

Exchange Rates, Gold and Money Demand in India and South Africa

Seyyedsajjad Seyyedi

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Approval of the Institute of Graduate Studies and Research

Prof. Dr. Ali Hakan Ulusoy
Acting Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy in Economics.

Prof. Dr. Mehmet Balcılar
Chair, Department of Economics

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Doctor of Philosophy in Economics.

Prof. Dr. Glenn Paul Jenkins
Supervisor

Examining Committee

1. Prof. Dr. Adalet Hazar

2. Prof. Dr. Glenn Paul Jenkins

3. Prof. Dr. İlhan Öztürk

4. Assoc. Prof. Dr. Hasan Ulaş Altıok

5. Assoc. Prof. Dr. Çağay Coşkuner

ABSTRACT

This dissertation endeavors to explore the different aspects of macroeconomic factors such as the exchange rate, price of gold and demand function for money in India and South Africa respectively. In the second chapter, we investigate the co-movements and relationships among gold and oil prices and Indian Rupee (INR) to US Dollar (USD) exchange rate over the period of January 12, 2004 to April 30, 2015, to consider whether economic policymakers in India should separate financial policies and energy policies. We use different econometric methods such as Johansen's cointegration test, vector autoregressive (VAR) model, Granger-causality test and impulse response to describe the relationships among the factors. Our empirical results show that in spite of short-run causality effects between the variables, there is not a long-run relationship between them. This analysis provides a number of important economic insight into these markets in India.

The third chapter is an empirical exercise in money demand behavior, testing whether economic and monetary uncertainties may affect the demand function for money in South Africa. This is often done by utilizing the unlimited error-correction model and bounds testing method to cointegration explained by Pesaran et al. (2001). We employ the moving-average standard deviation method to generate the results uncertainty estimation and monetary uncertainty estimation. The results suggest that any increase in output uncertainty causes a substitution effect away from cash and less volatile assets, whereas an increase in monetary uncertainty causes a precautionary impact to save more volatile assets i.e. cash. Finally, we use Brown et al.'s (1975) cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests to consider the

coefficients strength. Our findings report the steady demand function for money in South Africa.

In the fourth chapter, we check the impact of domestic and foreign interest rate volatility on the demand function for money in South Africa. Our findings show that the measure of interest rate volatility on domestic money has a negative relationship with the demand for money. This could induce a few investors to move a portion of their wealth out of ostensible resources, including money, into substantial resources such as product inventories. Moreover, the foreign interest rate fluctuation measure is not significantly related to the demand function for money in South Africa. The findings imply that monetary and financial policies have an important role in explaining the economy of less developed countries.

Keywords: Exchange rate, gold price, oil price, money demand, India, South Africa

ÖZ

Bu tez Hindistan ve Güney Afrika'daki döviz kurları, altın fiyatları ve para talebi fonksiyonu gibi makroekonomik değişkenlerin farklı yönlerini keşfetmeye çalışmaktadır. Birinci bölümde, Hintli ekonomik politika belirleyicilerinin finansal politikaları enerji politikalarından ayırmalarının gerekip gerekmediğini araştırmak için 12 Ocak 2004 - 30 Nisan 2015 tarihleri arasındaki altın fiyatları, petrol fiyatları ve Hindistan Rupisi-dolar döviz kurları arasındaki ortak hareketleri ve bağlantıları araştırıyoruz. Değişkenler arasındaki eş hareketleri açıklamak için Johansen'in eşbütünleşme testi, vektör otoregresif (VAR) modeli, Granger nedensellik testi ve dürtü yanıtı gibi çeşitli ekonometrik yöntemler kullanılmıştır. Bu bağlamda, altın fiyatlarının, petrol fiyatlarının ve rupi-dolar döviz kurlarının birbirinden büyük ölçüde bağımsız olduğu ve dolayısıyla enerji politikalarının ve finansal politikaların birbirinden ayrı düşünülmesi sonucuna varılmıştır.

İkinci bölüm, ekonomik ve parasal belirsizliklerin Güney Afrika'daki para talebi işlevini etkileyip etkilemediğini test eden ampirik bir çalışmadır. Bu çalışmada, sınırsız hata düzeltme modeli ve Pesaran ve arkadaşlarının (2001) önerdiği eşbütünleşme için sınır testi yaklaşımı kullanıldı. Çıktı belirsizlik ölçüsü ve parasal belirsizlik ölçüsü oluşturmak için hareketli ortalama standart sapma yöntemini kullanıyoruz. Sonuçlar, çıktı belirsizliğindeki herhangi bir artışın, nakitten uzak ve daha az değişken varlıklar lehine bir ikame etkisine yol açtığını, parasal belirsizliğin artmasından dolayı, daha fazla değişkenlikten tasarruf etmenin bir ihtiyati etki olduğunu göstermektedir. Son olarak, Brown ve arkadaşlarının (1975) kümülatif toplamı (CUSUM) ve kümülatif kareler toplamı (CUSUMSQ) testlerini, katsayıların

durağanlığını deęerlendirmek için kullandık. Bulgularımız Güney Afrika'da para talebi fonksiyonunun istikrarlı olduğunu gösteriyor.

Son bölümde, Güney Afrika'daki yerli ve yabancı faiz oranındaki dalgalanmaların para talebi fonksiyonu üzerindeki etkilerini kontrol ettik. Bulgularımız, faiz oranının yerel para üzerindeki hareketliliğinin para talebiyle olumsuz yönde ilişkili olduğunu göstermektedir. Bu, bazı yatırımcıların servetlerinin bir kısmını nominal varlıklardan emtia stokları gibi maddi varlıklara kaydırmaya zorlayabilir. Öte yandan, yabancı faiz oranı hareketliliğinin, Güney Afrika'daki para talebi fonksiyonu ile önemli bir ilişkisi yoktur. Bu sonuçlar, parasal ve finansal politikaların, gelişmekte olan ülkelerin ekonomisini açıklamada önemli bir rol oynadığını göstermektedir.

Anahtar Kelimeler: Döviz kuru, altın fiyatı, petrol fiyatı, para talebi, Hindistan

DEDICATION

This thesis is dedicated to my wife, Zahra Ebrahimi, for her kindness and devotion, and for her endless support.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criteria
ADF	Augment Dickey Fuller
ECM	Error Correction Model
EX	Exchange Rate
KPSS	Kwiatkowski Phillip Schmidt and Schin
M	Supply of Money
NEER	Nominal Effective Exchange Rate
P	GDP Deflator
R	Domestic Interest Rate
Rf	Foreign Interest Rate
RGDP	Real Gross Domestic Product
SBIC	Schwarz Bayesian Information Criterion
UM	Monetary Uncertainty
UY	Output Uncertainty
VAR	Vector Auto Regression
Y	Real GDP

Chapter 1

INTRODUCTION

This thesis contains three different studies covering the effects of macroeconomic fundamentals, such as monetary and economic uncertainties on the demand function for money in South Africa, and the interactive linkages between exchange rates and prices of gold and oil in India. In the case of India, gold and oil are two of its major imports whose prices it does not control. It is important for economic stabilization policies for the macroeconomic policymakers to know the likely impacts that shocks to these prices will have on India's exchange rate. Any changes in the exchange rate caused by the price shocks of major imports will have broad economic consequences for the rest of the economy.

The studies on the demand for money in South Africa focus on the role of the degree of variability of the traditional independent variables that affect the monetary balances demanded by South Africans. An understanding of the factors that determine the stability of the demand for money in a country is at the core of enabling the monetary authorities to design effective monetary policies. It is expected that the results of the study for South Africa will provide the relevant lessons for all countries that experience such variability of the variables determining the demand for money.

The first paper investigated the long-run equilibrium relationships between oil and gold prices and the INR to USD exchange rate over the period of January 12, 2004 to

April 30, 2015. In order to clarify the linkage between these factors, we used the Johansen's cointegration test, vector autoregressive (VAR) model and impulse response.

The empirical findings of Augmented Dicky-Fuller (ADF), Phillips-Perron and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests show that the variables are integrated of order one $I(1)$ i.e. they become stationary in first-order differentiation and the cointegration test reveals that there is no long-run linkage between the factors. The findings of the VAR model demonstrate that exchange rates and the oil prices are the most affected variables and the variable for the spot prices of gold is the most independent variables. The Granger causality test discloses that gold prices have a one-way feedback linkage for the INR to USD exchange rate and with regard to the price of oil, i.e. they Granger cause the exchange rates and the oil prices. Furthermore, gold prices are not impacted by any other two factors and there is a two-way feedback linkage between the price of oil and the exchange rates. Finally, the impulse response indicates that when the variables are influenced by shocks, the impulse response impact only lasts for three periods maximum. To this end, it is implied that the three variables are independent of each other. Lastly, the policy implication for energy policymakers is that they should try to detach energy policies from financial policies.

The results of the second chapter contain important suggestions for policymakers and academic centers. The interactive linkages between the prices of gold and crude oil and the INR exchange rate highlight the necessity for energy and financial policies to be detached by the Indian government and the Reserve Bank of India. The results of the study, with respect to the fact that India is the world's biggest gold importer and meets the majority of its need for crude oil through imports, should be very useful to

assist Indian officials in making policy decisions. During recent years, prices of crude oil and gold have been applied to control the INR exchange rate in India.

The third chapter explains the effect of output uncertainty and monetary uncertainty on the demand function for money in South Africa. As different variables have different implications for the economy and affect traditional monetary policy, the choice of uncertainty measures is an important issue. To this end, in order to have comparable estimation results, their estimation must be conducted within a consistent framework. In carrying out this task, we generate UM and UY using the moving-average standard deviation technique as the monetary and output uncertainty measures respectively. This depended on the conventional description of the demand function for money as linkages between the stabilization of real money, a scale variable, and the opportunity cost of keeping money is limited.

No previous research that investigated the demand function for money in South Africa has consisted of measures for output and monetary uncertainty. Most of them formulated the function employing income, interest rate, inflation rate and the exchange rate. Our empirical findings are different from previous literature in some respects. Firstly, the estimated coefficient of real income is larger. This reveals that the long-run function of demand for money in South Africa might be more elastic in terms of real income than hitherto supposed. The findings explain also that the measurements of output uncertainty and monetary uncertainty have short-run and long-run impacts on money demand. Also, these measurements and related short-run effects include the estimation outcomes in a balanced demand function for money in South Africa. Following Poole (1970), as there is no instability in money demand, we interpret that

the supply of money is a suitable monetary policy which should be selected for implementation by the South African Reserve Bank (SARB).

The third study considers the effect of interest rate fluctuation on bank time deposit rates (ur) and short-term treasury bills (ur^f) on the demand function for money in South Africa. Furthermore, (ur) and (ur^f) are estimated using the moving average-standard deviation of domestic and foreign interest rates. This is related to the opinion that the conventional specification of the demand function for money is linked with the stability of real money, a scale variable and the limited opportunity cost of keeping money and assumes the country has a closed economy. In open economies, people can decide whether to hold their property in domestic or foreign resources. Hence the demand function for money has to include the return on holding foreign properties.

No previous research that has investigated the demand function for money in South Africa has included measures for the uncertainty of the interest rate on deposit rates and treasury bills. Most researchers formulated the function employing the interest rate, exchange rate, inflation rate, income and different findings as long as the steady item was investigated. Empirical results of the study reveal that interest rate fluctuation on treasury bills does not affect the demand function for money in South Africa. However, any increase in the volatility of treasury bills will lead to an increase in the demand for money. The fluctuation of interest rates on deposit rates significantly affects money demand, which shows that by increasing the deposit rate fluctuation, domestic currency demand will increase too. The coefficient of inflation is negative and statistically significant. It indicates that in inflationary periods holding real domestic assets is preferable to holding domestic currency for South African people. If the exchange rate is positive, people will hold South African Rand instead of foreign

currencies. Raising the exchange rate will also increase the anticipated return on holding domestic currency and, as a result, the demand for money will rise. Furthermore, including the two measures of the volatility of domestic and foreign interest rates, and consolidating the relationship in the short run into the conclusion of the estimation results in a steady demand function for money in South Africa.

Chapter 2

AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN THE PRICE OF GOLD, THE PRICE OF OIL AND THE EXCHANGE RATE IN INDIA

2.1 Introduction

India is one of the fastest-growing economies in the world. According to the World Economic Outlook (WEO) of IMF¹, India's nominal GDP in 2014 was approximately USD 2049 billion and its GDP value was based on its purchasing power parity (PPP) which was USD 7375.9 billion. India's nominal GDP and PPP were the seventh largest and it was the third strongest economy in the world. Over the last decade, India's demand for crude oil and precious metals, especially gold, has increased dramatically. Therefore, the vulnerability of the interactive linkage between crude oil prices, gold prices and macroeconomic indicators such as the exchange rate is extremely important for policymakers to make appropriate policies in specific situations.

From 2000 to 2007, the INR was not declining and had stabilized with a range between 44 to 48 INR per USD. In late 2007, constant foreign investment into the economy resulted in the INR appreciating and experiencing a record value of 39 INR per USD. However, concurrent with the world financial crisis in 2008, investors transferred a large amount of their investments out to their own countries and the appreciation trend

¹ International Monetary Fund

of the INR reversed. Once again in 2013, due to foreign investment outflow from the economy and stagnant reforms, the Rupee started losing its value against hard currencies. The situation deteriorated on the passing of the Right to Food Act 2013. The central government of India had to allocate huge funds to provide subsidized food grains for approximately two thirds of its population. The source for the subsidies caused an increment in the country's fiscal deficit and, as a consequence, fueled inflation. After passing this financially disastrous bill, the INR value declined to INR 68.80 per USD. (See figure 1).

We considered India in this study because of her importance in the world crude oil and gold market. First, coal and crude oil are India's largest primary sources of energy. For instance, the US Energy Information Administration (EIA) 2019 overview of India illustrated that in 2018 India was the third-biggest demander and net importer of crude oil and petroleum products following the China, and United States. The demand for oil in India increased to about 4.543 million barrels per day while the country's production was approximately 695 thousand barrels per day. Thus, we can conclude that the widening gap between the demand and supply of oil in India must be met through an increase in imports. This is one of India's main concerns in the short-run. The changes in the prices of gold and oil prices have resulted in a much smaller impact on the demand for foreign exchange than would be expected.



Figure 1: Indian rupee's trend against US Dollar

World Gold Council statistics imply that during the past decade about 30 percent of the world demand for gold was from India. Investing in gold is particularly favored in India not only because gold is universally accepted but also because of its liquidity features and its ability to avoid financial or economic turbulence. However, India's desire for gold is also deeply related to its cultural heritage. Gold plays a very important part in socio-economic life for both destitute and wealthy people in India. Hence, India is one of the biggest importers of gold in the world (Kanjilal and Ghosh, 2014). As internal gold production in India is very limited in comparison to its demand for gold, the country must meet its needs through imports. This may cause a huge amount of US dollars to flow out of the economy adding to the instability of the Indian macroeconomic and financial sectors.

In India, gold is seen as one of the most desirable investment options and as a popular hedge against inflation; the exchange rate is a vital financial factor and the price of oil is an important variable determining the competitiveness of many Indian industries. Additionally, with respect to the reality that it is mainly the US Dollar that is utilized

to conduct international oil market transactions, it is expected that any increase in the demand for oil will lead to a depreciation of the Indian Rupee in the short-run. But, in the case of petroleum there is a significant opportunity to substitute local coal for oil e.g. for electricity production. In addition, price responsiveness to the quantity of fuel demanded (income effect) is greater for consumers in low income countries, where the share of people's income spent on basic fuels is greater than for residences of higher income countries.

Consequently, the aim of the study was to test both the long-run equilibrium linkage and the short-run causality effect among these three variables simultaneously and also to find a solution for the question of whether policymakers in India should consider financial and energy policies. Several econometric methods were employed to analyze the linkages between gold and oil prices and exchange rates in India over the period of January 12, 2004 to April 30, 2015. This research is a unique contribution to the limited literature of emerging economies in several aspects. First, no study has analyzed them in a multivariate framework for the Indian economy. Second, our results are more robust compared to the other studies because the employed methodology effectively captures the interactive linkages among oil and gold prices and the exchange rate. Third, the outcomes of this research also contain recommendations for policymakers to consider other important variables as well when evaluating the impact of energy policies. Moreover, this analysis provides a number of important economic insights into these markets in India.

2.2 Literature review

Financial indicators and energy price shocks, in general, are the sources of economic fluctuations. If they affect each other, then the effects of other important control factors should also be considered when assessing the influence of adjustments in energy policies. In the same way, when evaluating the influence of financial policies, the impacts of the same policies on energy prices should be calculated and analyzed. This means policymakers should examine the impacts and relationships between financial and energy policies. At the same time, if energy price changes arising from energy policy adjustments do not stimulate fluctuations in financial variables and financial policy adjustments do not influence the energy price, policymakers must detach energy and financial policies.

Therefore, economists have been successful in clarifying the link between these commodity and exchange rate markets. Several studies have shown there is an individual relationship among the above-mentioned factors and related issues². However, some research concludes that there is no long-run linkage among these variables. For instance, Tiwari et al. (2013) show that there is no causality between the price of oil and the exchange rate in high-frequency bands for India. Chang et al (2013) claim that the price of oil, price of gold and the exchange rate remain considerably independent from one another in Taiwan's economy. Sari et al. (2010) show that there is a strong relationship in the short-run and weak relationships in the long-run among oil and precious metal prices and exchange rate.

² See, for example, Krugman (1980), Darby (1982), Golub (1983), Dooley et al. (1995), Amano and van Norden (1998), Sadorsky (2000), Rautava (2004), Nikos (2006), Chen and Chen (2007), Huang and Guo (2007), Benassy-Quere et al. (2007), Narayan et al. (2008), Coudert et al. (2008), Zhang and Wei (2010), Lizardo and Mollick (2010), Jain and Ghosh (2013), Turhan et al. (2014), Beckmann et al. (2015).

Moreover, the association between the price of Gold, the price of Oil and the Exchange Rate draws the attention of many researchers over time. A strand of the studies focused on the linkage between oil price and exchange rate (Amano and Van Norden, 1998; Chen and Chen, 2007; Al-mulali and Che Sab, 2012). These studies found that oil price surge triggers exchange rate appreciation for the oil-exporting economies. Similarly, Camarero and Tamarit (2002), Cologni and Manera (2008), and Rautava (2004) submitted that long-run correlation exists between oil price and exchange rates even in the economies which do not heavily depend on oil export. Recently, Mensah, Obi and Bokpin (2017) confirmed the existence of long-run negative relationship between oil price and exchange rate in oil dependent economies. Likewise, Delgado, Delgado and Saucedo (2018) and Singhal, Choudhary and Biswal, (2019) investigated the oil price exchange rate nexus in Mexico. The studies concluded that, in the long run, oil price negatively affect exchange rate.

Moreover, researchers examined the relationship between gold price and exchange rates in various economies. Some of the studies showed a significant relationship between gold price and exchange rates (Srinivasan and Prakasam, 2015; Jain and Biswal, 2016; Akbar, Iqbal and Noor, 2019) while others concluded that gold price and exchange do not have significant relationship (Jain and Ghosh (2013; Sinton, 2014; Tiwari and Gupta, 2015). The extant literature also indicates strong nexus between oil price and gold price in several economies (Le and Chang, 2016; Šimáková, 2011; Zhang and Wei, 2010; Lescaroux, 2009; Ye, 2007;).

However, most of the studies considered the three variables (oil price, gold price and exchange rate) in pairs rather than examining their concurrent interdependence. Further, there is no consensus among the studies vis-à-vis the association of the

variables. In addition, the Indian case regarding the association among the variables did not receive adequate attention. This current study fill the gap by investigating the relationship between the oil price, gold price and exchange rate in India.

2.3 Methodology

2.3.1 Unit root test

Before running the model, the unit root test must be carried out to determine that the time series variables are stationary. Hence, the Augmented Dickey-Fuller (1979) test is one of the tests employed to run the unit root test. There are three different types of model to conduct the Augmented Dickey-Fuller (ADF) unit root test:

Model I: Without intercept and trend

$$\Delta z_t = \pi z_{t-1} + \alpha_1 \Delta z_{t-1} + \alpha_2 \Delta z_{t-2} + \dots + \alpha_p \Delta z_{t-q} + \varepsilon_t \quad (1)$$

Model II: With intercept and without trend:

$$\Delta z_t = \alpha_0 + \pi z_{t-1} + \alpha_1 \Delta z_{t-1} + \alpha_2 \Delta z_{t-2} + \dots + \alpha_p \Delta z_{t-q} + \varepsilon_t \quad (2)$$

Model III: With intercept and trend:

$$\Delta z_t = \alpha_0 + \delta t + \pi z_{t-1} + \alpha_1 \Delta z_{t-1} + \alpha_2 \Delta z_{t-2} + \dots + \alpha_p \Delta z_{t-q} + \varepsilon_t \quad (3)$$

the null hypothesis is $H_0: \pi = 0$ i.e. the data should be differenced to be stationary, and the alternative hypothesis is $H_1: \pi < 0$ which means data is stationary. Where α_0 is intercept, δ represents the trend, and q denotes the number of augmenting lags which are determined by minimizing the Akaike Information Criteria (AIC) or Schwarz Bayesian Information Criteria (SBIC).

2.3.2 The cointegration test

The long-run linkage between series is explained by the cointegration test. Engle and Granger (1987) mention that nonstationary series can become stationary if they are linearly combined. It is said that such times are cointegrated. For that reason, it can be interpreted that a long-run linkage exists between the series. Brooks (2008) states the

test for cointegration among factors is measured by the classifying of the Π matrix through its eigenvalues. The classifying of a matrix is equivalent by the number of its characteristic roots, eigenvalues, which are not zero. If the factors are not cointegrated, the classifying Π will be significantly close to zero, so $\lambda_i \approx 0 \forall i$. The results of test really include $\ln(1 - \lambda_i)$, more than the λ_i themselves, but still, when $\lambda_i = 0$, $\ln(1 - \lambda_i) = 0$.

According to the Johansen (1988) approach there are two test statistics for cointegration:

$$\lambda_{max}(r, r + 1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (4)$$

where λ_{max} conducts distinct tests on eigenvalues under the following hypotheses:

$H_0: r = \text{number of cointegrating vectors}$

$H_1: r + 1 = \text{number of cointegrating vectors.}$

and

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^g \ln(1 - \hat{\lambda}_i) \quad (5)$$

where r is the cointegrating vectors numbers and $\hat{\lambda}_i$ is the calculated value for the i^{th} ordered eigenvalue from the Π matrix. λ_{trace} is a joint test where H_0 is that the number of cointegrating vectors is less than or equal to r against H_1 that there are more than r cointegrating vectors.

2.3.3 Vector Autoregressive (VAR) model

The VAR model represented mathematically is:

$$X_t = A_1 X_{t-1} + \dots + A_q X_{t-q} + B Y_t + \varepsilon_t \quad (6)$$

where X_t represents k vector of endogenous variables, Y_t shows a d vector of exogenous variables, the matrices of estimated coefficients are B and A_1, \dots, A_q , and the vector of innovations are denoted by ε_t . Using VAR models has several advantages

over other methodologies such as all the variables are endogenous and the researcher does not need to specify whether variables are exogenous or endogenous. These models are adjustable and could be capable of capturing more attributes of the data and the generated forecasts by VAR models are superior to traditional conventional models (Brooks, 2008).

2.3.4 Granger Causality test

Based on Granger (1969) approach, x Granger causes y if it helps predict y . To this end, the lagged x 's must have statistically significant coefficients. Notice that there is two-way causation; x induces y and y induces x . It is noteworthy to know that the statement “ y is induced by x ” does not mean that y is the result or effect of x .

The following forms of bivariate regressions are run to test the Granger causality:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \dots + \alpha_l y_{t-l} + \beta_1 x_{t-1} + \dots + \beta_l x_{t-l} + \varepsilon_t \quad (7)$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \dots + \alpha_l x_{t-l} + \beta_1 y_{t-1} + \dots + \beta_l y_{t-l} + \varepsilon_t \quad (8)$$

The null hypothesis is that x does not induce y and that y does not induce x in the first and second regressions, respectively.

2.3.5 Impulse Response Function

Impulse response function finds the impact of each factor on other factors in a system.

Suppose that Z_t is a series with k -dimensional vector and is estimated by

$$Z_t = B_1 Z_{t-1} + \dots + B_q Z_{t-q} + U_t = \phi(A)U_t = \sum_{i=0}^{\infty} \phi_i U_{t-i} \quad (9)$$

$$I = (I - B_1 A - B_2 A - \dots - B_q A^q) \phi(A) \quad (10)$$

where Σ is equal to the covariance of U_t , ϕ_i contains the moving average coefficients that measure the impulse response. More precisely, $\phi_{ij,t}$ denotes the variable i response to an impulse in variable j happening t^{th} period ago. Impulse response functions are utilized to evaluate the efficiency of a change in policy.

2.4 Data

Daily nominal data for crude oil and gold prices and the INR/USD exchange rates are used in the present study. In accordance with Narayan et al. (2008), in order to track the behavior of gold prices, crude oil prices, and exchange rate it is not required to know the real values. Following Hamao et al. (1990), we ignore the variables for a certain date if any of the variables were missing for that date. Hamao asserts that the accuracy of final empirical findings is not influenced by such data processing.

The time period of the study is from January 12, 2004 to April 30, 2015. Figures 2 and 3 are a graphical representation of the data. The crude oil price is estimated according to Brent crude oil spot prices. The gold price, on the other hand, is taken from the gold spot market on the London Metal Exchange. To interpret calculated parameters in terms of their elasticities, we put the variables into the logarithm form. All the data are downloaded from Thomson Reuter's DataStream.

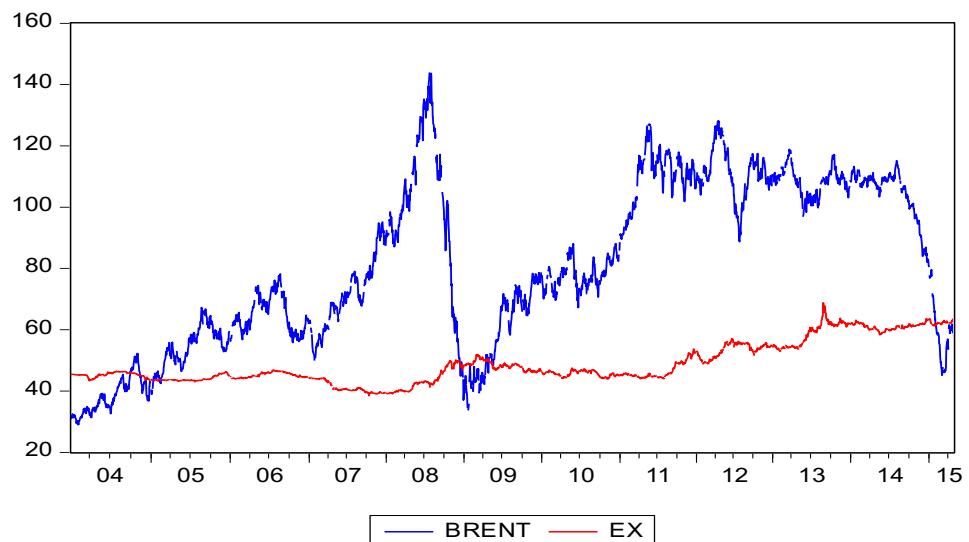


Figure 2: Crude oil prices and Rupee-dollar exchange rate

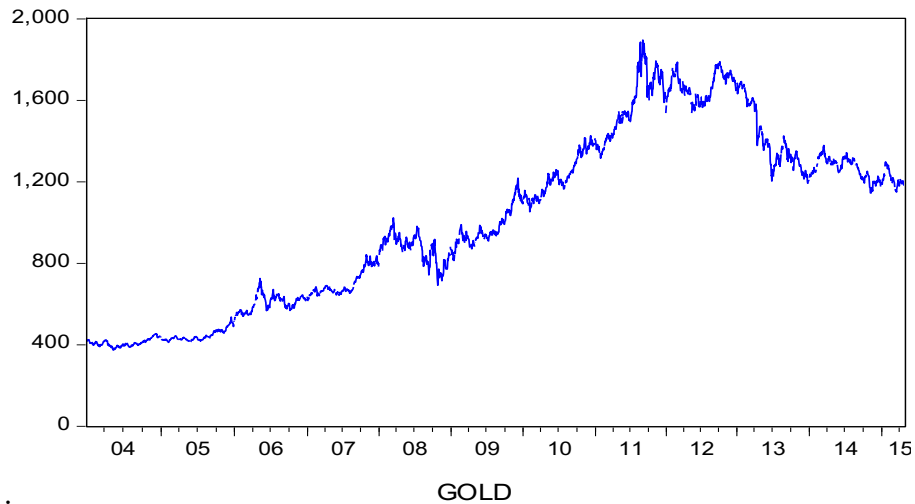


Figure 3: Gold prices

2.5 Results and discussion

Table 1 contains the descriptive statistics of all the variables. The table shows that the prices of gold and crude oil are left-skewed, while the exchange rate is right-skewed. The gold price has the highest central tendency, as represented by mean. Its standard deviation shows that gold prices have the highest volatility.

Table 1: Descriptive statistics of the variables

	EX	GOLD	OIL
Mean	3.878831	6.819626	4.330827
Median	3.830813	6.889337	4.350342
Maximum	4.231204	7.547765	4.969466
Minimum	3.650139	5.926926	3.367985
Standard Deviation	0.133326	0.474095	0.369240
Skewness	0.685535	-0.40995	-0.534330
Kurtosis	2.390757	1.876065	2.334757

Source: Author's computation. Note: Statistical data is available on table 14.

2.5.1 Unit root test and Cointegration test

Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were used to find out whether factors become

stationary after taking the first difference. Table 2 presents the finding of the unit root test. The estimations show that all the factors are integrated at order one $I(1)$ i.e. they are stationary after first order differentiation. In order to have a valid Johansen's cointegration test, all the factors should be integrated of order (1).

Table 2: Unit root test results

		ADF		PP		KPSS		
		Trend & intercept	Intercept	Trend & intercept	Intercept	Trend & intercept	Intercept	
First differe nce	Level	LEX	1.04	4.56	-1.92	-0.16	-1.91	-0.15
		LGOLD	1.17	5.81	-0.80	-1.58	-0.87	-1.57
		LOIL	0.38	3.79	-1.56	-2.38	-1.49	-2.37
	First differe nce	LEX	0.04	0.22	-54.58	-54.56	-40.35	-40.31
		LGOLD	0.08	0.29	-54.41	-54.39	-54.41	-54.38
		LOIL	0.06	0.33	-52.17	-52.12	-52.16	-52.11

Source: Author's computation. Note: The amounts of t-critical at 1% level of significance for all factors are -3.4325 and -3.9613 for ADF test, -3.4325 and -3.9613 for PP test, and 0.7390 and 0.2160 for KPSS test when intercept and trend and intercept are included, respectively.

Using Johansen's cointegration test that is on the basis of autoregressive (VAR) model requires determining the optimum lag length. Relying on the Schwarz Bayesian Information Criteria (SBIC), the optimum lag length of 1 was selected. Then, the cointegration test was run to check the existence of a long-run linkage among the factors. The findings of the test presented in Table 3 show that Max-Eigen statistics and Trace statistics could reject neither of the null hypotheses of no cointegrating vector ($r = 0$), maximum one cointegrating vector ($r \leq 1$), and maximum two cointegrating vectors ($r \leq 2$) at 1% percent significance level. Consequently, there is not a long-run linkage among the factors.

Table 3: Johansen's cointegration test results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.01 Critical Value	Eigenvalue	Max- Eigen Statistic	0.05 Critical Value
Intercept and no trend						
None	0.0078	29.441	35.458	0.0078	21.569	25.86
At most 1	0.0021	7.872	19.937	0.0021	5.840	18.520
At most 2	0.00073	2.0312	6.6349	0.00073	2.031	6.635
Intercept and trend						
None	0.0078	35.537	49.363	0.0078	21.834	30.834
At most 1	0.0034	13.721	31.154	0.0034	9.345	23.975
At most 2	0.0016	4.376	16.554	0.0016	4.376	16.554

Source: Author's computation. Note 1: Trace test indicates no cointegration at the 0.01 level. Note 2: Max-eigenvalue test indicates no cointegration at the 0.01 level.

2.5.2 Vector autoregressive model results

The results of VAR model estimation presented in Table 4 indicate that although for Δ GOLD the coefficient of Δ OIL(-1) and Δ EX(-1) are statistically insignificant, the coefficients of Δ GOLD(-1) is significant at 1% level. In Δ EX, the coefficient of Δ OIL(-1) is statistically insignificant, but the coefficient of Δ GOLD(-1), and Δ EX(-1) are significant at 1% and 5% level respectively. For Δ OIL, the coefficients of Δ GOLD(-1), and Δ OIL(-1) are all statistically insignificant, but the coefficient of Δ EX(-1) is significant at 10% level. Generally, results of the VAR model estimation show that the rupee-dollar exchange rate and the oil prices are the most vulnerable and dependent variable, while the gold price is most independent variable.

Table 4: Vector autoregressive (VAR) model results

	ΔEX	$\Delta GOLD$	ΔOIL
$\Delta EX(-1)$	-0.044659** (0.01902) [-2.34860]	0.064893 (0.95701) [0.06781]	0.199873*** (0.10725) [1.86369]
$\Delta GOLD(-1)$	-0.002749* (0.00038) [-7.21253]	-0.04318** (0.01918) [-2.25137]	0.002574 (0.00215) [1.19782]
$\Delta OIL(-1)$	-0.002338 (0.00337) [-0.69381]	-0.065874 (0.16957) [-0.38847]	0.031924 (0.01900) [1.67997]
Constant	0.005767 (0.00526) [1.43970]	0.295473 (0.26453) [1.11697]	0.006690 (0.02964) [0.22567]

Source: Author's computation. Note: Standard errors in () & t-statistics in []. *, ** and *** denote the 1%, 5% and 10% level of significance, respectively.

2.5.3 Granger causality test results

The outcomes for the Granger causality test (Table 5) demonstrate that $\Delta GOLD$ has a one-way feedback relationship with ΔEX and ΔOIL . It Granger causes the rupee-dollar exchange rate and prices of oil. $\Delta GOLD$ is not affected by other factors. Our findings show bidirectional causality between oil prices and rupee-dollar exchange rates, and ΔOIL is also influenced by $\Delta GOLD$. Oil prices affect exchange rates through two transmission channels: wealth effect and terms of trade (TOT). According to Krugman (1983), wealth is moved from oil importing countries such as India to oil-exporters when oil prices rise. As a result, rupee-dollar exchange rates will change through portfolio reallocation and account imbalances. Through the TOT channel, any increment in oil prices causes a worsening of the trade balance and consequently a decrease in the value of the INR. On the other hand, depreciation of the USD increases oil demand in oil-importing countries, as oil imports become cheaper in the domestic currency (Fratzscher et al., 2014).

Table 5: Granger causality test results

Null Hypothesis:	F-statistic	p-value
DGOLD does not Granger Cause DEX	3.50024	0.0615***
DEX does not Granger Cause DGOLD	0.92880	0.3353
DOIL does not Granger Cause DEX	5.96985	0.0146**
DEX does not Granger Cause DOIL	3.27293	0.0705***
DOIL does not Granger Cause DGOLD	0.02400	0.8769
DGOLD does not Granger Cause DOIL	3.44530	0.0635***

Source: Author's computation. Note ** and *** denote 5% and 10% level of significance, respectively.

2.5.4 Impulse response results

The Indian economy depends heavily on oil imports to expedite its economic growth. The impulse response is forecasted in five periods, days, and the dynamic relationships among the variables are analyzed. As illustrated in Figure 4 and Tables 6, 7, and 8 the INR/USD exchange rates have the greatest independent and positive impact during the first period. In the second period, the impact becomes moderately negative and in the third period it vanishes. The fluctuations of exchange rate have a negative effect on the prices of gold and oil which disappears after the third period. This indicates that the impact of Rupee/Dollar exchange rate on the prices of oil and gold is short-term.

Next, gold price fluctuations have a negative impact on ΔEX but become positive during the second period and die away in the third period. The price of oil is influenced by the gold price very slightly and positively in period two. This demonstrates that the shock impact of fluctuations in the prices of oil and gold price and ΔEX on each other is only a short-term impact. In other words, the impact of shocks vanishes before discovering their long-term level. The response of the variables within the confront of the shocks annuls in a few days to recover quickly to their initial levels. In spite of the

existence of causality among some variables in the short-run, there is no long-run linkage among the three parameters in India. The changes in the prices of gold and oil have resulted in a much smaller impact on the demand for foreign exchange than would be expected if the quantities of gold and oil imports had remained constant.

Table 6: Impulse Response of ΔEX

Period	ΔEX	$\Delta GOLD$	ΔOIL
1	0.276471 (0.00371)	0.000000 (0.0000)	0.000000 (0.0000)
2	-0.006827 (-0.0526)	-0.037789 (0.00527)	-0.003645 (0.00525)
3	-9.98E-05 (0.00078)	0.003236 (0.00112)	0.000329 (0.00073)
4	2.60E-05 (8.3E-05)	-0.000183 (0.00017)	-1.86E-05 (4.2E-05)
5	-1.97E-06 (5.2E-06)	7.60E-06 (2.1E-05)	7.86E-07 (2.7E-06)

Source: Author's computation.

Table 7: Impulse Response of $\Delta GOLD$

Period	ΔEX	$\Delta GOLD$	ΔOIL
1	-2.010391 (0.26300)	13.76856 (0.18498)	0.000000 (0.0000)
2	0.10547 (0.26234)	-0.592976 (0.26416)	-0.102706 (0.26439)
3	-0.008263 (0.01986)	0.020867 (0.04570)	0.000920 (0.00558)
4	0.000317 (0.00071)	-0.000166 (0.00526)	-5.76E-05 (0.00052)
5	-1.04E-05 (2.6E-05)	-3.41E-05 (0.00040)	-4.46E-06 (4.3E-05)

Source: Author's computation.

Table 8: Impulse Response of ΔOIL

Period	ΔEX	$\Delta GOLD$	ΔOIL
1	0.002617 (0.02963)	-0.23495 (0.02963)	1.559133 (0.02095)
2	0.050167 (0.02940)	0.034697 (0.02961)	0.049774 (0.02964)
3	0.000506 (0.00153)	-0.007972 (0.00432)	0.000596 (0.00226)
4	-2.51E-05 (0.00018)	0.000446 (0.00036)	8.71E-05 (0.00015)
5	5.21E-06 (1.3E-05)	-2.28E-05 (3.9E-05)	-1.09E-06 (6.6E-06)

Source: Author's computation.

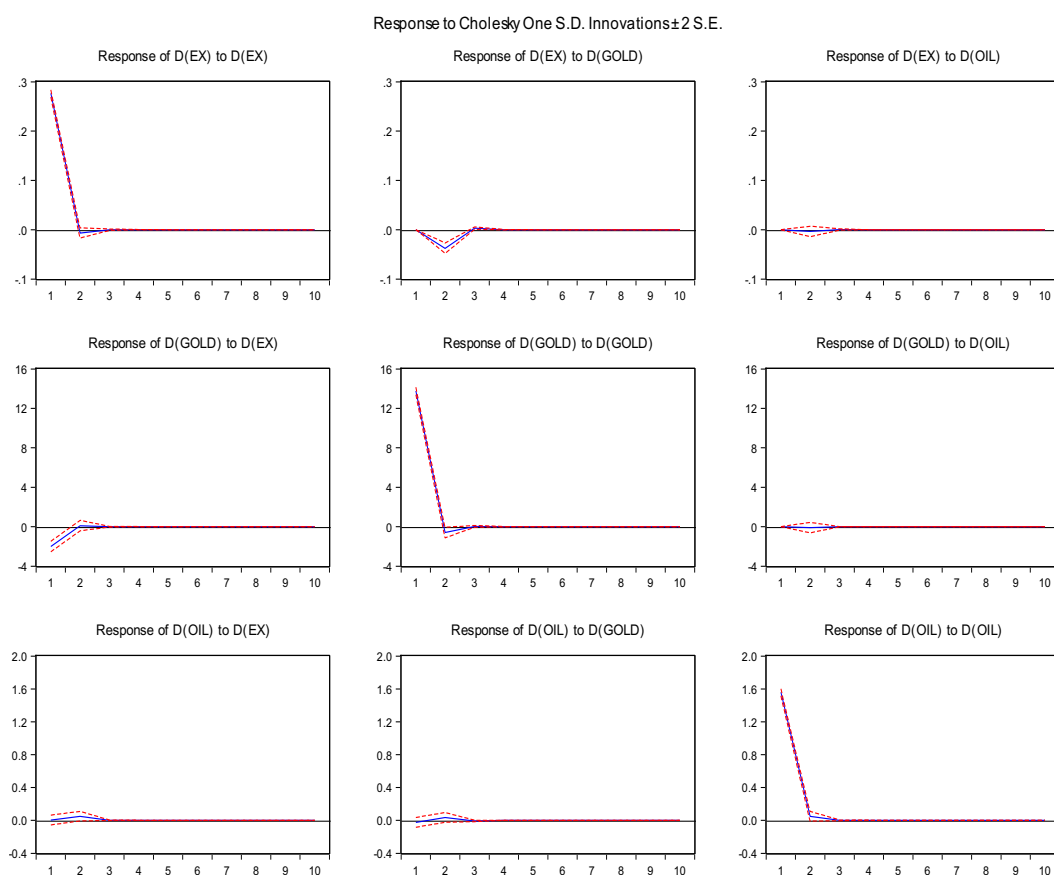


Figure 4: The impulse response

2.5.5 Discussion of results

The logarithm form of the variables is used to do econometric analysis. On the basis of the Indian data statistical analysis, the results of the cointegration test indicate that there is no cointegration among the prices of oil and gold and exchange rate. This

confirms that the equilibrium of the factors in the long run does not show any relationship among crude oil price and gold prices and the exchange rate. This is in tandem with the findings of Le and Chang (2016), Šimáková (2011), Zhang and Wei (2010), Lescaroux (2009) and Ye (2007)

Investigating the results of the Granger causality test reveals that there is a unidirectional relationship among the gold price and the INR/USD exchange rate and oil price i.e. they Granger cause the exchange rate and oil price. On the other hand, only gold prices affect exchange rates and oil prices and there is no bidirectional relationship between them. Furthermore, gold prices are not impacted by any other two variables, and there is a bidirectional linkage between the price of oil and the exchange rate. The findings infer that any decrease in gold prices and crude oil prices depreciates the Indian Rupee in the short-run. A decrease in global gold prices would increment gold demand in India, consequently, imports would increase and the currency depreciate. Also, any fall in global crude oil prices, as a measurement for growth expectation, shows that a global slowdown is anticipated to take place which causes depreciation of the Rupee. This conforms to the findings of Mensah, Obi and Bokpin (2017), Delgado, Delgado and Saucedo (2018), and Singhal, Choudhary and Biswal, (2019). The impulse response analysis indicates that when factors are struck by interference, the strongest impact is seen on the first day and then vanishes within two or three days. This shows that the effect on each other of gold and oil price fluctuations and exchange rates is only a short-term impact. The findings of the present chapter show that there is no long-run linkage among the factors of the study in India. In spite of the existence of short-run causality among some variables, the effects do not last for a long period of time among oil and gold prices and the exchange rate. Thus, we can claim that these factors are independent of each other in the long-run.

Usually, the whole economy is influenced by shocks in financial variables and energy prices. If they affect each other then when assessing the impact of one variable adjustment, the effect of the other should also be examined (Chang et al. 2013). The aim of the research was to explore whether fluctuations in financial variables are stimulated by changes in energy prices following the adjustment of energy policies in India and whether energy prices are influenced by adjustments of financial policies. As estimations revealed for India, in line with the submission of Tiwari et al. (2013), Chang et al (2013) and Sari et al. (2010), we find that there is not a long-run correlation among the spot prices of gold and oil and exchange rates. The equilibrium relationships are very short term.

The findings imply that energy policymakers should make these policies independent of other economic and financial variables. In other words, energy policies must primarily concentrate on the achievement of their goals rather than be concerned with economic disorders as a result of the effects of policy on financial variables.

2.6 Conclusions and policy implications

We investigated long-run equilibrium relationships among the INR/USD exchange rate and oil and gold prices over the period of January 12, 2004 to April 30, 2015. In order to clarify the correlation among these variables Johansen's cointegration test, vector autoregressive (VAR) model, and impulse response were utilized.

The empirical findings of Augmented Dicky-Fuller (ADF), Phillips-Perron, and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests show that the variables are integrated of order one $I(1)$ i.e. they get stationary in first-order differentiation; the cointegration test reveals that there is no long-run linkage among the factors. The

findings of the VAR model demonstrate that exchange rate and the oil prices are the most affected variables and the variable for the gold price is the most independent variable. The Granger causality test discloses that gold prices have a unidirectional relationship with the price of oil and the INR/USD exchange rate i.e. they Granger cause the price of oil and exchange rate. Furthermore, the gold price is not impacted by any other two variables and there is a two-way feedback linkage between the price of oil and the exchange rate. Moreover, the impulse response indicates that when the variables are influenced by shocks, the impulse response impact only lasts for three periods maximum. To this end, the three variables are independent of each other.

In the case of petroleum, there is a significant opportunity to substitute local coal for oil, (electricity production). The price responsiveness to the quantity of fuel demanded (income effect) is greater by consumers in low-income countries than high income countries. In addition, the empirical results are consistent with an increasing the own-price elasticity of demand for petroleum over time. Actually, the exchange rate impact is based on the value of the imports. The changes in the quantity demanded of foreign exchange to import petroleum is less than the changes in the international prices of petroleum.

The existing stock of gold held by individuals is very large. In the short-term, a higher price of gold will lead some people inside India to sell gold. In the short run, the volume of domestic gold sells will reduce the demand for gold imports for new dowries. Thus, in the short-run the exchange rate will decrease. Since, gold is used in India largely as an asset as a type of savings, (dowries), in the long run, we would expect the total value of gold purchases would be approximately a fixed proportion of income. Hence, the own price elasticity of demand should be close to -1.0.

It would be expected that in the long-run the percentage change in prices would be offset by an opposite percentage change in the amount of quantities. Therefore, the empirical results support the fundamental economics of these markets in India and provide an insight for the understanding of the markets.

The results of the paper have important implications for policymakers, and academic centers. The linkage among the prices of gold and crude oil, and Indian Rupee exchange rate highlight the necessity of energy and financial policies to be detached by the Indian government and the Reserve Bank of India. The results of the study, with respect to the fact that India is the world's biggest gold importer and meets the majority of its need for crude oil through imports, should be very useful to assist Indian officials in making policy decisions.

Chapter 3

THE IMPACTS OF ECONOMIC UNCERTAINTY AND MONETARY UNCERTAINTY ON THE FUNCTION OF DEMAND FOR MONEY IN SOUTH AFRICA

3.1 Introduction

The most important issue for the transference system of monetary policy is to find a robust and coherent model. To have an effective monetary policy, an economy should have a steady function of demand for money. Almost all studies about money demand demonstrate the stability test of money demand e.g. Arize et al. (1990), Hoffman et al. (1995), Muscatelli and Spinelli (2000), Choi and Oh (2003), Pradham and Subradanian (2003), Sterken (2004), Akinlo (2005), Drama and Yao (2010), Chukwu et al. (2010), Lim et al. (2012), Wang (2011), Hossain (2013), Dreger and Wolters (2006) and (2014). The volatility of the money demand function has been broadly explained as the primary cause for decreasing the character of monetary accumulations in the monetary policy function (Ozdemir and Saygili, 2013). Furthermore, if the money demand is determined to be unsteady, economists have pointed out that removed factors from their determinations and shown that by adding those removed factors, stability could be accomplished (Bahmani-Oskooee and Xi, 2011).

Conventionally, it is held that real demand for money includes income and interest rates mainly, as income has a positive relationship with the demand for money, and an

increment in interest rates increases the opportunity cost of keeping money. This definition of demand for money is very limited. As an extension to the existing literature, we tried to find out the impacts of monetary and output uncertainty on the demand for money in South Africa; this is the issue that has not been considered by previous studies.

The choice of South Africa is apt for many reasons. Foremost, during the period of this study South Africa (1980-2014) has experienced many commodity booms and busts, plus the strife over the overthrow of the apartheid regime. This has resulted in fluctuations in real GDP in South Africa over time. Because of the periodic expansion and contraction of the money supply, the inclusion of monetary uncertainty in the formulation of the demand function for money is also being examined.

Therefore, we consider output and monetary uncertainties as an independent variable in money demand function in South Africa. We also employ Pesaran et al.'s (2001) bounds testing methodology for cointegration and error-correction test, instead of other cointegration tests because, according to this approach, the stationarity of the variables does not matter and variables could have a unit root problem. This differentiates our study from previous studies.

3.2 Literature review

A short investigation of the previous studies will shed light on the scope of our study. Choi and Oh (2003) showed that the monetary and output uncertainties, interest rates, and financial innovations affect the demand for money in the US. The measured long-run linkages were compatible with their suggested relationships. The model delivered reliable high-income elasticity with cross-sectional confirmation and helped to resolve

M1³ demand puzzles. The model suggested a dynamic error-correction formation and exhibited an acceptable level of firmness and forecasting. Atta-Mensah (2004) examined the effect of economic uncertainty on the demand for money in Canada. Employing a general-equilibrium principle, he argued that in a world occupied by risk-averse operators who are continually making portfolio choices against a scenery of macroeconomic uncertainty, the demand for money includes real income, interest rates, and an index of economic uncertainty. Atta-Mensah claims that generally rising economic uncertainty causes an increment in the suggested M1 and M1++ equalization in the short-run that operators should like to keep. However, the effect of economic uncertainty on M2++ is negative.

Ozdemir and Saygili (2013) attempted to find out the reasons of instabilities in the routine models of money demand for Turkey by measuring the impact of macroeconomic uncertainty on cash property. Their findings show that there is no cointegration among the balances of money, income, and interest spread when the Vector Autoregressive mechanism (VAR) omitted the estimation of economic uncertainty. They found steady long-run relationships and coefficients after the introduction of a correct estimation of uncertainty into the mechanism. Bahmani-Oskooee and Xi (2011) added the measure of economic uncertainty and monetary uncertainty (both GARCH-based) in the long-run demand for money for M3. By utilizing the bounds testing methodology to cointegration, according to which factors could be stationary or non-stationary, they observed solid proof that the M3 money demand is stable in Australia. Both short-run and long-run uncertainty measures can affect the demand for M3. These factors were not considered by previous researchers.

³ An estimation of the supply for money with all physical money, demand deposits, checking accounts and Negotiable Order of Withdrawal (NOW) accounts.

Bahmani and Bahmani-Oskooee (2012) tried to find the effect of exchange rate volatility on Iran's money demand by utilizing data for the period after the Iranian Revolution in 1979 and the bounds testing methodology to cointegration. They also claimed that the exchange rate is a key factor in the demand for money on Mundell's theory; exchange rate volatility is a main variable and also has an impact on demand for money and must contain the demand for money. Their findings presented that over the period of 1979–2007, exchange rate fluctuation had both short and long-run impacts on the demand for real M2 monetary aggregation in Iran and is, therefore, a very important determinant when it comes to demand for money.

A number of studies have used cointegration and error-correction methodologies on the demand for money in South Africa. A number of studies pre-date the econometric literature that created these methodologies. Hurn and Muscatelli (1992) applied the cointegration approach to examine the long-run linkage between the demand for money and its factors and the nature of long-run elasticities of the model. All the variables, except the interest rate, had positive relationships to real money demand. Moll (2000) used real variables to investigate the demand for money by employing the cointegration approach. He mentioned that the function of demand for money had steady parameters and all other variables, except the inflation rate, had the expected signs. Similarly, Tlelima and Turner (2004) and Nell (2003) used the cointegration approach and the error-correction model to estimate the demand for money and its stability in South Africa respectively.

Zirammba (2007) in his study examines the long-run linkage between the demand for money and its determinants in South Africa. He included exports, expenditure on investment goods, and final consumption expenditure as the disaggregated

components in the model. He also added the exchange rate, government bonds, and the domestic interest rate on the model. He shows that the real income's various concepts have different effects on the demand for money in South Africa. Todani (2007) offers a cointegration investigation mechanism of a long-run money demand, M3, in South Africa. The research computes a cointegrated VAR model, including income, real money, and the opportunity cost of keeping money. The model indicates that income and real money have an error-correcting relationship with the demand for money. This relationship is approximately steady during the sample period when short-run volatilities are corrected for. And, it is discovered that the long-run linkage between money and inflation is not strong. Mutsau (2013) analyzed the broad and narrow demand for money in South Africa using the autoregressive distributed lag (ARDL) approach. He found that M2 and M3 money aggregates are cointegrated and maintain a steady long-run linkage with their explanatory variables. However, M0 and M1 monetary aggregates were discovered not to be cointegrated with their explanatory variables.

Recently, Bahmani-Oskooee and Bahmani (2016) investigated the impact of exchange rate on money demand in China. The study found that exchange rate has asymmetric effect on the demand for money. That, the effect of appreciation is different from the effect of the depreciation of the exchange rate. The asymmetric effect is also found for the case of exchange rate and money demand in Turkey (Bahmani-Oskooee, Halicioglu and Bahmani, 2017) and Africa (Bahmani-Oskooee and Gelan, 2019)

Similarly, Bahmani-Oskooee and Nayeri (2018) investigated the effect of economic policy uncertainty on demand for money in Korea. The study used non-linear ARDL and found asymmetric long-run effect of policy uncertainty on the demand for cash in

Korea. They submit that increase in uncertainty leads to holding of less cash in favor of safer asset and decrease uncertainty has opposite effect.

In their study, Ivanovski and Churchill (2019) estimated an ARDL model of quarterly data from 1998 to 2017 for Australia. The study found that economic policy uncertainty have significant short-run negative and positive long-run effects on demand for money. The study also reveals an asymmetric effect of currency appreciation on the demand for money.

3.3 Methodology

Following previous research on the demand for money, we assume that money demand depends on a scale variable such as national income, personal consumption, and wealth, plus the long-run interest rate, which accounts for the opportunity cost of keeping money opposed to the real and other financial properties. Nominal effective exchange rate (NEER) is also contained, as Mundell (1963) states, that the money demand is dependent on the exchange rate, interest rate, and the level of income. Furthermore, the exchange rate is a function of account for currency substitution which will occur between the domestic currency and foreign currencies (Bahmani-Oskooee and Xi, 2011). The long-run demand function for money will be:

$$\ln(M - p)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln NEER_t + \beta_3 \ln r_t + \varepsilon_t \quad (11)$$

where $(M - P)_t$ is supply for money and estimated by real M3; nominal M3 is depreciated by the GDP deflator; Y_t is the real GDP; $NEER_t$ is the nominal effective exchange rate for South Africa; r_t is the long-term interest rate estimated by 10-year government bond yield; and ε_t is the error term.

In equation (11), according to Arize et al. (1999) due to the dictation of the usual budget conditions, real money equilibriums are predicted to be a raising function of

real income; that is the demand for money with a positive linkage with scale variable (Y_t). As the interest rate increases, the opportunity cost of keeping money goes up and people will be less willing to hold money. So, β_3 is supposed to be negative. When the worth of the domestic currency against foreign currencies decreases, the value of foreign securities held by people will increase. If this is measured as an increment in wealth, the demand for local currency may rise, (Arango and Nadiri, 1981). On the other hand, Arize (1989) have discussed that, because of the weak domestic currency, asset holders may shift their portfolios into foreign currencies as they expect further weakening. Therefore, β_2 can be either negative or positive.

In this study, according to Bahmani-Oskooee and Xi (2011), we introduce macroeconomic uncertainty and monetary uncertainty measures to our model. The volatility measures are derived using moving-average standard deviation method introduced by Kenen and Rodrik (1986) and Koray and Lastrapes (1989).

$$J_{t+m} = \left[\frac{1}{m} \sum_{i=1}^m (V_{t+i-1} - V_{t+i-2})^2 \right]^{\frac{1}{2}} \quad (12)$$

where J is the measure of volatility, and m denotes the order of the moving average (m=4). For this purpose, we define them as the fluctuation of the supply of nominal money (M3), UM, and the fluctuation of the real output, UY.

By entering these two variables into the equation (11), we will have

$$\ln(M - P)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln NEER_t + \beta_3 r_t + \beta_4 \ln UM_t + \beta_5 \ln UY_t + \varepsilon_t \quad (13)$$

Adding volatility measures reduces the instability of money demand. β_4 and β_5 might be positive or negative. Expanded output or monetary uncertainty may cause a substitution impact from cash in support of slightly unstable resources, predicting a

negative sign for both β_4 and β_5 . However, an increment in both uncertainties seems to create a protective impact to save more unstable resources by decreasing their support of more cash, therefore giving a positive sign for both β_4 and β_5 (Bahmani-Oskooee and Xi, 2011).

Equation (13) shows the long-run linkage between the factors. We should include the short-run effects in equation (13) to test the stability of the coefficients. To this end, we need to define equation (13) in an error-correction model format. We utilize the ARDL model of Pesaran et al. (2001), or the bounds testing for cointegration, and reproduce the equation (13) as:

$$\begin{aligned} \Delta \ln M_t = & \alpha + \sum_{i=1}^{n1} \gamma_i \Delta \ln M_{t-i} + \sum_{i=0}^{n2} \delta_i \ln Y_t + \sum_{i=0}^{n3} \theta r_{t-i} + \\ & \sum_{i=0}^{n4} \vartheta_i \ln NEER_{t-i} + \sum_{i=0}^{n5} \rho_i \ln UM_{t-i} + \sum_{i=0}^{n6} \varphi_i \ln UY_{t-i} + \beta_0 \ln M_{t-1} + \\ & \beta_1 \ln Y_{t-1} + \beta_2 \ln NEER_{t-1} + \beta_3 r_{t-1} + \beta_4 \ln UM_{t-1} + \beta_5 \ln UY_{t-1} + \\ & \varepsilon_t \end{aligned} \quad (14)$$

The ARDL cointegration model has some advantages over other methodologies. First of all, the long-run and short-run coefficients of the model are measured at the same time. Secondly, it overcomes endogeneity problems and the inability to examine hypotheses in the long-run measured coefficients which we face when applying the Engle–Granger (1987) method. Thirdly, to test the long-run linkage among the factors in levels, we can employ the ARDL approach regardless that the regressors are $I(0)$, $I(1)$, or partially integrated (Narayan, 2005). In equation (14), the linear integration of lagged level factors as a proxy for the lagged error term is included.

Following Pesaran et al. (2001), we first carry out the F -test to explain the lagged level of factors. Pesaran et al. (2001) defined new critical values for this test. According to Bahmani-Oskooee and Harvey (2012), the values they organize account for the degree

of integration of factors included and illustrate that in this model, factors may be stationary, non-stationary or a combination of the two. A bigger bound statistic is given by accepting all factors in the equation to be integrated of order one, or $I(1)$. A smaller bound statistic is given by accepting all factors to be stationary, or $I(0)$. Pesaran et al. (2001) show that the bigger statistic may be utilized to explain cointegration indeed in case some factors are $I(1)$ and some $I(0)$. Once cointegration exists, the long-run impacts are determined by the measures of β_1 to β_6 normalized on β_0 . The null hypothesis of ($H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$) is tested against the alternative hypothesis ($H_1: \beta_1 \neq 0, \beta_2 \neq 0, \beta_3 \neq 0, \beta_4 \neq 0, \beta_5 \neq 0, \beta_6 \neq 0$). If the computed F -statistic exceeds the bigger bounds statistic, then H_0 is rejected and there is cointegration among the factors. Short-run impacts are determined by the evaluation of coefficients related to the first-differenced factors. The error-correction approach presented by equation (4) is related to investigating the quarterly data for South Africa for the period 1980Q1–2014Q2.

3.4 Data

The data on Supply of money (M), nominal effective exchange rate (NEER), real GDP (Y) and interest rate (r) for South Africa are used in this chapter. The data are quarterly data over the period of 1980Q1 to 2014Q2. The period witness significant changes in the variables and high levels of economic uncertainty and monetary policy uncertainty across the globe. In addition, the dynamics of the variables enormously affect the South African economy. We sourced all the data from the International Monetary Fund's International Financial Statistics (IFS) CD-ROM (see appendix for the presentation of the data).

3.5 Results and discussion

Table 9 shows that the Supply of money (M), nominal effective exchange rate (NEER), real GDP (Y) and interest rate (r) are left-skewed. Real GDP has the highest central tendency, as represented by mean. Its standard deviation shows that the highest volatility belongs to the interest rate.

Table 9: Descriptive statistics of the variables

	M	NEER	Y	r
Mean	24.51	5.32	27.15	12.51
Median	24.57	5.19	27.28	13.31
Maximum	28.04	6.91	28.99	17.79
Minimum	21.49	4.20	24.85	7.29
Standard Deviation	1.88	0.79	1.23	3.35
Skewness	-0.02	0.61	-0.25	-0.15
Kurtosis	-1.37	-0.73	-1.12	-1.53

Source: Author's computation. Note 1: These statistics measured from logarithm form of data. Note 2: Statistical data is available on table 15.

For the first step, to confirm that factors are either $I(0)$ or $I(1)$, using Augmented Dickey-Fuller (ADF) test we use for unit root. The test results presented in table 10 indicate that only the output uncertainty measure is stationary at its level. The ADF statistics for other factors are all more than their critical values implying that they become stationary after first differentiation. Thus, the ARDL approach to cointegration is the most suitable methodology to estimate the equation.

Table 10: Unit root test results

Variables	ADF Statistics	95% Critical Value
lnM	0.0365(4)	-2.8832
dlnM	-3.3240(4)	
lnNEER	-1.4524(3)	-2.8830
dlnNEER	-5.1314(3)	
Lny	0.8408(9)	-2.8841
Dlny	-6.2989(9)	
lnUM	-1.5974(10)	-2.8848
dlnUM	-12.4925(10)	
lnUY	-4.6671(12)	-2.8852
R	-1.2133(3)	-2.8830
Dr	-9.8179(3)	

Source: Author's computation. Note: Numbers in parenthesis are the lag orders in the ADF test selected by the AIC criterion

Following this, we use the F-test to the significance level of the factors with lag to see whether they are cointegrated. Then, in order to estimate equation (14), we exploit a maximum four lags on each first-differenced factor and rely on Akaike's Information Criterion (AIC) in choosing the biggest lag length. Table 11 reports the results of the optimum model.

Table 11: Estimation of equation (14) using the ARDL approach

Short-run coefficient estimates						
Lag order	0	1	2	3	4	
$\Delta \ln M$		0.7062 (8.0236)	0.0386 (0.3552)	0.1613** (1.1979)		
$\Delta \ln Y$	0.8813 (3.8824)	-0.7212 (-3.1343)				
Δr	-0.0012 (-0.5831)	-0.2144E-3 (-0.0710)	-0.0042 (-1.4546)	0.0065 (2.2467)	-0.0066 (-3.2860)	
$\Delta \ln NEER$	0.0278 (1.0615)	-0.0333 (-1.3005)				
$\Delta \ln UM$	-0.0059 (-1.3702)	0.0040 (0.6922)	0.0103** (1.7611)	0.0166 (3.4952)		
$\Delta \ln UY$	0.0038 (1.2599)	-0.0007 (-0.1814)	-0.0016 (-0.3969)	-0.0111 (-3.3147)	0.0025** (1.8496)	
Long-run coefficient estimates						
Constant	$\ln Y$	R	$\ln NEER$	$\ln UM$	$\ln UY$	
-19.9733 (-1.8833)	1.7065 (3.5177)	-0.0623 (-2.2756)	-0.0584 (-0.5120)	0.2668* (2.1661)	-0.0763** (-1.7985)	
Diagnostic statistics						
F	ECM(-1)	LM	Adj. R2	RESET	CUSUM	CUSUMSQ
9.8883	-0.0938 (-2.7357)	5.4223 [0.247]	0.5291	0.1259 [0.723]	Stable	Stable

Source: Author's computation. Note *Figures in parentheses are t -statistics; those in brackets are p -values. * and ** stand for the 5% and 10% level of significance, respectively.

As shown in the first panel of Table 11, at least one coefficient is obtained for each first-differenced factor that is significant at the 10% or 5% level, indicating that all factors have short-run effects on the demand for money in South Africa, except the nominal effective exchange rate. These impacts also last in the long run. All the long-run coefficients carry the expected signs and are statistically significant. The nominal effective exchange rate (NEER) has the expected sign but does not have a statistically significant coefficient. The interest rate (r) coefficient is negative and significant, while income (y) has a significantly positive coefficient, which implies that in the long

run, a 1% growth in the economy needs an increase of 1.7% in the supply of money. This is similar to the findings of the Moll (2000) and Tavlas (1989). Furthermore, the nominal effective exchange rate coefficient is not significant, and it shows that there is limited currency substitution in the long run. The coefficient for output uncertainty measure is statistically significant at 10% level and carries the expected sign. It implies that by increasing the output uncertainty there is a movement away from cash, including short-term financial assets and in support of less volatile assets, real and financial assets, in the South African economy. Finally, monetary uncertainty (UM) carries a significantly positive coefficient at the 5% level, implying that increased monetary uncertainty may produce a precautionary effect to save more monetary assets i.e. cash (Bahmani-Oskooee and Xi, 2011). With respect to the main variables and monetary uncertainty, these findings are in line with the findings of Bahmani-Oskooee and Xi (2011) and Choi and Oh (2003) for Australia and the US, respectively. They found that output uncertainty has a negative impact on the demand for money, while monetary uncertainty has a positive impact.

The results of the F -test show that cointegration is existent between the factors, as the F -statistic is bigger than 3.76, F -critical, at 5% level. According to Bahmani-Oskooee and Tanku (2008), we apply the long-run coefficient measures and make an error-correction term, ECM. After that, we substitute the linear combination of lagged level factors in equation (14) with ECM (-1) and re-measure the variables after using the optimum number of lags. As can be seen from Table 11, a negative parameter acquired for ECM (-1) that is statistically significant in the long-run.

Table 11 also shows some diagnostic statistics. The Lagrange multiplier (LM) statistic and Ramsey's RESET test are utilized to measure the serial correlation among the residuals of the optimum model and misspecification, respectively. The LM test is

dealing out as χ^2 with four degrees of freedom since data is quarterly, and the RESET test is distributed as χ^2 with one degree of freedom. The reported LM statistic is much lower than its critical value, 9.48, at the 5% significance level, confirming autocorrelation-free residuals. Ramsey's RESET value is smaller than its critical value, 3.84, showing a shortage of misspecification.

At the end, to measure the steadiness of the short-run and long-run coefficients, we use Brown et al.'s (1975) cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests on the residuals of the error-correction model. If the graph of CUSUM or CUSUMSQ is significant at 5% significance level, the estimated coefficient is stable. As can be seen from Figure 5, the cumulative sum test and the cumulative sum of squares test prove the existence of stability.

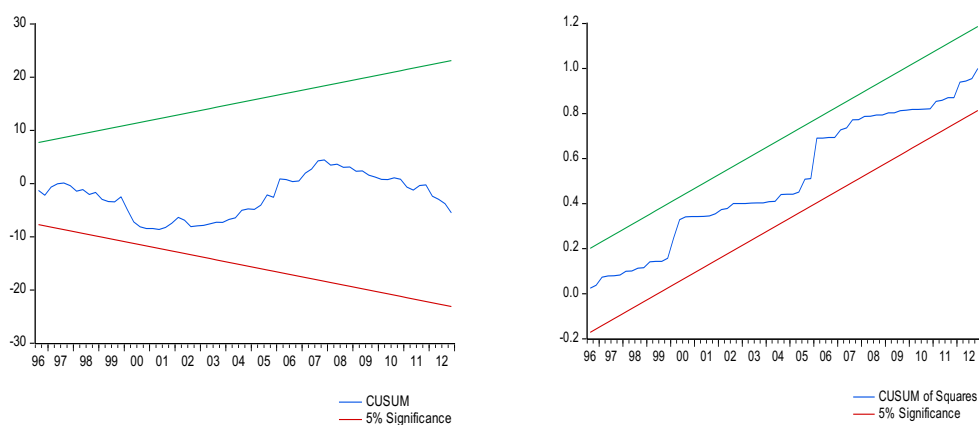


Figure 5: Graphical presentation of the CUSUM and CUSUMSQ tests

3.6 Conclusion and policy implications

This chapter examines the impact of output and monetary uncertainty on the function of demand for money in South Africa. As different variables have different implications in the economy as a whole and affect the traditional monetary policy, the

choice of uncertainty measures is an important issue. To this end, in order to have comparable estimation results, their estimation must be conducted in a consistent framework. In carrying out this task, we generate UM and UY using moving-average standard deviation technique as the monetary and output uncertainty measures, respectively. This can be based on the belief that the conventional attributes of the demand for money as linkages among real money balances, a scale variable, and the opportunity cost of keeping money are very limited.

Our empirical results are different from previous literature in certain respects. Firstly, the estimated coefficient of real income is larger than one. This reveals that long-run function of demand for money in South Africa might be more elastic in terms of real income than hitherto supposed. In the long-run the coefficients are much larger. The large coefficient of real income indicates that money demand is a function of permanent income. In other words, the income elasticity of demand for money is elastic in terms of real income. The findings indicate also that the measure of output uncertainty and monetary uncertainty have short-run and long-run impacts on money demand in South Africa. After including these two estimations and including short-run factors into the estimation outcomes, the demand for money in South Africa is shown to be stable. Besides, counting these two estimations and including short-run factors into the estimation outcomes in a steady demand function for money in South Africa. Following Poole (1970), as there is no instability in money demand, we can claim that the supply for money is the suitable monetary policy instrument to be used by the South African Reserve Bank (SARB) for income stabilization.

Chapter 4

HOW DO DOMESTIC AND FOREIGN INTEREST RATE VOLATILITIES AFFECT THE DEMAND FUNCTION FOR MONEY IN SOUTH AFRICA?

4.1 Introduction

A steady demand function for money plays a crucial role in the implementation of monetary policy. It is able to change monetary aggregates to have forecastable impacts on output, interest rates, and eventually price (Sriram, 1999). High and volatile interest rates, financial innovations and deregulations, inflationary recessions, and significant change in the reaction of inflation can be distinguished as the references of the unforecastability of demand for money in an economy. The theories of demand for money state that the function of demand for money has a negative linkage with the opportunity cost of holding money and interest rates. The function of demand for money has a positive linkage with scale variables including personal consumption, national income and wealth.

Interest rate volatility was introduced into money demand theory through the financial asset motivation for keeping money (Garner, 1986). In literature for the demand function for money there is limited research which has considered the measure of interest rate fluctuation as the main determinant of the money demand system. Interest rate fluctuation can influence monetary policy implementation and economic

accomplishment through the money demand function. Friedman (1983) states that, “It is eminently plausible that uncertainty should raise the demand for cash balances, that is, reduce velocity.” By raising the demand for money, the tendency to hold securities will decrease. Hence, the interest rate will increase. According to Garner (1986), interest rate volatility could have important monetary policy implications because an increment in the demand for money caused by higher interest rate volatility could require the central banks to raise their target growth ranges for monetary aggregates. Therefore, the inclusion of interest rate volatility as an important variable in the function of demand for money is inevitable. No previous research on the function of demand for money in South Africa has included measures for the uncertainty of the interest rate on deposit rates and treasury bills. Most of the previous studies formulated the function by employing the exchange rate, income, inflation rate, and interest rate. This provide differing outcomes. For instance, Falls and Zangeneh (1989) argue that to find the level of demand for real balances, the level of the interest rate, as well as interest rate fluctuation, should be considered as a determinant.

Majority of researches have also investigated the impacts of domestic interest rate fluctuation on money demand. Such a system accepts a closed economy. In a progressively dependent world, where capital movements have accomplished more economic prominence, the avoidance of outside opportunity cost will present too limited a view. In an open economy, people can select to keep their wealth in domestic or foreign resources or both. So, the normal demand function for money must contain the return on holding foreign assets. We expect the positive coefficient of the interest rate on domestic money when interest-bearing deposits are contained in broad money, while we expect to cause a negative money demand because of an increment within

the foreign interest rate, as operators increase their foreign keepings by decreasing their domestic money keepings (Bjørnland, 2005).

Cekiloz and Arslan (2011), state that agreeing to portfolio hypothesis of money demand, high-interest rate fluctuation will increment the money demand. Money is a favorite resource in financial portfolios, in spite of the fact that it pays insignificant interest compared to other resources. Whilst interest rates vary, the worth of money does not change whereas the worth of bonds changes. This causes money to be more trusted. However, as Garner (1986) argues, by increasing interest rate fluctuation the transaction demand for money also rises because transactions theory of demand for money emphasizes money's role as a medium of exchange. Firms and households need cash balances in order to buy and sell goods and services. Interest rate uncertainty increases the transaction demand for money for the same reason it increases the asset demand for money⁴. Therefore, we can see the positive linkage between money demand and domestic interest rate fluctuation.

However, to find the level of demand for real balances, an interest rate volatility, should also be considered as an explanatory variable in the money demand function in South Africa. The linkage between the demand for money and interest rate volatility can be either positive or negative in South Africa. Therefore, the main purpose in this chapter is to include the measures of bank time deposit interest rate and foreign short-term interest rate volatility into the demand function for money. In South Africa there are not any government sponsored social security pension funds. Institutional investments in the private pensions, life insurance policies, and long-term financial

⁴ The incentive to hold money rises as the risk of holding alternative assets rises.

assets are important saving instrument for retirement. Hence, higher interest rate volatility on short-term time deposits is likely to cause people to reduce their demand for money and shift to longer-term investments where the yield on the financial asset is known for a longer period of time. Nevertheless, there are no studies, which included the abovementioned measures into the money demand equation for South Africa. We also employ the Pesaran et al. (2001) bounds testing methodology for cointegration and error-correction modeling, more than other cointegration methodologies.

4.2 Literature review

A short review of related studies will shed light on the contribution of this paper. Cekiloz and Arslan (2011) aim to examine the impacts of interest rate volatilities on money demand in the case of Turkey for 1987: Q1 to 2007: Q3. They utilize the Pesaran, Shin and Smith (2001) bound test as the methodology for their study. They find the expected positive sign of interest rate fluctuation on treasury bills, but it is not statistically significant for Turkey. Bjørnland (2005) models the demand for money in Venezuela in a situation of rising and changing inflation and steady upcoming exchange rate devaluation. The finding appears that there exists a long-run linkage between the exchange rate, inflation, real money, real income, and an interest rate differential, which continue to remain steady over main policy varying and high volatility. The long-run attributes highlight the negative impacts of inflation and exchange rate depreciation on real money demand, although a bigger interest rate differential has positive impacts.

Garner (1986) estimates M1 demand functions for the US with quarterly data from 1959: Q3 to 1973: Q4 and 1976: Q1 to 1984: Q1. He finds that interest rate fluctuation has a significant negative sign in the first part of the sample period but insignificant

positive sign in the second part. Payne (1992), in his paper, empirically looks at the impacts of both money growth and interest rate fluctuation estimations according to the demand for real balances. The results of this paper show that the estimations of money growth and interest rate fluctuation are statistically insignificant, although his finding shows a structural move in money demand after 1979. In addition, there is a recognizable change within the speed of alteration shifting from real to favorite real balances with the alteration parameter after 1979 expanding generally in magnitude nine and a half times the alteration parameter before 1979.

Brüggemann and Nautz (1997) investigated the effect of German money growth fluctuation on income and demand for money according to Friedman's theorem for money growth fluctuation. Some confirmation for a velocity-fluctuation linkage was provided by Granger-causality tests. However, the measurement of fluctuation-augmented function of demand for money revealed that - in contrast to Friedman's hypothesis - incremented money growth fluctuation decreased the demand for money. Lombra and Struble (1979) raised a variety of issues that relate to the degree of interest rate fluctuation likely to accompany the Federal Reserve's attempt to control monetary growth more precisely and has sketched out the costs that might be generated by more volatility. They declared that it was not obvious that the avalanche of regressions produced over the 1970s has improved the Federal Reserve's approach to policymaking or its actual performance.

Todani (2007) offers a model for cointegration investigations of a long-run demand for money, M3, in South Africa. He computes a cointegrated VAR model, including the opportunity cost of keeping money, income, and real money. The model shows that just income and real money have an error-correcting linkage with the demand for

money. This linkage of demand for money is approximately steady during the sample period when short-run variations are corrected for. And, it is concluded that there is a weak long-run linkage between money and inflation. Zirammba (2007) in his study examines empirically the long-run linkage of demand for money and its related variables in South Africa. He included expenditure on investment goods and exports, and final consumption expenditure as the disaggregated components in the model. The other determinants were the local interest rate, the efficiency of government bonds and the exchange rate. He shows that real income's different components have different effects on the demand for money in South Africa.

Recently, Dogan, Sahin and Berument (2016) provided an empirical insight of the effect of interest rate variability on monetary policy in Turkey. They found that interbank interest rate have significant effect on monetary policy and can be used by the policymakers to achieve monetary policy stability the country.

In addition, Patalinghug, (2017) investigated the effect of interest rate on money demand in Philippines. Using error correction method with quarterly data over the period 1994q1-2015q4, the study submits that 364-day Treasury Bill rates have significant negative effect on money demand while 364-day Treasury Bill rates do not significantly affect money demand.

4.3 Methodology

According to Bjørnland (2005), money may be demanded for two reasons: as a stuck to adjust the contrasts between income and expenditure flows, and as one among a few resources in a portfolio. These two types of demands cause a long-run determination of the following function:

$$M^d = g(P, I, \Delta p, R) \quad (15)$$

where the nominal money demanded (M^d) is related to the price level (P), a scale factor (I), inflation (Δp) and a vector of returns on various assets (R). Following Bahmani-Oskooee and xi (2011), we add the Nominal Effective Exchange Rate (NEER) in the model to consider the currency substitution that can occur between the local currency and foreign currencies.

By introducing the measures of volatility for domestic interest rate (deposit rate) and interest rate fluctuation on treasury bills, we rewrite the long-run money demand function as:

$$\ln M_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln NEER_t + \beta_3 \ln(P_t) + \beta_4 ur_t + \beta_5 ur_t^f + \varepsilon_t \quad (16)$$

where M_t is supply for money that is estimated by real M3; nominal M3 is deflated by the GDP deflator; Y_t is the real GDP; $NEER_t$ is the nominal effective exchange rate for South Africa; P_t is the changes in prices and is defined as (P_t/P_{t-1}) ; ur_t is the instability of domestic interest the rate measured by deposit rate; ur_t^f is the interest rate fluctuation on treasury bills and ε_t is the error term. All the factors are in the logarithm except the interest rate variables (log-linear model). According to Mutluer and Barlas (2002), coefficients of the logarithmic factors are long-run elasticities while the linear form coefficients are semi-elasticities.

In equation (16), the demand for money has a positive linkage with scale variable (Y_t), and negative linkage with the opportunity cost of keeping money with respect to real assets. So, β_3 is expected to be negative. β_2 can be either negative or positive. β_4 is supposed to be positive while β_5 is supposed to be negative. The volatility measures

are derived using the moving-average standard deviation method accepted by Kenen and Rodrik (1986) and Koray and Lastrapes (1989).

$$J_{t+m} = \left[\frac{1}{m} \sum_{i=1}^n (RM_{t+i-1} - RM_{t+i-2})^2 \right]^{\frac{1}{2}} \quad (17)$$

where RM is the interest rates on deposit rates and treasury bills. Adding the volatility measures reduces the instability of the demand for money.

The next step is to test the stability of the coefficients. To this end, we should include the short-run factors into equation (16). Thus, we follow the autoregressive distributed lag (ARDL) method of Pesaran et al. (2001), or the bounds testing method to cointegration, and rewrite equation (16) as:

$$\begin{aligned} \Delta \ln M_t = & \alpha + \sum_{i=1}^n \gamma_i \Delta \ln M_{t-i} + \sum_{i=0}^n \delta_i \ln Y_t + \sum_{i=0}^n \vartheta_i \ln(P_t)_{t-i} + \\ & \sum_{i=0}^n \mu_i \ln NEER_{t-i} + \sum_{i=0}^n \rho_i ur_{t-i} + \sum_{i=0}^n \varphi_i ur_{t-i}^f + \beta_0 \ln M_{t-1} + \beta_1 \ln Y_{t-1} + \\ & \beta_2 \ln NEER_{t-1} + \beta_3 \ln(P_t)_{t-1} + \beta_4 ur_{t-1} + \beta_5 ur_{t-1}^f + \varepsilon_t \end{aligned} \quad (18)$$

Short-run impacts are judged by the estimations of coefficients of the first-differenced factors. The long-run impacts are presented by the estimations of β_1 to β_6 normalized on β_0 . According to Nayaran (2005), ARDL approach is higher-level than other cointegration approaches, such as Engle–Granger (1987) because it estimates the short-run and long-run parameters of the model at the same time and it tests the linkage between factors in levels, independent of whether they are purely I(0), I(1), or mutually cointegrated. In equation (18), includes the linear function parameters with lag as an alternative for the error term with lag.

To explain the significance level of the factors with lag, we employ the F-test with tabulated new critical values. This is a sign of cointegration in order to be of meaning

and value (Bahmani and Bahmani-Oskooee, 2012). The values they arrange a version for the degree of integration of factors included and appear that in this method, factors may be stationary, non-stationary or a combination of the two (Bahmani-Oskooee and Harvey, 2012). A higher level of critical values is given by expecting all factors in a given method to be integrated of order one, or I(1). A smaller level of critical values is given by expecting all factors to be stationary, or I(0). Pesaran et al. (2001) mention that the higher-level of critical values may be applied to explain cointegration even if a few factors are I(1) and some I(0). If the measured F-statistic surpasses the higher-level of critical values, then H_0 is rejected and there is cointegration among the factors. The error-correction method defined by equation (18) according to experimental investigation by using quarterly data in South Africa for the period 1990Q1–2012Q4.

4.4 Data

The data on Supply of money (M), nominal effective exchange rate (NEER), real GDP (Y) and interest rate (r) for South Africa are used in this chapter. We calculated the volatility of the interest rate from the raw data. The data are quarterly data over the period of 1980Q1 to 2012Q4. The period witness significant changes in the variables and high levels of economic uncertainty and monetary policy uncertainty across the globe. In addition, the dynamics of the variables enormously affect the South African economy. We sourced all the data from the International Monetary Fund's International Financial Statistics (IFS) CD-ROM (see appendix for the presentation of the data).

4.5 Results and discussion

Table 12 shows that the Supply of money (M), real GDP (Y), and foreign interest rate (r^f) are right-skewed while the nominal effective exchange rate (NEER), domestic interest rate (r), and GDP deflator (P) are left-skewed. The supply of money has the

highest central tendency, as represented by mean. Its standard deviation shows that the highest volatility belongs to the domestic interest rate.

Table 12: Descriptive statistics of the variables

	M	NEER	Y	ur	urf	P
Mean	22.96	6.69	4.28	12.43	6.18	3.38
Median	22.78	6.62	4.20	13.31	5.75	3.39
Maximum	23.84	7.83	4.72	17.79	14.85	5.23
Minimum	22.32	3.70	3.95	7.29	0.97	1.24
Standard Deviation	0.55	0.77	0.25	3.42	3.18	1.11
Skewness	0.47	$-\hat{0.83}$	0.41	-0.12	0.70	-0.04
Kurtosis	-1.45	1.39	-1.35	-1.58	0.10	-1.09

Source: Author's computation. Note 1: The statistics of M, NEER, Y, and P measured from logarithm form of data. Note 2: Statistical data is available on table 16.

Firstly, to see the lagged level of factors are cointegrated we use the F-test to the significance level of them. Then, after selecting the maximum number of six lags by relying upon the Schwarz Bayesian information criterion (SBIC), we measure equation (18). Table 13 shows the results of the optimum model.

The first panel of Table 13 illustrates that all factors, except the exchange rate and volatility of interest rate on treasury bills (ur^f), present at the minimum one significant short-run coefficient, explaining that all factors have short-run impacts on demand for money in South Africa. To see whether these impacts last into the long-run, we carry to the second panel of the table. All the long-run coefficients have the expected signs and are statistically significant, but the nominal effective exchange rate and the estimation of fluctuation of the foreign interest rate. The fluctuation of interest rate on deposit rates (ur) carries the significantly negative coefficient, while the coefficient of income (y) is positively significant. It confirms that in the long run, a 10% growth in

the economy needs an increase of 1.8% in the supply of money. However, the inflation rate's coefficient is negatively significant.

It confirms that in South Africa, the importance of financial properties is relatively less than real properties as an option for holding money. In spite of the fact that the coefficient of the exchange rate (NEER) is insignificant, the positive sign demonstrates that in South Africa the wealth effect⁵ dominates the expectation effect⁶. The measure of interest rate fluctuation on domestic money (ur) has a negative coefficient. This shows that the interest rate fluctuation on deposit rates, in both short-run and long-run, significantly affects demand for money, which shows that by increasing the time deposit rate fluctuation the demand for domestic money holdings will decrease too. The coefficient of inflation rate variable is significant and negative as expected. Any increase in inflation rate will make all nominal fixed value properties riskier to hold because the value of these assets, particularly the cash and near cash assets value in terms of goods and services, becomes less predictable. This could cause some investors to move a portion of their wealth out of nominal properties, counting money, into physical properties like commodity inventories. In some cases, investors change their funds from cash balances into interest-paying financial instruments as better inflation hedging.

⁵ According to Arango and Nadiri (1981), an increment in foreign currency value may rise the domestic currency worth of foreign properties kept by domestic inhabitant, that may be seen by people as an increment in wealth, consequently, an increment in the money demand.

⁶ Devaluation of domestic currency comes about in an increment in supposition of more devaluation, so individuals may chose to keep further foreign currency and fewer domestic money (Bahmani-Oskooee, 1996).

Table 13: Estimation of equation (4) using the ARDL approach

Short-run coefficient estimates							
Lag order	0	1	2	3	4	5	6
$\Delta \ln M$		0.8334 (8.2786)	0.0609 (0.4819)	0.0686 (0.5463)	0.0839 (0.6686)	0.0033 (0.0264)	-0.2219 (-2.5373)
$\Delta \ln Y$	0.3202 (4.1238)						
$\Delta \ln NEER$	0.0142 (1.1179)						
$\Delta \ln(P_t)$	-0.8244 (-5.0427)						
Δur	-0.4466 (-2.2651)						
Δur^f	0.2286 (0.9704)						
Long-run coefficient estimates							
Constant	$\ln Y$	$\ln(P_t)$	$\ln NEER$	ur	ur^f		
0.4469 (0.4974)	1.8665 (14.625)	-4.8057 (-3.0852)	0.0833 (1.1678)	-2.6034 (-2.5913)	1.3330 (1.0616)		
Diagnostic statistics							
F	ECM(-1)	LM	Adj. R ²	RESET	CUSUM	CUSUMSQ	
8.6717	-0.1715 (-4.5974)	0.9088 [0.923]	0.4981	2.0473	Stable	Stable	

Source: Author's computation. Note: Figures in parentheses are *t*-statistics; those in brackets are p-values.

To have meaningful long-run results, first, we should form cointegration or add the significant lagged level factors in equation (18). The outcomes of F-test, similar to other diagnostics, are presented in the third panel. According to our results, the estimated F statistic of 8.67 is more than the higher-level critical values of 3.94, which support the cointegration. Next, the ECT (-1) is derived from the long-run relationship of error terms with one lag that shows how much the short-run lopsidedness will adjust in the long-run. The predicted sign of this lagged value should be negative. From the third panel, it is explicit that the estimated sign is negative and statistically significant for the lagged error-correction expression supports adaptation toward equilibrium.

The 17 percent rate of adaptation appears somewhat low and is probably caused by rigidities in the South African economy. Table 13 also reports some diagnostic

statistics. The Lagrange multiplier (LM) statistic and Ramsey's RESET test are utilized for testing serial correlation among the residuals of the optimum model and misspecification, respectively. The LM test is distributed as χ^2 with four degrees of freedom since data is quarterly, and the RESET test is distributed as χ^2 with one degree of freedom. The reported LM statistic is much lower than its critical values at the 5% level, and it supports autocorrelation-free residuals. According to Ramsey's RESET test, the result is much lower than its critical values, and it shows a lack of misspecification. At the end, to investigate the stability of the short-run and long-run coefficients, Brown et al.'s (1975) cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) test on the residuals of the error-correction method is used. This is because these two tests are well known for testing both the short-run and long-run coefficient measures steady. If the plot of CUSUM or CUSUMSQ is within the 5% significance level, the estimated coefficient will be stable. As can be seen from Figure 6, the cumulative sum test and the cumulative sum of squares test prove the existence steady.

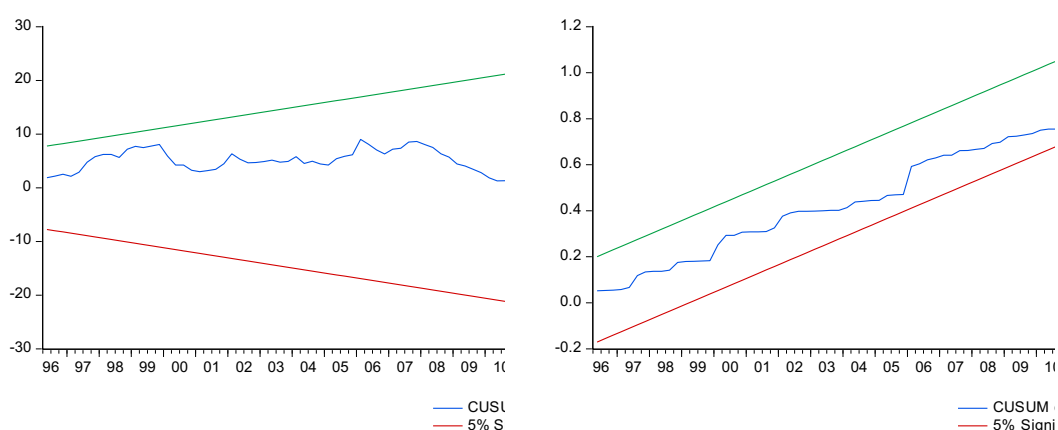


Figure 6: Graphical presentation of the CUSUM and CUSUMSQ tests

4.6 Conclusion and policy implications

This chapter analyzes the effect of interest rate fluctuation on bank time deposit rate (ur) and short-run treasury bills (ur^f) on the money demand function in South Africa. In the implementation of this task, (ur) and (ur^f) are measured using the moving average-standard deviation of foreign and domestic interest rates. In spite of the fact that the conventional determination of demand for money as connections between real money equilibrium, a scale factor, and the opportunity cost of keeping money is exceptionally prohibitive and assumes the country as a closed economy. In an open economy, people can select to keep their properties in both domestic and foreign resources. So, the standard function of demand for money must contain the return on holding foreign resources.

Conclusions of this study reveal that the volatility of the interest rate on treasury bills does not have short-run and long-run impacts on money demand in South Africa. However, any increase in the volatility of treasury bills will lead to an increase in demand for money. This corroborates the finding of Patalinghug, (2017), and Cekiloz and Arslan (2011) . The interest rate fluctuation on deposit rates, in both the short and long run, significantly affects demand for money, which shows that by increasing the deposit rate fluctuation the demand for domestic currency will decrease too. As, higher interest rate volatility on the short-term time deposits is likely to cause people to reduce their demand for money and shift to longer-term investments where the yield on the financial asset is known for a longer period of time. The negative and significant sign of inflation coefficient indicates that in inflationary periods holding real domestic assets is preferable to holding domestic currency for South African people. The positive sign of the exchange rate demonstrates that people will substitute South

African Rand instead of foreign currencies. By raising the exchange rate, the anticipated return from keeping domestic currency will increment and also consequently money demand will rise. Furthermore, including the two measures of the volatility of domestic and foreign interest rates, and consolidating short-run flow into the measured method findings in a steady function of demand for money in South Africa.

In sum, this study provides interesting policy inferences. Including the two measures of the volatility of domestic and foreign interest rates, and consolidating short-run flow into the measured methods yields in a stable function of demand for money in South Africa. Hence, money supply quantitative control should be an effective policy for macroeconomic management.

Chapter 5

CONCLUSION

5.1 Summary

The general objective of this dissertation is to explore the interdependence of exchange rates, gold price, oil prices, and the function of demand for money in India and South Africa. In the first chapter, the empirical findings of Augmented Dicky-Fuller (ADF), Phillips-Perron, and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests show that variables are integrated of order one $I(1)$ i.e. they become stationary in first-order differentiation; the cointegration test confirms that there is no long-run correlation among the factors.

The findings of the VAR method demonstrate that exchange rates are the most affected variable and the variable for oil price is the most independent variable. The Granger-causality test discloses gold prices have a unidirectional linkage with prices of oil and INR/USD exchange rates i.e. they Granger cause the prices of oil and exchange rates. Furthermore, gold prices are not impacted by any other two factors, and there is a bidirectional linkage between oil prices and exchange rates. Finally, the impulse response indicates that when variables are influenced by shocks, the impulse response impact only lasts for three periods maximum. To this end, it is implied that the three variables are independent of each other. Lastly, the policy implication for energy policymakers is that they should try to detach energy policies from financial policies.

The results of the research have imperative suggestions for policymakers and academic centers. The intuitive relationship between the prices of gold, prices of crude oil, and the Indian Rupee exchange rate highlight the necessity of energy and financial policies being detached by the Indian government and the Reserve Bank of India. The results of the study, with respect to the fact that India is the world's biggest gold importer and meets the majority of its need for crude oil through imports, should be very useful to assist Indian officials in making policy decisions. During recent years, prices of crude oil and prices of gold have been applied to control the Rupee exchange rate in India. For example, the government negotiated with oil-producing countries, to use the Rupee instead of the US dollar in their transactions. Furthermore, the duty on gold imports was increased to decrease gold imports and stabilize the Rupee exchange rate.

The second chapter investigates the impact of output uncertainty and monetary uncertainty on the function of demand for money in South Africa. As different variables have different implications in the economy generally and affect traditional monetary policy, the choice of uncertainty measures is an important issue. To this end, in order to have comparable estimation results, their estimation must be conducted in a consistent framework. In carrying out this task, we generate UM and UY using moving-average standard deviation technique as the monetary and output uncertainty measures, respectively. This is based on the reality that the conventional definition of the function of demand for money as linkages between a scale factor, real money balances, and the opportunity cost of keeping money is very prohibitive.

Our empirical results are different from existing literature in certain respects. Firstly, the estimated coefficient of real income is larger. This reveals that the long-run function of demand for money in South Africa might be more elastic in relation to real

income than hitherto supposed. The findings present also that the measures of output uncertainty and monetary uncertainty have short-run and long-run impacts on money demand in South Africa. Additionally, counting these two estimations and including short-run elements into the measurement method findings in a steady function of demand for money in South Africa. Following Poole (1970), as there is no instability in money demand, we can claim that the supply of money is the suitable monetary policy mechanism to be focused on by the South African Reserve Bank (SARB). Finally, the last chapter includes the overall conclusion of the study and reveals that interest rate fluctuation and treasury bills do not have short-run and long-run impacts on the demand for money in South Africa, however, any increase in the volatility of treasury bills will lead to an increment in money demand. The interest rate fluctuation on deposit rates, in both the short and long run, significantly affects money demand, which shows that by increasing the deposit rate fluctuation the demand for domestic currency will increase too. The significant and negative sign of inflation coefficient confirms that in inflationary periods holding real domestic assets is preferable to domestic currency for South African people. The positive sign of the exchange rate demonstrates that people will substitute South African Rand instead of foreign currencies. By raising the exchange rate, the anticipated return from keeping domestic currency will increase also and as a result, money demand will rise. Furthermore, including the two measures of the volatility of domestic and foreign interest rates, and including short-run elements into the estimation method findings in a steady function of demand for money in South Africa.

5.2 General conclusion

This thesis assesses the association of vital macrocosmic variables including exchange rate, oil price and gold price in India. It also examines the effect of interest rate

volatility, output uncertainty and monetary uncertainty on the money demand function for South Africa. Using appropriate econometric methodologies, the thesis concludes that exchange rate, oil price and gold price are independent in India. This suggests that there is no interdependence of the financial sector and the energy sector in the country. Each of these sectors is self-regulating and policies affecting one may not have significant influence on the other. Thus, policymakers need independent financial policies and energy policies to achieve the desired results in each sector respectively. Furthermore, the thesis submits that the money demand function is income elastic at the current level of per capita income in South Africa while output uncertainty and monetary uncertainty are fundamental determinants of the demand for money of the country in the short and long run. This implies the interconnectivity of the real sector and the monetary sector of the South African economy.

In addition, treasury bills do not influence the money demand function in South Africa. Hence, stock market dynamics do not alter monetary policy in the country. However, interest rate volatility, inflation and deposit rates are important drivers of the money demand in the countries. Therefore, from the aforementioned inferences, the thesis conclude that the energy sector and the financial sector are independent while the real sector and the monetary sector are interdependent in India and South Africa, respectively.

5.3 Suggestions for further studies

Although this thesis contributes significantly to literature and provides a number of important insights for better understanding of the interrelationship between the fundamental macroeconomic variables analyzed, there is a room for further studies in the area.

Foremost, researchers should conduct similar studies on other developing countries. The markets situations differ from one country to another due to differences in domestic policies and institutional framework. Hence, further studies on other developing economies will allow for robust understanding of the interdependence or otherwise of the macroeconomic variables analyzed in this dissertation. In addition, comparative analysis of countries at different categories of income and level of development can provide holistic insight about the relationship among the macroeconomic variables analyzed in this thesis.

Moreover, further studies may consider both the volatilities of the variables rather than only their level values. Thus, the dynamism of the interrelationship between their level values may be different from the association of their volatilities. Therefore, analysis of the volatilities of the variables is capable of changing the narratives about their interrelationship for the countries considered in this thesis.

Furthermore, we suggest the application of different econometric methodology to affirm or dispute the findings of this study and earlier ones. Further studies should adopt methods such as the volatility (ARCH and GARCH) models, Nonlinear ARDL, structural VAR and unit root test with structural breaks. This will provide further insights on the relationship between the variables. The volatility models are suitable for the analysis of the volatilities of the variables, Nonlinear ARDL accounts for asymmetric effects while the structural VAR provide theoretically consistent estimates. In addition, the unit root tests with structural breaks accounts for structural shifts and fundamental economic events in the analysis of the stationarity properties of the variables.

All these may provide new policy inferences regarding the relationship between the macroeconomic variables analyzed in this dissertation. In addition, studies with current data may be helpful in further understanding of the interactions of the variables.

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APPENDIX

Data

Table 14: Daily Statistical Data for India (chapter 2)

Date	Oil ⁷	GOLD	EX	Date	Oil	GOLD	EX
1/12/2004	31.2	415.25	45.44	8/19/2009	68.06	934.25	48.79
1/13/2004	30.99	420.6	45.44	8/20/2009	68.82	943.5	48.7
1/14/2004	31.11	424.4	45.42	8/21/2009	69.78	941.5	48.58
1/15/2004	31.91	421.75	45.44	8/24/2009	68.53	953.75	48.43
1/16/2004	31.41	421	45.45	8/25/2009	65.79	947.5	48.5
1/19/2004	32.55	423.35	45.45	8/26/2009	68.82	949.5	48.755
1/20/2004	31.84	425.25	45.43	8/27/2009	70.08	943.5	48.9
1/21/2004	31.43	425.5	45.43	8/28/2009	72.9	950.75	48.81
1/22/2004	31.26	419.5	45.43	9/1/2009	74.39	949.75	48.83
1/23/2004	31.67	412.5	45.43	9/2/2009	74.61	955	49.05
1/26/2004	32.26	408.4	45.36	9/3/2009	74.21	982.5	48.88
1/27/2004	31.95	406.6	45.38	9/4/2009	73.79	987.25	48.87
1/28/2004	31.42	409.25	45.36	9/7/2009	71.58	992.75	48.86
1/29/2004	32.08	407.6	45.29	9/8/2009	74.03	1004.5	48.86
1/30/2004	31.15	409.25	45.32	9/9/2009	73.76	995.75	48.4
2/2/2004	31.05	409	45.3	9/10/2009	71.33	988.5	48.33
2/3/2004	30.77	408.2	45.3	9/11/2009	68.65	998.25	48.45
2/4/2004	29.47	405.7	45.3	9/14/2009	68.66	994.25	48.39
2/5/2004	29.53	411	45.29	9/15/2009	72.81	997.5	48.67
2/6/2004	30.3	405.7	45.3	9/16/2009	73.75	1017	48.5
2/9/2004	30.07	399.75	45.25	9/17/2009	73.71	1020.5	48.2
2/10/2004	29.63	398.35	45.22	9/18/2009	74.34	1014	48.1
2/11/2004	29.02	401.45	45.24	9/21/2009	73.1	999.25	48.02
2/12/2004	29.26	399.25	45.23	9/22/2009	70.74	1015.8	47.95
2/13/2004	29.1	399.55	45.24	9/23/2009	70.68	1014.8	47.86
2/16/2004	30.06	404.25	45.24	9/24/2009	72.8	1014	47.9
2/17/2004	30.33	405.95	45.28	9/25/2009	69.02	997	47.89
2/18/2004	30.17	408.55	45.24	9/28/2009	68.78	990.5	47.93
2/19/2004	30.96	405.75	45.28	9/29/2009	67.6	991.75	47.75
2/20/2004	31.08	411.6	45.23	9/30/2009	66.78	1001.3	48.05
2/23/2004	31.43	416	45.32	10/1/2009	65.84	1005.8	48.09
2/24/2004	31.57	411.7	45.32	10/5/2009	69.2	1004.3	47.61
2/25/2004	31.63	414.5	45.25	10/6/2009	69.76	1020.3	47.39
2/26/2004	31.22	414.5	45.27	10/7/2009	68.96	1047	46.79
2/27/2004	31.89	409.8	45.32	10/8/2009	68.76	1054.8	46.58
3/1/2004	31.6	405.25	45.32	10/9/2009	66.91	1046.8	46.2
3/2/2004	32.46	399.5	45.25	10/12/2009	66.53	1052	46.44
3/3/2004	32.45	402.25	45.22	10/13/2009	68.51	1064.5	46.44
3/4/2004	32.94	400.25	45.32	10/14/2009	71.56	1066	46.28
3/5/2004	33.34	393.25	45.32	10/15/2009	70.72	1052.5	46
3/8/2004	34.15	395.85	45.26	10/16/2009	68.11	1047.8	46.04
3/9/2004	33.32	400	45.23	10/19/2009	69.65	1054.5	46.2
3/10/2004	33.45	395.75	45.25	10/20/2009	67.43	1064	46.02
3/11/2004	34.4	390.5	45.28	10/21/2009	64.99	1053.5	46.24
3/12/2004	34.27	392	45.22	10/22/2009	64.6	1054.8	46.34
3/15/2004	33.72	399.25	45.25	10/23/2009	65.43	1061.3	46.59

⁷- Oil: oil price, GOLD: gold price, EX: exchange rate

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
3/16/2004	32.83	399.85	45.22	10/26/2009	64.63	1055	46.41
3/17/2004	33.22	401.5	45.27	10/27/2009	65.82	1040.8	46.68
3/22/2004	34.72	398	45.145	10/30/2009	65.26	1044.5	47.18
3/23/2004	34.95	398.1	44.85	11/2/2009	68.51	1052	46.9
3/24/2004	34.43	402.5	44.8	11/3/2009	67.65	1058	46.81
3/25/2004	34.33	402.75	44.73	11/4/2009	68.47	1091.8	47.37
3/26/2004	33.57	410.75	44.44	11/5/2009	69.45	1088	46.94
3/29/2004	34.4	412	44	11/6/2009	70.75	1095	46.93
3/30/2004	34.14	417.65	44.07	11/9/2009	70.81	1108.5	46.83
3/31/2004	33.32	416.25	43.4	11/10/2009	72.16	1099.8	46.36
4/1/2004	32.51	415.25	43.4	11/11/2009	73.14	1114.8	46.3
4/2/2004	32.04	416.1	43.75	11/12/2009	74.58	1116	46.3
4/5/2004	33.04	421.5	43.67	11/13/2009	75.86	1107.5	46.6
4/6/2004	32.29	421.25	43.7	11/16/2009	76.51	1128.8	46.24
4/7/2004	32.59	420	43.55	11/17/2009	77.74	1131.8	46.06
4/8/2004	31.19	423.7	43.6	11/18/2009	78.36	1146	46.2
4/12/2004	31.17	427.25	43.45	11/19/2009	77.72	1136	46.2
4/13/2004	31.48	419	43.66	11/20/2009	76.45	1142.5	46.73
4/14/2004	33.07	417.7	43.75	11/23/2009	76.69	1166	46.63
4/15/2004	33.98	418.5	43.69	11/24/2009	75.11	1170.3	46.4
4/16/2004	34.03	419	44	11/25/2009	77.18	1176.5	46.31
4/19/2004	34.51	419.5	43.85	11/26/2009	74.91	1183	46.18
4/20/2004	34.15	407.9	43.88	11/27/2009	75.56	1164.5	46.18
4/21/2004	33.54	397.75	43.97	11/30/2009	75.68	1172	46.55
4/22/2004	33.72	398.25	44.1	12/1/2009	78.21	1193.5	46.44
4/23/2004	33.85	400.85	44.14	12/2/2009	78.02	1211.5	46.21
4/26/2004	34.71	403.1	44	12/3/2009	75.51	1218.3	46.24
4/27/2004	33.56	396.85	44.1	12/4/2009	77.18	1203.3	46
4/28/2004	33.23	392.75	44.23	12/7/2009	77.07	1147.5	46.1
4/29/2004	33.24	392.3	44.21	12/8/2009	76.99	1164.3	46.45
4/30/2004	33.78	394.5	44.4	12/9/2009	75.18	1142.3	46.6
5/3/2004	34.18	397	44.52	12/10/2009	74.81	1125.8	46.51
5/4/2004	34.11	396.25	44.88	12/11/2009	77.14	1140	46.5
5/5/2004	35.02	392.25	44.7	12/14/2009	77.36	1120	46.47
5/6/2004	34.66	386	44.55	12/15/2009	78.64	1115	46.65
5/7/2004	35.23	388.5	44.65	12/16/2009	76.45	1134	46.7
5/10/2004	34.97	391.25	44.66	12/17/2009	75.61	1121.5	46.57
5/11/2004	36.07	392.55	44.95	12/18/2009	78.14	1106.5	46.85
5/12/2004	36.58	387.5	45.35	12/21/2009	75.35	1113.3	46.69
5/13/2004	37.05	380.8	45.35	12/22/2009	76.57	1094.3	46.8
5/14/2004	37.25	375	45.25	12/24/2009	76	1104.5	46.8
5/17/2004	35.83	375.25	45.57	12/29/2009	78.68	1103	46.72
5/18/2004	36.97	382.2	45.5	12/30/2009	76.96	1092.5	46.44
5/19/2004	37.95	375.15	45.47	12/31/2009	77.76	1104	46.56
5/20/2004	38.3	376.5	45.18	1/4/2010	77.74	1113	46.27
5/21/2004	39.04	382.95	45.28	1/5/2010	76.18	1125.3	46.13
5/24/2004	38.88	377.7	45.28	1/6/2010	74.93	1125	45.72
5/25/2004	38.43	380.75	45.31	1/7/2010	73.63	1130.8	45.67
5/26/2004	38.35	379.5	45.36	1/8/2010	70.91	1121.8	45.5
5/27/2004	38.89	385.3	45.4	1/11/2010	70.07	1158	45.35
5/28/2004	37.6	384	45.4	1/12/2010	71.19	1152.8	45.6

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
5/31/2004	39.22	388.9	45.42	1/13/2010	71.33	1132.8	45.47
6/1/2004	38.46	389.65	45.42	1/14/2010	73.34	1137.5	45.55
6/2/2004	38.05	393.6	45.43	1/15/2010	71.28	1132	45.8
6/3/2004	37.03	393.25	45.37	1/18/2010	71.87	1135.8	45.8
6/4/2004	37	397.2	45.22	1/19/2010	72.74	1134	45.84
6/7/2004	37	394.85	45.07	1/20/2010	71.64	1129	46.1
6/8/2004	39.05	390.35	45.1	1/21/2010	73.87	1104	46.1
6/9/2004	37.99	388.3	45.05	1/22/2010	75.15	1096.5	46.21
6/10/2004	36.26	393.6	44.94	1/26/2010	76.59	1090.8	46.06
6/11/2004	35.97	392.35	45.05	1/27/2010	76.65	1094.8	46.3
6/14/2004	35.57	386.85	45.09	1/28/2010	77.62	1091.8	46.35
6/15/2004	35.47	384.95	45.35	1/29/2010	77.91	1082.8	46.08
6/16/2004	34.69	384.85	45.38	2/2/2010	79.05	1114	46.11
6/17/2004	35.75	385.1	45.34	2/3/2010	79.27	1118.5	45.97
6/18/2004	35.23	386.5	45.49	2/4/2010	80.14	1102.5	46.21
6/21/2004	35.22	385.25	45.66	2/5/2010	80.57	1052.3	46.72
6/22/2004	34.66	386.1	45.88	2/8/2010	80.06	1070	46.79
6/23/2004	34.56	395.1	46.21	2/9/2010	80.14	1068	46.49
6/24/2004	35.58	395.25	45.7	2/10/2010	79.38	1075.5	46.36
6/25/2004	35.43	395.75	45.85	2/11/2010	77.57	1079.5	46.39
6/28/2004	34.82	393.9	45.85	2/12/2010	77.61	1078.3	46.44
6/29/2004	34.95	400	45.99	2/15/2010	76.85	1099.5	46.44
6/30/2004	34.81	401.5	46.05	2/17/2010	75.18	1118.3	46
7/1/2004	34.71	404.25	45.99	2/18/2010	75.09	1105.5	46.2
7/2/2004	34.25	394.4	45.88	2/19/2010	74.13	1107	46.24
7/5/2004	33.24	395.8	45.75	2/22/2010	72.73	1119.8	46.15
7/6/2004	32.61	394.8	45.75	2/23/2010	72.18	1112	46.25
7/7/2004	33.22	397.75	46.05	2/24/2010	72.63	1093	46.27
7/8/2004	35.58	398.25	45.84	2/25/2010	72.75	1092.8	46.29
7/9/2004	35.36	394.5	45.75	2/26/2010	70.65	1112.5	46.05
7/12/2004	35.73	399.65	45.66	3/1/2010	71.2	1117.3	46.01
7/13/2004	36.47	405.35	45.72	3/2/2010	71.58	1116	46.01
7/14/2004	35.62	406.5	45.86	3/3/2010	73.94	1136.3	45.55
7/15/2004	37.13	406.35	45.95	3/4/2010	75.77	1136.3	45.82
7/16/2004	37.58	400.9	46.08	3/5/2010	71.3	1135	45.49
7/19/2004	37.73	403.8	45.96	3/8/2010	70.11	1134	45.5
7/20/2004	36.68	403.15	46.11	3/9/2010	69.62	1120	45.6
7/21/2004	37.51	406.3	46.1	3/10/2010	70.4	1124.5	45.35
7/22/2004	38.41	406.35	46.13	3/11/2010	70.4	1106	45.49
7/23/2004	38.49	400	46.3	3/12/2010	72.35	1118.8	45.48
7/26/2004	39.07	398.5	46.35	3/15/2010	71.49	1104	45.55
7/27/2004	38.96	397.75	46.28	3/17/2010	74.82	1131.3	45.28
7/28/2004	38.48	391.5	46.25	3/18/2010	74.89	1122.8	45.45
7/29/2004	39.16	390.75	46.3	3/19/2010	76.61	1121.5	45.31
7/30/2004	39.59	389.85	46.45	3/22/2010	76.88	1104.3	45.52
8/2/2004	39.75	387.3	46.4	3/23/2010	76.95	1100.8	45.5
8/3/2004	40.09	387.3	46.35	3/24/2010	76.44	1094	45.4
8/4/2004	41.08	391.4	46.35	3/25/2010	77	1093.5	45.5
8/5/2004	40.93	391.5	46.36	3/26/2010	74.38	1098	45.16
8/6/2004	41.47	390.95	46.35	3/29/2010	76.36	1111.3	44.94
8/9/2004	41.35	391.5	46.33	3/30/2010	76.07	1109.8	45.06

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
8/10/2004	41.82	390.85	46.4	3/31/2010	77.5	1109.5	44.95
8/11/2004	41.75	399	46.34	4/1/2010	78.66	1116	44.79
8/12/2004	42.49	399	46.32	4/6/2010	79.2	1124	44.39
8/13/2004	42.63	399.5	46.21	4/7/2010	78.94	1133.3	44.41
8/16/2004	43.21	393.85	46.27	4/8/2010	78.77	1146.5	44.44
8/17/2004	42.5	394.15	46.36	4/9/2010	80.29	1156	44.41
8/18/2004	42.45	396.75	46.34	4/12/2010	79.44	1163.5	44.1
8/19/2004	43.5	401.65	46.34	4/13/2010	79.38	1149.3	44.41
8/20/2004	44.13	401.3	46.27	4/14/2010	77.08	1159	44.468
8/23/2004	44.35	402.45	46.25	4/15/2010	79.45	1151.3	44.2
8/24/2004	44.05	406.5	46.26	4/16/2010	80.28	1157	44.32
8/25/2004	44.12	410.55	46.295	4/19/2010	80.09	1127.5	44.3
8/26/2004	44.84	410.6	46.36	4/20/2010	78.37	1142.5	44.72
8/27/2004	45.46	406.2	46.35	4/21/2010	78.09	1143.8	44.5
8/30/2004	44.39	406	46.28	4/22/2010	79.17	1144.3	44.54
8/31/2004	42.99	406.05	46.35	4/23/2010	78.03	1140	44.52
9/1/2004	42.39	405.1	46.35	4/26/2010	78.64	1154	44.42
9/2/2004	40.65	407.25	46.34	4/27/2010	77.98	1152.3	44.33
9/3/2004	40.72	407.65	46.32	4/28/2010	79.89	1164.3	44.41
9/6/2004	40.78	406.1	46.33	4/29/2010	79.46	1170	44.54
9/7/2004	39.8	401.15	46.33	4/30/2010	80.37	1175.3	44.61
9/8/2004	40.96	401.6	46.35	5/5/2010	84.48	1172	44.62
9/9/2004	42.39	398.1	46.35	5/6/2010	85.05	1178	44.82
9/10/2004	41.07	396.3	46.3	5/7/2010	84.49	1199.6	45.29
9/13/2004	40.4	398.7	46.26	5/10/2010	82.63	1188.3	45.4
9/14/2004	40.19	401.35	46.18	5/11/2010	82.77	1209	44.84
9/15/2004	39.91	399.3	45.85	5/12/2010	85.21	1241.3	45.1
9/16/2004	41.45	405.25	45.81	5/13/2010	83.44	1235	45.08
9/17/2004	41.03	404.45	45.82	5/14/2010	85.81	1238.8	45
9/20/2004	40.63	403.4	45.84	5/17/2010	86.9	1230.3	45.2
9/21/2004	41.34	405.7	45.93	5/18/2010	84.81	1215	45.51
9/22/2004	42.03	404.3	45.86	5/19/2010	83.09	1209.5	45.51
9/23/2004	40.68	408.5	45.86	5/20/2010	84.73	1187.3	46.27
9/24/2004	43.08	405.35	45.87	5/21/2010	84.55	1183.5	46.8
9/27/2004	43.6	411.5	45.9	5/24/2010	84.58	1183.8	46.9
9/28/2004	44.56	407.85	45.97	5/25/2010	86.09	1189.5	46.97
9/29/2004	45.66	409.2	46.1	5/26/2010	86.72	1212.5	47.49
9/30/2004	46.53	411.7	46	5/27/2010	85.59	1210.8	47.1
10/1/2004	46.13	412.95	45.91	5/28/2010	84.59	1214	46.71
10/4/2004	46.87	415.65	45.85	6/1/2010	86.19	1219.8	46.31
10/5/2004	47.52	418.1	45.85	6/2/2010	88.09	1221	47.08
10/6/2004	46.54	412.55	45.86	6/3/2010	85.39	1219.8	46.89
10/7/2004	47.76	415.4	45.86	6/4/2010	82.31	1203.5	46.55
10/8/2004	46.86	418.45	45.86	6/7/2010	80.21	1212.4	46.85
10/11/2004	46.99	418.1	45.8	6/8/2010	76.48	1248	47.08
10/12/2004	47.1	421.75	45.8	6/9/2010	78.08	1235	46.82
10/13/2004	47.95	421.7	45.87	6/10/2010	79	1220	46.95
10/14/2004	48.98	414.7	45.83	6/11/2010	78.7	1220.5	46.89
10/15/2004	49.41	411.25	45.81	6/14/2010	79.41	1229.5	46.76
10/18/2004	50.75	415.35	45.85	6/15/2010	76.43	1223	46.4
10/19/2004	51.28	420.4	45.83	6/16/2010	73.87	1235.5	46.41

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
10/20/2004	50.42	419.1	45.85	6/17/2010	75.12	1234.5	46.43
10/21/2004	51.31	419.35	45.7	6/18/2010	71.86	1244	46.22
10/22/2004	51.02	423.6	45.65	6/21/2010	69.56	1259.5	45.96
10/25/2004	49.16	422.5	45.62	6/22/2010	70.45	1235.3	45.64
10/26/2004	49.21	422.8	45.58	6/23/2010	69.62	1243	46
10/27/2004	50.78	429.15	45.66	6/24/2010	67.18	1233.3	46.185
10/28/2004	51.06	427.5	45.57	6/25/2010	70.59	1242.5	46.478
10/29/2004	52.28	428.25	45.51	6/28/2010	73.56	1256	46.36
11/1/2004	51.68	424.2	45.3	6/29/2010	73	1236	46.2
11/2/2004	52.04	425.55	45.33	7/1/2010	73.08	1240	46.41
11/3/2004	49.99	428.85	45.4	7/2/2010	72.78	1210.5	46.59
11/4/2004	48.88	424.2	45.33	7/5/2010	73.12	1208.5	46.55
11/5/2004	48.16	423.5	45.1	7/6/2010	71.84	1210.8	46.55
11/8/2004	46.84	430.5	45.1	7/7/2010	71.09	1186	46.76
11/9/2004	46.25	431	45.08	7/8/2010	71.43	1201.3	46.96
11/10/2004	46.14	431.9	45.12	7/9/2010	73.68	1196.3	46.865
11/11/2004	45.32	433.65	45.14	7/12/2010	74.33	1203.8	46.66
11/12/2004	44.37	433.4	45.14	7/13/2010	73.28	1206.5	46.66
11/15/2004	44.78	433.8	45.04	7/14/2010	75.11	1212.3	46.74
11/16/2004	43.27	436.05	45.03	7/15/2010	75.29	1211.8	46.71
11/17/2004	42.57	437.6	45.01	7/16/2010	76.12	1204.8	46.5
11/18/2004	42.22	439.4	44.96	7/19/2010	77.52	1190.3	46.7
11/19/2004	41.33	443.45	45	7/20/2010	77.05	1181.5	47.1
11/22/2004	39.32	442	45	7/21/2010	78.53	1191.3	47.23
11/23/2004	40.48	445.6	44.97	7/22/2010	78.08	1187	47.08
11/24/2004	40.27	447.8	45.02	7/23/2010	75.22	1198.8	47.12
11/25/2004	40.8	448.15	44.94	7/26/2010	75.17	1189	46.9
11/26/2004	42.29	448.6	44.94	7/27/2010	76.21	1184	47.04
11/29/2004	42.26	451.15	44.94	7/28/2010	76.66	1164	46.25
11/30/2004	43.03	451	44.67	7/29/2010	74.21	1166	46.7
12/1/2004	42.62	451.25	44.47	7/30/2010	74.94	1168	46.53
12/2/2004	43.12	453.4	44.3	8/2/2010	71.73	1178	46.35
12/3/2004	42.87	452.85	44.1	8/3/2010	71.75	1184	46.09
12/6/2004	44.05	454.2	44	8/5/2010	73.08	1195.5	46.02
12/7/2004	44.23	448.65	43.51	8/6/2010	72.97	1194.5	46.06
12/8/2004	41.19	453.05	43.6	8/9/2010	74.56	1206	45.94
12/9/2004	38.49	451.8	44.15	8/10/2010	75.2	1196.8	46.07
12/10/2004	38.57	436.9	44.12	8/11/2010	74.35	1198	46.3
12/13/2004	38.43	437.1	44.52	8/12/2010	76.45	1200	46.66
12/14/2004	37.11	434	44.15	8/13/2010	76.63	1215	46.7
12/15/2004	36.9	435.1	44.05	8/16/2010	75.52	1222	46.61
12/16/2004	38.33	437.1	43.86	8/17/2010	75.55	1226.3	46.68
12/17/2004	37.24	439	43.75	8/18/2010	76.29	1223	46.6
12/20/2004	36.77	439.5	43.88	8/19/2010	76.31	1228	46.54
12/21/2004	37.03	438.9	43.85	8/20/2010	75.75	1230.5	46.35
12/22/2004	41.53	442.45	43.66	8/23/2010	77.59	1227	45.7
12/23/2004	41.49	440.95	43.8	8/24/2010	77.27	1218	46.5
12/24/2004	43.06	441	43.61	8/25/2010	77.9	1237.5	46.86
12/27/2004	42.67	441.1	43.63	8/26/2010	75.52	1240.3	46.87
12/29/2004	40.44	440.25	43.63	8/27/2010	76.66	1234.5	46.78
12/30/2004	40.29	435.6	43.67	8/31/2010	77.5	1233.5	46.87

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
1/4/2005	40.24	427.75	43.47	9/1/2010	81.93	1250	47.02
1/5/2005	38.93	426	43.6	9/2/2010	83.6	1247.8	46.74
1/6/2005	39.8	424.35	43.75	9/3/2010	83.76	1252	46.65
1/7/2005	40.38	422.2	43.63	9/6/2010	82.9	1249.5	46.58
1/11/2005	40.75	421.35	43.68	9/7/2010	81.28	1247.3	46.58
1/12/2005	41	426.6	43.53	9/8/2010	81.54	1258	46.82
1/13/2005	43.25	423.6	43.52	9/9/2010	79.89	1253.5	46.5
1/14/2005	43.28	422.5	43.55	9/10/2010	77.83	1248.8	46.3
1/17/2005	44.71	422.25	43.55	9/13/2010	76.63	1243	46.28
1/18/2005	43.45	421.75	43.59	9/14/2010	75.14	1253.3	46.26
1/19/2005	43.75	424.95	43.61	9/15/2010	74.56	1270.4	46.15
1/20/2005	45.76	422.9	43.7	9/16/2010	76.74	1271.3	46.23
1/21/2005	45.26	423.3	43.64	9/17/2010	75.1	1281.5	46.14
1/24/2005	45.1	427.35	43.65	9/20/2010	74.84	1280.3	45.88
1/25/2005	45.18	424.5	43.65	9/21/2010	73.48	1278.8	45.65
1/26/2005	45.16	425.8	43.65	9/22/2010	73.08	1291.8	45.59
1/27/2005	44.06	424.5	43.65	9/23/2010	70.61	1291.5	45.56
1/28/2005	45.88	426.8	43.66	9/24/2010	70.74	1298	45.56
1/31/2005	45.74	422.15	43.6	9/27/2010	74.5	1298.3	45.1
2/1/2005	46.14	420.9	43.66	9/28/2010	75.16	1289	44.94
2/2/2005	45.94	421.6	43.28	9/29/2010	76.05	1307.5	45.04
2/3/2005	46.51	416.5	43.3	9/30/2010	75.51	1311	44.8
2/4/2005	44.75	415.9	43.34	10/1/2010	75.53	1313	44.56
2/7/2005	44.51	414.4	43.38	10/4/2010	74.93	1316	44.41
2/8/2005	45.12	411.1	43.58	10/5/2010	75.03	1325.8	44.55
2/9/2005	44.17	411.15	43.62	10/7/2010	75.78	1359.5	44.25
2/10/2005	43.13	415.5	43.68	10/8/2010	77.48	1330.5	44.21
2/11/2005	43.26	418.85	43.7	10/11/2010	77.87	1348.5	44.39
2/14/2005	42.7	424.2	43.64	10/12/2010	77.54	1343.5	44.39
2/15/2005	42.79	424.4	43.71	10/13/2010	78.52	1358.5	44.55
2/16/2005	42.49	423.1	43.65	10/14/2010	78.89	1380.8	44.35
2/17/2005	44.04	426.25	43.68	10/15/2010	78.46	1377.3	44.05
2/18/2005	44.41	427.1	43.73	10/18/2010	78.89	1359.8	44.15
2/21/2005	44.51	427.15	43.73	10/19/2010	77.43	1367.8	44.26
2/22/2005	44.91	432.85	43.63	10/20/2010	79.42	1340.5	44.3
2/23/2005	45.42	432.6	43.61	10/21/2010	78.76	1345.3	44.25
2/24/2005	45.42	433.75	43.57	10/22/2010	77.29	1319	44.25
2/25/2005	45.86	434.25	43.61	10/25/2010	77.69	1345	44.52
2/28/2005	46.09	435.45	43.57	10/26/2010	78.73	1334	44.39
3/1/2005	47.6	433.45	43.58	10/27/2010	77.71	1332.3	44.54
3/2/2005	48.16	431.75	43.59	10/28/2010	79.14	1326.5	44.4
3/3/2005	49.24	430.2	43.58	10/29/2010	78.79	1336.8	44.36
3/4/2005	50.05	433.45	43.64	11/1/2010	80.77	1361.5	44.44
3/7/2005	50.13	433	43.58	11/2/2010	82.69	1358	44.36
3/8/2005	50.47	437.25	43.58	11/3/2010	83.42	1358.5	44
3/9/2005	51.05	439.5	43.55	11/4/2010	83.35	1361	44.38
3/10/2005	52.89	440.9	43.48	11/5/2010	85.01	1384.3	44.08
3/11/2005	52.1	443.7	43.45	11/8/2010	83.67	1390	43.9
3/14/2005	51.87	441.95	43.44	11/9/2010	83.88	1416.3	44.29
3/15/2005	53.29	440.65	43.46	11/10/2010	83.08	1402	44.25

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
3/16/2005	54.11	443	43.5	11/11/2010	82.99	1413	44.28
3/17/2005	53.04	438.6	43.55	11/12/2010	84.01	1387	44.28
3/18/2005	53.15	437.15	43.67	11/15/2010	83.55	1367	44.78
3/21/2005	53.68	432.7	43.61	11/16/2010	81.94	1363.3	45.11
3/22/2005	53.97	432.15	43.61	11/17/2010	82.3	1336.5	45.51
3/23/2005	54.61	426.15	43.66	11/18/2010	81.12	1356.8	45.09
3/24/2005	56.03	425.15	43.65	11/19/2010	81.68	1357.5	45.14
3/29/2005	55.79	426.1	43.67	11/22/2010	81.28	1357.5	45.25
3/30/2005	55.39	426.45	43.7	11/23/2010	80.75	1361	45.48
3/31/2005	51.52	427.5	43.69	11/24/2010	81.91	1376.3	45.56
4/1/2005	52.35	427.15	43.62	11/25/2010	82.62	1370.5	45.72
4/5/2005	51.75	424.6	43.68	11/26/2010	81.27	1366.5	45.72
4/6/2005	51.42	425.75	43.69	11/29/2010	82.97	1360	45.82
4/7/2005	50.63	428	43.72	11/30/2010	82.47	1375	45.8
4/8/2005	53.22	425.2	43.69	12/1/2010	84.06	1391.5	45.83
4/11/2005	54.14	429	43.66	12/2/2010	84.71	1390	45.29
4/12/2005	55.92	427.3	43.6	12/3/2010	85.33	1391.8	45.09
4/13/2005	54.53	427.5	43.62	12/6/2010	86.83	1411.5	44.9
4/14/2005	54.08	423.45	43.65	12/7/2010	87.05	1426	44.89
4/15/2005	52.57	424.6	43.64	12/8/2010	87.15	1395	44.7
4/18/2005	51.83	425.75	43.7	12/9/2010	87.93	1382	45
4/19/2005	51.21	427.45	43.62	12/10/2010	87.92	1390	45.13
4/20/2005	51.53	433.2	43.7	12/13/2010	88.08	1388.3	45.1
4/21/2005	49.67	434	43.58	12/14/2010	86.07	1405	45.18
4/22/2005	50.21	434.6	43.68	12/15/2010	85.49	1388.3	45.01
4/25/2005	49.52	432.9	43.66	12/16/2010	83.98	1384	45.38
4/26/2005	48.58	437	43.61	12/17/2010	83.36	1374.8	45.54
4/27/2005	50.79	434.35	43.6	12/20/2010	83.7	1381	45.16
4/28/2005	51.53	432.5	43.6	12/21/2010	83.17	1386	45.4
4/29/2005	51.73	435.7	43.68	12/22/2010	82.34	1389	45.19
5/3/2005	53.1	427.9	43.46	12/23/2010	82.37	1384	45.05
5/4/2005	52.47	428.8	43.56	12/24/2010	84.53	1380.5	45.06
5/5/2005	51.29	429.15	43.4	12/29/2010	85.9	1403.5	45
5/6/2005	50.74	425.15	43.33	12/30/2010	86.02	1411.5	44.97
5/9/2005	50.61	425.5	43.35	12/31/2010	88.56	1410.3	44.8
5/10/2005	50.89	427.4	43.45	1/4/2011	90.65	1405.5	44.9
5/11/2005	49.48	426.1	43.36	1/5/2011	91.25	1382.8	45.35
5/12/2005	50.36	424.25	43.21	1/6/2011	90.78	1376	45.15
5/13/2005	49.81	420	43.3	1/7/2011	89.74	1358	45.35
5/16/2005	49.7	419.25	43.35	1/10/2011	89.93	1368.3	45.36
5/17/2005	49.71	420	43.38	1/11/2011	89.54	1381	45.08
5/18/2005	50.61	419.75	43.41	1/12/2011	90.4	1383.5	45.02
5/19/2005	48.91	420.8	43.43	1/13/2011	90.63	1380.8	45.02
5/20/2005	47.4	418	43.45	1/14/2011	91.33	1369.3	45.41
5/23/2005	46.85	418	43.34	1/17/2011	91.09	1357.5	45.41
5/24/2005	46.42	418.3	43.45	1/18/2011	91.11	1368.8	45.32
5/25/2005	47.31	418.4	43.45	1/19/2011	91.31	1373.8	45.5
5/26/2005	47.35	418	43.43	1/20/2011	93.11	1364.5	45.77
5/27/2005	46.92	418.25	43.46	1/21/2011	93.55	1344	45.58
5/31/2005	47.28	414.45	43.46	1/24/2011	93.63	1347.5	45.51
6/1/2005	47.29	415.35	43.62	1/26/2011	93.08	1335.5	45.46

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
6/2/2005	49.24	420.4	43.71	1/27/2011	93.52	1337.5	45.68
6/3/2005	49.71	423.55	43.64	1/28/2011	93.52	1316	45.83
6/6/2005	49.42	425.85	43.5	1/31/2011	92.5	1333.5	45.92
6/7/2005	49.33	424.1	43.58	2/1/2011	93.23	1337.5	45.65
6/8/2005	49.3	424.55	43.53	2/2/2011	95.82	1337	45.55
6/9/2005	50.46	422.5	43.46	2/3/2011	93.52	1332.5	45.66
6/10/2005	51.3	422.55	43.46	2/4/2011	95.07	1347.5	45.6
6/13/2005	51.9	429.1	43.48	2/7/2011	94.95	1347	45.35
6/14/2005	52.61	426.85	43.6	2/8/2011	94.25	1354	45.15
6/15/2005	51.62	428.7	43.57	2/9/2011	95.05	1362.5	45.36
6/16/2005	51.92	433	43.56	2/10/2011	96.8	1358.8	45.64
6/17/2005	51.36	437.5	43.55	2/11/2011	97.86	1359	45.6
6/20/2005	51.98	439.35	43.5	2/14/2011	97.86	1356.8	45.44
6/21/2005	52	435.2	43.53	2/15/2011	97.86	1372.3	45.41
6/22/2005	53.52	437	43.5	2/17/2011	97.83	1377	45.25
6/23/2005	54.12	439.15	43.45	2/18/2011	98.42	1385.5	45.1
6/24/2005	54.3	440.55	43.51	2/21/2011	96.27	1399.5	45.1
6/27/2005	56.92	439.3	43.5	2/22/2011	96.84	1394.5	45.15
6/28/2005	57.1	437	43.44	2/23/2011	96.76	1401.3	45.06
6/29/2005	57.36	435.8	43.46	2/24/2011	96.76	1414.5	45.4
6/30/2005	56.06	437.1	43.5	2/25/2011	96.04	1405	45.26
7/1/2005	57.03	432.6	43.51	2/28/2011	96.48	1409.8	45.18
7/4/2005	57.21	427.4	43.45	3/1/2011	97.06	1414.5	44.82
7/5/2005	58.5	423.75	43.45	3/2/2011	98.97	1430.5	44.81
7/6/2005	57.75	423.5	43.55	3/3/2011	100.4	1430.5	45.04
7/7/2005	55.42	425.2	43.45	3/4/2011	101.3	1418	44.89
7/8/2005	55.36	424.4	43.59	3/7/2011	101.69	1437	44.95
7/11/2005	56.41	424.2	43.51	3/8/2011	99.43	1435	45.03
7/12/2005	57.13	426.25	43.51	3/9/2011	99.44	1431.5	44.88
7/13/2005	57.86	424.5	43.45	3/10/2011	99.25	1424.3	45.17
7/14/2005	58.38	424.3	43.46	3/11/2011	100.16	1409.8	45.24
7/15/2005	57.55	418.35	43.48	3/14/2011	100.74	1424.5	44.99
7/18/2005	59	420.9	43.45	3/15/2011	99.93	1407	45.22
7/19/2005	56.1	419.25	43.47	3/16/2011	103.12	1398.5	45
7/20/2005	58.95	422.15	43.48	3/17/2011	102.48	1403.5	45.12
7/21/2005	58.33	424.25	43.46	3/18/2011	102.78	1415.5	45.06
7/22/2005	56.79	425	43.05	3/21/2011	103.45	1427.8	44.98
7/25/2005	56.98	425.4	43.4	3/22/2011	102.2	1425.5	44.95
7/26/2005	56.25	423.25	43.45	3/24/2011	106.82	1441.3	44.69
7/27/2005	56.75	424	43.41	3/25/2011	109.77	1434	44.6
7/28/2005	56.39	426.4	43.34	3/28/2011	113.91	1420	44.8
7/29/2005	55.59	429	43.32	3/29/2011	111.47	1414	44.7
8/1/2005	56.98	431.65	43.4	3/30/2011	112.27	1419	44.75
8/2/2005	57.51	431	43.37	3/31/2011	113.34	1431	44.54
8/3/2005	58.58	434.6	43.41	4/1/2011	116.89	1434.5	44.44
8/4/2005	58.34	438.6	43.36	4/4/2011	114.42	1432.5	44.3
8/5/2005	58.28	438.25	43.43	4/5/2011	115.71	1434.5	44.3
8/8/2005	59.77	436.2	43.42	4/6/2011	116.58	1457	44.06
8/9/2005	60.56	433.3	43.44	4/7/2011	112.32	1456.5	44.18
8/10/2005	60.13	436.55	43.46	4/8/2011	115.19	1470.5	44.05
8/11/2005	60.04	440.75	43.54	4/11/2011	114.07	1469.5	44.33

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
8/12/2005	60.62	447.25	43.5	4/12/2011	114.07	1461.3	44.17
8/15/2005	60.73	443.5	43.48	4/13/2011	112.95	1458	44.46
8/16/2005	62.56	443	43.45	4/14/2011	111.11	1457.5	44.39
8/17/2005	62.79	442	43.45	4/15/2011	110.96	1472.5	44.26
8/18/2005	63.77	439.65	43.46	4/18/2011	114.18	1484.5	44.36
8/19/2005	65.9	439.65	43.5	4/19/2011	114.13	1495	44.49
8/22/2005	67.26	439.65	43.51	4/20/2011	114.92	1505	44.33
8/23/2005	66.68	439.35	43.58	4/21/2011	115.63	1507	44.26
8/24/2005	65.1	440	43.57	4/26/2011	115.41	1505	44.41
8/25/2005	63.41	438.85	43.69	4/27/2011	115.45	1508	44.51
8/26/2005	61.75	436.75	43.6	4/28/2011	115.95	1531	44
8/30/2005	65.87	430.65	43.86	5/3/2011	116.94	1546.5	44.27
8/31/2005	65.16	433.25	43.97	5/4/2011	118.63	1536	44.47
9/1/2005	65.25	439.6	44	5/5/2011	120.07	1514.5	44.35
9/2/2005	65.88	443.6	43.94	5/6/2011	122.87	1487.8	44.76
9/5/2005	66.23	446.05	43.87	5/9/2011	123.01	1505	44.72
9/6/2005	64.77	444.15	43.87	5/10/2011	122.9	1517.3	44.68
9/7/2005	66.15	445.05	43.82	5/11/2011	126.3	1524.5	44.75
9/8/2005	66.8	448.55	43.79	5/12/2011	126.46	1488.3	44.59
9/9/2005	66.79	448.25	43.78	5/13/2011	121.33	1511	44.98
9/12/2005	65.95	448.35	43.76	5/16/2011	122.7	1495	44.86
9/13/2005	64.16	445.4	43.75	5/17/2011	122.74	1495.5	45.15
9/14/2005	64.16	449.3	43.82	5/18/2011	124.63	1491.3	45.13
9/15/2005	63.6	454.8	43.83	5/19/2011	121.69	1488.8	45.06
9/16/2005	61.66	457.2	43.82	5/20/2011	121.35	1502.8	44.9
9/19/2005	62.62	464.5	43.81	5/23/2011	124.26	1508.5	44.99
9/20/2005	60.69	464.8	43.82	5/24/2011	123.64	1520.8	45.22
9/21/2005	61.31	469.1	43.82	5/27/2011	124.55	1525	45.33
9/22/2005	61.7	466.25	43.85	5/31/2011	126.59	1537	45.17
9/23/2005	61.9	462.65	43.8	6/2/2011	126.64	1540.8	44.84
9/26/2005	60.48	461.7	43.8	6/3/2011	124.01	1531	44.86
9/27/2005	64.04	464.1	43.86	6/6/2011	121.55	1542.8	44.82
9/28/2005	62.98	464	43.96	6/7/2011	111.93	1548.4	44.78
9/29/2005	64.31	472.4	43.98	6/8/2011	113.69	1535.5	44.67
9/30/2005	64.64	473.25	43.95	6/9/2011	113.21	1534	44.72
10/3/2005	62.17	466.1	43.94	6/10/2011	117.82	1541	44.64
10/4/2005	61.73	467.45	44	6/13/2011	115.66	1524.7	44.72
10/5/2005	62.56	463.5	44.1	6/14/2011	112.87	1519	44.85
10/6/2005	62.81	471.8	44.21	6/15/2011	113.08	1517.8	44.74
10/7/2005	62.02	472.7	44.18	6/16/2011	113.72	1525	44.79
10/10/2005	61.7	473.2	44.3	6/17/2011	109.39	1526.3	44.88
10/11/2005	61.64	475.5	44.3	6/20/2011	112.54	1537	44.76
10/12/2005	59.17	475.1	44.78	6/21/2011	113.2	1543	44.92
10/13/2005	59.33	469.5	44.74	6/22/2011	111.25	1546	44.84
10/14/2005	57.2	466	44.88	6/23/2011	110.13	1541.5	44.82
10/17/2005	57.29	474.5	44.76	6/24/2011	112.52	1521	44.89
10/18/2005	57.01	472	44.81	6/27/2011	114.47	1501	44.99
10/19/2005	58.1	465.9	45.05	6/28/2011	115.06	1502.5	44.94
10/20/2005	59.91	464.3	45.1	6/29/2011	114.85	1506	45
10/21/2005	59.48	462.85	45.11	7/1/2011	117.18	1492.8	44.59
10/24/2005	58.45	466.1	45.01	7/4/2011	116.15	1495.3	44.62

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
10/25/2005	59.81	472.25	45.11	7/5/2011	114.3	1498.8	44.62
10/26/2005	58.85	473.2	44.96	7/6/2011	115.09	1515.8	44.35
10/27/2005	58.13	474.4	45.01	7/7/2011	115.4	1526.3	44.48
10/28/2005	57.04	470.75	44.94	7/8/2011	116.14	1526	44.32
10/31/2005	56.94	470.75	45.01	7/11/2011	118.43	1543.5	44.41
11/1/2005	57.64	459.5	45.09	7/12/2011	119.95	1544.5	44.48
11/2/2005	58.72	460.8	45.02	7/13/2011	118.71	1571.5	44.6
11/3/2005	58.56	461.85	45.18	7/14/2011	120.49	1592.5	44.52
11/4/2005	58.1	460.5	45.23	7/15/2011	120.35	1578.5	44.5
11/7/2005	59.47	456.5	45.43	7/18/2011	114.67	1598.3	44.51
11/8/2005	58.47	461.6	45.78	7/19/2011	114.69	1602	44.6
11/9/2005	56.69	462.55	45.72	7/20/2011	113.74	1584.3	44.48
11/10/2005	58.53	467	45.73	7/21/2011	112.21	1600.5	44.44
11/11/2005	59.55	466.75	45.69	7/22/2011	112.02	1588	44.4
11/14/2005	60.48	467.5	45.69	7/25/2011	113.59	1618.5	44.34
11/15/2005	58.19	468.25	45.62	7/26/2011	108.27	1610	44.39
11/16/2005	57.89	475.75	45.61	7/27/2011	104.79	1621	44.1
11/17/2005	57.71	486.15	45.73	7/28/2011	104.57	1617.5	44.15
11/18/2005	55.85	485.85	45.67	7/29/2011	107.57	1613.8	44.03
11/21/2005	54.3	488.95	45.7	8/1/2011	111.49	1613.5	44.2
11/22/2005	54.1	492.6	45.7	8/2/2011	111.71	1624	44.06
11/23/2005	54.45	487.6	45.78	8/3/2011	109.82	1667.5	44.26
11/24/2005	53.68	493.4	45.71	8/5/2011	113.21	1665	44.56
11/25/2005	53.8	495.9	45.71	8/8/2011	113.55	1709.8	44.73
11/28/2005	52.84	496	45.77	8/9/2011	117.4	1770	45
11/29/2005	53.36	496	45.85	8/10/2011	117.4	1753.8	45.2
11/30/2005	54.21	495.65	45.84	8/11/2011	117.35	1786	45.25
12/1/2005	53.73	499.75	45.87	8/12/2011	117.36	1755	45.29
12/2/2005	53.41	502.5	45.97	8/15/2011	118.46	1738	45.39
12/5/2005	53.15	505.65	46.11	8/16/2011	117.38	1779	45.23
12/6/2005	52.91	504.25	46.26	8/17/2011	118.06	1792	45.25
12/7/2005	53.24	515.4	46.13	8/18/2011	117.05	1794.5	45.3
12/8/2005	53.25	515.7	46.17	8/19/2011	118.18	1862	45.71
12/9/2005	53.65	525.5	46.18	8/22/2011	118.52	1877.8	45.66
12/12/2005	54.91	536.5	46.11	8/23/2011	118.25	1886.5	45.56
12/13/2005	56.05	522.5	46	8/24/2011	118.99	1850	45.62
12/14/2005	55.68	509.5	46.01	8/25/2011	118.27	1716.5	45.89
12/15/2005	55.17	506.25	45.63	8/26/2011	118.14	1787	46.04
12/16/2005	56.26	507	45.28	8/30/2011	118.16	1791	45.95
12/19/2005	57.18	508.75	45.19	8/31/2011	115.93	1826	46.01
12/20/2005	57.23	502.5	44.94	9/1/2011	116.37	1815.5	45.79
12/21/2005	59.16	489	45.14	9/2/2011	116.02	1854	45.66
12/22/2005	59.59	500	45.17	9/5/2011	113.74	1896.5	45.74
12/28/2005	56.09	518	45.17	9/6/2011	110.22	1891	45.74
12/29/2005	56.08	513	45.17	9/7/2011	106.92	1844	46
1/3/2006	57.3	520.75	44.92	9/8/2011	103.06	1827	46.07
1/4/2006	56.28	534.35	44.73	9/9/2011	103.63	1879.5	46.2
1/5/2006	56.54	531.6	44.6	9/12/2011	103.84	1843	46.64
1/9/2006	56.91	541	44.2	9/13/2011	107.82	1806	47.22
1/10/2006	57.72	545.25	44.14	9/14/2011	108.17	1829	47.49
1/11/2006	58.34	542.25	43.89	9/15/2011	108.89	1806	47.58

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
1/13/2006	61.51	547.25	44.1	9/16/2011	109.69	1778	47.54
1/16/2006	61.25	559.4	44.1	9/19/2011	111.37	1817	47.27
1/17/2006	61.68	558.05	44.23	9/20/2011	108.36	1792	47.72
1/18/2006	62.43	544.75	44.29	9/21/2011	109.37	1810.3	47.93
1/19/2006	62.51	547.7	44.14	9/22/2011	108.83	1765.5	48.32
1/20/2006	62.32	559.25	44.1	9/23/2011	110.35	1730	49.47
1/23/2006	61.54	558.5	44.1	9/26/2011	111.91	1615	49.34
1/24/2006	62.95	556.65	44.19	9/27/2011	111.91	1671	49.47
1/25/2006	61.58	562.25	44.08	9/28/2011	112.29	1655	48.92
1/26/2006	62.34	562.25	44	9/30/2011	115.59	1629	48.93
1/27/2006	63.22	559.75	44	10/3/2011	116.48	1660	49.05
1/30/2006	63.6	560.3	44.04	10/4/2011	116.43	1672	49.09
1/31/2006	63.64	569.8	43.96	10/5/2011	115.92	1600	49.3
2/1/2006	64.92	567.2	44.13	10/7/2011	113.29	1651	49.18
2/2/2006	64.56	571.85	44.16	10/10/2011	117.5	1664	48.89
2/3/2006	63.82	571.85	44.14	10/11/2011	117.99	1662	48.89
2/6/2006	62.61	570	44.14	10/12/2011	115.1	1687	49.24
2/7/2006	62.93	568.25	44.15	10/13/2011	114.75	1673	48.95
2/8/2006	64.95	548.65	44.17	10/14/2011	114.08	1676	49.22
2/9/2006	65.14	559	44.1	10/17/2011	113.1	1689	48.89
2/10/2006	63.19	558.75	44.1	10/18/2011	116.71	1658	49.03
2/13/2006	65.64	546.6	44.17	10/19/2011	116.26	1651	49.33
2/14/2006	63.49	540.5	44.15	10/20/2011	112.89	1629	49.17
2/15/2006	62.54	544.3	44.15	10/21/2011	114.39	1623	49.86
2/16/2006	63.32	540.65	44.25	10/24/2011	114.26	1651	49.82
2/17/2006	61.64	545.75	44.33	10/25/2011	109.21	1656.3	49.72
2/20/2006	60.82	556	44.33	10/26/2011	109.17	1713	49.41
2/21/2006	60.7	553.4	44.36	10/27/2011	107.9	1708	49.4
2/22/2006	59.66	551.75	44.54	10/28/2011	109.54	1735	49
2/23/2006	59.16	552.5	44.36	10/31/2011	108.52	1718	48.63
2/24/2006	58.27	550.75	44.35	11/1/2011	107.08	1702	48.67
2/27/2006	57.67	556.1	44.41	11/2/2011	105.42	1731	49.26
2/28/2006	56.78	556.5	44.21	11/3/2011	103.61	1732.5	49.1
3/1/2006	58.34	562.6	44.35	11/4/2011	101.84	1756	49.04
3/2/2006	60.05	563.75	44.18	11/7/2011	103.77	1764	48.99
3/3/2006	59.35	568.6	44.09	11/8/2011	104.38	1794	48.94
3/6/2006	58.71	568	44.18	11/9/2011	106.56	1780	49.39
3/7/2006	58.71	555.25	44.24	11/10/2011	109.49	1766	50.05
3/8/2006	60.13	548.6	44.36	11/11/2011	109.22	1764	49.98
3/9/2006	59.44	547.25	44.3	11/14/2011	112.44	1780.5	49.98
3/10/2006	59.78	545.4	44.31	11/15/2011	112.45	1765	50.37
3/13/2006	61.12	545.25	44.38	11/16/2011	114.33	1773	50.62
3/14/2006	62.27	545.25	44.37	11/17/2011	112.92	1756	50.66
3/15/2006	62.69	551.25	44.11	11/18/2011	112.08	1730	50.95
3/16/2006	61.41	553.25	44.29	11/21/2011	111.76	1704	51.23
3/17/2006	59.79	555.5	44.26	11/22/2011	109	1697.5	52.06
3/20/2006	58.42	554.25	44.25	11/23/2011	111.6	1686	52.48
3/21/2006	58.82	553	44.29	11/24/2011	111.67	1699	52.26
3/22/2006	59.04	548.5	44.36	11/25/2011	112.11	1676	52.26
3/23/2006	60.99	548	44.43	11/28/2011	110.43	1714	52.23
3/24/2006	62.39	549.75	44.49	11/29/2011	112.45	1717	51.94

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
3/27/2006	63.12	564	44.58	11/30/2011	110.01	1704	51.9
3/28/2006	62.07	563.75	44.49	12/1/2011	108.43	1750	52.12
3/29/2006	63.54	562.25	44.53	12/2/2011	106.97	1751	51.36
3/30/2006	62.3	578.5	44.45	12/5/2011	110.82	1744	50.5
3/31/2006	59.96	584	44.48	12/6/2011	110.76	1720	51.31
4/3/2006	61.23	585.5	44.39	12/7/2011	112.22	1731	51.23
4/4/2006	61.76	585	44.58	12/8/2011	114.75	1739	51.62
4/5/2006	62.78	583.85	44.42	12/9/2011	115.61	1712	51.7
4/6/2006	62.59	595.5	44.49	12/12/2011	115.29	1680	51.87
4/7/2006	64.31	597	44.46	12/13/2011	113.32	1665	52.6
4/10/2006	64.88	597.5	44.66	12/14/2011	114.43	1635	53.09
4/11/2006	65.95	599.5	44.68	12/15/2011	112.57	1590	53.71
4/12/2006	66.06	596.75	45.09	12/16/2011	111.9	1589.5	53.55
4/13/2006	67.28	597	45.05	12/19/2011	111.91	1593	52.49
4/18/2006	66.74	616.75	44.97	12/20/2011	109.25	1605	52.69
4/19/2006	67.58	623.75	45.08	12/21/2011	107.82	1637.5	52.76
4/20/2006	67.11	644.5	45.01	12/22/2011	105.98	1609	52.39
4/21/2006	68.2	623.5	45.06	12/23/2011	107.77	1607.5	52.56
4/24/2006	68.52	634	45.05	12/29/2011	106.08	1537.5	52.93
4/25/2006	69.54	627.75	44.86	12/30/2011	109.38	1574.5	52.88
4/26/2006	69.39	630.75	44.88	1/3/2012	111.25	1590	53.11
5/2/2006	72.69	657.75	44.77	1/4/2012	111.22	1603	52.85
5/3/2006	72.57	675.25	44.82	1/5/2012	108.83	1614.5	52.89
5/4/2006	73.94	664.65	44.81	1/6/2012	109.59	1621	52.67
5/5/2006	73.96	682	44.81	1/9/2012	110.18	1618	52.39
5/8/2006	72.86	682	44.85	1/10/2012	110.16	1627	51.59
5/9/2006	73.46	679.75	44.82	1/11/2012	110.07	1641	51.78
5/10/2006	71.79	704.3	44.84	1/12/2012	108.23	1652.5	51.51
5/11/2006	72.15	707	44.84	1/13/2012	107.91	1642	51.43
5/12/2006	73.37	725.75	44.88	1/16/2012	107.82	1643.5	51.43
5/15/2006	74.45	693	44.89	1/17/2012	109.25	1662	50.69
5/16/2006	73.73	681	45.37	1/18/2012	105.72	1657	50.4
5/17/2006	71.84	713	45.05	1/19/2012	104.52	1664	50.3
5/18/2006	71.22	688	44.69	1/20/2012	104	1646	50.22
5/19/2006	68.26	682	45.26	1/23/2012	104.55	1675	49.99
5/22/2006	70.6	645.5	45.35	1/24/2012	107.8	1669	50.02
5/23/2006	69.83	661.7	45.42	1/25/2012	108	1659	50.18
5/24/2006	72.2	667.5	45.38	1/26/2012	108.98	1713	49.42
5/25/2006	71.3	643.75	45.56	1/27/2012	109.28	1722	49.39
5/26/2006	68.69	652	45.74	2/1/2012	107.54	1744	49.274
5/30/2006	67.52	652.25	45.74	2/2/2012	106.89	1747.5	49.03
5/31/2006	67.39	654	46.13	2/3/2012	108.09	1759.5	48.65
6/1/2006	66.93	633.25	46.22	2/7/2012	111.12	1720	49.2
6/2/2006	66.52	630.8	46.19	2/8/2012	113.37	1743	49.22
6/5/2006	68.97	644.5	45.67	2/9/2012	113.59	1733	49.35
6/6/2006	68.45	634.6	45.7	2/10/2012	111.96	1715.5	49.48
6/7/2006	68.51	623.5	45.8	2/13/2012	111.07	1727	49.14
6/8/2006	69.88	619	45.89	2/14/2012	113.3	1721	49.4
6/9/2006	69.16	612.25	45.91	2/15/2012	111.66	1725.5	49.35
6/12/2006	69.82	607.75	45.81	2/16/2012	112.97	1716	49.43
6/13/2006	67.57	590.75	45.71	2/17/2012	109.88	1732	49.31

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
6/14/2006	68.77	567.25	45.81	2/21/2012	110.55	1737	49.21
6/15/2006	68.42	574.25	45.5	2/22/2012	109.81	1754.8	49.24
6/16/2006	69.13	581.5	45.83	2/23/2012	109.54	1776.5	49.19
6/19/2006	68.25	569.75	45.69	2/24/2012	108.5	1778.5	48.98
6/20/2006	67.17	571	45.76	2/27/2012	109.46	1765	49.12
6/21/2006	65.76	576.5	45.8	2/28/2012	108.38	1774.8	49.01
6/22/2006	69.13	594.4	45.8	2/29/2012	108.48	1788	48.99
6/23/2006	68.62	582.6	45.99	3/1/2012	109.08	1721	49.14
6/26/2006	65.67	586.25	46.01	3/2/2012	110.5	1714.5	49.55
6/27/2006	65.52	587.7	46.22	3/5/2012	110.24	1698	49.82
6/28/2006	66.04	584	46.21	3/6/2012	110.26	1685.5	50.376
6/29/2006	65.01	581.75	46.25	3/7/2012	111.96	1682.5	50.27
6/30/2006	66.4	600.4	46.13	3/8/2012	110.96	1701.5	50.17
7/3/2006	67.57	619.5	45.87	3/9/2012	112.56	1699.5	49.75
7/4/2006	68.17	620.9	45.92	3/12/2012	115.47	1705.3	49.98
7/5/2006	69.6	625.75	45.92	3/13/2012	116.86	1694.8	49.92
7/6/2006	69.91	623.75	45.92	3/14/2012	117.18	1662	50
7/7/2006	69.85	631	45.99	3/15/2012	118.4	1646.8	50.28
7/10/2006	71.26	624.5	45.84	3/16/2012	118.13	1649	50.11
7/11/2006	71.76	628.35	45.97	3/19/2012	118.73	1654	50.16
7/12/2006	73.02	642	46.01	3/20/2012	118.3	1648.5	50.48
7/13/2006	73.2	648.8	46.09	3/21/2012	120.25	1656	50.6
7/14/2006	73.94	660.4	46.16	3/22/2012	121	1636	51.28
7/17/2006	73.17	671.5	46.19	3/23/2012	120.69	1651	51.18
7/18/2006	72.88	647.5	46.64	3/27/2012	120.85	1694	50.66
7/19/2006	73.12	626	46.61	3/28/2012	123.07	1677	50.97
7/20/2006	74.14	642.9	46.81	3/29/2012	124.53	1655.8	51.38
7/21/2006	72.39	626.75	46.75	3/30/2012	124.89	1660.8	50.89
7/24/2006	73.14	616.4	46.64	4/2/2012	126.46	1664	50.79
7/25/2006	73.04	618.75	46.83	4/3/2012	124.02	1674.8	50.64
7/26/2006	75.23	617.75	46.76	4/4/2012	122.23	1631.8	51.18
7/27/2006	76.13	634.2	46.68	4/5/2012	125.76	1622.5	51.11
7/28/2006	75.12	631.25	46.52	4/10/2012	126.68	1643.8	51.1
7/31/2006	75.32	637	46.53	4/11/2012	125.03	1654	51.47
8/1/2006	71.62	635.5	46.49	4/12/2012	125.37	1655.5	51.5
8/2/2006	72.56	648.25	46.51	4/13/2012	127.96	1670.5	51.22
8/3/2006	72.96	646.25	46.61	4/16/2012	128.08	1648.3	51.45
8/4/2006	72.09	644.5	46.48	4/17/2012	127.27	1652	51.6
8/7/2006	72.49	647.25	46.42	4/18/2012	128.14	1646.5	51.41
8/8/2006	73.76	645.4	46.51	4/19/2012	126.98	1642	51.79
8/9/2006	75.36	640.5	46.47	4/20/2012	123.63	1640	52.07
8/10/2006	73.95	650.5	46.4	4/23/2012	125.09	1632	52.02
8/11/2006	74.75	641.55	46.32	4/24/2012	125.76	1638.8	52.38
8/14/2006	76.39	628	46.5	4/25/2012	124.38	1641.3	52.63
8/15/2006	77.63	624.75	46.52	4/26/2012	123.89	1648.3	52.45
8/16/2006	76.28	626	46.47	4/27/2012	122.49	1654	52.44
8/17/2006	76.53	630.75	46.47	4/30/2012	125.21	1662.5	52.45
8/18/2006	77.82	614.75	46.36	5/1/2012	125.85	1661.3	52.65
8/21/2006	77.93	621.5	46.38	5/2/2012	125.25	1652.5	52.5
8/22/2006	78.26	626.5	46.4	5/3/2012	124.41	1642.5	52.97
8/23/2006	75.69	623.5	46.44	5/4/2012	123.23	1629.5	53.33

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
8/24/2006	75.19	623.5	46.45	5/8/2012	124.44	1627	52.91
8/25/2006	73.78	622	46.42	5/10/2012	123.04	1590	53.75
8/29/2006	72.67	616.85	46.47	5/11/2012	123.58	1580.8	53.25
8/30/2006	70.42	614.7	46.45	5/16/2012	121.89	1537.5	53.91
8/31/2006	71.3	621.75	46.37	5/17/2012	120.41	1547	54.34
9/1/2006	72.42	624	46.43	5/18/2012	120.57	1588	54.37
9/4/2006	72.06	626.75	46.38	5/21/2012	120.62	1590.3	54.48
9/5/2006	71.12	629.75	46.38	5/22/2012	118.23	1575.8	54.97
9/6/2006	71.4	636.7	46.19	5/23/2012	117.41	1555	55.34
9/7/2006	72.58	634	46.13	5/24/2012	115.18	1558.5	55.95
9/8/2006	69.44	611.5	46.14	5/25/2012	117	1560.5	55.55
9/11/2006	67.01	597.1	46.06	5/28/2012	118.08	1579	55.35
9/12/2006	67.15	596	46.19	5/29/2012	116.66	1573.8	55.35
9/13/2006	67.66	581.5	46.27	5/30/2012	117.74	1548.8	55.71
9/14/2006	70.49	593.4	46.18	5/31/2012	117.45	1567.5	56.13
9/15/2006	68.62	578.6	46.12	6/1/2012	119.33	1552.5	56.38
9/18/2006	65.94	581.5	45.95	6/6/2012	119.57	1633.3	55.54
9/19/2006	65.41	582.5	46.09	6/7/2012	117.57	1620.8	55.26
9/20/2006	64.52	576.25	46.08	6/8/2012	115.91	1576	54.91
9/21/2006	64.3	580.5	45.83	6/11/2012	111.66	1593	55.39
9/22/2006	62.41	592	45.74	6/13/2012	110.48	1612.8	55.6
9/25/2006	62.23	589.5	45.77	6/14/2012	111.89	1619	55.56
9/26/2006	61.28	591.25	45.83	6/15/2012	112.24	1622.3	55.7
9/27/2006	60.75	595.1	45.77	6/18/2012	112.5	1623.5	55.34
9/28/2006	60.23	603.5	45.76	6/19/2012	110.79	1628.5	55.85
9/29/2006	61.47	601.75	45.78	6/20/2012	111.4	1618.8	55.87
10/2/2006	62.52	602	45.95	6/21/2012	109.8	1600	56.24
10/3/2006	59.09	593	45.97	6/22/2012	109.31	1570.5	56.25
10/4/2006	59.27	578.5	45.68	6/25/2012	108.03	1569	57.11
10/5/2006	58.81	568.25	45.65	6/26/2012	109.02	1583.3	57.13
10/6/2006	57.89	570.6	45.57	6/27/2012	109.76	1567.5	56.95
10/9/2006	58.53	578.25	45.42	6/28/2012	106.88	1567.8	56.93
10/10/2006	57.6	577.25	45.42	6/29/2012	107.2	1569.5	56.81
10/11/2006	60.68	574	45.67	7/2/2012	107.86	1596.3	55.57
10/12/2006	59.09	575.9	45.55	7/4/2012	107.55	1617	54.31
10/13/2006	58.8	577.9	45.52	7/5/2012	103.85	1616.8	54.31
10/16/2006	56.28	593	45.31	7/6/2012	103.86	1591.8	54.95
10/17/2006	55.82	594.9	45.35	7/9/2012	98.63	1581	55.47
10/18/2006	57.93	595.25	45.19	7/10/2012	97.74	1594.5	55.87
10/19/2006	56.9	589.75	45.28	7/11/2012	98.65	1576.5	55.39
10/20/2006	59.25	598	45.22	7/12/2012	101.14	1565.5	55.52
10/23/2006	57.8	588.5	45.18	7/13/2012	100.05	1579	55.83
10/24/2006	57.75	578.4	45.3	7/16/2012	97.57	1584	55.1
10/25/2006	57.87	581.6	45.18	7/17/2012	98.6	1595	55.05
10/26/2006	58.97	591.8	45.36	7/18/2012	96.59	1579.5	55.03
10/27/2006	58.22	593.75	45.19	7/19/2012	97.29	1580	55.33
10/30/2006	60.13	604.75	45.07	7/20/2012	96.46	1583	55.16
10/31/2006	58.51	600.9	44.9	7/23/2012	97.13	1571.5	55.27
11/1/2006	57.74	611.25	44.9	7/24/2012	95.21	1573	55.92
11/2/2006	57.94	615.75	44.79	7/25/2012	95.14	1587.5	56.22
11/3/2006	56.56	625.65	44.82	7/26/2012	93.5	1603	56.1

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
11/6/2006	56.56	625.75	44.76	7/27/2012	89.22	1618.8	55.59
11/7/2006	58.79	625.75	44.8	7/30/2012	89.22	1616.5	55.39
11/8/2006	58.76	625.5	44.62	7/31/2012	88.69	1622.8	55.42
11/9/2006	57.99	618	44.59	8/1/2012	90.19	1614.8	55.55
11/10/2006	57.08	632.25	44.46	8/2/2012	92.06	1604.5	55.47
11/13/2006	56.13	628.5	44.55	8/3/2012	91.02	1595	55.84
11/14/2006	56.37	623.4	44.83	8/6/2012	94.17	1606.8	55.75
11/15/2006	56.26	620.25	45.05	8/7/2012	95.28	1613	55.52
11/16/2006	56.55	624.5	45.26	8/8/2012	99.89	1607	55.06
11/17/2006	57.02	618.25	44.82	8/10/2012	101.54	1608.5	55.17
11/20/2006	56.99	624	44.75	8/13/2012	98.5	1622.3	55.18
11/21/2006	57.18	625	44.89	8/14/2012	99.94	1614.5	55.34
11/22/2006	59.72	627.75	44.77	8/15/2012	99.15	1594.8	55.66
11/23/2006	59.18	630.7	44.62	8/16/2012	99.23	1603.5	55.66
11/24/2006	56.88	636	44.62	8/17/2012	99.18	1616.5	55.62
11/27/2006	57.9	637.5	44.59	8/20/2012	101.91	1615.3	55.62
11/28/2006	57.97	637.75	44.56	8/21/2012	102.1	1624	55.5
11/29/2006	59.5	638.25	44.58	8/22/2012	104.21	1640.5	55.46
11/30/2006	57.01	638.4	44.54	8/23/2012	105.92	1662.5	55.5
12/1/2006	57.38	644.4	44.59	8/24/2012	107.79	1666.5	55.14
12/4/2006	59.53	644.8	44.5	8/28/2012	103.91	1663.5	55.68
12/5/2006	58.66	643	44.49	8/29/2012	103.57	1664.3	55.65
12/6/2006	59.7	636.75	44.42	8/30/2012	102.35	1657	55.69
12/7/2006	60.72	630.5	44.6	8/31/2012	104.77	1657.8	55.63
12/8/2006	60.52	630.9	44.52	9/3/2012	106.3	1686	55.52
12/11/2006	61.22	625.5	44.53	9/4/2012	106.54	1691.5	55.52
12/12/2006	62.13	629.5	44.69	9/5/2012	105.93	1689.5	55.61
12/13/2006	64.36	629	44.7	9/6/2012	106.78	1708.5	55.88
12/14/2006	64.74	628.75	44.68	9/7/2012	107.55	1696	55.64
12/15/2006	63.97	626	44.56	9/10/2012	109.57	1732.8	55.27
12/18/2006	63.65	617.5	44.54	9/11/2012	110.01	1731	55.44
12/19/2006	63.7	616	44.63	9/12/2012	112.39	1742.8	55.25
12/20/2006	63.17	623.4	44.61	9/13/2012	113.42	1730.5	55.21
12/21/2006	63.67	622	44.55	9/14/2012	113.52	1772.5	55.34
12/22/2006	62.59	619.75	44.51	9/17/2012	113.13	1767.3	53.3
12/27/2006	61.89	628.3	44.37	9/18/2012	114.48	1756.8	53.88
12/28/2006	62.85	629	44.32	9/19/2012	113.9	1774.5	53.9
12/29/2006	62.91	635.7	44.2	9/20/2012	115.51	1760	53.99
1/2/2007	62.81	614.1	44.2	9/21/2012	116.12	1773.8	54.26
1/3/2007	62.19	628.25	44.13	9/24/2012	115.2	1758.5	53.46
1/4/2007	63.13	625.6	44.24	9/25/2012	115.5	1766.8	53.43
1/5/2007	62.13	623.25	44.16	9/26/2012	116.03	1763.8	53.36
1/8/2007	61.92	632.8	44.2	9/27/2012	115.77	1755.3	53.52
1/11/2007	60.7	637.5	44.44	9/28/2012	117.45	1781	52.99
1/12/2007	59.41	643	44.49	10/1/2012	115.76	1770.5	52.92
1/15/2007	58.96	648.75	44.43	10/2/2012	113.74	1778.5	52.46
1/17/2007	58.49	643.4	44.2	10/3/2012	112.62	1777.3	52.42
1/18/2007	56.63	642.25	44.09	10/4/2012	112.53	1786.5	52.25
1/19/2007	54.58	645.75	44.15	10/5/2012	112.28	1790	51.74
1/22/2007	52.82	652.55	44.15	10/8/2012	113.93	1769	51.77
1/23/2007	52.82	654.75	44.11	10/10/2012	114.98	1763	52.73

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
1/24/2007	52.38	648	44.14	10/11/2012	113.32	1767.3	53.05
1/25/2007	52.11	653.9	44.15	10/12/2012	114.5	1767	52.66
1/26/2007	51.68	655.25	44.15	10/15/2012	113.64	1747.3	52.81
1/29/2007	49.95	650.55	44.08	10/16/2012	113.84	1737.5	53.09
1/31/2007	51.28	663.35	44.23	10/17/2012	114.86	1747.8	52.89
2/1/2007	51.19	664.75	44.07	10/18/2012	114.86	1748	52.86
2/2/2007	50.83	668.25	44.01	10/19/2012	116	1732.8	53.46
2/5/2007	52.29	670	44	10/22/2012	117.48	1725	54.08
2/6/2007	54.34	665.25	44.03	10/23/2012	116.7	1717	53.51
2/7/2007	53.93	670.5	44.03	10/24/2012	113.29	1708.5	53.72
2/8/2007	55.11	668.6	44.01	10/25/2012	108.49	1715	53.73
2/9/2007	55.67	658.6	43.98	10/26/2012	109.41	1704	53.55
2/12/2007	55.29	676.4	43.93	10/29/2012	111.27	1712	53.55
2/13/2007	54.71	677.5	44	10/30/2012	109.2	1713.5	54.1
2/14/2007	54.69	684.5	44.02	10/31/2012	110.77	1718	53.96
2/15/2007	56.52	684.5	44	11/1/2012	108.99	1723.3	53.8
2/16/2007	56.74	677	43.91	11/2/2012	111.45	1708.3	53.76
2/19/2007	56.93	673.6	43.87	11/5/2012	111.36	1679	53.75
2/20/2007	58.67	664	43.87	11/6/2012	112.58	1691.8	54.6
2/21/2007	58.04	638.6	44.12	11/7/2012	112.49	1730.5	54.42
2/22/2007	58.35	644.6	44	11/8/2012	109.32	1715	54.37
2/23/2007	57.24	646.35	44.05	11/9/2012	110.48	1732.8	54.3
2/26/2007	57.21	653.75	44.08	11/12/2012	112.17	1735.8	54.61
2/27/2007	55.52	653.85	44.04	11/13/2012	112.6	1724.8	54.61
2/28/2007	56.12	652.5	44.21	11/14/2012	114.32	1724.5	54.82
3/1/2007	55.05	650.5	44.08	11/15/2012	116.11	1723.5	54.87
3/2/2007	54.25	640.75	44.11	11/16/2012	116.18	1710	54.65
3/5/2007	56.78	646.1	44.1	11/19/2012	115.17	1723.3	55.16
3/7/2007	55.91	654.5	44.18	11/20/2012	115	1734	55.05
3/8/2007	57.74	654.4	44.18	11/21/2012	115	1726.8	55.1
3/9/2007	58.62	660.5	44.19	11/22/2012	113.49	1729.8	55.14
3/12/2007	60.38	664	44.07	11/23/2012	112.58	1734.8	55.14
3/13/2007	60.34	662.15	44.11	11/26/2012	111.89	1747.3	55.44
3/14/2007	60.28	659.65	44.08	11/27/2012	109.62	1747.3	55.63
3/15/2007	59.39	665.15	44.25	11/28/2012	107.53	1741	55.35
3/16/2007	61.18	665.6	44.19	11/29/2012	107.66	1724.5	55.7
3/19/2007	61.92	664.9	44.08	11/30/2012	107.64	1728.3	54.71
3/20/2007	59.78	663.5	44.04	12/3/2012	108.9	1718	54.26
3/21/2007	59.68	663.3	43.53	12/4/2012	109.33	1706.8	54.66
3/22/2007	61.13	663.5	43.28	12/5/2012	109.4	1703	54.73
3/23/2007	60.9	665.9	43.52	12/6/2012	109.89	1693	54.46
3/26/2007	60.25	672.6	43.56	12/7/2012	108.84	1697	54.31
3/27/2007	60.59	676.85	43.2	12/10/2012	106.79	1708.5	54.35
3/28/2007	61.52	679.1	43.03	12/11/2012	105.59	1709.8	54.42
3/29/2007	60.89	678.5	42.78	12/12/2012	109.27	1712.5	54.31
3/30/2007	60.4	677	43.45	12/13/2012	108.21	1694.8	54.23
4/2/2007	60.93	687.25	43.1	12/14/2012	107.23	1696.5	54.36
4/3/2007	60.49	688	43.05	12/17/2012	108.61	1690	54.49
4/4/2007	60.11	690.4	43.04	12/18/2012	110.23	1699.5	54.68
4/5/2007	60.18	687.25	42.84	12/19/2012	108.82	1674.5	54.91
4/10/2007	63.1	687.6	42.74	12/20/2012	109.66	1667	54.67

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
4/11/2007	64.43	691	42.65	12/21/2012	110.07	1648.3	54.92
4/12/2007	64.25	689.7	42.65	12/24/2012	106.81	1662.5	55.06
4/13/2007	66.15	686.2	42.69	12/27/2012	110.01	1655.3	54.95
4/16/2007	67.19	685.5	42.65	12/28/2012	110.81	1658.8	54.86
4/17/2007	68.47	672.5	42.42	1/2/2013	110.14	1681.5	54.23
4/18/2007	68.94	678	41.75	1/3/2013	110.18	1684.5	54.46
4/19/2007	68	677.5	41.98	1/4/2013	109.33	1632.3	54.93
4/20/2007	68.09	673.25	42	1/7/2013	108.26	1653.8	55.2
4/23/2007	69.15	675.9	42.08	1/8/2013	110.47	1653.8	55.02
4/26/2007	67.64	686.5	40.75	1/9/2013	110.84	1663.5	54.79
4/27/2007	68.6	677.85	40.58	1/10/2013	111.27	1663	54.49
4/30/2007	67.79	667.85	40.56	1/11/2013	109.99	1669.5	54.81
5/1/2007	68.78	674.2	40.79	1/14/2013	108.96	1667.8	54.5
5/2/2007	67.1	667	41.04	1/15/2013	108.01	1681	54.58
5/3/2007	66.34	670.9	41	1/16/2013	107.16	1679.8	54.66
5/4/2007	65.09	663.2	41.04	1/17/2013	108.25	1683.3	54.35
5/8/2007	66.34	660.75	40.58	1/18/2013	107.6	1690	53.82
5/9/2007	66.8	662.4	40.53	1/21/2013	110.17	1688	53.82
5/10/2007	67.94	663.5	40.64	1/22/2013	110.18	1692.5	53.72
5/11/2007	67.44	659.2	40.67	1/23/2013	109.28	1692.3	53.66
5/14/2007	67.51	661.5	41.04	1/24/2013	109.35	1677	53.67
5/15/2007	67.28	655	40.74	1/25/2013	109.96	1670.3	53.78
5/16/2007	67.23	657.6	40.59	1/28/2013	109.95	1656.8	53.97
5/17/2007	67.4	657.1	40.64	1/29/2013	110.57	1660.5	53.64
5/18/2007	65.57	656.6	40.58	1/30/2013	109.13	1666.3	53.21
5/21/2007	64.85	662.5	40.59	1/31/2013	108.44	1674.5	53.32
5/22/2007	65.14	670.75	40.36	2/4/2013	110.72	1664.3	53.24
5/23/2007	62.7	671.3	40.48	2/5/2013	110.04	1678	52.99
5/24/2007	63.55	669.8	40.14	2/6/2013	110.05	1670	53.07
5/25/2007	63.5	670.85	40.28	2/7/2013	110.8	1675.8	53.22
5/29/2007	65.18	656.75	40.28	2/11/2013	112.98	1663.5	53.95
5/30/2007	65.86	652.75	40.28	2/12/2013	113.03	1641.8	53.75
5/31/2007	66.74	652.8	40.19	2/13/2013	112.58	1648	53.79
6/1/2007	66.83	644.1	40.53	2/14/2013	112.49	1644	53.94
6/4/2007	69.08	650.75	40.36	2/15/2013	113.03	1629.3	54.28
6/5/2007	69.26	650.6	40.27	2/18/2013	113.07	1611.3	54.28
6/6/2007	69.51	658	40.5	2/19/2013	112.97	1613.5	54.26
6/7/2007	70.05	655.1	40.28	2/20/2013	110.3	1602	54.18
6/8/2007	71.01	659.6	40.41	2/21/2013	111.32	1568.5	54.47
6/11/2007	71.96	654.5	40.51	2/22/2013	111.72	1580	54.28
6/12/2007	70.72	652	40.82	2/25/2013	110.97	1592.5	53.96
6/14/2007	69.31	649.55	40.48	2/26/2013	111.01	1597.3	54.14
6/15/2007	67.64	642.85	40.7	2/27/2013	111.71	1608.5	53.72
6/18/2007	68.18	645.7	40.66	3/1/2013	112.72	1570	54.9
6/19/2007	68.65	648.5	40.52	3/4/2013	113.68	1578	54.92
6/20/2007	70.9	650.5	40.5	3/5/2013	114.59	1584.3	54.87
6/21/2007	71.36	657.25	40.58	3/6/2013	113.88	1574	54.83
6/22/2007	71.5	654	40.59	3/7/2013	113.92	1580.5	54.45
6/25/2007	72.36	655.9	40.59	3/8/2013	115.22	1577	54.32
6/26/2007	70.04	647.75	40.55	3/11/2013	115.42	1577.5	54.38
6/27/2007	68.85	657	40.73	3/12/2013	115.55	1582.5	54.19

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
6/28/2007	68.56	661.15	40.9	3/13/2013	115.55	1591.5	54.3
6/29/2007	69.24	664	40.88	3/14/2013	116.06	1585	54.22
7/2/2007	71.18	663	40.8	3/15/2013	117.03	1593.3	54.06
7/3/2007	71.63	667.5	40.58	3/18/2013	116.61	1599.5	54.1
7/4/2007	72.33	667.25	40.42	3/19/2013	117.17	1602.5	54.4
7/5/2007	72.17	663.15	40.41	3/20/2013	118.9	1611.5	54.32
7/6/2007	70.55	667.75	40.41	3/21/2013	118.29	1608.8	54.27
7/9/2007	71.81	673	40.34	3/22/2013	117.89	1611.5	54.3
7/10/2007	72.04	676	40.36	3/25/2013	118.43	1602.3	54.22
7/11/2007	71.36	683.5	40.37	3/26/2013	118.48	1597.3	54.42
7/12/2007	71.41	682.75	40.3	3/27/2013	117.4	1591	54.45
7/13/2007	71.84	677.25	40.31	4/2/2013	116.23	1597.8	54.28
7/16/2007	71.96	675.4	40.28	4/3/2013	114.19	1568.5	54.43
7/17/2007	72.22	663.5	40.26	4/4/2013	113.74	1545.3	54.46
7/18/2007	72.9	661.5	40.22	4/5/2013	114.55	1552.8	54.91
7/19/2007	74.26	666.75	40.23	4/8/2013	112.96	1577.3	54.75
7/23/2007	75.4	665.35	40.26	4/9/2013	112.24	1572.5	54.58
7/24/2007	76.58	666.35	40.18	4/10/2013	112.2	1581.5	54.47
7/25/2007	77.1	674.15	40.12	4/11/2013	110.14	1555.8	54.41
7/26/2007	77.88	669.25	40.15	4/12/2013	109.9	1548	54.36
7/27/2007	77.44	670.4	40.24	4/15/2013	110.42	1416	54.62
7/30/2007	78.24	670.85	40.24	4/16/2013	110.27	1378	54.48
7/31/2007	78.12	664.5	40.38	4/17/2013	110.42	1379	54.08
8/1/2007	78.17	669.85	40.27	4/18/2013	108.91	1397	54.16
8/2/2007	77.59	667.35	40.18	4/19/2013	108.64	1414	53.95
8/3/2007	78	665	40.25	4/22/2013	108.48	1425	53.98
8/6/2007	78.37	664.15	40.36	4/23/2013	107.51	1417.3	54.19
8/7/2007	79.09	653	40.25	4/24/2013	108.1	1424.5	54.39
8/8/2007	78.36	658.5	40.25	4/25/2013	109.32	1446.5	54.22
8/9/2007	75.88	655.5	40.26	4/26/2013	108.54	1462.3	54.11
8/10/2007	75.21	657.15	40.29	4/29/2013	106.91	1472.5	54.41
8/13/2007	77.28	662.25	40.4	4/30/2013	108.27	1472.8	54.2
8/14/2007	76.58	659.75	40.45	5/1/2013	106.41	1469.5	53.68
8/15/2007	76.07	667	40.4	5/2/2013	106.51	1456	53.65
8/16/2007	77.01	664.75	40.8	5/3/2013	106.66	1476.5	53.79
8/17/2007	77.11	666.3	40.55	5/7/2013	108.51	1463	54.13
8/20/2007	76.14	668	41.15	5/8/2013	108.46	1454	54.06
8/21/2007	75.36	672.75	41.04	5/10/2013	108.76	1449.3	54.34
8/22/2007	72.69	673.5	40.91	5/13/2013	109.66	1429.8	54.94
8/23/2007	70.42	679.5	41.01	5/14/2013	107.82	1436.5	54.85
8/24/2007	70.73	683.5	40.77	5/15/2013	105.09	1412.3	54.5
8/28/2007	69.57	695	40.9	5/16/2013	103.98	1377	54.78
8/29/2007	71.3	704	40.88	5/17/2013	103.16	1376.8	54.68
8/30/2007	69.29	704.25	41.1	5/20/2013	104.08	1353.8	55.17
8/31/2007	71.3	711.75	40.95	5/21/2013	104.8	1378.8	55.02
9/3/2007	68.77	708.1	41.02	5/22/2013	103.62	1385.3	55.42
9/4/2007	69.8	706.75	40.63	5/23/2013	100.58	1386	55.62
9/5/2007	68.37	710.25	40.63	5/24/2013	99.32	1385.3	55.7
9/6/2007	67.88	717.7	40.76	5/28/2013	96.84	1379	55.78
9/7/2007	67.73	723.75	40.81	5/29/2013	97.48	1384.5	56.07
9/10/2007	68.73	727.75	40.6	5/30/2013	98.94	1406.3	56.28

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
9/11/2007	69.49	735.35	40.4	5/31/2013	99.07	1410.3	56.5
9/12/2007	68.85	733.25	40.48	6/3/2013	99.25	1396.8	56.5
9/13/2007	69.66	727.7	40.36	6/4/2013	100.71	1405.3	56.66
9/14/2007	70.48	730.55	40.34	6/5/2013	101.62	1396.5	56.43
9/17/2007	71.46	729.75	40.25	6/6/2013	102.39	1399.5	56.84
9/18/2007	72.29	737.75	40.4	6/7/2013	102.88	1410	56.92
9/20/2007	74.22	735.75	40.45	6/10/2013	101.53	1376.8	56.57
9/21/2007	74.72	733.15	39.81	6/11/2013	98.34	1369.5	58.13
9/24/2007	76.21	726.75	39.87	6/12/2013	100.32	1377.3	58.34
9/25/2007	75.08	735.85	39.84	6/13/2013	104.6	1386.3	57.82
9/26/2007	74.97	736.5	39.5	6/14/2013	105	1379.8	58.07
9/27/2007	76.23	728.8	39.55	6/17/2013	105.18	1386	57.56
9/28/2007	77.15	740.5	39.5	6/18/2013	103.79	1378.5	57.97
10/1/2007	77.84	747.5	39.65	6/19/2013	103.59	1366	58.79
10/2/2007	78.27	748.5	39.75	6/20/2013	101.31	1303.3	58.7
10/3/2007	77.99	755.85	39.7	6/21/2013	102.17	1290.3	59.57
10/4/2007	77	761.75	39.65	6/24/2013	102.7	1283.3	59.43
10/5/2007	78.47	759.75	39.38	6/25/2013	101.57	1285	59.8
10/8/2007	78.48	758.35	39.37	6/26/2013	104.27	1229	59.66
10/9/2007	78.91	768.25	39.47	6/27/2013	103.83	1232	60.7
10/10/2007	77.87	755.6	39.47	6/28/2013	104.55	1203.3	60.19
10/11/2007	76.82	757.5	38.48	7/1/2013	103.1	1243.5	59.52
10/12/2007	76.21	757.35	39.13	7/2/2013	102.14	1260.8	59.38
10/15/2007	78.88	765	39.2	7/3/2013	100.46	1246	59.54
10/16/2007	80.97	775.6	39.16	7/4/2013	101.24	1249.5	60.21
10/17/2007	78.33	792.5	39.29	7/8/2013	103.77	1225.5	60.23
10/18/2007	76.87	784	39.23	7/9/2013	102.14	1252	60.75
10/19/2007	77.8	783	39.35	7/10/2013	101.79	1252.3	60.09
10/22/2007	77.84	792	39.72	7/11/2013	100.43	1280.8	59.88
10/23/2007	79.05	790.75	39.6	7/12/2013	101.63	1275	59.82
10/24/2007	76.94	802.5	39.72	7/15/2013	102.04	1281.3	59.88
10/25/2007	77.82	817.55	39.48	7/16/2013	103.51	1286	59.89
10/26/2007	77.85	841.75	39.49	7/17/2013	103.37	1284.3	59.29
10/29/2007	80.83	832.25	39.35	7/18/2013	104.07	1279.8	59.34
10/30/2007	80.82	836	39.3	7/19/2013	103.87	1286	59.59
10/31/2007	82.5	817	39.32	7/22/2013	101.5	1313.8	59.37
11/1/2007	84.43	803.4	39.3	7/23/2013	103.11	1326.8	59.71
11/2/2007	85.24	808.25	39.26	7/24/2013	103.38	1340	59.64
11/5/2007	85.03	806	39.22	7/25/2013	105.1	1312	59.14
11/6/2007	84.25	790.25	39.25	7/26/2013	105.8	1327.8	59.01
11/7/2007	82.72	788.5	39.18	7/29/2013	105.21	1330.8	59.08
11/8/2007	82.31	789.65	39.23	7/30/2013	105.56	1322.3	59.33
11/9/2007	83.47	796.25	39.15	7/31/2013	102.72	1331.5	60.8
11/12/2007	85.4	802.25	39.13	8/1/2013	100.36	1323.8	60.77
11/13/2007	84.71	810.5	39.11	8/2/2013	99.8	1285.8	60.45
11/14/2007	89.87	836.25	39.11	8/5/2013	101.51	1311	60.88
11/15/2007	89.87	823.25	39.22	8/6/2013	100.62	1292	60.88
11/16/2007	89.87	796.5	39.18	8/7/2013	102.74	1275.5	60.78
11/19/2007	90.36	807.25	39.18	8/8/2013	102.49	1287.8	61.2
11/20/2007	92.11	794.75	39.24	8/9/2013	103.19	1305.5	60.72
11/21/2007	92.16	783.75	39.23	8/12/2013	103.96	1325.8	60.34

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
11/22/2007	93.99	790.25	39.32	8/13/2013	106.12	1334	61.15
11/23/2007	94.85	801.75	39.29	8/15/2013	107.46	1339.5	61.27
11/26/2007	94.4	788.75	39.29	8/16/2013	107.75	1360.8	61.41
11/27/2007	92.32	799.75	39.65	8/19/2013	107.9	1375.3	61.65
11/28/2007	91.56	800	39.58	8/20/2013	108.43	1365.8	63.13
11/29/2007	89.09	806.75	39.68	8/21/2013	108.18	1360	63.21
11/30/2007	90.73	807.5	39.56	8/22/2013	109.03	1370.5	64.11
12/3/2007	90.32	809	39.65	8/23/2013	109.05	1374.5	64.55
12/4/2007	91.99	796.25	39.52	8/27/2013	109.67	1411	64.26
12/5/2007	91.59	787	39.39	8/28/2013	109.71	1425.5	66.24
12/6/2007	94.13	796.25	39.33	8/29/2013	109.34	1406.3	68.8
12/7/2007	94.97	801.5	39.31	8/30/2013	108.82	1392.8	66.55
12/11/2007	95.33	803	39.36	9/2/2013	109.27	1391.3	65.71
12/12/2007	94.88	810.25	39.3	9/3/2013	108.23	1391.3	65.71
12/13/2007	93.23	822.5	39.31	9/4/2013	108.1	1403.8	67.71
12/14/2007	91.64	828.5	39.29	9/5/2013	107.57	1391.8	67.08
12/17/2007	92.34	836.5	39.29	9/6/2013	108.1	1368.3	66.01
12/18/2007	88.71	836.25	39.3	9/9/2013	107.47	1386	65.23
12/19/2007	87.85	823.25	39.49	9/10/2013	107.89	1373	65.24
12/20/2007	89.97	796.5	39.48	9/11/2013	109.94	1365.3	63.83
12/21/2007	90.7	807.25	39.55	9/12/2013	109.63	1340.3	63.26
12/24/2007	88.46	794.75	39.41	9/13/2013	109.81	1308.3	63.42
12/27/2007	87.33	783.75	39.38	9/16/2013	108.77	1314.8	63.36
12/28/2007	87.77	790.25	39.38	9/17/2013	108.39	1317.3	62.83
12/31/2007	91.69	801.75	39.38	9/18/2013	107.32	1299.8	63.36
1/2/2008	92.57	840.75	39.41	9/19/2013	108.49	1363.5	63.37
1/3/2008	91.86	865.35	39.26	9/20/2013	109.28	1355.3	61.76
1/4/2008	90.32	858.75	39.15	9/23/2013	110.69	1321.8	62.27
1/7/2008	90.71	857.5	39.15	9/24/2013	110.26	1316.5	62.57
1/8/2008	90.98	873.25	39.13	9/25/2013	111.58	1320.3	62.72
1/9/2008	91.06	887.85	39.13	9/26/2013	111.82	1332.5	62.2
1/10/2008	91.03	874.25	39.27	9/27/2013	111.41	1321.5	61.68
1/11/2008	91.59	893.75	39.15	9/30/2013	110.74	1335.8	62.48
1/16/2008	95.66	881	39.29	10/1/2013	110.82	1332.3	62.58
1/17/2008	95.92	881.5	39.16	10/2/2013	110.51	1293.8	62.46
1/18/2008	93.68	872.75	39.2	10/3/2013	112.12	1309	62.46
1/22/2008	97.01	862	39.38	10/4/2013	112.23	1316	61.97
1/23/2008	98.45	887.8	39.55	10/7/2013	115.21	1311	61.42
1/24/2008	96.87	891.5	39.37	10/8/2013	116.27	1321	61.79
1/25/2008	94.19	921.25	39.33	10/9/2013	116.91	1309.5	61.79
1/28/2008	96.37	916.5	39.35	10/10/2013	115.97	1298	61.92
1/29/2008	96.76	927.5	39.28	10/14/2013	115.49	1276	61.07
1/30/2008	92.8	923.75	39.35	10/15/2013	115.65	1255.5	61.07
1/31/2008	91.86	923.75	39.31	10/16/2013	115.81	1278.3	61.84
2/1/2008	92.58	933	39.12	10/17/2013	117.15	1308.5	61.72
2/4/2008	90.87	899.5	39.13	10/18/2013	115.2	1317	61.13
2/5/2008	88.1	889.75	39.4	10/21/2013	112.1	1316	61.26
2/6/2008	88.96	892	39.49	10/22/2013	112.37	1311.8	61.56
2/7/2008	89.66	908.25	39.43	10/23/2013	113.11	1333	61.64
2/11/2008	88.11	925.5	39.6	10/24/2013	113.31	1336.3	61.54
2/12/2008	87.06	920.25	39.56	10/25/2013	110.86	1341.8	61.48

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
2/13/2008	87.69	905.75	39.75	10/28/2013	109.05	1351	61.4
2/14/2008	90.96	910.85	39.57	10/29/2013	109.09	1346.8	61.54
2/15/2008	90.91	909.75	39.65	10/30/2013	110.66	1349.5	61.34
2/18/2008	92.49	905	39.65	10/31/2013	110.22	1333.8	61.09
2/19/2008	92.46	916.5	39.91	11/1/2013	108.56	1314.8	61.61
2/20/2008	91.58	924.85	40.11	11/4/2013	107.68	1314.3	61.84
2/21/2008	91.41	943	39.83	11/5/2013	109.46	1311.3	61.74
2/22/2008	91.09	945.75	40.04	11/6/2013	108.86	1317	61.76
2/25/2008	89.6	947.5	39.9	11/7/2013	109.45	1316	62.48
2/26/2008	88.73	934	39.89	11/8/2013	107.85	1309	62.41
2/27/2008	88.55	958.75	39.68	11/11/2013	107.32	1283.8	62.48
2/28/2008	91.45	957	39.84	11/12/2013	109.09	1281	62.48
2/29/2008	93.93	969	39.96	11/13/2013	109.49	1276	63.73
3/3/2008	94.28	978.25	40.33	11/14/2013	109.42	1283.3	63.28
3/4/2008	93.82	981.75	40.27	11/15/2013	109.66	1281.8	63.12
3/5/2008	95.92	966.25	40.19	11/18/2013	110.56	1283.5	62.97
3/6/2008	96.96	986.25	40.13	11/19/2013	109.02	1272.3	62.07
3/10/2008	97.03	973.15	40.39	11/20/2013	111.63	1271.5	62.26
3/11/2008	97.88	980.5	40.23	11/21/2013	110.65	1248.5	62.34
3/12/2008	97.52	975.75	40.02	11/22/2013	110.13	1241.8	62.94
3/13/2008	96.07	988.25	40.18	11/25/2013	110.67	1231.8	62.72
3/14/2008	97.43	997	40.4	11/26/2013	110.79	1250.8	62.37
3/17/2008	99.05	1023.5	40.46	11/27/2013	109.55	1250.8	62.47
3/18/2008	98.28	1005.8	40.2	11/28/2013	109.4	1241.8	62.47
3/19/2008	99.83	995.25	40	11/29/2013	109.47	1245.3	62.47
3/20/2008	100.9	913.5	40.32	12/2/2013	109.57	1237.5	62.39
3/25/2008	98.6	930.65	40.03	12/3/2013	107.74	1219	62.3
3/26/2008	100.95	945.75	39.93	12/4/2013	106.63	1213	62.38
3/27/2008	103.47	948.25	39.96	12/5/2013	105.7	1234	61.9
3/28/2008	104.66	944.5	39.95	12/6/2013	108.29	1230.8	61.6
3/31/2008	105.33	937.25	39.76	12/9/2013	108.04	1228.5	61.43
4/1/2008	106.78	897	40.02	12/10/2013	108.41	1245.8	60.87
4/2/2008	107.99	893.5	39.88	12/11/2013	107.53	1255.3	61.04
4/3/2008	109.18	898.25	39.88	12/12/2013	105.78	1243.5	61.38
4/4/2008	109.16	905.25	39.94	12/13/2013	104.85	1222.8	61.85
4/7/2008	104.41	914.7	39.93	12/16/2013	105.01	1229.5	62.16
4/8/2008	105.35	921	39.96	12/17/2013	105.46	1237.3	61.68
4/9/2008	102.65	906.75	39.9	12/18/2013	103.08	1233.3	61.92
4/10/2008	99.78	934.25	39.91	12/19/2013	104.29	1205.3	62.06
4/14/2008	100.93	917.75	39.84	12/20/2013	105.76	1195	62.14
4/15/2008	99.91	931.75	39.86	12/23/2013	106.29	1192.8	61.98
4/16/2008	102.83	932.75	39.83	12/24/2013	106.9	1196.5	61.83
4/17/2008	103.89	951.5	39.89	12/27/2013	108.29	1209.3	61.75
4/18/2008	102.68	942.25	39.79	12/30/2013	108.25	1201.5	61.75
4/21/2008	102.33	915.75	39.73	12/31/2013	108.8	1201.5	62.15
4/22/2008	98.69	920.75	39.92	1/2/2014	108.29	1219.8	62.31
4/23/2008	98.85	916.25	39.93	1/3/2014	108.27	1232.3	62.17
4/24/2008	102.31	900.75	40	1/6/2014	109.9	1238	62.31
4/25/2008	102.21	883.5	40.14	1/7/2014	111.36	1237.5	62.3
4/28/2008	105.98	892.25	40.13	1/8/2014	110.83	1226.5	62.07
4/29/2008	105.05	886	40.1	1/9/2014	112.04	1226	62.07

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
4/30/2008	107.46	867.75	40.37	1/10/2014	111.32	1232.3	61.45
5/1/2008	107.37	863.5	40.45	1/14/2014	111.07	1248.8	61.51
5/2/2008	107.15	854.25	40.58	1/15/2014	111.49	1238	61.54
5/6/2008	110.84	878	40.45	1/16/2014	113.06	1237.3	61.54
5/7/2008	110.95	874	40.8	1/17/2014	113.27	1241	61.54
5/8/2008	111.34	872.25	41.3	1/20/2014	112.07	1254.8	61.54
5/9/2008	110.67	887.25	41.66	1/21/2014	111.5	1247.8	61.94
5/12/2008	111.35	882.5	41.55	1/22/2014	110.07	1239.5	61.86
5/13/2008	113.54	877	42	1/23/2014	108.91	1244.3	62.11
5/14/2008	115.34	863	42.08	1/24/2014	109.47	1259.3	62.68
5/15/2008	114.85	866.25	42.34	1/27/2014	108.99	1270	63.09
5/16/2008	116.62	885	42.6	1/28/2014	108.08	1253.5	62.56
5/19/2008	115.7	908.75	42.5	1/29/2014	110.3	1254.8	62.46
5/20/2008	113.86	907	42.46	1/30/2014	108.91	1254	62.56
5/21/2008	111.12	925	42.5	1/31/2014	109.56	1246.5	62.63
5/22/2008	107.3	928.25	42.77	2/3/2014	110.78	1246.5	62.63
5/23/2008	111.92	922.25	42.93	2/4/2014	112.15	1253	62.27
5/27/2008	119.88	923.75	42.68	2/5/2014	111.58	1257	62.57
5/28/2008	120.27	892	42.86	2/6/2014	111.57	1258.5	62.14
5/29/2008	119.85	893	42.75	2/10/2014	111.65	1273.5	62.44
5/30/2008	123.54	879.5	42.53	2/11/2014	112.06	1282.8	62.15
6/2/2008	122.89	891.25	42.15	2/12/2014	110.47	1286.5	61.84
6/3/2008	123.11	895.5	42.38	2/13/2014	109.95	1290.3	62.23
6/4/2008	121.18	877.25	42.5	2/17/2014	107.94	1326	62.23
6/5/2008	122.76	873	42.6	2/18/2014	106.57	1314	62.2
6/6/2008	122.98	883.5	42.82	2/19/2014	106.71	1318.8	62.32
6/9/2008	122.19	904.25	42.63	2/20/2014	107.01	1313.8	62.21
6/10/2008	124.12	884.5	42.85	2/21/2014	107.42	1320.8	62.13
6/11/2008	127.28	874.25	42.92	2/24/2014	107.49	1333	62.07
6/12/2008	129.04	871.25	42.65	2/25/2014	106.44	1332.8	61.96
6/13/2008	129.72	864	42.7	2/26/2014	108.02	1340	62.11
6/17/2008	128.92	883	42.93	2/27/2014	107.12	1331	62.11
6/18/2008	128.93	884	42.86	2/28/2014	108.09	1327.8	61.78
6/19/2008	129.33	893.25	42.8	3/3/2014	107.46	1344.3	62.17
6/20/2008	127.85	900	42.91	3/4/2014	108.45	1339.5	61.91
6/23/2008	128.5	905.25	42.86	3/5/2014	108.01	1333.5	61.75
6/24/2008	126.28	888.5	42.97	3/6/2014	109.17	1334.3	60.89
6/25/2008	121.72	887.25	42.75	3/7/2014	109.69	1348.3	61.24
6/26/2008	122.36	892.5	42.73	3/10/2014	109.69	1334.3	60.84
6/27/2008	132.81	923	42.6	3/11/2014	109.14	1348	61.01
6/30/2008	134.43	932.75	42.78	3/12/2014	108.72	1355.8	61.01
7/1/2008	135.24	929.5	42.93	3/13/2014	109.1	1371	61.2
7/2/2008	134.52	936	43.23	3/14/2014	108.83	1370	61.19
7/3/2008	132.11	939.75	43.15	3/17/2014	109.36	1379	61.08
7/4/2008	134.29	930.75	43.17	3/18/2014	108.16	1362.5	61.1
7/7/2008	133.9	921	43.17	3/19/2014	106.55	1346	60.95
7/8/2008	131.27	929.25	43.29	3/20/2014	107.04	1327	61.33
7/9/2008	129.12	923.25	43.23	3/21/2014	106.81	1338.5	60.9
7/10/2008	131.84	930.75	43.02	3/24/2014	108.15	1322	60.78
7/11/2008	134.28	949	42.94	3/25/2014	110.12	1314.8	60.27
7/14/2008	134.54	957.75	42.8	3/26/2014	110.18	1314.5	60.13

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
7/15/2008	135.37	981.75	42.8	3/27/2014	109.21	1295	60.26
7/16/2008	131.59	974	43.12	3/28/2014	108.62	1295.8	59.89
7/17/2008	136.82	964.5	43.05	3/31/2014	108.98	1294	60
7/18/2008	139.38	961.5	42.7	4/1/2014	108.63	1286.5	59.86
7/21/2008	138.4	966.25	42.66	4/3/2014	110.14	1287.3	60.35
7/22/2008	140.67	973	42.57	4/4/2014	110.37	1293.5	60.08
7/23/2008	141.24	934.75	42.65	4/7/2014	109.42	1299	60.11
7/24/2008	143.95	927.75	42.05	4/8/2014	109.03	1314.8	60.08
7/28/2008	139.62	929.25	41.1	4/9/2014	109.76	1309.8	60.09
7/29/2008	134.15	928.75	42.52	4/10/2014	109.19	1321.5	60.07
7/30/2008	133.91	914.1	42.56	4/11/2014	109.39	1317.3	60.18
7/31/2008	135.81	912	42.28	4/14/2014	108.54	1324.5	60.32
8/1/2008	143.68	909.5	42.47	4/15/2014	108.98	1311.5	60.34
8/4/2008	142.43	910	42.26	4/16/2014	111.26	1299	60.22
8/5/2008	136.02	884	42.45	4/17/2014	109.17	1299.3	60.29
8/6/2008	133.31	884.75	42.15	4/22/2014	107.99	1290.8	60.59
8/7/2008	134.16	882.5	42.01	4/23/2014	109.14	1283.5	60.8
8/8/2008	129.34	864.5	42.05	4/24/2014	108.27	1283.5	61.17
8/11/2008	129.34	863.75	42.05	4/25/2014	108.35	1294.3	61.11
8/12/2008	127.18	808.75	42.06	4/28/2014	107.88	1302	60.64
8/13/2008	126.86	824	42.34	4/29/2014	107.48	1289.8	60.69
8/14/2008	125.43	833.25	42.55	4/30/2014	108.08	1292	60.23
8/15/2008	124.7	784.75	43	5/1/2014	106.99	1283	60.21
8/18/2008	125.67	797.5	42.8	5/2/2014	106.79	1285	60.11
8/19/2008	125.77	791	43.49	5/6/2014	105.73	1308.5	60.21
8/20/2008	122.46	806.75	43.51	5/7/2014	107.2	1311	59.97
8/21/2008	124.1	821	43.61	5/8/2014	106.59	1291.3	60.01
8/22/2008	124.16	830	43.43	5/9/2014	107.01	1289	60.06
8/26/2008	116.5	809.75	43.68	5/12/2014	105.9	1292.8	60
8/27/2008	114.47	833.5	43.74	5/13/2014	106.58	1292.8	59.48
8/28/2008	116.94	832	43.62	5/14/2014	106.64	1300.3	59.44
8/29/2008	113.03	836.5	43.65	5/15/2014	105.95	1303.8	59.49
9/1/2008	110.54	832	43.25	5/16/2014	105.7	1293.8	59.38
9/2/2008	108.98	802.5	43.25	5/19/2014	103.37	1301	58.62
9/3/2008	110.68	794.5	44.4	5/20/2014	104.88	1291.5	58.38
9/4/2008	111.82	810.5	43.95	5/21/2014	106.41	1292	58.58
9/5/2008	108.8	796.25	44.26	5/22/2014	104.89	1294.5	58.66
9/8/2008	109.33	806.5	44.63	5/23/2014	105.83	1292	58.3
9/9/2008	109.02	799.75	44.5	5/27/2014	107.1	1283	58.36
9/10/2008	108.72	774.25	44.83	5/28/2014	107.34	1265.3	58.9
9/11/2008	117.24	742.75	45.14	5/29/2014	107.68	1254	58.94
9/12/2008	113.99	757.5	45.46	5/30/2014	109.1	1254	58.9
9/15/2008	109.74	779.25	45.62	6/2/2014	109.71	1244.8	59.16
9/16/2008	112.2	779.75	45.93	6/3/2014	109.79	1244.3	59.15
9/17/2008	113.05	785.5	46.81	6/5/2014	109.69	1244.8	59.34
9/18/2008	113.54	864.25	46.16	6/6/2014	108.54	1254	59.24
9/19/2008	113.49	837.5	46.36	6/9/2014	108.48	1255	59.17
9/23/2008	104.94	892.5	45.3	6/10/2014	109.79	1253.5	59.18
9/24/2008	103.88	888.5	45.65	6/11/2014	109.53	1262.5	59.18
9/25/2008	103.41	889	45.92	6/12/2014	109.12	1261.8	59.32
9/26/2008	102.51	869	46.08	6/13/2014	109.89	1273	59.19

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
9/29/2008	101.08	876.5	46.48	6/16/2014	108.63	1281.8	59.64
9/30/2008	98.94	897	46.49	6/17/2014	108.63	1264.5	60.16
10/1/2008	96	876	46.45	6/18/2014	109.48	1269	60.32
10/2/2008	96.01	866.25	46.47	6/19/2014	109.48	1282	60.28
10/3/2008	94.37	842.5	46.63	6/20/2014	108.3	1310	60.09
10/6/2008	90.45	836.5	47.01	6/23/2014	108.17	1313.5	60.23
10/7/2008	85.85	881.75	47.77	6/24/2014	108.19	1323	60.14
10/8/2008	86.09	913	47.78	6/25/2014	108.26	1312	60.14
10/9/2008	90.89	886.75	48	6/26/2014	108.37	1311.5	60.11
10/10/2008	93.46	918	48	6/27/2014	108.78	1315.3	60.17
10/13/2008	100.43	865	48.41	6/30/2014	109.87	1313	60.04
10/14/2008	100.72	849.5	48.41	7/1/2014	109.74	1325.8	60.06
10/15/2008	102.09	848.5	47.93	7/2/2014	110.9	1326.8	60.05
10/16/2008	100.45	834.5	48.53	7/3/2014	110.84	1322.5	59.69
10/17/2008	100.88	801	48.88	7/4/2014	110.35	1321.5	59.74
10/20/2008	95.96	803	48.88	7/7/2014	111.32	1313.3	59.74
10/21/2008	93.52	781	48.96	7/8/2014	110.89	1318.3	60.013
10/22/2008	92.19	757.5	49.1	7/9/2014	110.19	1322.5	59.78
10/23/2008	88.88	726	49.25	7/10/2014	110.01	1343.3	59.75
10/24/2008	88.95	692.5	49.82	7/11/2014	109.81	1336.5	60.19
10/27/2008	84.71	720.5	49.96	7/14/2014	109.09	1321.3	60.08
10/28/2008	83.17	745	49.8	7/15/2014	109.98	1312	60.11
10/29/2008	80.77	749.25	49.57	7/16/2014	109.21	1297.5	60.15
10/30/2008	81.65	772.25	49.71	7/17/2014	109.34	1302.8	60.12
10/31/2008	74.58	728.5	49.68	7/18/2014	108.87	1310.3	60.35
11/3/2008	74.37	734	49.4	7/21/2014	109.07	1312.8	60.33
11/4/2008	74.98	734	48.61	7/22/2014	108.43	1307	60.24
11/5/2008	66.86	753.25	47.25	7/23/2014	109.21	1307.5	60.16
11/6/2008	64.14	739	47.28	7/24/2014	110.55	1300	60
11/7/2008	66.05	742	47.64	7/25/2014	109.18	1292.5	60.11
11/10/2008	67.45	751.75	47.54	7/28/2014	109.83	1305	60.04
11/11/2008	65.99	741.75	47.3	7/29/2014	112.18	1307.5	60.13
11/12/2008	62.95	731.5	47.3	7/30/2014	113.15	1297.5	60.12
11/13/2008	65.06	714	49.2	7/31/2014	113.42	1295	60.4
11/14/2008	60.57	729.5	49	8/1/2014	114.02	1284.5	60.55
11/17/2008	59.34	745	48.78	8/4/2014	114.25	1293.5	61.2
11/18/2008	58.87	736.5	49.19	8/5/2014	115.19	1292.8	60.94
11/19/2008	64	737.75	49.51	8/6/2014	114.55	1288.5	61.05
11/20/2008	60.86	745.25	49.84	8/7/2014	113.62	1302	61.25
11/21/2008	60	758.5	50.12	8/8/2014	113.74	1317.5	61.2
11/24/2008	60.32	816.75	49.53	8/11/2014	112.84	1308.3	61.18
11/25/2008	62.78	802.5	49.94	8/12/2014	112.61	1311	61.17
11/26/2008	61.09	817	49.87	8/13/2014	112.62	1309.3	61.09
11/27/2008	56.14	813.5	49.18	8/14/2014	111.03	1315	61.22
11/28/2008	56.84	813.5	49.18	8/15/2014	110.84	1313.6	60.77
12/1/2008	57.08	795.5	49.55	8/18/2014	110.18	1302.8	60.77
12/2/2008	54.76	772.5	49.94	8/19/2014	108.98	1300.3	60.77
12/3/2008	52.47	773.5	50.05	8/21/2014	108.7	1280.5	60.58
12/4/2008	51.32	772.75	49.92	8/22/2014	107.65	1281	60.56
12/5/2008	50.7	771.75	49.82	8/26/2014	106.2	1286.5	60.56
12/8/2008	50.82	772.25	49.6	8/27/2014	105.77	1285	60.43

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
12/9/2008	49.1	771	49.44	8/28/2014	104.73	1288	60.45
12/10/2008	48.35	785.75	49.28	8/29/2014	104.73	1285.8	60.51
12/11/2008	45.79	821	48.7	9/1/2014	105.41	1287.3	61.51
12/12/2008	44.91	813.75	48.19	9/2/2014	106.04	1277.8	61.51
12/15/2008	49.51	827.5	48.2	9/3/2014	106.03	1268.5	60.69
12/16/2008	47.51	833.5	47.62	9/4/2014	105.71	1271	60.41
12/17/2008	49.39	853.75	47.81	9/5/2014	106.48	1264	60.38
12/19/2008	47.72	839	46.74	9/8/2014	106.85	1267.3	60.26
12/22/2008	47.58	846	47.05	9/9/2014	105.78	1256	60.29
12/23/2008	45.64	844	47.71	9/10/2014	106.89	1254.3	60.6
12/24/2008	44.39	836.75	48.66	9/11/2014	106.7	1247	60.95
12/29/2008	43.83	881	47.76	9/12/2014	106.98	1237.3	60.93
12/30/2008	37.04	870	47.76	9/15/2014	106.47	1234.8	60.95
12/31/2008	40.02	865	48.42	9/16/2014	104.94	1238.8	61.03
1/2/2009	39.77	869.75	48.25	9/17/2014	103.45	1236.5	61.06
1/5/2009	39.34	860	48.5	9/18/2014	103.63	1223	60.9
1/6/2009	43.54	844	48.5	9/19/2014	102.82	1222.5	60.78
1/7/2009	42.38	864	48.56	9/22/2014	104.17	1214	60.8
1/8/2009	45.02	842.5	48.45	9/23/2014	104.02	1225	60.93
1/9/2009	42	854	48.26	9/24/2014	103.36	1224	61.04
1/12/2009	41.84	848.5	48.78	9/25/2014	103.47	1210.5	60.93
1/13/2009	40.19	815.5	48.89	9/26/2014	101.68	1222.3	61.33
1/14/2009	39.52	827.25	48.75	9/29/2014	102.27	1217.8	61.14
1/15/2009	38.08	813	48.87	9/30/2014	101.15	1210	61.53
1/16/2009	35.27	824.25	48.62	10/1/2014	101.13	1208.5	61.92
1/19/2009	34.45	842.5	48.62	10/2/2014	99.37	1214.5	61.71
1/21/2009	33.73	860.5	49	10/3/2014	99.74	1207.5	61.61
1/22/2009	34.16	847.75	49.07	10/6/2014	99.92	1193.3	61.81
1/23/2009	35.22	873	49	10/7/2014	100.28	1207.5	61.68
1/26/2009	35.82	906.5	48.5	10/8/2014	100.09	1220	61.28
1/28/2009	42.94	891.25	48.81	10/9/2014	100.49	1227.5	61.38
1/29/2009	45.84	878.5	48.49	10/10/2014	100.5	1222.3	60.92
1/30/2009	48.89	918.5	48.83	10/13/2014	100.4	1228	61.27
2/2/2009	46.23	913.75	48.84	10/14/2014	100.71	1233	61.27
2/3/2009	42.94	902	48.37	10/15/2014	101.12	1223.5	61.38
2/4/2009	42.34	902.25	48.68	10/17/2014	100.21	1238	61.8
2/5/2009	40.86	914.75	48.72	10/20/2014	100.88	1241	61.46
2/6/2009	43.05	914	48.61	10/21/2014	101.21	1251.8	61.2
2/9/2009	42.27	901	48.52	10/22/2014	99.51	1246.8	61.14
2/10/2009	42.32	896	48.68	10/23/2014	99.53	1240.5	61.18
2/11/2009	43.42	922	48.78	10/24/2014	98.08	1231.8	61.16
2/13/2009	41.22	939.25	48.58	10/27/2014	96.26	1230.5	61.16
2/16/2009	39.9	943	48.58	10/28/2014	96.42	1228.3	61.28
2/17/2009	42.42	962.25	49.6	10/29/2014	96.31	1228	61.17
2/18/2009	43.13	964.75	49.84	10/30/2014	96.43	1205.8	61.2
2/19/2009	48	973.5	49.73	10/31/2014	97.39	1173.3	61.42
2/20/2009	42.86	981	49.71	11/3/2014	97.7	1170.8	61.44
2/23/2009	42.86	987	49.46	11/4/2014	96.82	1169.3	61.38
2/24/2009	43.13	989.75	49.75	11/5/2014	96.75	1145.3	61.38
2/25/2009	44.17	956.25	49.95	11/6/2014	95.37	1144.5	61.49
2/26/2009	42.96	945	50.32	11/7/2014	94.87	1145	61.45

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
2/27/2009	43.15	943.75	50.88	11/10/2014	94.53	1172	61.5
3/2/2009	43.68	949.5	51.8	11/11/2014	95.2	1151.3	61.52
3/3/2009	43.92	924.75	51.96	11/12/2014	95.08	1163.3	61.52
3/4/2009	44.49	911	51.53	11/13/2014	95.7	1161	61.4
3/5/2009	47.23	913.25	51.6	11/14/2014	94.67	1154	61.55
3/6/2009	45.88	937.75	51.68	11/17/2014	94.57	1187	61.7
3/9/2009	44.24	934.75	51.91	11/18/2014	91.29	1202	61.82
3/10/2009	47.23	911.5	51.35	11/19/2014	90.8	1200.8	61.72
3/11/2009	43.36	900	50.98	11/20/2014	90.65	1194	61.98
3/13/2009	39.69	920	51.54	11/21/2014	90.9	1193.3	61.92
3/16/2009	39.41	923	51.31	11/24/2014	90.25	1196	61.76
3/17/2009	42.36	920	51.42	11/25/2014	90.47	1202.3	61.85
3/18/2009	42.19	910.75	51.22	11/26/2014	88.66	1195.8	61.89
3/19/2009	41.27	937.25	50.21	11/27/2014	87.82	1196.5	61.78
3/20/2009	40.18	957	50.51	11/28/2014	86.36	1184.5	61.78
3/23/2009	42.37	952.75	50.38	12/1/2014	84.02	1178.8	62.2
3/24/2009	45.15	928.75	50.4	12/2/2014	84.02	1197	61.94
3/25/2009	44.41	921.25	50.5	12/3/2014	85.27	1203.3	61.8
3/26/2009	42.6	935.5	50.4	12/4/2014	84.42	1204	61.85
3/27/2009	42.72	927	50.46	12/5/2014	85.17	1204.5	61.78
3/30/2009	46.07	923	51.12	12/8/2014	86.38	1195.3	61.9
3/31/2009	44.45	918.5	50.87	12/9/2014	85.94	1206.5	61.82
4/1/2009	43.48	919.5	50.48	12/10/2014	86	1228.3	61.87
4/2/2009	44.55	914.75	50.22	12/11/2014	85.64	1219.5	62.1
4/3/2009	44.99	901.5	49.91	12/12/2014	85.57	1223.5	62.46
4/6/2009	43.2	879.5	50.01	12/15/2014	86.91	1210.8	62.52
4/7/2009	42.19	879.25	50	12/16/2014	85.5	1199.3	63.16
4/8/2009	44.97	887.25	50.28	12/17/2014	84.17	1199	63.65
4/9/2009	44.12	883.75	49.82	12/18/2014	84.9	1210.8	63.52
4/14/2009	45.22	895	49.77	12/19/2014	82.12	1197.5	62.98
4/15/2009	48.03	892.25	49.62	12/22/2014	82.88	1195.3	63.24
4/16/2009	49.27	889	49.55	12/23/2014	82.08	1179.5	63.22
4/17/2009	51.84	872	49.63	12/24/2014	83.2	1177	63.4
4/20/2009	51.32	870	49.8	12/29/2014	82.9	1194	63.55
4/21/2009	51.46	888.75	49.78	12/30/2014	80.94	1186.5	63.38
4/22/2009	51.89	885	50.45	12/31/2014	80.42	1199.3	63.04
4/23/2009	50.81	894.5	50.2	1/2/2015	77.74	1184.3	63.27
4/24/2009	49.05	909	49.88	1/5/2015	77.51	1192	63.34
4/27/2009	46.13	911.75	49.69	1/6/2015	76.86	1211	63.57
4/28/2009	45.92	897	50.15	1/7/2015	77.23	1213.8	63.27
4/29/2009	50.89	894.5	50.47	1/8/2015	77.21	1206.5	62.67
4/30/2009	50.48	889	50.05	1/9/2015	77.61	1211.3	62.34
5/1/2009	50.91	881.5	49.7	1/12/2015	79.2	1222	62.09
5/5/2009	52.06	903	49.75	1/13/2015	79.62	1239	61.97
5/6/2009	52.33	903.5	49.22	1/14/2015	77.62	1228.8	62.09
5/8/2009	50.73	917.5	49.09	1/15/2015	77.39	1235.3	62.06
5/11/2009	52.06	912.5	49.13	1/19/2015	71.89	1275.5	61.87
5/12/2009	51.31	920	49.44	1/20/2015	70.87	1292.3	61.64
5/13/2009	51.83	925.75	49.21	1/21/2015	71.13	1298	61.55
5/14/2009	52.02	923.25	49.58	1/22/2015	70.13	1287	61.32
5/15/2009	49.06	925	49.65	1/23/2015	68.48	1293.5	61.46

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
5/18/2009	48.69	929.75	49.38	1/26/2015	68	1282.8	61.46
5/19/2009	48.5	921.5	47.58	1/27/2015	65.64	1279	61.34
5/20/2009	48.29	928.5	47.65	1/28/2015	66.11	1287	61.34
5/21/2009	50.29	940	47.3	1/29/2015	63.32	1275.5	61.94
5/22/2009	48.67	952.5	47.3	1/30/2015	63.65	1263.5	62.01
5/26/2009	50.22	942	46.95	2/2/2015	61.67	1274.3	61.68
5/27/2009	50.3	949.5	47.7	2/3/2015	61.09	1281	61.67
5/28/2009	51.75	949.75	47.61	2/4/2015	60.26	1269.3	61.73
5/29/2009	53.26	972	47.5	2/5/2015	59.84	1263.8	61.73
6/1/2009	53.16	987	47.11	2/6/2015	58.81	1264	61.7
6/2/2009	55.07	973.5	46.78	2/9/2015	58.87	1242.3	62.1
6/3/2009	56.63	979	46.84	2/10/2015	58.31	1237.5	62.33
6/4/2009	56.02	967.25	46.88	2/11/2015	59.07	1235.5	62.41
6/5/2009	55.99	977.75	47.19	2/12/2015	58.67	1225.3	62.3
6/8/2009	56.52	946.5	47.05	2/16/2015	58.72	1233.5	62.04
6/9/2009	56.84	952.5	47.5	2/17/2015	57.86	1221.8	62.14
6/10/2009	56.25	961.25	47.3	2/18/2015	55.6	1206.5	62.25
6/11/2009	56.33	953	47.18	2/19/2015	55.27	1217.8	62.08
6/12/2009	56.51	950	47.49	2/23/2015	55.38	1193.5	62.15
6/15/2009	57.12	932	47.6	2/24/2015	51.08	1195.5	62.07
6/16/2009	59.1	936.75	47.67	2/25/2015	50.12	1206.5	61.84
6/17/2009	58.02	933.75	47.61	2/26/2015	49.06	1220	61.74
6/18/2009	58.7	936.75	47.96	2/27/2015	49.43	1205	61.67
6/22/2009	59.05	924	48	3/2/2015	47.64	1216.8	61.87
6/23/2009	61.28	920.25	48.5	3/3/2015	46.9	1207.8	61.76
6/24/2009	63.47	928.75	48.45	3/4/2015	45.13	1204.3	62.3
6/25/2009	64.98	934.25	48.4	3/5/2015	45.82	1199.8	62.26
6/26/2009	66.6	943	48.5	3/6/2015	47.66	1196.5	62.45
6/29/2009	67.67	939.75	48	3/9/2015	47.38	1173.8	62.67
6/30/2009	66.15	941	48	3/11/2015	46.49	1158.8	62.76
7/1/2009	67.68	931.5	47.74	3/12/2015	46.5	1161.3	62.44
7/2/2009	67.77	936	47.75	3/13/2015	46.09	1156.5	63.06
7/3/2009	67.61	932.5	47.9	3/16/2015	46.69	1157	62.8
7/6/2009	68.94	921.5	47.8	3/17/2015	46.07	1154.8	62.64
7/7/2009	70.52	925.75	48.5	3/18/2015	46.55	1149	62.69
7/8/2009	71.71	920.75	48.44	3/19/2015	47.07	1164	62.56
7/9/2009	70.62	914.75	48.8	3/20/2015	46.61	1171.8	62.47
7/10/2009	68.49	910	48.57	3/23/2015	47.52	1181.4	62.22
7/13/2009	70.52	908.5	48.76	3/24/2015	51.74	1193.3	62.4
7/14/2009	68.95	921.75	49.16	3/25/2015	54.41	1192.6	62.35
7/15/2009	69.96	930	48.955	3/26/2015	55.07	1209.4	62.83
7/16/2009	70.48	935.25	48.55	3/27/2015	55.98	1198	62.5
7/17/2009	66.13	934.5	48.61	3/30/2015	55.88	1187.4	62.52
7/20/2009	66.36	952.25	48.56	3/31/2015	57	1179.3	62.31
7/21/2009	68.47	947.75	48.1	4/1/2015	55.79	1181.3	62.14
7/22/2009	68.82	945.5	48.2	4/2/2015	53.48	1201.5	62.13
7/23/2009	68.1	955.25	48.45	4/7/2015	60.33	1208.5	62.16
7/24/2009	69.75	949.75	48.25	4/8/2015	61.57	1211.1	62.23
7/27/2009	68.11	956	48.16	4/9/2015	60.78	1196	62.22
7/28/2009	68.52	955	48.11	4/10/2015	60.72	1201.9	62.18
7/29/2009	65.74	935.5	48.2	4/13/2015	58.78	1197.9	62.21

Table 14- Daily statistical data for India (chapter 2) *Cont'd*

Date	Oil	GOLD	EX	Date	Oil	GOLD	EX
7/31/2009	63.12	936.5	48.35	4/14/2015	60.99	1191.5	62.38
8/3/2009	61.54	954.25	47.91	4/15/2015	59.78	1189.9	62.25
8/4/2009	59.71	953.5	47.4	4/16/2015	60.33	1204.6	62.34
8/5/2009	59.17	964.5	47.46	4/17/2015	59.77	1204.6	62.28
8/6/2009	58.43	960.75	47.27	4/20/2015	61.39	1203.3	62.48
8/7/2009	58.25	960.5	47.52	4/21/2015	61.89	1197.7	63.07
8/10/2009	60.48	953.5	47.72	4/22/2015	60.75	1202.4	62.92
8/11/2009	61.25	946	47.7	4/23/2015	61.18	1187.8	62.96
8/12/2009	62.02	943.5	47.88	4/24/2015	59.18	1192.2	63.27
8/13/2009	63.54	956	48.22	4/27/2015	60.33	1182.8	63.55
8/14/2009	64.64	957.5	48.11	4/28/2015	59.15	1201.4	63.34
8/17/2009	65.93	937.5	48.18	4/29/2015	58.67	1204.8	63.05
8/18/2009	65.36	938.25	48.82	4/30/2015	55.95	1204.3	63.38

Source: Thomson Reuters DataStream

<http://datastream.thomsonreuters.com/dsws/1.0/DSLogon.aspx?persisttoken=true&appgroup=DSExtranet&srcapp=Extranet&srcappver=1.0&prepopulate=&env=&redirect=https://infobase.thomsonreuters.com/infobase/>

Table 15- Quarterly Statistical Data for South Africa (chapter 3)

Date	lnM ^{8*}	lnNEER	lnUM	lnUY	lnY	r
1/1/1980	21.5208	6.7704	40.7962	43.843	24.8453	9.2533
4/1/1980	21.4944	6.8429	40.8758	44.2054	24.8554	9.4933
7/1/1980	21.7106	6.8241	41.1918	44.2382	24.9236	10.11
10/1/1980	21.5579	6.8637	41.1864	43.8088	24.9399	11.4867
1/1/1981	21.5572	6.907	41.0653	43.9145	24.9904	12.6533
4/1/1981	21.6785	6.8985	41.093	43.5245	25.0223	12.9233
7/1/1981	21.636	6.8999	41.0068	43.4307	25.0568	13.1133
10/1/1981	21.7565	6.7992	41.5848	43.3019	25.0904	13.26
1/1/1982	21.7984	6.7883	41.4343	43.2183	25.1091	14.1433
4/1/1982	21.6709	6.7579	41.3208	43.564	25.1432	14.2867
7/1/1982	21.8913	6.7174	41.9123	43.3841	25.1911	13.8367
10/1/1982	21.9409	6.7201	41.5954	42.9998	25.2236	11.7667
1/1/1983	21.9907	6.7702	41.3752	42.9978	25.2495	11.41
4/1/1983	22.1463	6.7717	41.3986	43.2131	25.2869	12.4533
7/1/1983	22.2055	6.7947	41.2087	42.9821	25.3191	13.2767
10/1/1983	22.3635	6.7816	41.112	42.9545	25.3497	13.52
1/1/1984	22.4394	6.72	41.5708	42.9805	25.4098	13.9033
4/1/1984	22.3779	6.693	41.3292	42.8606	25.4434	14.68
7/1/1984	22.39	6.6754	41.175	42.7538	25.4801	16.01
10/1/1984	22.339	6.4606	41.2333	42.532	25.5056	16.3133
1/1/1985	22.1985	6.2915	41.1116	42.9376	25.5531	17.2
4/1/1985	22.1696	6.3738	41.2384	42.6016	25.5833	16.0967

⁸ lnM: Logarithm of Supply of money, lnNEER: Logarithm of nominal effective exchange rate, lnUM: Logarithm of monetary uncertainty, lnUY: Logarithm of output uncertainty, lnY: Logarithm of real GDP, r: interest rate.

* These logarithm values calculated by author.

Table 15- Quarterly Statistical Data for South Africa (chapter 3) Cont'd

Date	lnM	lnNEER	lnUM	lnUY	lnY	r
7/1/1985	22.1775	6.3431	41.1933	42.6621	25.6102	16.08
10/1/1985	22.1465	5.9622	41.7496	42.8698	25.6644	17.79
1/1/1986	22.0564	6.0133	41.4607	42.9588	25.6865	17.3633
4/1/1986	22.1928	6.0927	41.8703	43.27	25.7416	17.2833
7/1/1986	22.1207	5.8667	41.5529	43.3806	25.7851	15.2633
10/1/1986	22.1515	5.9342	41.5736	43.0478	25.8295	15.5533
1/1/1987	22.3015	5.9611	41.6162	42.8372	25.8668	15.16
4/1/1987	22.3011	5.9587	41.6362	42.4628	25.8874	15.4433
7/1/1987	22.4334	5.9609	41.4086	43.158	25.935	15.2467
10/1/1987	22.5368	5.9397	42.2069	43.2545	25.9793	15.3367
1/1/1988	22.7047	5.9029	42.4743	43.1847	26.0329	16.43
4/1/1988	22.819	5.8194	43.149	43.8681	26.0765	16.34
7/1/1988	22.9121	5.7986	43.1739	43.7131	26.1263	16.0667
10/1/1988	22.9746	5.743	43.7877	44.0299	26.1608	16.65
1/1/1989	22.9386	5.7725	43.703	43.6185	26.2147	16.7333
4/1/1989	22.9001	5.7328	43.7697	44.4287	26.28	17.28
7/1/1989	22.9152	5.6979	43.7633	45.3607	26.3061	17.02
10/1/1989	22.9858	5.7061	43.479	44.9346	26.3273	16.57
1/1/1990	23.0171	5.7146	43.6581	44.6183	26.3751	15.5867
4/1/1990	23.1222	5.6832	43.3555	44.7817	26.4212	16.332
7/1/1990	23.1438	5.6674	42.8586	44.8572	26.4374	16.368
10/1/1990	23.1258	5.632	43.0476	44.7318	26.4588	16.3167
1/1/1991	23.1957	5.6304	43.4013	44.4286	26.5015	15.74
4/1/1991	23.1856	5.6363	44.106	44.5832	26.5377	16.05
7/1/1991	23.162	5.6269	43.7921	44.36	26.5831	16.6867
10/1/1991	23.1423	5.6041	43.5675	44.8628	26.6094	16.9
1/1/1992	23.1793	5.5817	43.2987	44.4258	26.6352	16.64
4/1/1992	23.2577	5.5827	42.8057	44.0005	26.6574	16.07
7/1/1992	23.344	5.5724	42.3763	43.7474	26.6809	14.6167
10/1/1992	23.6257	5.5433	42.4385	43.44	26.7173	14.4333
1/1/1993	23.7613	5.5489	42.9578	43.9587	26.7551	14.5
4/1/1993	23.6375	5.5026	43.8951	44.3968	26.7888	14.8767
7/1/1993	23.7998	5.494	44.2087	44.3127	26.8265	13.7933
10/1/1993	23.8361	5.4552	44.1319	44.6682	26.8566	12.7
1/1/1994	23.8504	5.4927	43.8938	44.3499	26.8969	12.6667
4/1/1994	24.166	5.4244	44.2206	45.04	26.9135	13.82
7/1/1994	23.9631	5.39	43.7107	44.9118	26.9292	15.9567
10/1/1994	23.9371	5.3693	43.4498	44.888	26.9798	16.8833
1/1/1995	23.9309	5.381	44.3634	46.1032	27.0141	16.8533
4/1/1995	23.9332	5.3042	43.9138	45.8337	27.0376	16.85
7/1/1995	24.2803	5.2941	45.5594	45.3898	27.0735	16.0233

Table 15- Quarterly Statistical Data for South Africa (chapter 3) Cont'd

Date	lnM	lnNEER	lnUM	lnUY	lnY	r
10/1/1995	24.4723	5.3343	45.0041	45.4339	27.1048	14.7
1/1/1996	24.5421	5.3586	44.7751	45.2103	27.1288	14.3033
4/1/1996	24.666	5.2273	45.3444	44.7669	27.1685	16.03
7/1/1996	24.4665	5.1992	45.8325	45.628	27.1902	15.5433
10/1/1996	24.3081	5.1495	45.271	45.202	27.2155	16.0567
1/1/1997	24.3113	5.1569	44.7184	44.7803	27.244	15.3367
4/1/1997	24.3604	5.2445	45.6749	44.6082	27.2685	15.0133
7/1/1997	24.5098	5.2252	45.1908	44.187	27.2902	14.21
10/1/1997	24.742	5.1973	46.0772	43.8169	27.3112	14.23
1/1/1998	25.0102	5.1939	45.5597	43.5611	27.3261	13.4767
4/1/1998	25.1226	5.1668	45.5554	44.6029	27.3589	13.66
7/1/1998	24.7382	5.1113	45.4173	45.1806	27.3647	17.0467
10/1/1998	24.6005	4.9749	44.9948	46.1804	27.3844	16.3067
1/1/1999	24.6648	4.9513	44.7454	45.7729	27.4087	15.1033
4/1/1999	24.8413	4.9721	45.3654	45.339	27.4262	14.8833
7/1/1999	25.6701	4.9742	44.8762	45.1493	27.4691	15.2
10/1/1999	26.2158	4.9421	45.0357	46.5761	27.4953	14.42
1/1/2000	25.8684	4.96	45.759	46.1705	27.5196	13.6367
4/1/2000	25.3154	4.9179	46.1749	45.7413	27.5569	14.4633
7/1/2000	25.05	4.8808	45.7759	46.3848	27.599	13.7133
10/1/2000	25.023	4.8619	45.5286	47.0297	27.6247	13.3333
1/1/2001	25.02	4.7899	45.3499	46.6169	27.6481	12.1233
4/1/2001	25.1857	4.7898	46.3987	46.1756	27.6632	11.8067
7/1/2001	25.5072	4.8132	45.841	46.0245	27.6785	10.82
10/1/2001	25.6517	4.6423	45.734	45.9003	27.7136	10.8767
1/1/2002	25.4409	4.4397	45.7332	46.4787	27.7767	12.0433
4/1/2002	25.1689	4.4705	48.0001	48.5125	27.8143	11.91
7/1/2002	24.8791	4.5126	47.4484	48.2762	27.846	11.1933
10/1/2002	24.6666	4.477	46.9298	47.9468	27.871	10.8567
1/1/2003	24.8839	4.6033	46.4683	47.5203	27.887	10.0367
4/1/2003	25.2551	4.7186	46.6397	47.1549	27.9026	9.65
7/1/2003	25.9081	4.6494	47.3221	46.8453	27.9193	9.59
10/1/2003	27.0512	4.7637	46.757	46.5208	27.9423	9.1867
1/1/2004	28.0382	4.7211	46.1928	46.0963	27.9818	9.4233
4/1/2004	28.0046	4.8004	46.7885	47.4092	28.0078	10.1567
7/1/2004	27.4243	4.8144	46.2965	47.0519	28.0295	9.6933
10/1/2004	27.0065	4.8079	47.5816	46.6046	28.0623	8.8333
1/1/2005	26.926	4.8359	47.1172	47.0394	28.08	8.0867
4/1/2005	26.9877	4.8134	46.8266	46.6661	28.1119	8.31
7/1/2005	26.8161	4.7507	48.0798	47.0379	28.1378	8.02
10/1/2005	26.9875	4.7892	48.5085	46.7634	28.1692	7.85

Table 15- Quarterly Statistical Data for South Africa (chapter 3) Cont'd

Date	lnM	lnNEER	lnUM	lnUY	lnY	r
1/1/2006	27.122	4.8593	48.1727	47.115	28.1814	7.33
4/1/2006	26.9276	4.8578	49.319	47.1448	28.2168	7.7933
7/1/2006	26.5457	4.7031	48.7982	47.7092	28.2648	8.6033
10/1/2006	26.4058	4.6098	48.4489	48.8182	28.295	8.0233
1/1/2007	26.3688	4.6542	48.6339	48.5202	28.3381	7.58
4/1/2007	26.2602	4.6413	49.223	48.9094	28.3569	7.7733
7/1/2007	26.2625	4.6378	49.2253	48.4654	28.3817	8.3867
10/1/2007	26.1764	4.6565	49.2067	48.0692	28.4308	8.2
1/1/2008	25.9907	4.6048	49.1437	49.2367	28.4567	8.7367
4/1/2008	25.9434	4.4553	48.8754	48.833	28.4834	9.67
7/1/2008	25.841	4.4482	49.0622	48.4797	28.5118	9.4467
10/1/2008	25.9684	4.3402	48.5146	48.2544	28.521	8.5467
1/1/2009	26.1151	4.3359	48.0422	48.2957	28.5248	8.18
4/1/2009	26.2048	4.4404	47.6459	48.6974	28.5321	8.7167
7/1/2009	26.4392	4.5087	47.4504	48.7012	28.5592	8.87
10/1/2009	26.5381	4.5465	47.9155	48.3986	28.5843	9.0467
1/1/2010	26.6207	4.5638	48.0083	48.0548	28.5993	9.09
4/1/2010	26.8888	4.6007	47.5387	47.7845	28.6394	8.9033
7/1/2010	27.1203	4.6011	46.9728	48.9296	28.6486	8.29
10/1/2010	27.1367	4.6291	46.5207	48.8223	28.6787	8.1767
1/1/2011	27.0636	4.6419	45.9571	48.6959	28.7124	8.72
4/1/2011	26.8578	4.6318	45.9664	48.8637	28.7206	8.5967
7/1/2011	26.721	4.6204	45.9013	48.8774	28.7408	8.3
10/1/2011	26.5991	4.4867	46.2765	48.4273	28.7766	8.4633
1/1/2012	26.595	4.5005	47.6278	48.9739	28.7848	8.3333
4/1/2012	26.6923	4.5176	48.3655	48.9919	28.8058	8.24
7/1/2012	26.8287	4.4753	47.8115	48.5456	28.8184	7.4667
10/1/2012	26.7538	4.4227	47.7338	48.4244	28.8442	7.56
1/1/2013	26.7549	4.4046	47.1684	48.2156	28.8673	7.3133
4/1/2013	26.8147	4.3837	46.6446	47.857	28.8798	7.29
7/1/2013	26.7031	4.2895	46.9202	48.0231	28.901	8.1633
10/1/2013	26.8658	4.2859	47.3348	47.5923	28.9251	8.1233
1/1/2014	26.8127	4.2011	47.2821	47.4556	28.9483	8.5567
4/1/2014	26.7192	4.2289	48.3535	47.2477	28.95	8.3033

Source: Source: International Monetary Fund's International Financial Statistics (IFS)
<https://data.imf.org/?sk=4C514D48-B6BA-49ED-8AB9-52B0C1A0179B&slid=1409151240976>

Table 16- Quarterly Statistical Data for South Africa (chapter 4)

Date	Y ⁹	P	r	rf	M	NEER
1/1/1990	59.44	13.48	15.59	8.42	6.25E+09	1757.36
4/1/1990	59.39	12.79	16.33	8.68	6.12E+09	1597.95
7/1/1990	59.34	12.85	16.37	8.7	6.03E+09	1554.94
10/1/1990	59.39	11.36	16.32	8.4	6.07E+09	1669.78
1/1/1991	58.92	11.66	15.74	8.02	6.23E+09	1686.08
4/1/1991	58.79	13.2	16.05	8.13	6.15E+09	1807.69
7/1/1991	58.77	14.47	16.69	7.94	6.01E+09	1870.36
10/1/1991	58.67	14.72	16.9	7.35	5.87E+09	1954.45
1/1/1992	58.25	15.09	16.64	7.3	5.86E+09	1949.46
4/1/1992	57.9	14.99	16.07	7.38	5.73E+09	1863.79
7/1/1992	57.23	13.69	14.62	6.62	5.73E+09	1738.61
10/1/1992	56.74	13.15	14.43	6.74	5.72E+09	1333.56
1/1/1993	57.24	14.58	14.5	6.28	5.66E+09	1159.85
4/1/1993	57.87	16.16	14.88	5.99	5.35E+09	1290.58
7/1/1993	58.7	16.82	13.79	5.62	5.46E+09	1113.61
10/1/1993	59.14	17.59	12.7	5.61	5.59E+09	1144.38
1/1/1994	59.05	20.62	12.67	6.07	5.82E+09	1173.4
4/1/1994	59.7	22.46	13.82	7.08	5.73E+09	812.76
7/1/1994	60.37	24.05	15.96	7.33	5.72E+09	1029.84
10/1/1994	61.37	24.36	16.88	7.84	5.9E+09	1135.56
1/1/1995	61.6	22.55	16.85	7.48	5.92E+09	1145
4/1/1995	61.87	23.16	16.85	6.62	6.06E+09	1168.71
7/1/1995	62.14	23.15	16.02	6.32	6.16E+09	866.84
10/1/1995	62.38	25.06	14.7	5.89	6.37E+09	746.74
1/1/1996	63.26	28.41	14.3	5.91	6.64E+09	742.57
4/1/1996	64.44	28.53	16.03	6.72	6.8E+09	622.22
7/1/1996	65.17	28.18	15.54	6.78	6.81E+09	761.39
10/1/1996	65.79	28.19	16.06	6.34	6.86E+09	901.89
1/1/1997	65.98	28.95	15.34	6.56	7.09E+09	1035.81
4/1/1997	66.38	29.75	15.01	6.7	7.08E+09	1046.89
7/1/1997	66.52	30.82	14.21	6.24	7.4E+09	954.02
10/1/1997	66.62	27.72	14.23	5.91	7.53E+09	744.31
1/1/1998	66.71	28.6	13.48	5.59	7.73E+09	599.56
4/1/1998	66.8	32.96	13.66	5.6	7.88E+09	540.71
7/1/1998	66.66	25.82	17.05	5.2	7.75E+09	707.97
10/1/1998	66.72	23.53	16.31	4.67	7.83E+09	871.51
1/1/1999	67.33	25.76	15.1	4.98	7.8E+09	793.88
4/1/1999	67.87	29.33	14.88	5.54	7.95E+09	697.94
7/1/1999	68.61	30.09	15.2	5.88	8.17E+09	319.77
10/1/1999	69.36	31.97	14.42	6.14	8.48E+09	186.74

⁹ - Y: real GDP, P: GDP deflator, r: domestic interest rate, rf: foreign interest rate, M: Supply of money, NEER: nominal effective exchange rate.

Table 156- Quarterly Statistical Data for South Africa (chapter 4) *Cont'd*

Date	Y	P	r	rf	M	NEER
1/1/2000	70.15	35.91	13.64	6.48	8.28E+09	265.61
4/1/2000	70.79	31.43	14.46	6.18	8.15E+09	452.35
7/1/2000	71.49	34.13	13.71	5.89	8.27E+09	611.76
10/1/2000	72.1	33.62	13.33	5.57	8.5E+09	620.92
1/1/2001	72.57	36.62	12.12	5.05	8.69E+09	636.1
4/1/2001	72.93	36.96	11.81	5.27	8.76E+09	557.07
7/1/2001	73.12	35.17	10.82	4.98	9.09E+09	395.76
10/1/2001	73.69	37.69	10.88	4.77	9.49E+09	299.16
1/1/2002	74.64	43.74	12.04	5.08	9.86E+09	361.49
4/1/2002	75.55	45.52	11.91	5.1	9.74E+09	538.79
7/1/2002	76.17	39.2	11.19	4.26	9.73E+09	716.03
10/1/2002	76.68	38.98	10.86	4.01	9.86E+09	964.22
1/1/2003	77.39	36.18	10.04	3.92	1E+10	903.78
4/1/2003	77.76	33.6	9.65	3.62	1.04E+10	686.47
7/1/2003	78.18	36.73	9.59	4.23	1.07E+10	431.96
10/1/2003	78.64	39.69	9.19	4.29	1.12E+10	72.11
1/1/2004	79.83	44.12	9.42	4.02	1.17E+10	40.65
4/1/2004	80.94	42.1	10.16	4.6	1.18E+10	65.88
7/1/2004	82.27	43.4	9.69	4.3	1.23E+10	127.3
10/1/2004	83.14	49.01	8.83	4.17	1.25E+10	320.76
1/1/2005	83.99	52.74	8.09	4.3	1.29E+10	290.19
4/1/2005	85.5	54.25	8.31	4.16	1.35E+10	308.57
7/1/2005	86.66	62.03	8.02	4.21	1.41E+10	380.18
10/1/2005	87.24	67.67	7.85	4.49	1.47E+10	362.55
1/1/2006	88.78	76.93	7.33	4.57	1.6E+10	394.17
4/1/2006	90.04	81.53	7.79	5.07	1.63E+10	396.13
7/1/2006	91.28	84.39	8.6	4.9	1.66E+10	465.61
10/1/2006	92.54	92.63	8.02	4.63	1.73E+10	483.58
1/1/2007	94.04	101.39	7.58	4.68	1.83E+10	522.83
4/1/2007	94.82	112.96	7.77	4.85	1.89E+10	621.69
7/1/2007	95.93	112.51	8.39	4.73	1.95E+10	617.37
10/1/2007	97.29	118.77	8.2	4.26	1.99E+10	771.27
1/1/2008	97.69	112.23	8.74	3.66	2.02E+10	813.66
4/1/2008	98.89	122.41	9.67	3.89	2.06E+10	923.23
7/1/2008	99.12	102.9	9.45	3.86	2.04E+10	1113.3
10/1/2008	98.56	76.23	8.55	3.25	2.07E+10	814.01
1/1/2009	97.03	74.18	8.18	2.74	2.06E+10	625.36
4/1/2009	96.69	79.21	8.72	3.31	2.02E+10	674.12
7/1/2009	96.92	88.36	8.87	3.52	2E+10	586.74
10/1/2009	97.56	95.48	9.05	3.46	2E+10	562.62
1/1/2010	98.71	96.91	9.09	3.72	1.98E+10	544.35

Table 166- Quarterly Statistical Data for South Africa (chapter 4) *Cont'd*

Date	Y	P	r	rf	M	NEER
4/1/2010	99.32	97.91	8.9	3.49	1.99E+10	450.27
7/1/2010	100.43	97.7	8.29	2.79	2.03E+10	349.99
10/1/2010	101.54	107.49	8.18	2.86	2.06E+10	356.12
1/1/2011	102.47	111.14	8.72	3.46	2.04E+10	387.77
4/1/2011	103.01	110.13	8.6	3.21	2.01E+10	470.12
7/1/2011	103.28	106.27	8.3	2.43	2.06E+10	535.51
10/1/2011	104.08	109.22	8.46	2.05	2.1E+10	548.76
1/1/2012	104.51	116.82	8.33	2.04	2.04E+10	585.4
4/1/2012	105.47	116.86	8.24	1.82	2.04E+10	538.34
7/1/2012	105.78	120.43	7.47	1.64	2.1E+10	473.58
10/1/2012	106.25	128.16	7.56	1.71	2.09E+10	499.7

Source: International Monetary Fund's International Financial Statistics (IFS)

<https://data.imf.org/?sk=4C514D48-B6BA-49ED-8AB9-52B0C1A0179B&slid=1409151240976>