period in India is employed and the results are shown in Table 4.2.3.3. The results indicate that changes in US interest rates affect imports of India negatively, and this impact is seen two months after the change. These changes affect stock prices positively and the effect is observed in the second month after the change has occurred.

TABLE 4.12 VAR ANALYSIS RESULT IN CRISIS PERIOD IN CHINA

	DCPI	DEXC	DEXP	DIMP	DINT	DPPP	DSTOCK
DINTUS(-1)	4.670550 [2.44929]	0.001294 [0.01035]	-3038.706 [-0.08596]	17045.91 [0.65641]	2.437545 [2.61368]	0.015428 [0.69234]	3768.738 [0.24102]
DINTUS(-2)	1.263109 [0.95928]	0.191793 [2.22232]	-38931.72 [-1.59498]	-35401.36 [-1.97427]	0.016182 [0.02513]	0.025104 [1.63144]	7687.559 [0.71200]

VAR analysis in crisis period in China is employed and the results are shown in Table 4.2.3.4. From the table is seen that changes in interest rates in US has relatively higher impact on China compared to all other countries in our study. Changes in US interest rates affect positively and significantly CPI, exchange rates and interest rates in China; and negatively imports of China. The effect on CPI and interest rates is seen since the first month, while effect on exchange rates and imports is seen in the second month of the change.

4.3 Impulse Response

In this section impulse response test result for the three periods of the study are shown.

4.3.1 Impulse Response 2000-2015

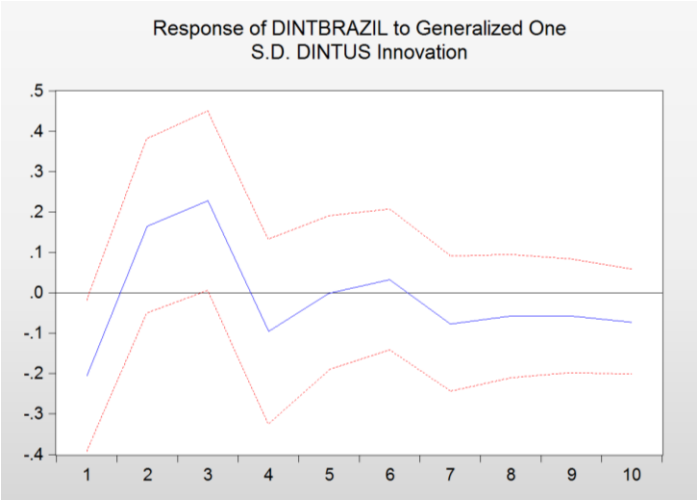


FIGURE 4.1 Response of DINTBRAZIL to GENERALIZED One S.D. DINTUS Innovation

Referring Figure 4.3.1.1, it can be concluded that during normal times when a shock to US interest rates occurs it has a positive impact on Brazil interest rates for the first two months. In the third the impact becomes negative and it stops its impact after the fifth month.

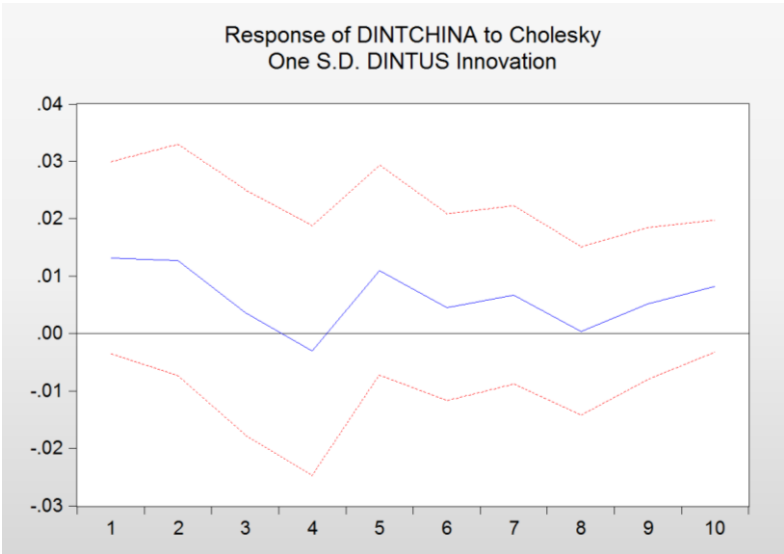


FIGURE 4.2 Response of DINTCHINA to Cholesky One S.D. DINTUS Innovation

The result of impulse response test for China is presented in Figure 4.3.1.2. From the figure, it can be seen that a shock in interest rates of US does not have any effect in the first month. In the fourth month the effect becomes negative.

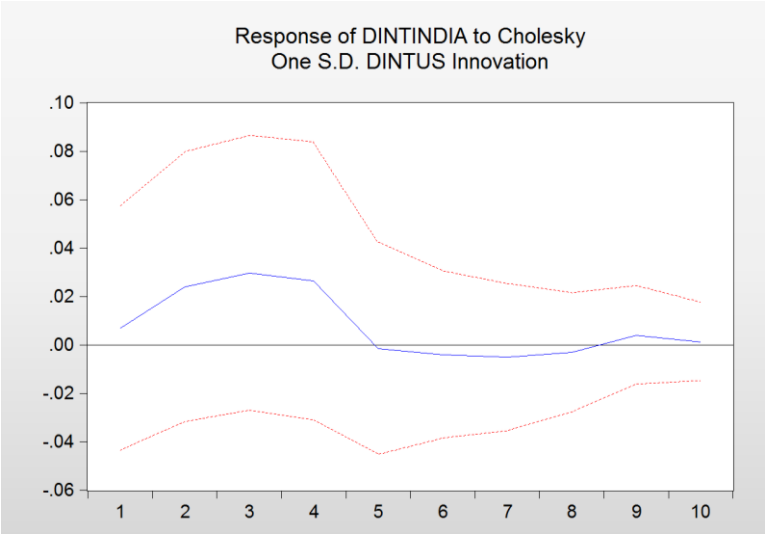


FIGURE 4.3 Response of DINTINDIA to Cholesky One S.D. DINTUS Innovation

Referring Figure 4.3.1.3, a shock in US interest rates seem to have a positive effect on interest rates of India. Then in the fourth month the effect starts to be negative until it becomes zero in the fifth month.

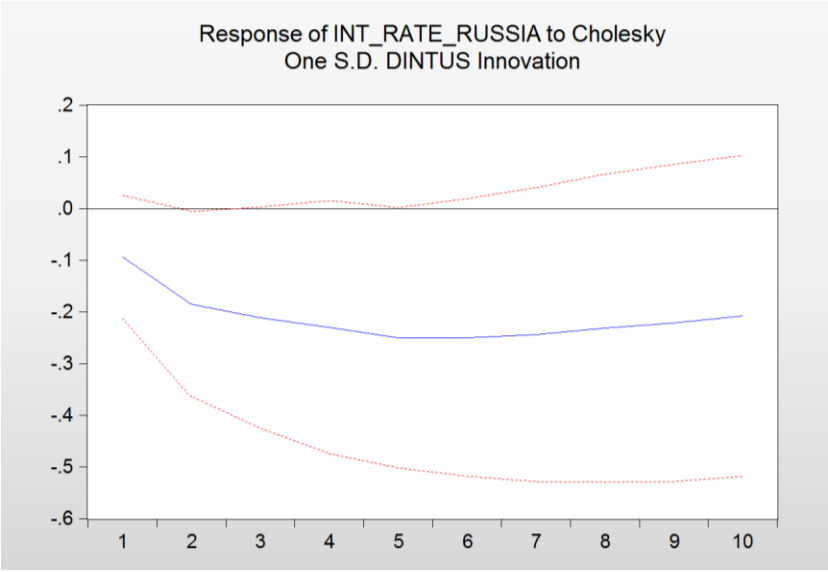


FIGURE 4.4 Response of INT_RATE_RUSSIA to Cholesky One S.D. DINTUS Innovation

Referring Figure 4.3.1.4, interest rates of Russia do not seem to be affected by a shock in interest rates of US.

4.3.2 Impulse Response Crises Free Period

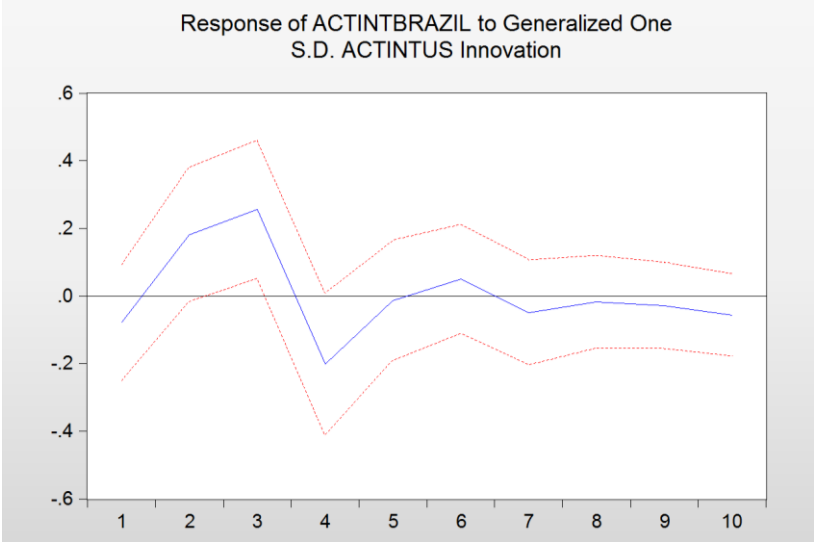


FIGURE 4.5 Response of ACTINBRAZIL to Generalized One S.D ACTINTUS Innovation

The impulse-response test of a shock in US interest rates for Brazil in crises free period is made and the result is shown in Figure 4.3.2.1. For the first two months, the impact is positive then in the third month this relationship changes until the effect becomes non-significant in the fifth month.

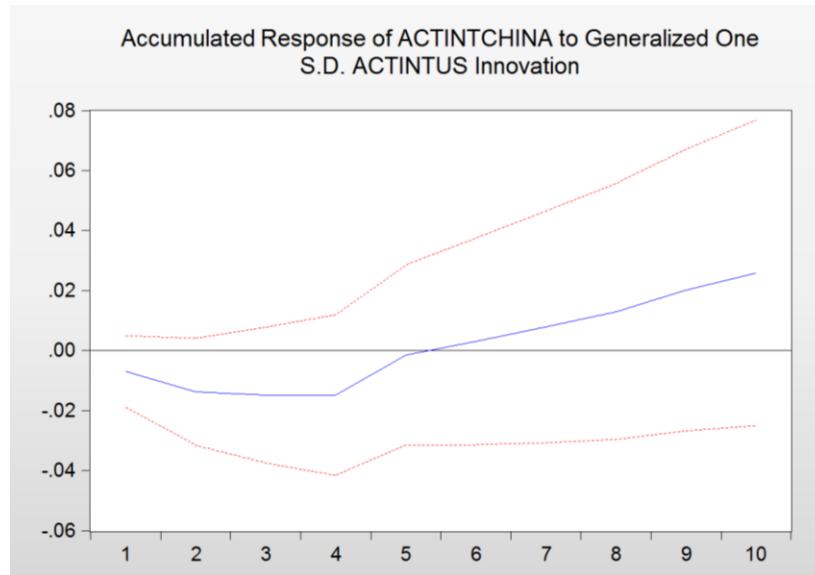


FIGURE 4.6 Response of ACTINCHINA to Generalized One S.D ACTINTUS Innovation

Referring Figure 4.3.2.2, the graph shows that in non-crisis period a shock in US interest rates does not have any significant effect on interest rates of China.

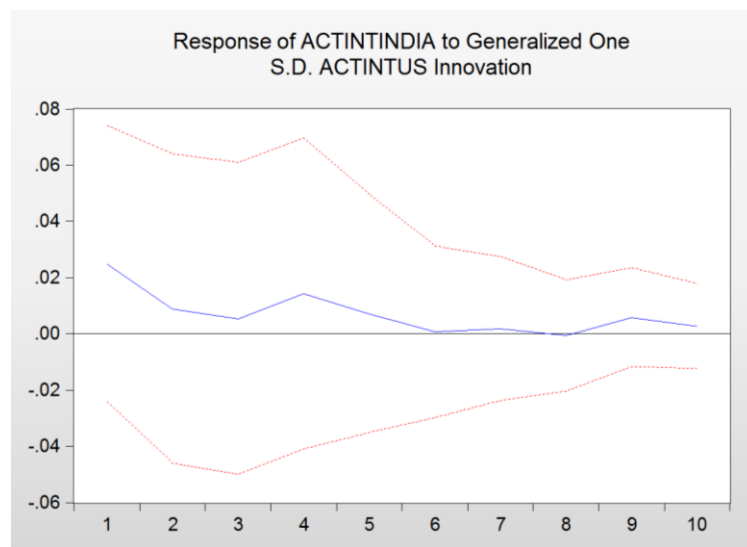


FIGURE 4.7 Response of ACTININDIA to Generalized One S.D ACTINTUS Innovation

The results of an impulse-response of a shock of US interest rates on India's interest rates during crises free period are shown on Figure 4.3.2.3. The graph shows that in the first months this effect is negative, until it becomes zero after the fifth month and latter.

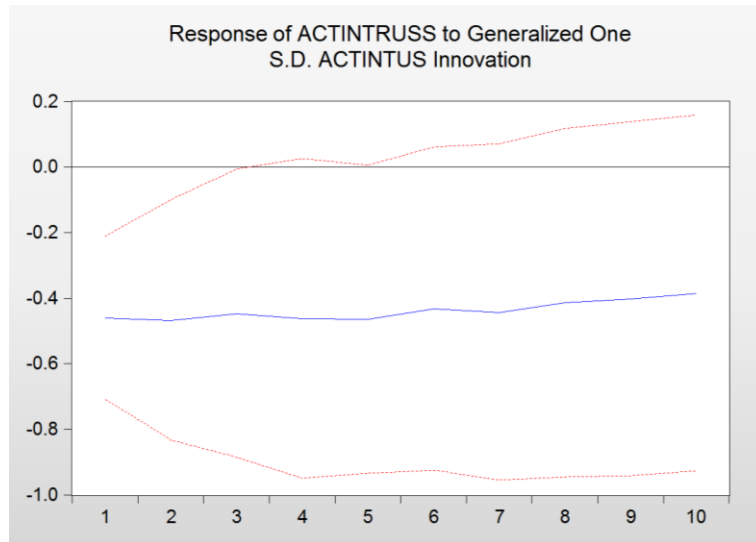


FIGURE 4.8 Response of ACTINTRUSS to Generalized One S.D ACTINTUS Innovation

The graph from Figure 4.3.2.4, of the response of interest rates of Russia to a shock on US interest rates, shows that there is no effect on Russian interest rates in such cases for crisis free-period.

CHAPTER 5

CONCLUSION

5.1 Concluding Remarks

The aim of this paper is to study the impact of Fed's monetary policy on BRIC countries. The results showed that Brazil is the country with the highest influence by changes in interest rates of US. This can be explained by the fact that Brazil is geographically closer to US than any other country, implying that geographical location is more important than trade relationships a country might have with the US. Both VAR models and Impulse-Response tests reveal same results. Interest rates of US and interest rates of Brazil exhibit a positive relationship within the first months. According to the analysis monetary policy conducted by Fed does not affect monetary policy on neither Russia nor India. However, it does affect China's interest rates. The results of VAR and Impulse Response tests are consistent for all periods of studies.

Impulse- response tests revealed the same results as those of VAR analysis. During shocks of US interest rates, the impact on interest rates of Brazil resulted to be positive for the first months. These results are valid for both crisis free period and all the period from 2000 to 2015. On the other hand, these kind of shocks in US affect interest rates in India negatively for the first months. This result stands for both crisis free period and all the period from 2000 to 2015. Shocks do not effect interest rates in neither Russia nor China.

The results of VAR and Impulse Response tests are consistent for all periods of studies.

5.2 Implications

It has implications for BRIC countries monetary policy makers. As the study is conducted into three sub-periods, crisis and crisis free period, the results of this research might be used to forecast the impact of US monetary policy on these countries economy's, in such similar cases in the future.

As Brazil and China resulted to be affected by changes in US interest rates, the policy makers in these countries must take precautions according to movements of interest rates in US.

International investors could also use the results of this research when making decisions about investment opportunities in BRIC countries. Based on the responses of interest rates, exchange rate and net exports of these countries to changes and shocks of US interest rates, investors can make safer investment decision, by predicting the behavior of these variables.

When there is crisis in US, it would be better for international investor to invest in countries like Russia and India, as they are not effected by US movements during crisis. For safer investments, one should diversify its portfolio among these countries.

This thesis research has also implications for scholars in the future. It will contribute in enriching existing literature on US monetary policy on BRIC countries.

5.3 Limitations

As almost every research, this thesis faced some limitations as well. Main limitations are listed below:

1. Lack of Sample Size: Data used in this research correspond to the period from 2000 to 2015, covering only the financial crisis of 2008. The results would more exact if there were data found for larger periods.
2. Lack of data about other developing countries. There is lack of information about the variables included in this study for other developing countries.
3. The variables included in this research do not cover all the variables which help explain the impact of US monetary policy on BRIC countries. Other variables such as political situation of the countries and geographical location could better explain this research.

5.4 Further Studies

The research conducted for this thesis suggests that a number of other studies can be done. Studies of this kind for all developing countries in Europe, Southeastern Europe, using the same variables and including more observations could be done in the future. Another deeper study on the impact of Fed's monetary policy on BRIC countries including more observations and adding other variable can be performed. Further studies on studying the effect of neighborhood on monetary policy impact in developing countries and effect of trade relationships on monetary policy impact in developing countries can be done in the future.

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APPENDIX

DATA

	Int. Rate US	Int. Rate Brazil	Int. Rate Russia	Int. Rate India	Int. Rate China	Exch. Rate Brazil	Exch. Rate Russia	Exch. Rate India	Exch. Rate China	Exp. Brazil	Exp. Russia	Exp. India	Exp. China		
Jan-00	8.50	60.01	34.00	12.50	5.85	1.80	28.19	43.55	8.28	3,453.88	6,801.00	2,948.32	16,797.00		
Feb-00	8.73	62.25	31.30	12.50	5.85	1.77	28.73	43.61	8.28	4,124.89	7,950.00	3,429.26	14,800.00		
Mar-00	8.83	58.29	29.80	12.50	5.85	1.74	28.46	43.59	8.28	4,473.25	9,142.00	3,720.65	20,100.00		
Apr-00	9.00	58.06	29.20	12.50	5.85	1.77	28.59	43.64	8.28	4,183.74	8,255.00	3,422.60	20,500.00		
May-00	9.24	57.43	25.50	11.75	5.85	1.83	28.31	43.97	8.28	5,065.53	8,469.00	3,447.00	20,105.00		
Jun-00	9.50	58.01	23.00	11.75	5.85	1.81	28.24	44.69	8.28	4,863.57	8,733.00	3,427.16	22,190.00		
Jul-00	9.50	56.22	22.70	11.75	5.85	1.80	27.85	44.78	8.28	5,005.99	8,576.00	3,554.06	21,500.00		
Aug-00	9.50	55.47	20.90	12.25	5.85	1.81	27.74	45.69	8.28	5,522.39	9,106.00	3,601.06	23,329.00		
Sep-00	9.50	55.17	20.50	12.50	5.85	1.84	27.80	45.89	8.28	4,727.43	8,954.00	3,869.82	22,973.00		
Oct-00			9.50	54.77	20.00	12.50	5.85	1.88	27.87	46.35	8.28	4,641.29	8,897.00	3,718.16	22,800.00
Nov-00	9.50	53.72	18.10	12.50	5.85	1.95	27.81	46.78	8.28	4,394.43	10,052.00	3,603.33	22,200.00		
Dec-00	9.50	52.56	18.20	12.50	5.85	1.96	27.97	46.75	8.28	4,662.53	10,101.00	3,657.24	22,000.00		
Jan-01	9.05	50.61	18.60	12.50	5.85	1.95	28.36	46.54	8.28	4,541.62	8,366.00	3,666.48	16,801.00		
Feb-01	8.50	53.20	19.10	12.50	5.85	2.00	28.59	46.52	8.28	4,086.79	8,245.00	3,694.46	18,982.00		
Mar-01	8.32	51.50	18.80	12.00	5.85	2.09	28.68	46.62	8.28	5,173.03	8,949.00	4,309.13	23,025.00		
Apr-01	7.80	54.79	17.50	12.00	5.85	2.19	28.85	46.79	8.28	4,735.32	8,461.00	3,501.20	22,797.00		
May-01	7.24	54.66	18.10	12.00	5.85	2.30	29.02	46.92	8.28	5,372.62	8,535.00	3,736.92	20,821.00		
Jun-01	6.98	55.58	18.00	12.00	5.85	2.38	29.11	47.01	8.28	5,047.76	9,157.00	3,294.87	22,078.00		
Jul-01	6.75	58.24	18.60	12.00	5.85	2.47	29.22	47.14	8.28	4,970.16	8,080.00	3,463.95	22,810.00		
Aug-01	6.67	62.04	18.10	12.00	5.85	2.51	29.35	47.13	8.28	5,733.05	9,026.00	3,630.54	23,532.00		
Sep-01	6.28	62.86	17.20	12.00	5.85	2.67	29.43	47.65	8.28	4,759.85	8,489.00	3,516.48	23,981.00		
Oct-01	5.53	65.79	17.40	12.00	5.85	2.74	29.53	48.02	8.28	5,008.56	7,987.00	3,444.03	22,780.00		
Nov-01	5.10	61.93	17.00	12.00	5.85	2.54	29.80	48.00	8.28	4,506.28	8,370.00	3,576.13	23,996.00		
Dec-01	4.84	60.20	16.50	12.00	5.85	2.36	30.09	47.92	8.28	4,351.54	8,221.00	3,250.26	24,496.00		
Jan-02	4.75	61.20	17.90	12.00	5.85	2.38	30.47	48.34	8.28	3,975.97	6,732.00	4,252.47	21,693.00		
Feb-02	4.75	61.00	15.90	12.00	5.31	2.42	30.80	48.69	8.28	3,662.99	6,675.00	3,534.81	19,136.00		
Mar-02	4.75	60.20	15.80	12.00	5.31	2.35	31.06	48.74	8.28	4,266.11	8,479.00	4,140.75	23,833.00		

Apr-02	4.75	59.10	18.30	12.00	5.31	2.32	31.17	48.92	8.28	4,647.81	9,498.00	3,994.56	26,728.00
May-02	4.75	59.50	17.70	12.00	5.31	2.48	31.25	49.00	8.28	4,447.74	8,566.00	3,981.96	24,640.00
Jun-02	4.75	59.60	15.20	12.00	5.31	2.71	31.40	48.96	8.28	4,084.58	8,228.00	3,861.55	25,997.00
Jul-02	4.75	62.60	16.00	12.00	5.31	2.93	31.51	48.76	8.28	6,230.57	9,273.00	4,433.48	29,189.00
Aug-02	4.75	62.90	14.90	12.00	5.31	3.11	31.56	48.59	8.28	5,758.05	9,951.00	4,376.84	29,413.00
Sep-02	4.75	62.50	13.40	12.00	5.31	3.34	31.63	48.44	8.28	6,497.98	9,705.00	4,297.18	31,935.00
Oct-02	4.75	66.30	13.70	12.00	5.31	3.81	31.69	48.37	8.28	6,482.18	9,904.00	4,649.34	29,936.00
Nov-02	4.35	69.50	14.70	11.50	5.31	3.58	31.81	48.38	8.28	5,134.79	9,254.00	3,941.62	31,205.00
Dec-02	4.25	70.10	14.90	11.50	5.31	3.63	31.84	48.14	8.28	5,249.88	11,037.00	3,847.44	31,890.00
Jan-03	4.25	70.30	14.50	11.50	5.31	3.44	31.82	47.93	8.28	4,811.18	9,627.00	4,629.69	29,754.00
Feb-03	4.25	72.70	14.10	11.50	5.31	3.59	31.70	47.74	8.28	5,009.03	9,861.00	4,162.06	24,450.00
Mar-03	4.25	74.20	13.30	11.50	5.31	3.45	31.45	47.65	8.28	5,246.40	11,592.00	5,150.36	32,083.00
Apr-03	4.25	72.80	15.70	11.50	5.31	3.12	31.21	47.38	8.28	5,720.01	10,172.00	4,176.77	35,589.00
May-03	4.25	71.90	12.50	11.50	5.31	2.95	30.92	47.08	8.28	6,381.49	10,452.00	4,490.97	33,786.00
Jun-03	4.22	70.40	11.80	11.50	5.31	2.88	30.48	46.72	8.28	5,882.94	11,126.00	4,224.18	34,463.00
Jul-03	4.00	67.90	11.90	11.50	5.31	2.88	30.36	46.23	8.28	6,114.52	11,402.00	4,437.16	38,088.00
Aug-03	4.00	65.40	11.80	11.50	5.31	3.00	30.35	45.93	8.28	6,413.61	11,988.00	4,386.39	37,395.00
Sep-03	4.00	62.00	13.20	11.50	5.31	2.92	30.60	45.85	8.28	7,291.20	11,555.00	5,280.15	41,921.00
Oct-03	4.00	60.60	12.50	11.50	5.31	2.86	30.16	45.39	8.28	7,578.69	12,647.00	5,439.99	40,893.00
Nov-03	4.00	59.50	12.00	11.50	5.31	2.91	29.81	45.52	8.28	5,993.13	11,541.00	4,876.57	41,749.00
Dec-03	4.00	57.30	12.40	11.00	5.31	2.92	29.44	45.59	8.28	6,761.03	13,967.00	6,082.10	48,058.00
Jan-04	4.00	56.60	12.20	11.00	5.31	2.85	28.92	45.46	8.28	5,809.79	11,254.00	5,201.83	35,710.00
Feb-04	4.00	56.10	11.10	11.00	5.31	2.93	28.52	45.27	8.28	5,733.24	12,079.00	6,213.35	34,048.00
Mar-04	4.00	56.00	11.70	11.00	5.31	2.90	28.53	45.02	8.28	7,944.14	13,956.00	7,862.59	45,845.00
Apr-04	4.00	55.50	12.00	11.00	5.31	2.91	28.68	43.93	8.28	6,606.29	14,712.00	5,603.96	47,109.00
May-04	4.00	54.80	12.80	11.00	5.31	3.10	28.99	45.25	8.28	7,960.02	13,615.00	5,905.62	44,844.00
Jun-04	4.00	54.50	11.60	11.00	5.31	3.13	29.03	45.51	8.28	9,347.43	14,862.00	5,973.68	50,521.00
Jul-04	4.25	54.20	11.20	11.00	5.31	3.04	29.08	46.04	8.28	9,011.28	15,439.00	5,705.21	50,955.00
Aug-04	4.42	54.90	11.60	11.00	5.31	3.00	29.21	46.34	8.28	9,073.76	16,759.00	5,958.59	51,346.00
Sep-04	4.59	54.70	11.50	10.75	5.31	2.89	29.22	46.10	8.28	8,939.58	16,271.00	6,726.43	55,753.00
Oct-04	4.75	54.50	10.90	10.75	5.58	2.85	29.08	45.78	8.28	8,861.63	17,208.00	6,340.95	52,508.00
Nov-04	4.92	54.20	10.70	10.75	5.58	2.79	28.58	45.13	8.28	8,177.33	17,807.00	6,097.29	60,900.00
Dec-04	5.15	53.10	10.00	10.75	5.58	2.72	27.92	43.98	8.28	9,213.35	19,247.00	6,806.25	63,790.00
Jan-05	5.25	54.90	10.80	10.75	5.58	2.69	27.94	43.75	8.28	7,457.19	13,675.00	8,194.40	50,729.00

Feb-05	5.49	55.00	10.60	10.75	5.58	2.60	27.97	43.68	8.28	7,771.88	15,867.00	8,046.42	44,277.00
Mar-05	5.59	55.30	10.50	10.75	5.58	2.70	27.62	43.69	8.28	9,270.43	19,549.00	10,154.73	60,846.00
Apr-05	5.75	55.70	10.30	10.75	5.58	2.58	27.82	43.74	8.28	9,220.57	19,515.00	7,627.20	62,085.00
May-05	5.99	56.40	11.00	10.75	5.58	2.45	27.92	43.49	8.28	9,835.73	20,047.00	8,083.68	58,424.00
Jun-05	6.01	55.70	10.90	10.75	5.58	2.41	28.50	43.58	8.28	10,224.83	19,131.00	7,965.24	65,933.00
Jul-05	6.25	55.60	10.00	10.75	5.58	2.37	28.69	43.54	8.23	11,079.53	21,191.00	7,546.89	65,536.00
Aug-05	6.43	55.60	10.50	10.75	5.58	2.36	28.48	43.62	8.10	11,366.26	21,378.00	8,613.17	68,394.00
Sep-05	6.60	56.30	10.50	10.75	5.58	2.29	28.36	43.92	8.09	10,654.22	21,402.00	8,450.33	70,178.00
Oct-05	6.75	56.10	10.60	10.75	5.58	2.26	28.55	44.82	8.09	9,922.94	21,831.00	8,640.25	68,092.00
Nov-05	7.00	54.70	11.40	10.75	5.58	2.21	28.76	45.73	8.08	10,809.25	21,792.00	7,292.87	72,220.00
Dec-05	7.16	53.30	11.10	10.75	5.58	2.28	28.81	45.64	8.08	10,916.34	24,647.00	9,235.31	75,412.00
Jan-06	7.26	54.00	10.20	10.75	5.58	2.27	28.41	44.40	8.07	9,286.85	20,524.00	9,194.72	64,989.00
Feb-06	7.50	54.00	10.70	10.75	5.58	2.16	28.20	44.33	8.05	8,774.46	21,449.00	9,066.90	54,110.00
Mar-06	7.54	53.60	10.20	10.75	5.58	2.15	27.88	44.48	8.04	11,396.77	24,439.00	11,561.37	78,080.00
Apr-06	7.75	52.90	10.70	10.75	5.85	2.13	27.57	44.95	8.02	9,830.69	23,652.00	8,593.51	76,950.00
May-06	7.92	51.40	10.90	11.25	5.85	2.18	27.06	45.41	8.01	10,304.88	26,770.00	10,045.99	73,110.00
Jun-06	8.02	50.80	10.40	11.25	5.85	2.25	26.98	46.06	8.01	11,463.25	25,137.00	10,405.07	81,310.00
Jul-06	8.25	49.70	10.10	11.25	5.85	2.19	26.92	46.46	7.99	13,651.05	25,482.00	10,557.69	80,340.00
Aug-06	8.25	49.40	10.30	11.50	6.12	2.16	26.77	46.54	7.97	13,671.70	27,853.00	10,668.78	90,770.00
Sep-06	8.25	49.20	10.50	11.50	6.12	2.17	26.74	46.12	7.94	12,576.86	25,392.00	10,730.34	91,630.00
Oct-06	8.25	48.70	10.00	11.50	6.12	2.15	26.86	45.47	7.90	12,689.26	24,049.00	9,806.69	88,130.00
Nov-06	8.25	48.70	10.60	11.50	6.12	2.16	26.62	44.85	7.87	11,896.87	24,382.00	9,835.15	95,850.00
Dec-06	8.25	47.30	10.50	11.50	6.12	2.15	26.29	44.64	7.82	12,264.83	28,354.00	10,410.55	94,090.00
Jan-07	8.25	47.60	10.00	12.00	6.12	2.14	26.47	44.33	7.79	10,983.87	21,287.00	10,907.80	86,620.00
Feb-07	8.25	46.60	9.90	12.50	6.12	2.10	26.34	44.16	7.75	10,129.51	22,945.00	11,482.55	82,100.00
Mar-07	8.25	45.80	10.00	12.50	6.39	2.09	26.11	44.03	7.74	12,888.96	25,945.00	12,862.40	83,420.00
Apr-07	8.25	45.20	9.80	13.25	6.39	2.03	25.84	42.15	7.73	12,446.17	26,994.00	10,952.78	97,450.00
May-07	8.25	44.40	9.50	13.25	6.57	1.98	25.82	40.78	7.67	13,647.28	28,681.00	12,209.98	94,070.00
Jun-07	8.25	43.60	9.50	13.25	6.57	1.93	25.93	40.77	7.63	13,118.08	26,194.00	11,870.43	103,270.00
Jul-07	8.25	42.90	9.20	13.25	6.84	1.88	25.56	40.41	7.58	14,119.55	29,083.00	12,453.88	107,740.00
Aug-07	8.25	42.70	9.90	13.25	7.02	1.97	25.63	40.82	7.58	15,100.03	30,318.00	12,613.79	111,370.00
Sep-07	8.03	42.40	10.40	13.25	7.29	1.90	25.34	40.34	7.52	14,165.68	27,680.00	12,163.86	112,340.00
Oct-07	7.74	42.10	10.60	13.25	7.29	1.80	24.89	39.51	7.50	15,767.82	34,437.00	14,303.97	107,723.99
Nov-07	7.50	41.10	10.80	13.25	7.29	1.77	24.47	39.44	7.42	14,051.33	35,197.00	12,425.12	117,620.00

Dec-07	7.33	40.20	10.80	13.25	7.47	1.79	24.57	39.44	7.37	14,230.80	37,769.00	12,314.96	114,420.00
Jan-08	6.98	44.40	10.40	13.25	7.47	1.77	24.50	39.37	7.25	13,276.88	33,870.00	13,140.75	109,640.00
Feb-08	6.00	44.50	11.00	13.25	7.47	1.73	24.53	39.73	7.17	12,799.92	35,095.00	14,191.62	87,370.00
Mar-08	5.66	43.90	11.30	13.00	7.47	1.71	23.76	40.36	7.08	12,612.77	39,407.00	16,282.79	108,960.00
Apr-08	5.24	43.90	11.20	12.75	7.47	1.69	23.51	40.02	7.00	14,058.43	40,525.00	18,460.36	118,720.00
May-08	5.00	44.00	11.00	12.75	7.47	1.66	23.73	42.13	6.97	19,303.36	42,478.00	18,686.62	120,550.00
Jun-08	5.00	45.00	11.30	12.75	7.47	1.62	23.64	42.82	6.90	18,593.31	43,024.00	19,180.92	121,170.00
Jul-08	5.00	47.00	11.40	13.25	7.47	1.59	23.35	42.84	6.84	20,451.41	46,546.00	19,030.42	136,630.00
Aug-08	5.00	47.80	11.80	14.00	7.47	1.61	24.13	42.94	6.85	19,746.87	44,952.00	17,759.32	134,820.00
Sep-08	5.00	48.60	12.70	14.00	7.20	1.80	25.28	45.56	6.83	20,017.21	42,974.00	15,789.09	136,410.00
Oct-08	4.56	51.00	14.10	14.00	6.66	2.17	26.35	48.66	6.83	18,512.31	38,383.00	14,130.78	128,230.00
Nov-08	4.00	53.90	15.00	13.50	5.58	2.27	27.31	49.00	6.83	14,752.57	29,353.00	11,162.31	114,980.00
Dec-08	3.61	53.00	15.50	13.25	5.31	2.39	28.13	48.63	6.84	13,817.40	29,692.00	13,368.08	111,160.00
Jan-09	3.25	51.20	17.10	12.50	5.31	2.31	31.47	48.83	6.84	9,781.92	18,868.00	12,868.96	90,482.00
Feb-09	3.25	49.50	16.60	12.50	5.31	2.31	35.76	49.26	6.84	9,586.41	17,419.00	11,940.86	64,866.00
Mar-09	3.25	47.30	16.10	12.50	5.31	2.33	34.67	51.23	6.84	11,809.23	21,467.00	12,916.39	90,219.00
Apr-09	3.25	46.60	16.00	12.25	5.31	2.21	33.56	50.06	6.83	12,321.62	18,836.00	12,146.84	91,923.00
May-09	3.25	45.60	15.90	12.25	5.31	2.07	32.06	48.53	6.82	11,984.59	21,159.00	11,915.69	88,698.00
Jun-09	3.25	43.90	15.60	12.25	5.31	1.96	31.03	47.77	6.83	14,467.78	23,573.00	13,474.23	95,458.00
Jul-09	3.25	43.30	14.90	12.00	5.31	1.94	31.52	48.48	6.83	14,141.93	26,166.00	14,220.32	105,391.00
Aug-09	3.25	42.50	15.20	12.00	5.31	1.84	31.63	48.34	6.83	13,840.85	26,805.00	13,585.54	103,663.00
Sep-09	3.25	42.00	14.70	12.00	5.31	1.82	30.81	48.44	6.83	13,863.22	28,613.00	14,623.50	115,865.00
Oct-09	3.25	42.40	14.10	12.00	5.31	1.74	29.47	46.72	6.83	14,081.69	30,162.00	14,805.25	110,642.00
Nov-09	3.25	41.20	13.80	12.00	5.31	1.72	28.98	46.57	6.83	12,652.89	30,400.00	14,932.01	113,659.00
Dec-09	3.25	40.30	13.70	12.00	5.31	1.75	29.94	46.63	6.83	14,462.62	33,687.00	16,511.49	130,740.00
Jan-10	3.25	41.20	13.90	12.00	5.31	1.77	29.94	45.96	6.83	11,305.07	26,977.00	15,569.06	109,490.00
Feb-10	3.25	40.30	12.70	12.00	5.31	1.85	30.19	46.33	6.83	12,197.24	30,094.00	15,716.84	94,463.00
Mar-10	3.25	39.70	11.80	12.00	5.31	1.79	29.56	45.50	6.83	15,727.50	32,992.00	20,180.87	112,059.00
Apr-10	3.25	39.80	11.40	12.00	5.31	1.76	29.20	44.50	6.83	15,161.21	32,693.00	17,731.30	119,851.00
May-10	3.25	40.30	11.30	12.00	5.31	1.80	30.35	45.81	6.83	17,702.50	31,106.00	16,511.86	131,661.00
Jun-10	3.25	39.60	11.40	12.00	5.31	1.81	31.17	46.56	6.82	17,093.91	31,554.00	19,948.20	137,339.00
Jul-10	3.25	40.30	10.50	8.00	5.31	1.77	30.68	46.84	6.78	17,672.92	30,726.00	16,139.71	145,434.00
Aug-10	3.25	40.00	10.00	8.00	5.31	1.76	30.34	46.57	6.79	19,236.25	31,260.00	16,854.45	139,236.00
Sep-10	3.25	39.60	9.70	8.00	5.31	1.72	30.84	46.06	6.74	18,832.79	33,670.00	18,221.87	144,923.00

Oct-10	3.25	40.30	8.90	8.50	5.56	1.68	30.32	44.41	6.67	18,380.42	34,589.00	17,976.76	135,918.00
Nov-10	3.25	39.10	9.10	8.50	5.56	1.71	30.97	45.02	6.66	17,687.33	34,506.00	21,514.00	153,279.00
Dec-10	3.25	39.70	9.10	9.00	5.81	1.70	30.85	45.16	6.65	20,918.14	42,507.00	26,385.60	154,101.00
Jan-11	3.25	42.60	8.60	9.00	5.81	1.67	30.08	45.39	6.60	15,214.35	29,590.00	24,523.26	150,688.00
Feb-11	3.25	43.10	8.70	9.50	6.06	1.67	29.29	45.44	6.58	16,732.47	39,623.00	25,670.80	96,708.00
Mar-11	3.25	44.00	8.70	9.50	6.06	1.66	28.43	44.99	6.57	19,285.98	42,461.00	30,420.10	152,130.00
Apr-11	3.25	45.40	8.40	9.50	6.31	1.59	28.10	44.37	6.53	20,172.98	45,803.00	22,512.08	155,590.00
May-11	3.25	45.30	8.00	10.00	6.31	1.61	27.87	44.90	6.50	23,208.66	44,039.00	25,656.54	157,050.00
Jun-11	3.25	44.60	8.60	10.00	6.31	1.59	27.98	44.85	6.48	23,689.08	43,656.00	26,634.09	161,890.00
Jul-11	3.25	44.60	7.90	10.75	6.56	1.56	27.90	44.42	6.46	22,251.88	41,435.00	26,341.63	175,150.00
Aug-11	3.25	44.60	7.90	10.75	6.56	1.60	28.77	45.28	6.41	26,158.51	43,842.00	24,739.53	173,240.00
Sep-11	3.25	43.70	8.00	10.75	6.56	1.74	30.49	47.64	6.38	23,285.06	43,037.00	26,595.05	169,580.00
Oct-11	3.25	44.50	8.60	10.75	6.56	1.78	31.35	49.26	6.36	22,139.95	45,247.00	23,558.77	157,360.00
Nov-11	3.25	42.80	8.80	10.75	6.56	1.77	30.86	50.84	6.34	21,773.46	46,427.00	23,223.34	174,390.00
Dec-11	3.25	41.40	9.30	10.75	6.56	1.83	31.45	52.67	6.33	22,127.20	50,248.00	25,287.02	174,620.00
Jan-12	3.25	42.70	8.80	10.75	6.56	1.79	31.51	51.35	6.32	16,140.34	39,497.00	25,204.78	149,862.00
Feb-12	3.25	42.90	8.90	10.75	6.56	1.72	29.88	49.16	6.30	18,027.79	44,877.00	24,883.32	114,409.00
Mar-12	3.25	42.00	9.20	10.75	6.56	1.79	29.40	50.32	6.31	20,910.73	46,658.00	28,838.38	165,578.00
Apr-12	3.25	39.60	9.00	10.75	6.56	1.85	26.43	51.80	6.30	19,566.30	44,903.00	23,833.99	163,131.00
May-12	3.25	36.90	8.90	10.75	6.56	1.97	30.65	54.47	6.31	23,213.93	45,473.00	24,783.90	181,033.00
Jun-12	3.25	34.90	9.30	10.50	6.31	2.05	32.91	56.03	6.32	19,352.83	40,810.00	24,935.07	180,204.47
Jul-12	3.25	34.70	9.50	10.50	6.00	2.03	32.50	55.49	6.32	21,003.24	41,155.00	23,140.42	176,940.03
Aug-12	3.25	34.10	9.10	10.50	6.00	2.03	32.03	55.56	6.34	22,380.91	41,119.00	23,130.28	177,973.30
Sep-12	3.25	33.90	8.90	10.50	6.00	2.03	31.53	54.61	6.34	19,998.38	42,930.00	24,877.99	186,349.51
Oct-12	3.25	33.40	9.10	10.50	6.00	2.03	31.09	53.02	6.31	21,763.37	46,540.00	24,026.84	175,571.10
Nov-12	3.25	32.70	9.10	10.50	6.00	2.06	31.41	54.78	6.30	20,471.90	45,268.00	23,250.19	179,380.77
Dec-12	3.25	31.84	9.40	10.50	6.00	2.08	30.74	54.65	6.29	19,748.29	48,203.00	25,519.65	199,229.68
Jan-13	3.25	26.20	8.80	10.50	6.00	2.03	30.26	54.32	6.28	15,966.73	38,836.00	25,679.51	187,365.57
Feb-13	3.25	26.50	9.60	10.50	6.00	1.97	30.16	53.77	6.28	15,549.46	41,855.00	25,761.68	139,367.24
Mar-13	3.25	26.00	10.00	10.25	6.00	1.98	30.80	54.40	6.27	19,320.43	44,460.00	30,541.44	182,190.00
Apr-13	3.25	26.30	10.20	10.25	6.00	2.00	31.33	54.38	6.25	20,631.04	44,474.00	24,225.53	187,061.47
May-13	3.25	25.80	9.90	10.25	6.00	2.03	31.24	55.01	6.20	21,822.42	40,980.00	24,863.57	182,766.12
Jun-13	3.25	26.60	9.50	10.25	6.00	2.17	32.28	58.40	6.17	21,134.04	41,836.00	23,971.16	174,315.80
Jul-13	3.25	27.50	9.20	10.25	6.00	2.25	32.74	59.78	6.17	20,806.77	43,710.00	25,824.65	185,991.32

Aug-13	3.25	28.00	9.30	10.25	6.00	2.34	33.02	63.21	6.17	21,424.02	42,531.00	26,357.10	190,608.32
Sep-13	3.25	28.40	9.50	10.25	6.00	2.27	32.63	63.75	6.16	20,850.46	44,807.00	28,125.14	185,643.58
Oct-13	3.25	29.00	9.20	10.25	6.00	2.19	32.06	61.62	6.14	22,821.00	43,463.00	27,461.16	185,405.58
Nov-13	3.25	29.40	9.00	10.25	6.00	2.29	32.64	62.63	6.14	20,861.37	46,799.00	24,079.56	202,204.80
Dec-13	3.25	29.00	9.40	10.25	6.00	2.35	32.89	61.91	6.12	20,845.84	49,525.00	26,399.52	207,742.42
Jan-14	3.25	30.70	9.20	10.25	6.00	2.38	33.46	62.08	6.10	16,026.19	39,598.00	26,813.21	207,132.12
Feb-14	3.25	31.50	9.40	10.25	6.00	2.39	35.22	62.25	6.11	15,933.83	36,413.00	25,145.31	114,093.69
Mar-14	3.25	31.60	10.30	10.25	6.00	2.33	36.21	61.01	6.14	17,627.93	47,002.00	30,341.04	170,107.99
Apr-14	3.25	31.70	10.50	10.25	6.00	2.23	35.66	60.36	6.16	19,723.93	47,580.00	25,534.50	188,540.55
May-14	3.25	32.00	10.60	10.25	6.00	2.22	34.93	59.31	6.16	20,752.08	44,049.00	27,949.96	195,472.92
Jun-14	3.25	32.00	10.70	10.25	6.00	2.23	34.41	59.73	6.16	20,466.92	40,695.00	25,832.39	186,788.54
Jul-14	3.25	32.30	10.70	10.25	6.00	2.22	34.64	60.06	6.17	23,024.07	46,210.00	25,754.28	212,891.06
Aug-14	3.25	32.20	10.60	10.25	6.00	2.27	36.11	60.90	6.16	20,463.31	41,454.00	26,766.51	208,465.86
Sep-14	3.25	31.90	10.60	10.25	6.00	2.33	37.87	60.86	6.15	19,616.60	38,082.00	28,735.34	213,687.46
Oct-14	3.25	32.90	10.80	10.25	6.00	2.45	40.76	61.34	6.14	18,329.65	41,543.00	26,057.00	206,866.72
Nov-14	3.25	32.90	12.00	10.25	5.60	2.55	45.86	61.70	6.14	15,645.63	36,755.00	26,475.75	211,662.67
Dec-14	3.25	32.40	18.30	10.25	5.60	2.63	55.41	62.75	6.12	17,490.74	38,383.00	26,126.84	227,512.54
Jan-15	3.25	39.10	19.90	10.25	5.60	2.63	61.70	62.23	6.13	13,704.04	27,712.00	24,370.25	200,258.04
Feb-15	3.25	40.60	18.10	10.25	5.60	2.80	64.63	62.04	6.13	12,092.23	29,225.00	21,576.64	169,190.55
Mar-15	3.25	40.90	17.90	10.25	5.35	3.11	60.23	62.45	6.15	16,978.97	32,663.00	24,032.54	144,568.56
Apr-15	3.25	41.80	17.20	10.25	5.35	3.04	52.87	62.75	6.13	15,156.27	30,585.00	22,061.91	176,330.82
May-15	3.25	42.50	16.00	10.00	5.10	3.06	50.58	63.80	6.11	16,769.18	30,564.00	22,431.39	190,057.57
Jun-15	3.25	43.50	15.50	10.00	4.85	3.11	54.50	63.86	6.12	19,628.44	29,970.00	22,494.25	191,975.44
Jul-15	3.25	44.20	14.70	10.00	4.85	3.22	57.07	63.63	6.12	18,533.07	27,167.00	23,252.72	195,096.52
Aug-15	3.25	45.40	14.20	10.00	4.60	3.51	65.15	65.07	6.31	15,485.35	24,972.00	21,530.09	196,868.25
Sep-15	3.25	46.20	13.97	10.00	4.60	3.91	66.77	66.22	6.37	16,148.18	26,307.00	21,819.63	205,554.59
Oct-15	3.25	47.90	13.58	9.70	4.35	3.88	63.07	65.06	6.35	16,048.99	27,235.00	21,427.47	192,395.79
Nov-15	3.25	48.10	13.75	9.70	4.35	3.78	65.03	66.12	6.36	13,806.36	25,534.00	19,490.63	196,463.22
Dec-15	3.37	47.30	13.80	9.70	4.35	3.87	69.66	66.60	6.45	16,783.23	28,415.00	22,496.89	223,683.50

	Imp. Brazil	Imp. Russia	Imp. India	Imp. China	CPI. Brazil	CPI. Russia	CPI .India	CPI China	CPI USA	Br. Stock Price	Rus. Stock Price	Ind. Stock Price	Chi. Stock Price
Jan-00	3747.305771	3177.9	3684.294	15272	51.33217	28.52530531	52.93273	81.47718	77.41148	16388	188.81	5205.290039	15532.33984
Feb-00	4249.087918	3771.9	3856.156	13400	51.39825	28.82303779	52.80992	82.53736	77.87008	17660	191.49	5447.470215	17169.43945
Mar-00	4675.00799	4028.2	4139.319	17800	51.51113	29.00674506	53.30117	81.39101	78.51212	17820	254.68	5001.279785	17406.53906
Apr-00	4196.771771	3724.6	4600.472	18361	51.72862	29.26646914	53.79243	80.91164	78.55798	15538	242.85	4657.549805	15519.29981
May-00	4932.770478	3742.2	4549.624	16966	51.73413	29.77958256	54.03806	80.42792	78.6497	14957	217.05	4433.609863	14713.86035
Jun-00	4836.035708	3951.2	4169.233	20300	51.85251	30.53975059	54.28368	79.69788	79.06244	16728	194.93	4748.77002	16155.78027
Jul-00	5131.663902	3962.2	4341.587	19500	52.68671	31.08453768	54.65212	79.22126	79.24588	16455	200.22	4279.859863	16840.98047
Aug-00	5696.425595	4152.5	4179.982	20788	53.37775	31.38860489	54.4065	79.69306	79.24588	17347	239.03	4477.310059	17097.50977
Sep-00	5306.888479	4125	4249.145	20717	53.50164	31.80669731	54.52931	81.2957	79.65862	15928	204.61	4090.379883	15648.98047
Oct-00	5447.657299	4545.2	4263.058	18920	53.57598	32.47817907	55.14338	81.29545	79.7962	14867	192.22	3711.02002	14895.33984
Nov-00	5305.517963	4787.2	4697.228	21600	53.74667	32.96595355	55.26619	81.53975	79.84206	13287	149.84	3997.98999	13984.38965
Dec-00	5118.063422	5380.1	3975.805	21400	54.06328	33.50440591	54.77494	81.62129	79.7962	15259	144.39	3972.120117	15095.53027
Jan-01	5273.316301	3558.5	4006.811	15541	54.37163	34.42017841	54.65212	82.45491	80.30066	17673	167.74	4326.720215	16102.34961
Feb-01	4203.186692	4122.8	3456.811	18239	54.62217	35.21993233	54.4065	82.53736	80.62168	15891	158.1	4247.040039	14787.87012
Mar-01	5721.6402	4739.9	4625.261	20750	54.82865	35.86588742	54.65212	82.04214	80.80512	14438	166.67	3604.379883	12760.63965
Apr-01	4842.092613	4794.9	3965.588	21868	55.14802	36.51184251	55.02057	82.20622	81.12614	14918	178.29	3519.159912	13386.04004
May-01	5418.842892	5030.3	4467.054	18808	55.37377	37.1577976	55.38901	81.79519	81.49301	14650	207.71	3631.909912	13174.41016
Jun-01	4999.461434	5152.4	4015.019	21276	55.66285	37.77299293	56.12589	80.81365	81.63059	14560	219.4	3456.780029	13042.53027
Jul-01	5099.367914	4871.9	4387.145	20944	56.40069	37.92679176	56.86277	80.40958	81.40129	13754	200.64	3329.280029	12316.69043
Aug-01	5353.749744	5066.6	4370.297	22174	56.79714	37.92679176	57.23121	80.48999	81.40129	12841	193.72	3244.949951	11090.48047
Sep-01	4367.847744	4623.3	4185.514	21842	56.95682	38.17286989	57.1084	81.2144	81.76817	10636	167.33	2811.600098	9950.700195
Oct-01	4996.947544	5289.9	4191.399	18896	57.42761	38.57274685	56.86277	81.45804	81.49301	11365	187.41	2989.350098	10073.96973
Nov-01	4424.208186	5568.2	4157.644	20834	57.83507	39.09566287	57.9681	81.29513	81.35543	12932	213.32	3287.560059	11279.25
Dec-01	3681.183715	6322.8	4078.568	22381	58.21225	39.74161796	57.59965	81.37642	81.03442	13578	237.63	3262.330078	11397.20996
Jan-02	4007.336063	4050.2	4242.267	18976	58.5151	40.97200861	57.35403	81.62055	81.21786	12721	260.77	3311.030029	10725.29981
Feb-02	3584.176302	4404.4	3758.377	15913	58.72434	41.43340511	57.23121	82.51838	81.53887	14033	262.65	3562.310059	10482.54981
Mar-02	3865.231027	5128.2	4432.652	22432	59.07674	41.8948016	57.47684	81.44564	81.99747	13255	302.96	3469.350098	11032.91992

Apr-02	4366.486226	5644.1	4207.116	25744	59.55028	42.35619809	57.59965	81.2013	82.45607	13085	343.33	3338.159912	11497.58008
May-02	4268.478952	5151.3	5180.633	22437	59.67692	43.09443248	57.9681	80.9577	82.45607	12861	333.61	3125.72998	11301.94043
Jun-02	3578.888185	5450.5	4251.17	23084	59.92745	43.30975085	58.45935	80.22908	82.50193	11139	304.18	3244.699951	10598.54981
Jul-02	5279.999007	6004.9	4873.563	26984	60.64052	43.61734851	59.07342	79.66748	82.59365	9763	281.81	2987.649902	10267.36035
Aug-02	4378.617313	5650.7	4861.237	27199	61.03421	43.64810827	59.44186	79.90648	82.86881	10382	292.23	3181.22998	10043.87012
Sep-02	4216.76773	5641.9	5085.302	29774	61.47196	43.83266687	59.56468	80.70554	83.00639	8623	289.96	2991.360107	9072.209961
Oct-02	4505.482782	6463.6	5593.304	25189	62.27863	44.29406337	59.8103	80.86695	83.14397	10168	311.41	2949.320068	9441.25
Nov-02	4051.903439	6318.4	5058.956	28710	64.15902	45.03229775	60.05593	80.78609	83.14397	10509	321.41	3228.820068	10069.87012
Dec-02	3615.312331	7155.5	4972.236	28728	65.5053	45.70901261	59.44186	81.02845	82.96053	11268	318.91	3377.280029	9321.290039
Jan-03	3834.160743	5205.2	5571.291	31012	66.98098	46.8163642	59.31905	81.91976	83.32741	10941	307.78	3250.379883	9258.950195
Feb-03	4085.02958	5733.2	4630.823	23751	68.03268	47.58535835	59.44186	82.65704	83.96945	10281	341.52	3283.659912	9122.660156
Mar-03	3893.031032	6640.7	5889.308	32492	68.86963	48.07751461	59.8103	82.16109	84.47391	11274	325.56	3048.719971	8634.450195
Apr-03	4203.955047	6825.5	5586.323	34565	69.53589	48.56967087	60.54719	81.99677	84.29047	12557	369.77	2959.790039	8717.219727
May-03	4067.843858	6510.9	6026.146	31579	69.95987	48.93878807	60.67	81.42279	84.15289	13422	421.08	3180.75	9487.379883
Jun-03	3715.626871	6684.7	5552.587	32329	69.85525	49.33866503	61.03844	80.44572	84.24461	12973	455.44	3607.129883	9577.120117
Jul-03	4268.444327	7386.5	5651.664	36496	69.99566	49.67702245	61.5297	80.04349	84.33633	13572	430.3	3792.610107	10134.83008
Aug-03	3927.427711	7005.9	5656.042	34598	70.23243	49.49246386	61.28407	80.6038	84.65735	15174	484	4244.72998	10908.99023
Sep-03	4874.557654	7137.9	6080.332	41624	70.78031	49.64626269	61.28407	81.57104	84.93251	16011	515.17	4453.240234	11229.87012
Oct-03	5288.223169	7788	6929.936	35150	70.98679	50.13841895	61.77532	82.30518	84.84079	17982	468.85	4906.870117	12190.09961
Nov-03	4491.110693	7463.5	6318.308	36855	71.22907	50.63057521	61.89814	83.12823	84.61149	20184	484.73	5044.819824	12317.46973
Dec-03	4230.687432	9295	7320.655	42309	71.59799	51.184251	61.65251	83.627	84.51977	22236	514.71	5838.959961	12575.94043
Jan-04	4442.784344	6116	6826.405	35714	72.14311	52.07628422	61.89814	84.5469	84.93251	21851	551.72	5695.669922	13289.37012
Feb-04	3965.452491	7225.9	6737.795	42019	72.58361	52.59920025	61.89814	84.37781	85.3911	21755	591.09	5667.509766	13907.03027
Mar-04	5648.100477	8567.9	8033.853	46479	72.925	52.99907721	61.89814	84.63094	85.94142	22142	644.64	5590.600098	12681.66992
Apr-04	4875.081721	8492	6900.146	49529	73.1948	53.52199323	61.89814	85.05409	86.21658	19607	561.78	5655.089844	11942.95996
May-04	5101.868473	8096	8004.853	42984	73.56648	53.92187019	62.38939	84.96904	86.72104	19545	535.4	4759.620117	12198.24023
Jun-04	5865.435043	8684.5	8540.702	48894	74.08957	54.32174715	62.88065	84.37426	86.9962	21149	534.84	4795.459961	12285.75
Jul-04	5858.683738	9190.5	7435.167	48980	74.76409	54.84466318	63.49472	84.20551	86.85862	22337	502.81	5170.319824	12238.03027
Aug-04	5953.985505	9152	7716.277	46821	75.27893	55.05998154	64.10878	84.79495	86.90448	22803	549.28	5192.080078	12850.28027
Sep-04	6105.601297	9115.7	8953.791	50719	75.52671	55.30605967	64.2316	85.72769	87.08792	23245	611.03	5583.609863	13120.03027
Oct-04	6175.72218	9798.8	8579.351	45440	75.85984	55.921255	64.60004	85.72769	87.54652	23052	632.97	5672.27002	13054.66016
Nov-04	6437.373558	10377.4	9042.905	50970	76.38293	56.56721009	64.47723	85.47051	87.59238	25128	570.76	6234.290039	14060.04981
Dec-04	6022.397726	12303.5	9424.597	52680	77.04093	57.18240541	63.98597	85.55598	87.27136	26196	552.22	6602.689941	14230.13965
Jan-05	5568.54825	7627.4	11008.86	44253	77.48694	58.68963396	64.60004	86.06931	87.4548	24351	575.74	6555.939941	13721.69043

Feb-05	5280.087524	9180.6	10356.81	39900	77.94396	59.42786835	64.47723	87.61856	87.95926	28139	635.38	6713.859863	14195.34961
Mar-05	6249.40027	11022	12369.39	55217	78.42025	60.1968625	64.47723	86.83	88.64716	26611	598.04	6492.819824	13516.87988
Apr-05	5645.738996	10484.1	10764.7	57676	79.10303	60.87357736	64.96848	86.5695	89.24333	24844	593.88	6154.439941	13908.96973
May-05	6712.530006	10396.1	12207.02	49425	79.49122	61.36573362	64.72285	86.39637	89.15162	25207	603.89	6715.109863	13867.07031
Jun-05	6527.569671	10887.8	11242.42	56242	79.4747	61.76561058	64.96848	85.7052	89.19747	25051	639.98	7193.850098	14201.05957
Jul-05	6393.676169	11794.2	11384.62	54912	79.67293	62.04244848	66.0738	85.7052	89.61021	26042	700.65	7635.419922	14880.98047
Aug-05	8078.566868	11708.4	12420.91	57789	79.80783	61.98092894	66.31943	85.87661	90.06881	28045	784.28	7805.430176	14903.54981
Sep-05	6650.776444	11790.9	12529.79	62630	80.08865	62.13472778	66.56506	86.47774	91.16945	31584	892.5	8634.480469	15428.51953
Oct-05	6543.19416	12601.6	11572.64	56076	80.68883	62.4730852	67.30194	86.82365	91.35289	30194	842.52	7892.319824	14386.37012
Nov-05	7063.613764	13523.4	11325.84	61690	81.13209	62.9344817	67.91601	86.56318	90.61913	31917	944.55	8788.80957	14937.13965
Dec-05	6888.509548	15207.5	12389.59	64396	81.42392	63.42663796	67.54757	86.90943	90.25225	33456	1011	9397.929688	14876.42969
Jan-06	6787.654364	9142.1	12893.97	55497	81.90297	64.99538604	67.64535	88.03926	90.94015	38383	1171.44	9919.889648	15753.13965
Feb-06	6279.443416	11088	12841.27	51680	82.23885	66.07197785	67.64535	88.47945	91.12359	38610	1320.83	10370.24023	15918.48047
Mar-06	8093.037032	13588.3	14314.39	66860	82.594	66.59489388	67.64535	87.68314	91.62805	37952	1299.19	11279.95996	15805.04004
Apr-06	7071.523628	12494.9	12534.53	66490	82.76745	66.84097201	68.21379	87.8585	92.40767	40363	1486.85	11851.92969	16661.30078
May-06	7628.012831	14213.1	14306.76	60110	82.85004	67.14856967	68.78224	87.77065	92.86627	36530	1281.5	10398.61035	15857.88965
Jun-06	7716.050671	15924.7	14044.43	66810	82.6766	67.36388803	69.91914	87.33179	93.04971	36631	1331.39	10609.25	16267.62012
Jul-06	8386.396935	14826.9	14542.21	65710	82.83352	67.79452476	70.48759	87.0698	93.32486	37077	1380.24	10743.87988	16971.33984
Aug-06	9550.67094	15664	14753.47	71970	82.87482	67.91756383	70.48759	87.33101	93.5083	36232	1448.72	11699.04981	17392.26953
Sep-06	8496.561649	15776.2	16828.82	76340	83.04827	67.97908336	71.05603	87.76766	93.04971	36449	1367.24	12454.41992	17543.05078
Oct-06	9164.334418	17403.1	16725.65	64300	83.32358	68.19440172	72.19293	87.85543	92.54525	39263	1426.86	12961.90039	18324.34961
Nov-06	9083.007277	17798	15875.57	72930	83.57962	68.62503845	72.19293	88.119	92.40767	41932	1550.58	13696.30957	18960.48047
Dec-06	7580.905654	21587.5	15581.12	73100	83.98158	69.14795448	72.19293	89.35266	92.54525	44474	1693.47	13786.91016	19964.7207
Jan-07	8873.1762	12820.5	13757.85	70740	84.35601	70.31682559	72.19293	89.97813	92.82774	44642	1656.94	14090.91992	20106.41992
Feb-07	7597.008659	15480.3	20958.01	58340	84.72768	71.08581975	72.76138	90.87791	93.32441	43892	1655.25	12938.08984	19651.50977
Mar-07	9996.874155	18572.4	17136.46	76550	85.04154	71.51645647	72.19293	90.60528	94.17419	45805	1698.08	13072.09961	19800.92969
Apr-07	8672.033676	18363.4	17769.44	80600	85.25078	71.91633344	72.76138	90.51467	94.78596	48956	1697.28	13872.37012	20318.98047
May-07	10285.83599	19198.3	19312.73	71590	85.48755	72.37772993	73.32983	90.78622	95.36517	52268	1570.34	14544.45996	20634.4707
Jun-07	9771.070934	20395.1	19424.33	76360	85.72431	73.05444479	73.89828	91.14936	95.54999	54392	1665.96	14650.50977	21772.73047
Jul-07	11294.1755	21265.2	18333.05	83380	85.92805	73.70039988	75.03517	91.96971	95.52568	54183	1734.42	15550.99023	23184.93945
Aug-07	12137.6109	21994.5	19804.66	86350	86.33	73.76191941	75.60362	93.07334	95.3505	54637	1677.02	15318.59961	23984.14063
Sep-07	11213.0918	20562.3	16919.19	88580	86.48143	74.34635497	75.60362	93.35256	95.61327	60465	1759.44	17291.09961	27142.4707
Oct-07	12990.97879	24447.5	21137.95	80673.333	86.74022	75.57674562	76.17207	93.63262	95.81781	65318	1874.73	19837.99023	31352.58008
Nov-07	12663.20163	24871	20372.8	91340	87.0706	76.4995386	76.17207	94.28805	96.38693	63006	1850.64	19363.18945	28643.60938

Dec-07	11150.17374	27420.8	18600.64	91730	87.71208	77.36081206	76.17207	95.23093	96.32227	63886	1888.86	20286.99023	27812.65039
Jan-08	13064.59362	17113.8	22504.36	90170	88.18286	79.1448785	76.17207	96.3737	96.80104	59490	1574.33	17648.71094	23455.74023
Feb-08	12637.86807	23074.7	18654.71	78810	88.61511	80.09843125	76.74052	98.87942	97.08216	63489	1660.42	17578.7207	24331.66992
Mar-08	12201.4268	25561.8	23174.94	95620	89.03909	81.051984	77.87741	98.18726	97.92369	60968	1628.43	15644.44043	22849.19922
Apr-08	12955.14871	27732.1	30316.87	102240	89.52915	82.22085512	78.44586	98.28545	98.51758	67868	1667.35	17287.31055	25755.34961
May-08	15966.54277	26714.6	29443.61	100550	90.2367	83.32820671	79.01431	97.89231	99.34718	72593	1925.24	16415.57031	24533.11914
Jun-08	16657.05894	27842.1	28950.61	100250	90.90296	84.12796063	79.58276	97.69652	100.3483	65018	1753.67	13461.59961	22102.00977
Jul-08	18033.62067	31554.6	31625.45	111470	91.38476	84.55859735	81.2881	97.79422	100.8752	59505	1495.33	14355.75	22731.09961
Aug-08	18388.32674	29843	33523.25	106050	91.6408	84.83543525	82.425	97.69642	100.4726	55680	1348.92	14564.53027	21261.89063
Sep-08	18213.97131	29953	31135.73	107050	91.88032	85.54290987	82.99345	97.69642	100.3336	49541	1027.66	12860.42969	18016.21094
Oct-08	18112.81751	29382.1	25869.22	92930	92.29329	86.31190403	84.13035	97.40333	99.32013	37257	731.96	9788.05957	13968.66992
Nov-08	14045.67369	23183.6	23486.38	74810	92.62642	87.01937865	84.13035	96.62411	97.41786	36596	611.32	9092.719727	13888.24023
Dec-08	12100.44169	25583.8	19456.35	72180	92.88521	87.63457398	83.5619	96.43086	96.41032	37550	619.53	9647.30957	14387.48047
Jan-09	10858.73809	11308	18228.15	51375	93.33122	89.72623808	84.13035	97.29874	96.82994	39301	624.9	9424.240234	13278.20996
Feb-09	8209.188338	14531	15062.19	60062	93.84331	91.20270686	84.13035	97.29874	97.31146	38183	666.05	8891.610352	12811.57031
Mar-09	10553.0601	15653	16596.56	71883	94.03052	92.37157798	84.13035	97.00684	97.5481	40926	772.93	9708.5	13576.01953
Apr-09	9037.254485	15560.6	19051.77	78980	94.48203	93.01753307	85.26724	96.81283	97.79162	47290	920.35	11403.25	15520.99023
May-09	9784.400868	14426.5	19805.7	75690	94.92529	93.57120886	85.83569	96.52239	98.07411	53198	1123.38	14625.25	18171
Jun-09	10285.74752	16135.9	22643.88	87511	95.26668	94.12488465	86.97259	96.03978	98.91656	51465	971.55	14493.83984	18378.73047
Jul-09	11712.18086	16734.3	21111.53	95151	95.49519	94.70932021	90.95172	96.03978	98.75972	54766	1053.3	15670.30957	20573.33008
Aug-09	11260.53335	16299.8	22439.56	88243	95.63835	94.70932021	92.08862	96.51998	98.98122	56489	1091.98	15666.63965	19724.18945
Sep-09	13093.5949	18492.1	21463.8	103199	95.86686	94.67856044	92.65707	96.90605	99.04313	61518	1197.2	17126.83984	20955.25
Oct-09	13349.97149	20249.9	25390.29	86848	96.13391	94.67856044	93.79397	96.81152	99.13852	61546	1237.18	15896.28027	21752.86914
Nov-09	12640.50189	20286.2	24786.38	94691	96.52761	94.95539834	95.49931	97.10286	99.20869	67044	1284.95	16926.2207	21821.5
Dec-09	12891.79621	22638	28190.46	112349	96.88552	95.3552753	96.06776	98.07397	99.03396	68588	1370.01	17464.81055	21872.5
Jan-10	12083.70856	12256.2	25244.56	95530	97.61235	96.92402338	97.7731	98.65663	99.37241	65402	1419.42	16357.95996	20121.99023
Feb-10	12429.15836	16762.9	25979.59	87126	98.37496	97.7237773	96.63621	99.84624	99.39717	66503	1332.64	16429.55078	20608.69922
Mar-10	15829.85787	20279.6	29391.43	119467	98.88705	98.36973239	96.63621	99.14219	99.80532	70372	1450.15	17527.76953	21239.34961
Apr-10	14619.05654	20794.4	28547.85	118444	99.45144	98.64657029	96.63621	99.3445	99.97868	67530	1436.04	17558.71094	21108.58984
May-10	15041.40031	20958.3	27427.31	112213	99.87817	99.13872655	97.7731	99.24739	100.0562	63047	1332.62	16944.63086	19765.18945
Jun-10	15634.08552	21259.7	26905.47	117153	99.87817	99.53860351	98.91	98.64854	99.9585	60936	1309.31	17700.90039	20128.99023
Jul-10	17226.64463	22892.1	27356.09	116888	99.88919	99.9077207	101.1838	99.04508	99.97959	67515	1397.12	17868.28906	21029.81055
Aug-10	17753.51545	25965.5	27608.05	119475	99.93048	100.4613965	101.1838	99.63583	100.1176	65145	1368.9	17971.11914	20536.49023
Sep-10	18706.42661	25529.9	27001.5	128356	100.3792	101.2919102	101.7522	100.2347	100.1759	69430	1440.3	20069.11914	22358.16992

Oct-10	17455.79602	26898.3	29141.96	109107	101.1336	101.7840664	102.8891	100.9387	100.3006	70673	1523.39	20032.33984	23096.32031
Nov-10	18329.33169	26998.4	26340.96	130970	101.9733	102.6145801	103.4576	102.0474	100.3428	67705	1565.52	19521.25	23007.99023
Dec-10	16428.02812	29651.6	28995.31	141466	102.6148	103.7219317	105.1629	102.5573	100.5152	69305	1687.99	20509.08984	23035.44922
Jan-11	15611.28363	17850.8	31268.92	144591	103.4655	106.182713	106.8683	103.585	100.994	66575	1723.42	18327.75977	23447.33984
Feb-11	16331.94168	23837	30893.77	104270	104.2942	107.0132267	105.1629	104.8232	101.4921	67383	1777.84	17823.40039	23338.01953
Mar-11	18595.52152	29473.4	34268.42	152310	105.1174	107.6591818	105.1629	104.6128	102.4817	68587	1813.59	19445.2207	23527.51953
Apr-11	19165.93098	29610.9	36730.02	144370	105.9268	108.1205783	105.7314	104.718	103.1416	66133	1741.84	19135.96094	23720.81055
May-11	20620.65957	30723	45265.41	144120	106.4251	108.6434943	106.2998	104.8232	103.6268	64620	1666.3	18503.2793	23684.13086
Jun-11	20146.89099	30225.8	40683.27	139700	106.5848	108.8895724	107.4367	105.1388	103.5158	62404	1666.59	18845.86914	22398.09961
Jul-11	20001.28339	29540.5	41061.13	145020	106.7555	108.8895724	109.7105	105.6648	103.6076	58823	1705.18	18197.19922	22440.25
Aug-11	23278.23558	32370.8	39950.57	155380	107.1492	108.6434943	110.279	105.9804	103.8933	56495	1546.05	16676.75	20534.84961
Sep-11	21151.46927	29525.1	39761.51	154990	107.7163	108.5819748	111.9843	106.5145	104.051	52324	1366.54	16453.75977	17592.41016
Oct-11	20659.14804	31572.2	41227.71	140220	108.1789	109.1048908	112.5528	106.6197	103.8364	58338	1498.6	17705.00977	19864.86914
Nov-11	22188.36152	32730.5	38888.74	159720	108.7405	109.5662873	113.1212	106.4093	103.7488	56875	1499.62	16123.45996	17989.34961
Dec-11	19212.92448	32950.5	39670.46	158160	109.2829	110.0584436	111.9843	106.7249	103.4929	56754	1402.23	15454.91992	18434.39063
Jan-12	18244.91182	21055.1	42968.11	122788	109.8968	110.5813596	112.5528	108.3273	103.9483	63072	1514.03	17193.55078	20390.49023
Feb-12	17062.32656	27165.6	39864.7	146395	110.3913	111.0119963	113.1212	108.214	104.406	65812	1597.67	17752.67969	21680.08008
Mar-12	19731.48808	31245.5	42379.25	160395	110.6231	111.6579514	114.2581	108.4325	105.1989	64511	1517.34	17404.19922	20555.58008
Apr-12	19478.91851	29448.1	37802.32	144581	111.3309	111.9963088	116.5319	108.3273	105.5167	61820	1473.5	17318.81055	21094.21094
May-12	21171.91807	30971.6	41585.28	162863	111.7315	112.5807444	117.1003	108.0036	105.3929	54490	1306.42	16218.53027	18629.51953
Jun-12	19371.03295	29676.9	35761.54	148482.365	111.8207	113.5650569	118.2372	107.3562	105.2383	54355	1387.52	17429.98047	19441.46094
Jul-12	18980.4353	32670	40202.43	151793.278	112.3014	114.9800062	120.511	107.4595	105.0668	56097	1407.02	17236.17969	19796.81055
Aug-12	20069.55224	32954.9	36890.58	151312.746	112.7628	115.0722855	121.6479	108.1007	105.6515	57061	1422.91	17380.75	19482.57031
Sep-12	18293.604	30100.4	41751.87	158680.48	113.4043	115.7182405	122.2164	108.4325	106.123	59176	1458.26	18762.74023	20840.38086
Oct-12	21073.64872	35372.7	44660.75	143524.416	114.0733	116.2411566	123.3533	108.3192	106.0817	57068	1425.7	18505.38086	21641.82031
Nov-12	21592.85587	33645.7	41332.03	159747.492	114.7589	116.6410335	123.9217	108.4325	105.5791	57475	1405.97	19339.90039	22030.39063
Dec-12	18327.81635	35040.5	43362.86	167611.245	115.6646	117.2562289	124.4902	109.2984	105.2948	60952	1474.72	19426.71094	22656.91992
Jan-13	20916.6594	23889.8	45670.16	158219.313	116.6585	118.3943402	125.6271	110.3909	105.6061	59761	1546.76	19894.98047	23729.5293
Feb-13	17647.4907	29134.6	41251.75	124141.775	117.3578	119.0710551	126.764	111.6048	106.4711	57424	1486.04	18861.53906	23020.26953
Mar-13	20055.85724	31209.2	40947.77	183013.097	117.9084	119.5016918	127.3324	110.6013	106.7494	56352	1438.57	18835.76953	22299.63086
Apr-13	22618.13521	32830.6	42851.38	168899.994	118.5582	120.0861273	128.4693	110.8199	106.6384	55910	1385.88	19504.17969	22737.00977
May-13	22034.11781	29005.9	44266.25	162341.158	118.9959	120.8858813	129.6062	110.1562	106.8283	53506	1350.17	19760.30078	22392.16016
Jun-13	19684.82068	31069.5	35560.92	147191.392	119.3043	121.4087973	131.3116	110.1562	107.0847	47457	1330.46	19395.81055	20803.28906
Jul-13	23673.03944	33282.7	38448.91	168173.366	119.3401	122.3931098	133.5853	110.2651	107.1269	48234	1375.79	19345.69922	21883.66016

Aug-13	21120.20214	31200.4	37153.27	162089.547	119.6264	122.5776684	134.7222	110.8198	107.2557	50008	1364.65	18619.7207	21731.36914
Sep-13	19712.47074	31585.4	34514.83	170426.362	120.0449	122.8237465	135.2907	111.703	107.3805	52338	1462.82	19379.76953	22859.85938
Oct-13	24030.87761	33738.1	38306.89	154298.864	120.7304	123.5312212	136.996	111.8152	107.1039	54256	1510.21	21164.51953	23206.36914
Nov-13	20008.09556	32787.7	33783.04	168403.885	121.3829	124.2386958	138.1329	111.7029	106.8852	52482	1479.35	20791.92969	23881.28906
Dec-13	19054.06844	35734.6	36684.74	182101.573	122.5007	124.8538911	135.8591	112.038	106.876	51507	1504.08	21170.67969	23306.39063
Jan-14	21029.56258	23117.6	36306.64	175262.82	123.1752	125.5921255	134.7222	113.1584	107.2736	47639	1454.45	20513.84961	22035.41992
Feb-14	18891.71049	26514.4	33473.16	137082.488	124.0251	126.4841587	135.2907	113.7242	107.6703	47094	1444.71	21120.11914	22836.96094
Mar-14	18346.63351	30122.4	41294.41	162404.693	125.166	127.7453091	135.8591	113.1555	108.3637	50415	1369.29	22386.26953	22151.06055
Apr-14	20107.31764	30541.5	35822.56	170087.977	126.0054	128.9141803	137.5645	112.8161	108.7209	51627	1306.01	22417.80078	22133.9707
May-14	20944.67842	28729.8	39032.51	159551.189	126.5863	130.0522916	138.7014	112.9289	109.1007	51239	1432.03	24217.33984	23081.65039
Jun-14	18855.44763	29421.7	38327.88	155223.841	127.0929	130.8828053	139.8383	112.8186	109.3038	53168	1476.38	25413.7793	23190.7207
Jul-14	22350.26661	32121.1	40050.63	165590.512	127.1067	131.4980006	143.249	112.9319	109.2612	55829	1379.61	25894.9707	24756.84961
Aug-14	20104.90237	27811.3	37481.79	158629.387	127.4233	131.836358	143.8174	113.1585	109.0787	61288	1400.71	26638.10938	24742.06055
Sep-14	21382.04509	28595.6	43326.32	182724.108	128.1501	132.6976315	143.8174	113.7169	109.1607	54116	1411.07	26630.50977	22932.98047
Oct-14	20353.93178	29517.4	39475.2	161461.228	128.687	133.7742233	143.8174	113.7204	108.8865	54629	1488.47	27865.83008	23998.06055
Nov-14	18868.68766	25402.3	42702.38	157186.291	129.3422	135.4967702	143.8174	113.493	108.2986	54664	1533.68	28693.99023	23987.44922
Dec-14	17920.92144	26934.6	35255.65	177900.669	130.3499	139.0341433	143.8174	113.8302	107.6845	50007	1396.61	27499.41992	23605.03906
Jan-15	17672.95308	13542.1	32108.6	140226.15	131.9659	144.3863427	144.3859	114.1782	107.1778	46908	1647.69	29182.94922	24507.05078
Feb-15	15557.51661	17033.5	28107.89	108571.55	133.5765	147.5853584	143.8174	115.545	107.6432	51583	1758.97	29220.11914	24823.28906
Mar-15	17259.43194	18887	35428.7	141487.341	135.3385	149.3694248	144.3859	114.9673	108.2839	51150	1626.18	27957.49023	24900.89063
Apr-15	15319.13632	17902.5	33160.68	142196.335	136.2994	150.0461396	145.5228		108.504	56229	1688.34	27011.31055	28133
May-15	14632.67561	16937.8	32863.38	131190.146	137.307	150.5690557	146.6597		109.0571	52760	1609.19	27828.43945	27424.18945
Jun-15	15800.09251	17955.3	33109.76	145436.663	138.3918	150.8766533	148.365		109.4391	53081	1654.55	27780.83008	26250.0293
Jul-15	16705.57043	18548.2	36162.71	152071.574	139.2507	152.0762842	149.5019		109.4464	50865	1669	28114.56055	24636.2793
Aug-15	13306.68348	17987.2	33770.86	136628.528	139.5563	152.5992002	150.0703		109.2914	46626	1733.17	26283.08984	21670.58008
Sep-15	13759.87837	18573.5	31832.27	145212.712	140.3107	153.4912335	151.2072		109.1213	45059	1642.97	26154.83008	20846.30078
Oct-15	14626.86391	18888.1	30943.28	130752.399	141.4615	154.6293448	152.9126		109.0722	45869	1711.53	26656.83008	22640.03906
Nov-15	13167.68996	18062	29704.93	142718.411	142.8904	155.7674562	153.481		108.842	45120	1771.05	26145.66992	21996.41992
Dec-15	11023.53806	19178.5	34078.01	164294.338	144.2614	156.9670871	152.9126		108.4701	43350	1761.36	26117.53906	21914.40039

	PPP Brazil	PPP Rusia	PPP India	PPP China
Jan-00	0.663108	0.368489	0.683784	1.052521
Feb-00	0.660051	0.370143	0.67818	1.059937
Mar-00	0.656091	0.369456	0.678891	1.036668
Apr-00	0.658477	0.372546	0.684748	1.029961
May-00	0.657779	0.378636	0.687073	1.022609
Jun-00	0.655843	0.386274	0.686593	1.008037
Jul-00	0.664851	0.392254	0.689653	0.999689
Aug-00	0.673571	0.396091	0.686553	1.005643
Sep-00	0.671637	0.399288	0.684537	1.020551
Oct-00	0.67141	0.407014	0.691053	1.018789
Nov-00	0.673162	0.41289	0.692194	1.021263
Dec-00	0.677517	0.419875	0.686435	1.022872
Jan-01	0.677101	0.428641	0.680594	1.026827
Feb-01	0.677512	0.436854	0.674837	1.023761
Mar-01	0.678529	0.443857	0.676345	1.015309
Apr-01	0.679781	0.450063	0.67821	1.013314
May-01	0.679491	0.455963	0.679678	1.003708
Jun-01	0.681887	0.462731	0.687559	0.989992
Jul-01	0.692872	0.465924	0.698549	0.987817
Aug-01	0.697742	0.465924	0.703075	0.988805

Sep-01	0.696565	0.466843	0.698418	0.993228
Oct-01	0.704694	0.473326	0.697763	0.999571
Nov-01	0.710894	0.480554	0.712529	0.999259
Dec-01	0.718365	0.490429	0.710805	1.004221
Jan-02	0.720471	0.50447	0.706175	1.004958
Feb-02	0.7202	0.508143	0.701889	1.012013
Mar-02	0.72047	0.510928	0.700959	0.99327
Apr-02	0.722206	0.513682	0.69855	0.984783
May-02	0.723742	0.522635	0.703018	0.981828
Jun-02	0.726376	0.524954	0.708582	0.972451
Jul-02	0.734203	0.528096	0.71523	0.964571
Aug-02	0.736516	0.526713	0.717301	0.964253
Sep-02	0.740569	0.528064	0.717591	0.972281
Oct-02	0.749046	0.532739	0.719358	0.972614
Nov-02	0.771662	0.541618	0.722313	0.971641
Dec-02	0.789596	0.550973	0.716508	0.976711
Jan-03	0.803829	0.561836	0.711879	0.983107
Feb-03	0.810208	0.566698	0.707899	0.98437
Mar-03	0.815277	0.56914	0.708033	0.972621
Apr-03	0.824956	0.576218	0.718316	0.972788
May-03	0.831343	0.581546	0.72095	0.967558
Jun-03	0.829196	0.58566	0.724538	0.954906
Jul-03	0.829959	0.589035	0.729575	0.949099
Aug-03	0.829608	0.584621	0.723907	0.952118
Sep-03	0.833371	0.584538	0.721562	0.960422
Oct-03	0.836706	0.590971	0.728132	0.970113
Nov-03	0.841837	0.598389	0.731557	0.98247

Dec-03	0.847115	0.605589	0.729445	0.989437
Jan-04	0.849417	0.613149	0.728792	0.99546
Feb-04	0.850014	0.61598	0.724878	0.988133
Mar-04	0.848543	0.616688	0.720236	0.984751
Apr-04	0.848964	0.620785	0.717938	0.986517
May-04	0.848312	0.621785	0.719426	0.979797
Jun-04	0.851641	0.624415	0.722798	0.969861
Jul-04	0.860756	0.631425	0.731012	0.969455
Aug-04	0.866226	0.633569	0.737693	0.975726
Sep-04	0.867247	0.63506	0.737549	0.984381
Oct-04	0.866509	0.63876	0.737894	0.979224
Nov-04	0.872027	0.645801	0.736105	0.975776
Dec-04	0.882775	0.655225	0.733184	0.980344
Jan-05	0.886023	0.671085	0.738668	0.984158
Feb-05	0.886137	0.675629	0.733035	0.996127
Mar-05	0.884634	0.679061	0.727347	0.979501
Apr-05	0.886375	0.682108	0.727993	0.970039
May-05	0.891641	0.68833	0.725986	0.969095
Jun-05	0.890997	0.692459	0.728367	0.960848
Jul-05	0.889105	0.692359	0.737347	0.956422
Aug-05	0.886076	0.688151	0.73632	0.953456
Sep-05	0.878459	0.68153	0.730125	0.948539
Oct-05	0.883265	0.683865	0.736725	0.95042
Nov-05	0.895309	0.694494	0.749467	0.955242
Dec-05	0.902182	0.702771	0.748431	0.962961
Jan-06	0.900625	0.714705	0.743845	0.968101
Feb-06	0.902498	0.725081	0.742347	0.970983

Mar-06	0.901405	0.726796	0.73826	0.956946
Apr-06	0.895677	0.723327	0.738183	0.950771
May-06	0.892144	0.723067	0.740659	0.945129
Jun-06	0.888521	0.723956	0.751417	0.93855
Jul-06	0.887583	0.726436	0.755293	0.932975
Aug-06	0.886283	0.726327	0.753811	0.933939
Sep-06	0.892515	0.730567	0.763635	0.943234
Oct-06	0.900355	0.736876	0.780083	0.949324
Nov-06	0.904466	0.742634	0.781244	0.95359
Dec-06	0.907465	0.74718	0.780083	0.965502
Jan-07	0.908737	0.757498	0.777709	0.969302
Feb-07	0.907883	0.761707	0.779661	0.973785
Mar-07	0.903024	0.759406	0.766589	0.962103
Apr-07	0.899403	0.758723	0.767639	0.954938
May-07	0.896423	0.758953	0.768937	0.951985
Jun-07	0.897167	0.764568	0.773399	0.953944
Jul-07	0.899528	0.771524	0.785497	0.962775
Aug-07	0.905396	0.773587	0.792902	0.976118
Sep-07	0.904492	0.777574	0.790723	0.976356
Oct-07	0.905262	0.788755	0.794968	0.977194
Nov-07	0.903344	0.793671	0.790274	0.978224
Dec-07	0.910611	0.803146	0.790804	0.98867
Jan-08	0.91097	0.817604	0.786893	0.995585
Feb-08	0.912785	0.825058	0.79047	1.018513
Mar-08	0.90927	0.827706	0.795287	1.002692
Apr-08	0.908763	0.834581	0.796263	0.997644
May-08	0.908297	0.838758	0.795335	0.985356

Jun-08	0.905874	0.83836	0.793065	0.973574
Jul-08	0.905919	0.838249	0.805828	0.969457
Aug-08	0.912098	0.844364	0.820373	0.972369
Sep-08	0.915748	0.852585	0.827175	0.973716
Oct-08	0.929251	0.869027	0.847062	0.980701
Nov-08	0.950816	0.893259	0.863603	0.991852
Dec-08	0.963436	0.908975	0.866732	1.000213
Jan-09	0.963867	0.926637	0.868846	1.004841
Feb-09	0.96436	0.937225	0.864547	0.999869
Mar-09	0.96394	0.946934	0.86245	0.994451
Apr-09	0.966157	0.951181	0.871928	0.989991
May-09	0.967893	0.954087	0.875212	0.984178
Jun-09	0.963101	0.951558	0.879252	0.970917
Jul-09	0.966945	0.958987	0.920939	0.972459
Aug-09	0.966227	0.956841	0.930365	0.975134
Sep-09	0.96793	0.955933	0.935522	0.978423
Oct-09	0.969693	0.955013	0.94609	0.976528
Nov-09	0.972975	0.957128	0.96261	0.978774
Dec-09	0.978306	0.962854	0.970049	0.990306
Jan-10	0.982288	0.975362	0.983906	0.992797
Feb-10	0.989716	0.983165	0.972223	1.004518
Mar-10	0.990799	0.985616	0.968247	0.993356
Apr-10	0.994727	0.986676	0.966568	0.993657
May-10	0.998221	0.990831	0.977182	0.991917
Jun-10	0.999196	0.995799	0.989511	0.986895
Jul-10	0.999096	0.999281	1.012044	0.990653
Aug-10	0.998131	1.003434	1.010649	0.995188

Sep-10	1.00203	1.011141	1.015736	1.000587
Oct-10	1.008305	1.01479	1.025808	1.006362
Nov-10	1.016249	1.02264	1.031041	1.016988
Dec-10	1.020888	1.031903	1.046239	1.020316
Jan-11	1.024472	1.051376	1.058164	1.025655
Feb-11	1.02761	1.0544	1.036169	1.032822
Mar-11	1.025719	1.050521	1.026163	1.020795
Apr-11	1.027003	1.048273	1.025109	1.015283
May-11	1.027004	1.048411	1.025794	1.011545
Jun-11	1.029647	1.051912	1.037877	1.015678
Jul-11	1.030383	1.050981	1.058904	1.019856
Aug-11	1.031339	1.045722	1.061464	1.020089
Sep-11	1.035226	1.043545	1.076244	1.023676
Oct-11	1.04182	1.050738	1.083943	1.026805
Nov-11	1.048113	1.056073	1.090337	1.025644
Dec-11	1.055945	1.063439	1.082048	1.031229
Jan-12	1.057226	1.063811	1.082776	1.042126
Feb-12	1.057327	1.063272	1.083474	1.036473
Mar-12	1.051561	1.061398	1.086115	1.030738
Apr-12	1.055102	1.061408	1.104393	1.026636
May-12	1.060143	1.068201	1.111084	1.024771
Jun-12	1.062547	1.079122	1.123519	1.020124
Jul-12	1.068857	1.094351	1.146994	1.022773
Aug-12	1.067309	1.089168	1.151407	1.023181
Sep-12	1.068612	1.090416	1.151649	1.021762
Oct-12	1.075335	1.09577	1.162814	1.021092
Nov-12	1.086947	1.104774	1.173734	1.027026

Dec-12	1.098484	1.1136	1.182302	1.038023
Jan-13	1.104657	1.121093	1.189581	1.045307
Feb-13	1.102251	1.118342	1.190596	1.048217
Mar-13	1.104535	1.11946	1.192816	1.036083
Apr-13	1.111777	1.126105	1.204719	1.039212
May-13	1.113899	1.13159	1.21322	1.031152
Jun-13	1.114112	1.133765	1.226241	1.028683
Jul-13	1.114007	1.142506	1.246983	1.029295
Aug-13	1.115338	1.142854	1.256084	1.03323
Sep-13	1.11794	1.143818	1.259919	1.040254
Oct-13	1.127227	1.153377	1.279094	1.043988
Nov-13	1.135638	1.162357	1.292349	1.045074
Dec-13	1.146194	1.168213	1.271185	1.048299
Jan-14	1.148234	1.170764	1.255875	1.054858
Feb-14	1.151897	1.174736	1.256528	1.056226
Mar-14	1.155055	1.178857	1.253733	1.04422
Apr-14	1.15898	1.185735	1.265299	1.037666
May-14	1.160271	1.192039	1.271316	1.035089
Jun-14	1.162749	1.197422	1.279354	1.032156
Jul-14	1.163329	1.20352	1.311069	1.033596
Aug-14	1.168178	1.208636	1.318474	1.037403
Sep-14	1.173958	1.215617	1.317483	1.041738
Oct-14	1.181845	1.228566	1.320801	1.044394
Nov-14	1.194311	1.251141	1.327971	1.047964
Dec-14	1.210479	1.291125	1.335544	1.057071
Jan-15	1.231281	1.347167	1.347163	1.065316
Feb-15	1.240919	1.37106	1.336056	1.073407

Mar-15	1.249849	1.379424	1.333401	1.061721
Apr-15	1.256169	1.382862	1.341174	0
May-15	1.259038	1.380644	1.344797	0
Jun-15	1.264555	1.378636	1.355685	0
Jul-15	1.272318	1.389504	1.365982	0
Aug-15	1.276919	1.396259	1.373121	0
Sep-15	1.285823	1.406611	1.38568	0
Oct-15	1.296952	1.417678	1.401939	0
Nov-15	1.312824	1.431134	1.410127	0
Dec-15	1.329965	1.4471	1.409721	0