MASTER EN SCIENCES ÉCONOMIQUES

External Shock and Monetary Policy. Case Study in Ethiopia

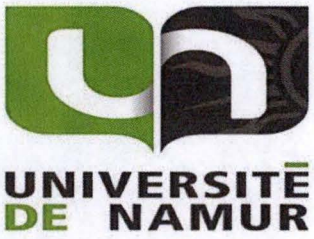
Asmare Sahilea, Esubalew Asmare Sahilea

Award date:
2016

Awarding institution:
Universite de Namur

Advanced Master in International and Development Economics

Jointly Organized By



External Shock and Monetary Policy - Case Study in Ethiopia

Esubalew Asmare Sahilea

Promoter: Professor *Paul Reding*

Tutor: *Jérémie Gross*

Project presented as part of the requirements for the award of the
Advanced Master in International and Development Economics
Academic year 2015-2016

Contents page

1. INTRODUCTION

External shock, defined as the unexpected and unpredictable events that originate from outside a country that affect a nation, either positively or negatively (UN conference on land locked developing countries 2014), may have economic, political, social, cultural and natural forms including, energy costs, famine, war, share prices, economic policies, uncertainties, natural disaster, etc. These may have various consequences for different countries based on different contexts.

Specific to commodity price shock, the rising of the international oil and food price becomes a permanent reality, with oil price attaining its climax in 2008, followed by the increase in food price over the same period. Unless properly managed by the concerned body it will have consequences of dislocating the economy of a given nation depending on its position in the shock (source of shock or recipient of the shock and other macroeconomic situations). The consequence will be strong and negative on main macroeconomic variables if the country is dominantly oil importing (e.g., Hamilton, 1983; and Burbidge &Harrison, 1984; Pérez de Gracia, 2003) and highly vulnerable for food price shocks that will have effect on poverty and welfare status of residents. This has been very true to lower income countries like Ethiopia.

Associated with these, monetary authorities of nations are faced with dilemmas of increase in price and decrease in output due to adverse demand and supply effects. In the case of both demand shocks and permanent supply shocks, policy makers can simultaneously pursue price stability and stability in economic activity. Following a temporary supply shock, however, policy makers can achieve either price stability or economic activity stability, but not both (Mishkin, 2007).

In line with these, this project will try to assess the effects of the recent oil and food price shocks on main macroeconomic variables and analyze the responses conducted by the National Bank of Ethiopia.

1.1 Objective of the Study

Specifically the main objectives of the Project are

- ✓ To review the theoretical dilemmas of monetary authority to commodity price shocks
- ✓ To assess the trend of energy and food price index and main macroeconomic variables
- ✓ To analyze the monetary policy responses of the National Bank of Ethiopia

1.2 Methodology

Data and sources

- ✓ Subjected to relevance and availability of data, the most important variables that are used includes world energy price index, world food price index, domestic inflation(Consumers price index), Real GDP (2010=100) at constant prices, monetary aggregates including broad money supply, credit to the private sector, monetary policy variables including the reserve requirement ratio (RRR), the liquidity requirement ratio, minimum deposit and lending rates, the money market interest rate, bank interest rate, and the official and real exchange rate.
- ✓ As a source of data the project dominantly relayed on the National Bank of Ethiopia (NBE) and Ethiopian central statistics agency. Besides, data for world commodity price including oil price and food price were collected from IMF and WB (via the Macro Bond data provider).
- ✓ The period for which the data are collected is consistent with the period of external shocks which is the first decade of 2000 (2000-2010). Both quarterly and annual data has been collected for analysis purpose.

Method of Analysis

Usually studies on the analysis of monetary policy, mainly of the effectiveness of monetary policy are analyzed using statistical approaches of VAR, SVAR, IRF, VD, and GC[1]. However, the use of such techniques is has limitations on the ground that such statistical techniques may

---

[1] *VAR-Vector autoregressive regression: treat all variables as endogenous*
SVAR- structural VAR model: helps to see the shocks originated from exogenous variables.
IRF-Impulse response function: helps to see the response of endogenous variables to the shocks originated from exogenous variables
VD- variance decomposition: helps to see the share of exogenous variable for variation in an endogenous variable.
GC- Granger causality: Helps to see the direction of cause-effect relationships

face with identification problems. According to Romer and Romer (1989), statistical techniques like VARs "probably have not played a crucial role in forming most economists' views about the real effects of monetary disturbances is that such procedures cannot persuasively identify the direction of causation" (p. 121). Furthermore, sometimes (not always), monetary policy may not be an exogenous effect that could mislead the conclusion.

On the other hand, Romer C. and Romer D. (1989) have developed a technique called narrative approach that allows having a vast body of information that enables to solve the problem of identification and to analyze the effects of monetary policy. This project therefore, uses this approach of analysis which is based on the historical record of variables that identifies a significant policy shocks and try to deeply look the transmission of policy shocks to real sector of the economy.

2. THE THEORETICAL ASPECTS OF DILEMMA TO MONETARY POLICY-EPMPHASIS TO LOW INCOME COUNTRIES

2. 1 Shocks to oil price

Theoretical considerations reveal that, as too many products, crude oil is an important input factor in the value added chain of most agricultural products (machinery fuel, fertilizers, transport). Price rise in energy inputs (like oil) raises the costs of producing food commodities. Higher oil prices may also raise the price of processing, storing, and distributing food to retail customers.

Moreover, as to many policy makers and researchers, the increased reliance on bio fuel production due to considerations of energy independence and environmental preoccupations is also suspected to have created a new link between crude oil and food prices movements. In line with this, the main channels through which oil price can have effect on the economy can be seen as short run demand and supply effect.

Demand effect: A higher oil price reduces aggregate demand by reducing spending on the domestic economy. It reduces spending by consumers after high payment for energy use. They must cut back on purchases of other goods and services which lead a decline in the overall

spending on the domestic economy. Partly offsetting these effects of higher oil price could be the increase in the income of oil producers, that could raise the demand for domestic products, but those beneficiaries of oil price spend only part of their income on domestic products. As a result, higher oil price will likely reduce domestic spending. Other things held constant, real output and price level will decline.

Supply effect: The supply effects of higher oil prices are more pervasive than the demand effects. A higher oil price reduces aggregate supply by increasing the overall cost of production. A higher cost of production discourages investment which ultimately reduces total output of the economy. Faced with an increase in the price of oil, producers will tend to rise prices for a given level of output or, alternatively decrease output for a given price level. As a result aggregate output declines and the price level rises.

Combined effect on output and price: the combination of demand and supply effect implies that higher oil price lead to a decline in output and to an increase in inflation. Demand and supply effect reinforce each other in reducing output. Considering that the effect on aggregate demand can be offset by the increase in the income of others, and, on the other hand, that oil is not only an input in the production of energy but also of many more goods and services it can be argued that the supply effect dominates the demand effect. This makes external price shocks result in an inflationary effect on the domestic economy. Hence, in the short run- until the economy can come back to its equilibrium, oil price increase can harm a lot by decreasing real output, increasing unemployment and increasing inflation.

Emphasis on Developing countries

The adverse economic impact of oil price shocks on oil-importing developing countries is greater than on developed countries. This is because developing countries have a more energy intensive and less efficient production technology. Besides, the availability of limited alternative sources of energy exacerbates the vulnerability to oil price shocks (IEA, 2004). According to the United Nations conference on trade and development (UNCTAD 2008), oil importing developing countries suffer from high levels of unemployment and exacerbating budget-deficit problems.

In the case of Ethiopia, as an importer of oil and petroleum products, Ethiopia's economy is potentially vulnerable to fluctuations in the world price of crude oil. The recent oil price shocks adversely affected oil-importing developing countries such as Ethiopia.

Tradeoffs to Monetary policy

There are doubts whether monetary policy can reverse inflationary situation in an economy particularly created due to **cost push** rather than inflation created due to **demand pull** factors[2]. Economists like Munn, et al, (1991) indicated that monetary policy is more powerful on inflation driven by excessive expansion of the money stock rather than on inflation driven by cost push. Therefore, the trade-off is particularly stark in the case of a shock that causes inflation and output to move in different directions (cost-push or supply shock domination). The central bank's chosen course of action will depend on the perceived costs of variability in output and inflation respectively.

Evidently, an increase of oil price through its cost push inflation hampers the economy by rising inflation and or decreasing output through its negative effect on investment and consumption spending.

These leave the central bank of an oil importing country with limited options when an oil price shock hits:

- It can use contractionary policy to keep inflation from rising. Doing so will cause real GDP to decrease, or at least to lag behind the growth of potential real GDP. The resulting negative output gap will cause the unemployment rate to increase.
- It can use expansionary monetary policy to try to offset the impact of oil prices on real output and employment. However, given the negative impact of the oil shock on real GDP, inflation will accelerate.

[2]*Cost push inflation is inflation caused by an increase in prices of inputs like labour, raw material (oil price), etc. Demand-pull inflation is asserted to arise when aggregate demand in an economy outpaces aggregate supply*

- It can compromise by doing nothing that is, accommodating the price rise without trying to mitigate the output decline. The result will be intermediate between Cases 1 and 2, that is, there will be some increase both in inflation and unemployment.

None of these options is however, completely satisfactory and hence, the choice among them depends on various factors, among which the phase of the business cycle at the time oil prices spike, the preferences of the monetary authorities, the legal framework they work in, the need to coordinate monetary policy with fiscal policy can be mentioned.

2.2 Shocks to food price

With regard to shocks from global food prices, the price rise can reinforce by the adverse supply shock of oil shown above. By increasing the cost of production, the rise in price of oilcan led to a decrease in output of food commodities for a give price level. Therefore, the adverse supply shock resulted from an increase in cost of inputs consequently lead for an increase in the price of food. Furthermore, an increase in the global food prices can be associated with many factors including, bad weather condition, food hording and panic buying practices, an increase in demand for production of bio fuels, speculations, etc.

These rises in food prices are a cause of major concern because they bring significant and immediate setbacks for poverty reduction, social stability, inflation and a rules-based trading system. These are particularly important for developing countries where food consumption constitutes a major share of spending. Since food represents a relatively large share of developing countries' consumption baskets, this results insignificant inflationary pressures and hurts the living standards of poor net consumers that ultimately pose difficult policy dilemmas to the governments.

Unlike the conventional wisdom among economists that short-run problems associated with high prices of staple foods are best dealt with by appropriate macroeconomic instruments and targeted safety nets, there are however, substantial policy dilemmas and challenges faced by governments in the developing countries(Nora Lustig, 2009).

Tradeoffs to monetary authority

To deal with inflationary pressure from global food price shocks, the monetary authorities can have options but with dilemmas.

...to accommodate the price increases as a one-time spike in the rate of inflation or to stick to the inflation target through tight monetary policy. Tight monetary policy has a dampening effect on economic activity. However, accommodation puts the hard-won credibility of central banks at risk and this risk has to be weighed against the costs of tight monetary policy in terms of foregone output. Also, for countries in which wage and price indexation is common, it will be hard to prevent the initial increase in inflation from becoming entrenched. But given that fulfilling the inflation targets may mean that nonfood prices must fall in nominal terms, governments find it hard not to acquiesce to some degree of accommodation. Without it losses in economic activity are likely and this, in turn, would exacerbate the impact on poverty. In addition, the recessionary impact of tight monetary policy might reduce the fiscal resources available to compensate the poor through targeted safety nets (Nora Lustig, 2009 P, 16).

On the other hand according to Nora Lustig (2009) we could think of that countries can use their available international reserve to appreciate the exchange rate through which they can reduce the pressure of inflation from outside. This however, has its own negative consequences to the domestic economy by discouraging the export sector which ultimately can hurt the growth of the economy.

In addition to the above policy dilemmas, absence/limited scale of safety net programs, cash transfer programs, inappropriate design of these social security programs to incorporate the new poor make the situation worse to the developing countries which were the case in Ethiopia in 2008 social security programs.

Hence, confronted with unpalatable macroeconomic choices, lacking or inadequate safety nets, and uncertainty about the evolution of international food commodities prices, it requires a deep analysis of how monetary authority should respond for such shocks most importantly to the developing world, paying much to the situation. Given those significant and negative consequences of external commodity price shocks to the macro environment as well as welfare cost of price fluctuation to the society and tradeoffs to the response of the monetary authority, a

reasonable analysis to the responses of monetary policy and channels through which it can affect the economy is vital to see the real effects of the policy response on the economy. In line with this, the project will try to describe the response of National Bank of Ethiopia to the recent price shocks using a historical record of data on main macro variable, Policy variables and Price shock variables.

3. EMPIRICAL LITERATURES ON THE RESPONSES OF MONETARY AUTHORITIES

There are various works on the response of monetary policies to external price shocks at the regional level unlike to that of national level. A study by (Andrew Berg, et al, 2013) on the monetary transmission mechanism in Kenya, Uganda, Ruanda and Tanzania have shown a clear evidence of monetary transmission mechanism with some level variation across countries which can be attributed to deviations in their policy regime. Using non statistical approach of analyzing the responses, the study reveals that monetary policy responses to the external shock have clear effects to macroeconomic variables.

Another study focused on food price rise of external shock by (Michal Andrle, et al, 2013) in Kenya indicates that while imported food price shocks have been an important source of inflation, both in 2008 and more recently, accommodating monetary policy has also played a role, most notably through its effect on the nominal exchange rate.

At national level however, studies are scant /nonexistent. Even those available are far related works. For example (BiroukeTefera, et al, 2012) tries to show that oil price rise has significant impact on the Ethiopian economy in general, that does not indicate the response of monetary policy to such shocks.

A study by Anteneh Geremew (2014) tries to see the effect of shocks to monetary policy on output and price using a VAR approach and concludes that a positive shock to reserve money increases output while it decreases the price level significantly. But this study is also not related to external shock but only analyzes the effect of monetary policy shocks to output and inflation.

Therefore, given the above potential adverse consequences of external price shocks on macroeconomic variables mainly inflation and output which is strong in developing countries, and the dilemmas of reaction of monetary policy, as well as the lack of studies on the responses of monetary policy, this project has focused on assessing the reactions of the National Bank of Ethiopia's monetary policy to the recent shocks of oil and food price rise's

4. THE ETHIOPIAN FINANCIAL SECTOR AND MONETARY FRAMEWORK

4.1 The Ethiopian Financial Sector

Financial intermediation among its broad based functions and contributions to the economy are it serves as a mechanism by which monetary authorities can implement policies and influence the functioning of the economy. It is through financial intermediaries and markets that central banks can set policies and implement them for healthy functioning of the economy. In line with this, depending on their structure and their level of development, financial institutions are more or less important in influencing the economy. Therefore it is vital to determine the structure of the financial sector for a better analysis of the effectiveness of monetary policies

The Structure of financial sector

As part of a small open rapidly growing economy, the Ethiopian financial sector has long been regarded as shallow, with low coverage of financial services and high regulation from the government. It is also closed from foreign competition, which could limit opportunities for competition, capital injection, foreign exchange access and banking technology and skills. In addition, there is a lack of more sophisticated financing mechanisms such as leasing, equity funds, etc. (Getnet, 2014).

Financial intermediaries

As of 2013, Ethiopian financial intermediaries consist of 3 public banks, including the Development Bank of Ethiopia, 16 private banks, 14 private insurance companies, 1 public insurance company, 31 microfinance institutions and over 8200 Saving and Credit Cooperatives (SACCOs) in both rural and urban areas (Table 1). The ownership structure of

microfinance institution is mixed, with the big microfinance institutions partially owned by regional states, some by NGO's and some by private owners.

Table 1: financial intermediaries in Ethiopia

Column1	Column2	Column3
Indicators	1998/99	2012/13Q1
Number and Composition		
• Commercial Banks	8	16
• Development Banks	1	1
• Investment Banks	0	0
• Insurance Companies	9	14
• Mutual Fund companies	0	0
• Credit Union	N.A	N.A
• Micro Finance Institutions (MFIs)	11	31
Number of Branches		
· Banks (including DBE)	278	1376
· Insurance	79	252
· MFIs	N.A	1385

Source Getnet, (2014)

The microfinance sector is relatively well developed but not strictly supervised. At last counts, about 31 MFIs, reaching 2.4 million people, operated in the country and have become a major source of financial services to many farmers and businesses. Some unlicensed NGOs are also active in the delivery of microfinance services through informal channels. The non-banking sector remains largely undeveloped, except for 14 insurance companies with about 252 branches across the country.

Financial Market Situation

Generally speaking, financial markets in Ethiopia are in their early stage of embryo, unlike the country's growth performance. There is a primary market for the issuing bonds and treasury bills at the government level. Yet, secondary markets are very illiquid. The interbank money market, established in 2001, is poorly developed and largely illiquid, featuring only a few participants and small transaction volumes (table 2).

Capital markets are in their early stages of development. While no stock market is present, the Ethiopian Commodity Exchange (ECX) was opened in 2008, trading coffee, sesame, haricot beans, wheat and maize. In early 2011, there were more than 60,000 shareholders in Ethiopia, but the holder of the share cannot exchange in the market due to inexistence of secondary market for share trading and retreading (Legesse, 2012). This creates non-liquid share and discourages new investors to participate in the development of the country.

In the aim of financial inclusion, structural changes have been made in Ethiopia to allow the development of banks and this increases participation of private sector in opening private banks (though not permitted to foreigners) and enhances access to financial services. In the opposite side, there is no stock market and the financial market is at an infant stage accommodating limited amount of transactions (Zwedu, 2014).Authorities are therefore currently working on a strategy to develop capital markets in the country through the Financial Sector Capacity Building Project.

Table: 2 financial markets in Ethiopia

Column1	Column2	Column3
Indicators	1998/99	2012/13Q1
• Money Market	Non-existent	Exist but shallow
• Foreign exchange market	Non-existent	Exist and relatively active
Securities market		
• TBs Market	Non-existent	Exist but shallow
• Bond Market	Non existent	Exist but shallow
• Capital Market (stock market)	Non-existent	Non existent

Source Getnet, (2014)

4.2 Monetary Policy Framework

Objective/ Target: The principal objective of NBE's monetary policy is maintaining price and exchange rate stability and support sustainable economic growth, on the ground that price stability is a proxy for macroeconomic stability, which is vital for private economic decisions. Exchange rate stability is important to maintain competitiveness in the international trade and matters for foreign reserve position and domestic money supply (NBE, 2009).

Intermediate target: The monetary policy of the National Bank of Ethiopia sets money supply as an intermediate target to achieve its objectives. In line with these objectives, NBE takes the broader definition of money, or M2, as money supply target, where Money (M2) is a measure of the domestic money supply that includes M1[3] plus Quasi-money (savings and time deposits), overnight repurchase agreements, and personal balances in money market accounts. Therefore, the current target is to ensure that the money supply growth is in line with nominal GDP growth rate (NBE, 2009).

Operational strategy: To achieve the intermediate target, the National Bank of Ethiopia uses the growth of base money[4]/reserve money as an operational target. The NBE wants to influence the base money largely on a day-to-day basis, through its monetary policy instruments and this helps to link instruments of monetary policy to the intermediate targets. The base money represents the first impulse in the transmission process of monetary policy (NBE, 2009).

Monetary policy instruments

Open Market Operation: The NBE uses sale and purchase of bonds or government securities as one of its monetary policy instruments. In the absence of its own securities, certain amount of government treasury bills needs to be allocated to NBE by the government for its monetary policy purpose. To prepare the ground for enhanced open market operations, the yield on government securities should be at least close to the minimum interest rate (NBE, 2009).

A standing central bank credit facility: It is another instrument used to enhance the financial capacity of commercial banks and to promote financial intermediation and efficiency through its key advantage of transparency and predictability of accessing central banks' resources to cover short-term needs (NBE, 2009). The NBE provides commercial banks an assurance when confronted with short of funds in the clearing and a lack of alternatives for rising immediate

---

[3] *Narrow money (M1) is a measure of money stock intended primarily for use in transactions. It consists of currency held by the public, traveler's checks, demand deposits and other checkable deposits.*

[4] *Reserve money (Base money) is defined as the sum of currency in circulation and deposits of commercial banks at NBE.*

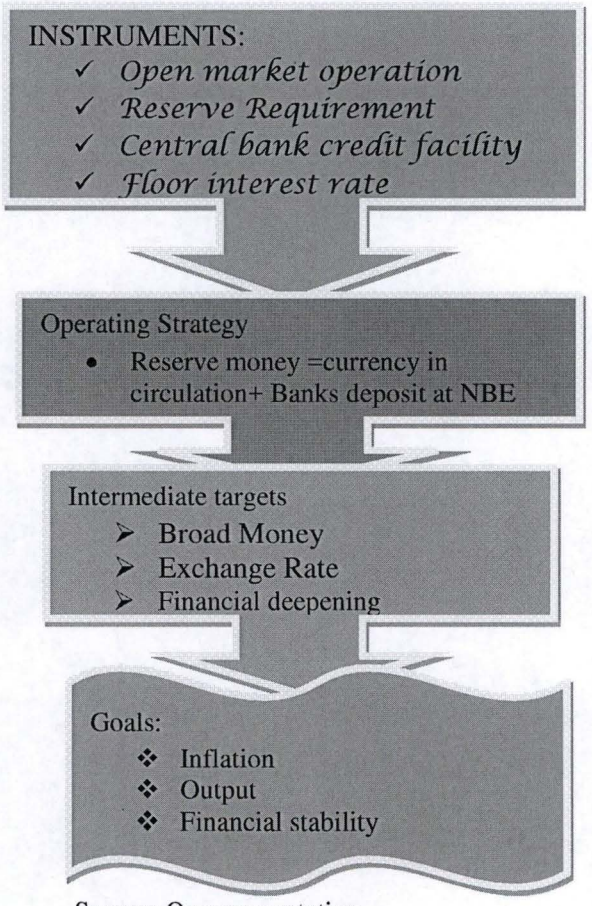
funds. Commercial banks therefore, can settle the clearing with the central bank's funds at a reasonable interest rate, which has a clear relationship with short-term market interest rates.

Other monetary policy instruments

- Reserve requirement
- Setting of floor deposit interest rate (until interest rate is fully deregulated)
- Direct borrowing/lending in the inter-bank money market and introducing re-purchase agreement (repo/reverse repo operations),
- Use of selected credit control when necessary, and
- Moral Suasion to curb inflation expectation (NBE, 2009)

Exchange Rate Regime: Considering the underlying economic situation of the country, managed floating exchange rate regime is being practiced in Ethiopia since 1992(NBE, 2009).

Figure: 1 Monetary Policy: Instruments, Strategy and Goals



Source: Own presentation

5. FACTS RELATED TO THE EXTERNAL SHOCK

5.1 What happened to world commodity prices?

External commodity price shocks in terms of persistent and strong increase has been the issue of many national and international institutions due to its adverse consequences mainly to countries that rely on importing those commodities. Over the last few decades, prices of oil and food have shown a steep rise until recent times where it goes back to a declining trend. Commodity prices soared during the 2000s, increasing by more than threefold between 2003 and 2011.

The rising of the international oil price becomes a permanent reality, with oil price attaining its climax in July 2008 when the international transaction export price index roses by 70 % relative to its base year value in 2010. In the same way, the international transactions export prices for energy Index roses by 26 percent in July 2006, 28 percent in July 2007, 138 percent July in 2008 and 14 percent in July 2009 as compared to the index in July 2005 (See figure 2).

According to the African Development Bank, (2009), a barrel of crude oil was trading between US$18 and US$23 in the 1990swhile it crossed the US$40 mark in 2004 and rose to about US$60 from 2005. During the summer of 2007, the price of one barrel of crude oil jumped above US$70 and even crossed the US$147 mark in July 2008.

The crude oil inflation, measured by the cumulative change in the spot price of a barrel of West Texas Intermediate measured in U.S. dollars, raised by almost 160 percent between 2003 Q1 and the same quarter in 2008. Both in nominal and in real terms(normalized by the U.S. GDP deflator), this increase is about double the increase in oil prices experienced during either the first or the second oil shock of the 1970s (IMF 2009).

The most frequent causes for energy price shocks are increases in the demand of energy by large emerging markets like China and India, together with constraints in the production of key commodities, which have pushed the price of many goods—notably oil to record-high levels.

Concerning the food price shock, it followed similar pattern to the energy price shocks over all periods. The international transactions export price index for food rose by 20.62 percent in 2008 relative to the base year (2010). In the same way, the value of the index rose by14

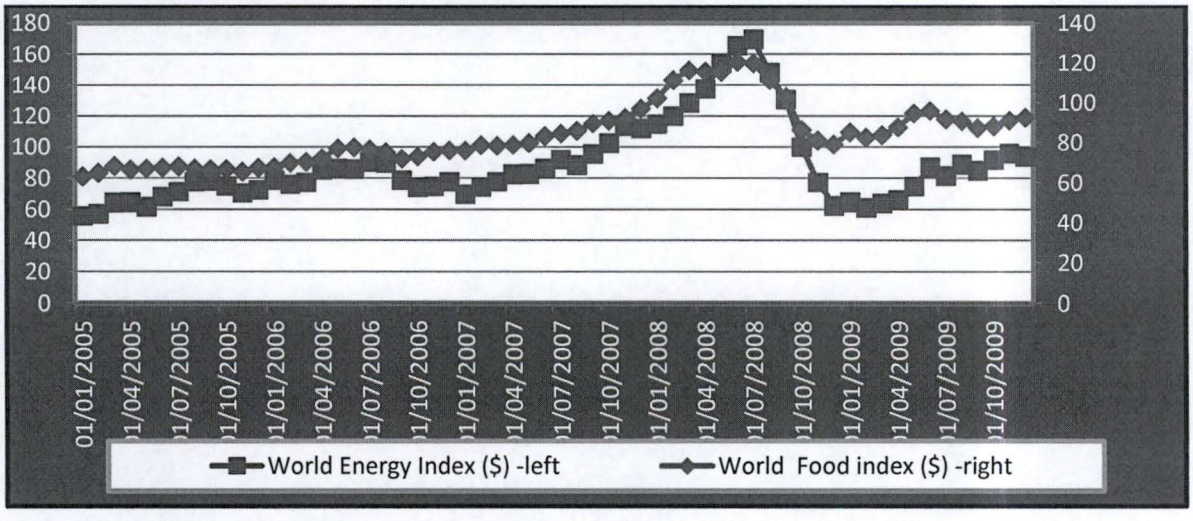
percent, 24.5 percent, 75.93 percent and 34 percent for July 2006, July 2007, July 2008 and July 2009 respectively relative to price level in 2005.

On the other hand, according to the United Nations Food and Agriculture Organization (FAO), in the period 1996 to 2006, world food prices rose on average by only 0.05% per semester in real terms. From 2007 to 2011, they have risen by an average of 2% per semester, that is, by 25 times more. The period beginning in 2006 (or post-great moderation) has been characterized by two price surges: the FAO price index increased by 54% between January 2006 and June 2008, declined of 34% between June 2008 and December 2008, then rose by 53% before stabilizing in December 2010.

The most frequently mentioned causes of food price volatility include: extreme weather conditions, increased demand from emerging countries caused by growth in incomes, increased costs to farmers due to oil price hike, rapid development of bio fuels, adoption of restrictive trade policies by major net exporters of key foods products such as rice, and speculation in commodity markets. As a consequence, for the monetary authorities of almost all small open economies, these shocks were perfectly exogenous from their policies or their own country situations, and were unanticipated.

In line with these, figure 2 illustrates this with a sharp increase in oil and food prices and a positive co-movement of food and oil prices.

Figure 2: Global energy and food export price index (monthly)



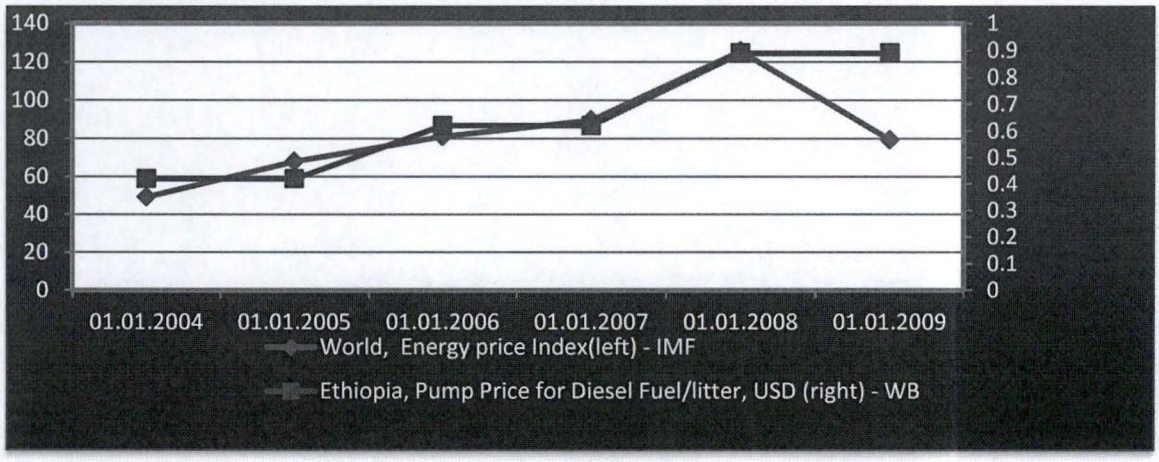
Source: (IMF) own computation

5.2 **Implication of Commodity Price Shocks to Ethiopia**

Following the commodity price shocks, the macroeconomic environments of many low and middle income countries had experienced negative shocks. According to IMF 2008, as a result of strong and persistent increases in international oil prices or in food prices, a large group of low and middle-income countries is experiencing a substantial weakening of their balance of payments, an acceleration of inflationary pressures, and a substantial weakening of their reserve position. Empirically, for net oil and food importing poverty reduction and growth facility (PRGF)eligible countries, the combined adverse effects of shocks on their balance of payments rose by an additional 1½ percent of GDP on average during May-July 2008 (IMF, 2008).

Effect on Price of food and fuel: Ethiopia, as one of the low-income country, has exhibited an increase in the price of oil and food during the commodity price shocks. During the shock (early IV quarter of 2007 to late III quarter of 2008), the pump price for diesel per litter has increased by 111.9 percent from its value in 2005 (See figure 3). To note here that, even though the world energy price index has shown a steep decrease after its peak in 2008, the decrease in Ethiopia was not significant. This could be attributed to the lifting of oil subsidy program of the government during the same period. A close examination of Figure3 reveals that the international and domestic oil prices have a strong correlation in that the two prices moves together. Until the end of August 2008, the gap between domestic and international prices (can be understood as the gap between the two lines in figure 3) was very minimal since the government has been subsidizing oil prices. From September 2008 onwards however, the government suspended the oil price subsidy scheme resulting in widening of the gap between international and domestic price of oil. Besides, the gap was precipitated by the decline in the foreign exchange value of the Ethiopian birr from the end of 2008 onwards.

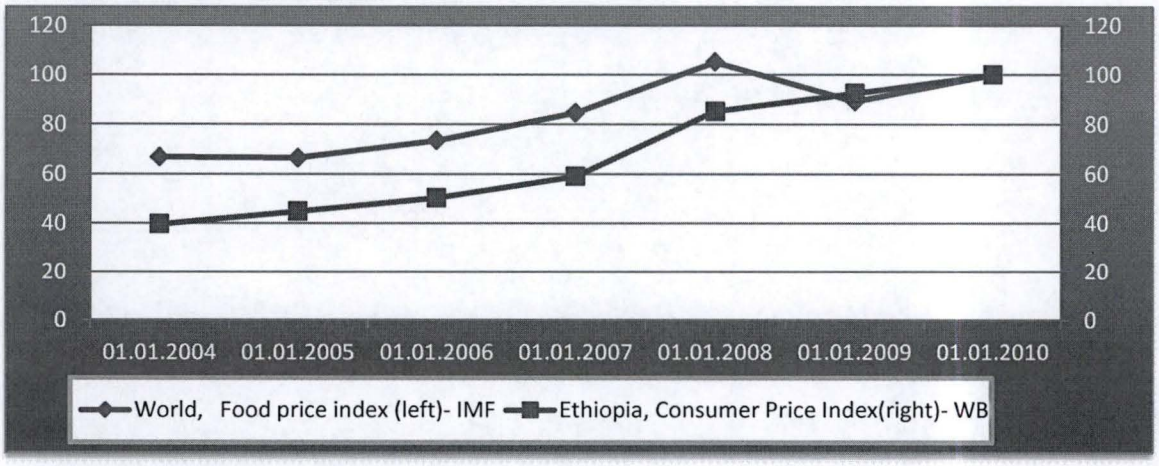
Figure: 3 Global and Ethiopia energy price index



Source WB (2015) and IMF (2015) own construction.

Similarly, following food price shocks, the consumer's price index has shown an increasing trend over the period's shocks. It has increased from 90.1 percent to 106.22 percent in the shock period-between early fourth quarters 2007 to late third quarter 2008 (Figure: 4).

Figure: 4 Global – Ethiopia food price index

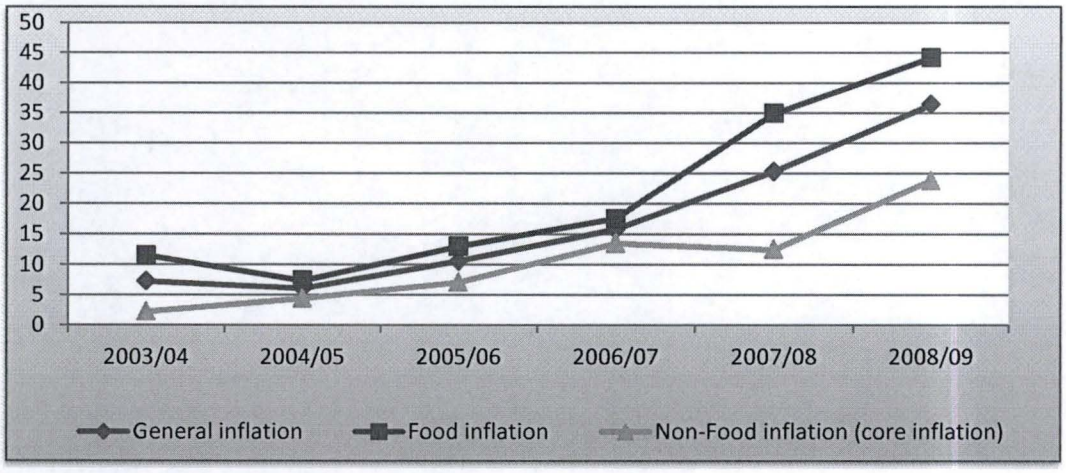


Source WB (2015) and IMF (2015) own construction

Inflationary Effects: Associated with the rise in the prices of oil and food commodities, the inflationary situation of the country has exhibited similar patterns. Even though historically Ethiopia has been one of the low inflation economies with average inflation rate of less than 5 %, since 2006/07 however, Ethiopia has no longer been considered a low inflation country. On

a year-by-year basis, annualized headline inflation reached 15.8 percent, 25.3 percent, and 36.4 percent in 2006/07, 2007/08 and 2008/09 respectively (figure 5). The major causes were then high fuel and food prices shocks, weaker foreign exchange earnings, and rising demand for imports that depleted international reserves of the country. The highest price increase was observed in food, housing, fuel and transport services. The rise in the annualized headline inflation was largely attributed to the rise in international food and oil price rise according to NBE consecutive annual reports.

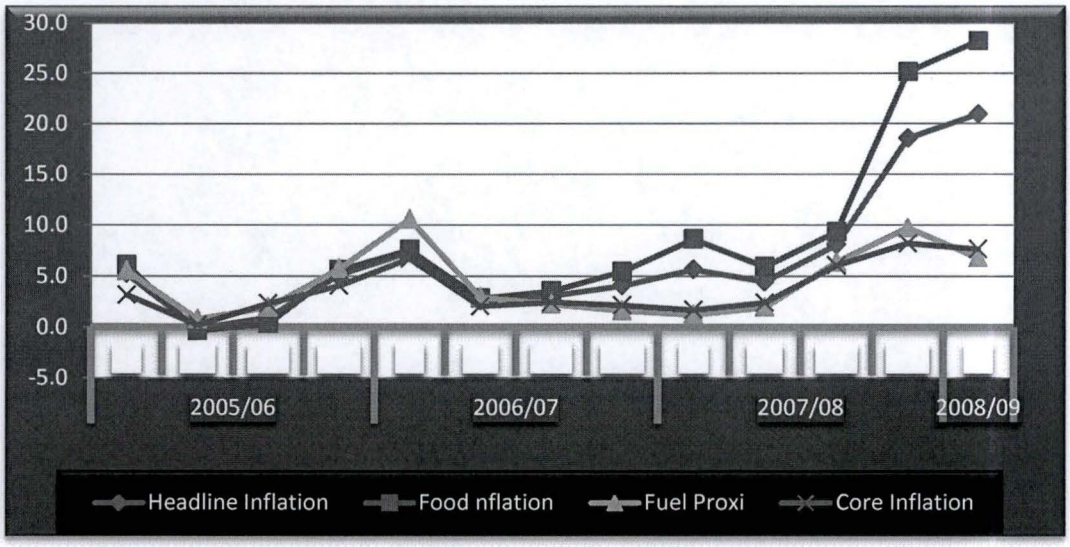
Figure: 5 inflationary situations in Ethiopia (annual)



Source NBE, own computation

On a quarterly basis, the first quarter of 2006/07 exhibited a significant rising trend in headline inflation rate greater than 6 % where it is moderated to 2.1 percent in the second quarter of the same year and starts to rise in the third and fourth quarters until it reach 5.7 percent in the first quarter of 2007/08 (figure 6). The change in both food and nonfood inflation has contributed to the movement in the general inflation rate. Rapid economic transformation and accompanied structural changes as well as rising world commodity prices have contributed to higher domestic prices. Core inflation (nonfood inflation) varies mainly due to fuel price index inflation that rises and falls with the international situation.

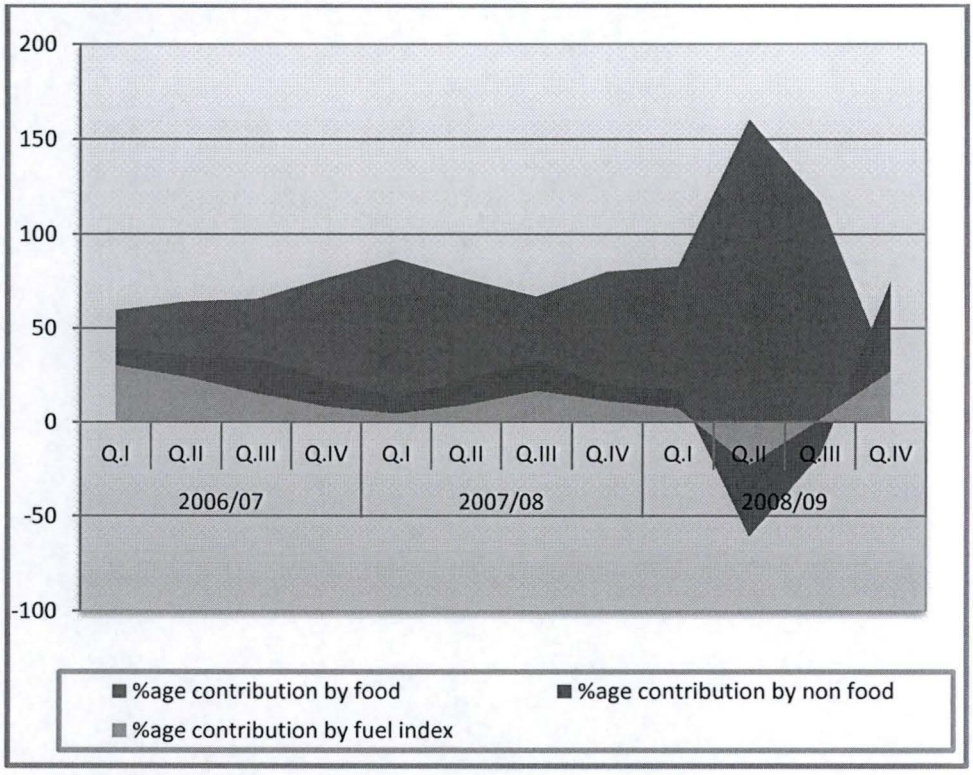
Figure: 6 Quarterly inflations



Source: NBE, own computation

In terms of contribution to the headline inflation, food inflation constitutes the largest share throughout the study period (figure 7). In part, it can be attributed to the weight attached to it (52.01 percent). On the other hand, nonfood inflation, as observed from figure 7, is largely influenced by the change in the price if oil. This implies that nonfood inflation is sensitive to oil inflation as evidenced by Fekadu (2005), who indicated oil price increase has a significant impact on the core inflation (nonfood inflation). Further, according to African development bank (2011), among the drivers of short-run inflation in Ethiopia is the rise in oil price accounts for 27% of inflation.

Figure 7: Contribution of components to the headline inflation[5]



Source: NBE, own computation

Other documented effects: In addition to effects on price of commodities and inflation, external shocks are also documented to have a deteriorating effect on other macro- and micro-environments of the nation. Historically, Ahmed (2007) found that oil price shocks have a deteriorating impact on private consumption and investment, a depreciation impact of on Birr (Ethiopian currency) and adversely affects public investment. Higher fuel prices raise food prices, reducing the purchasing power of the birr and in turn affecting the welfare of households as fuel and food are core elements of household budgets in Ethiopia.

---

[5]*Food inflation has weight of 52.01 percent to the headline inflation; core inflation has weight of 47.99percent to the headline inflation. Besides, fuel index which includes fuel and power, beverages, house rent, construction materials, water, has weight of 75% to the core inflation and has weight of 20.56% to the headline inflation.*
Therefore the contribution of each component to the headline inflation is constructed by considering their relative weight.

$$E.g. percentage contribution of food inflation to hedline inflation = \frac{food inflation * its weight\ (52.01) * 100}{headline inflation}$$

Birouke, Frehiwot, and Zewdu (2012), indicates, given the high vulnerability of the country for external shocks, that the oil price shock immediately causes price of tradable goods to rise and depreciation of birr (Ethiopian currency).This decreases Ethiopian international purchasing power and the real import. Moreover, the oil price shock had also a contractionary effect on the output of manufacturing and service sector associated with the shifting of resources from oil intensive sector to other sectors.

With regard to food price shocks, based on the analysis that the sample includes only those who consume by purchasing rather than own production, the study by Elisa Ticci, (2011) indicates that, rural areas experience lower inflation than urban ones, attributed to differences in the share of food expenditure in the budget of different households. Further, in both areas, households in the top expenditure quartile experience lower inflation rate than the rest. Further, the study indicates that, due to the loss of purchasing power and its impact on expenditures distribution, in both areas a larger proportion of individuals would have been pushed below the poverty line. Their estimates indicate the increase in food prices represents a higher share of poverty impact in urban areas than in rural areas, which can be attributed to higher share of food expenditure in urban than in rural counterparts.

Fiscal Policy Responses: As a coping strategy for oil price increase, price subsidies and petroleum product tax reduction are the two most commonly used methods of partially offsetting higher oil prices in the international market. Ethiopia spent more than 7.7 billion ETB (794 million USD) on fuel subsidies to stabilize the oil market between August 2006 and January 2008 (Kojima 2009). This is equivalent to 4.02 percent of nominal GDP of 2007 fiscal year, a midyear in between 2006 and 2008.

However, the subsidy benefitted rural and urban high-income households rather than targeted poor households, and by increasing government expenditures it exacerbated budget deficit, through which the government finances the deficit by borrowing from external as well as domestic sources (NBE, quarterly reports from 2007/08 to 2008/09). In October 2008, therefore, the Council of Ministers decided to eliminate fuel price subsidies, resulting in a price increase of 50 percent for kerosene and 40 percent for diesel (Kojima 2009).

With regard to subsidy to food price rise, unlike to various measures, it was less effective partly because policy makers often lack sufficient information to gauge the likely causes and effects of food price rise on the economy and to identify, design and implement policy actions that can best avoid risks. The Ethiopian government adopted immediate ad hoc measures to protect urban households. In April 2007, an urban food-rationing program was announced, and from 2008 up to now, households in possession of a ration card could have access to subsidized wheat. However, according to the World Food Program and (UNICEF 2009), a large proportion of urban poor did not have the card. In rural areas, no measures were adopted until 2008. Furthermore, some adjustments in the Productive Safety Nets Program (PSNP), a large-scale program, which started in 2005, were constrained by limited resources. The cash wage paid to public-works participants was raised by one third, but its purchasing power had already declined in May 2008 by 62 per cent (Gilligan et al. 2009).

6. MONETARY POLICY RESPONSE AND TRANSMISSION MECHANISM ANALYSIS

Monetary policy of central banks in a simplified analysis amounts to the determination of the optimal quantity of money (in a dynamic sense) or the optimal rate of growth of the money stock. In similar sense, the current target of monetary policy of NBE is to ensure that the money supply growth is in line with nominal GDP growth rate. To achieve this, the growth of base money/reserve money is being used as an operational target. Given this fact, this project has assessed the actions of the NBE on its monetary policy instruments and its effects on those monetary aggregates. To see if the NBE could achieve its current target of growth of M2 is in line with the requirement of the economy, I consider financial deepening (M2/Nominal GDP) on an annual basis.

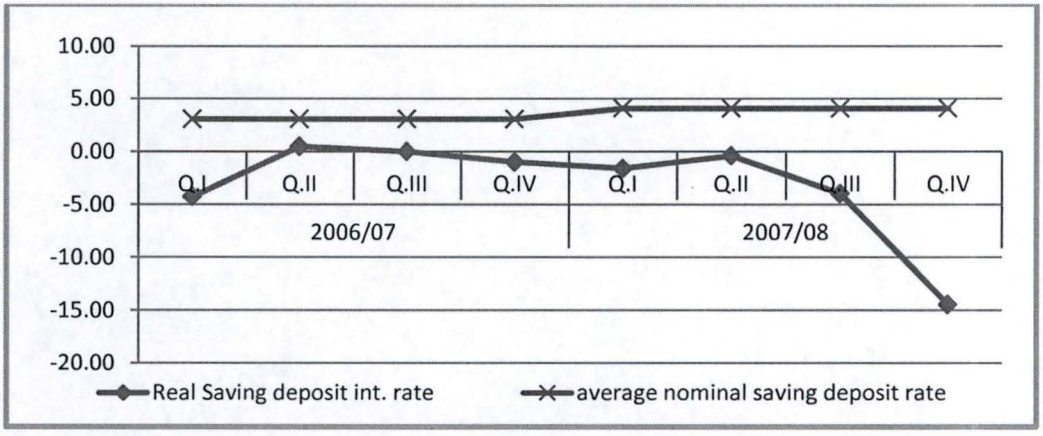
6.1 Monetary policy responses

Accommodation

During the shock period, even though the inflationary pressure has remained the most serious concern of the government, the National Bank waited until July 2007 to take actions on its instruments. The quarterly movement of real saving deposit interest rate and the vigorous

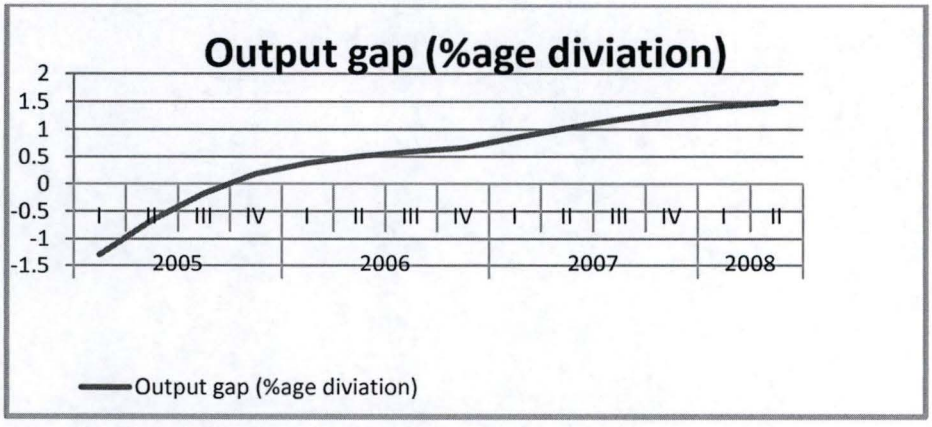
(overheating) of the economic activity explained by the positive output gap[6] /output above the potential level can infer the accommodative nature of monetary policy(Figure 8 and Figure 9). Given there was no significant increase in the interest rate structure of commercial banks, the real saving deposit rate was negative in real terms, considering the quarterly general inflation that coincides with the expansionary phase in the output gap.

Figure: 8 Quarterly real saving deposit rate and nominal average saving deposit rate



Source: NBE, own computation

Figure: 9 Output gap based on quarterly real GDP

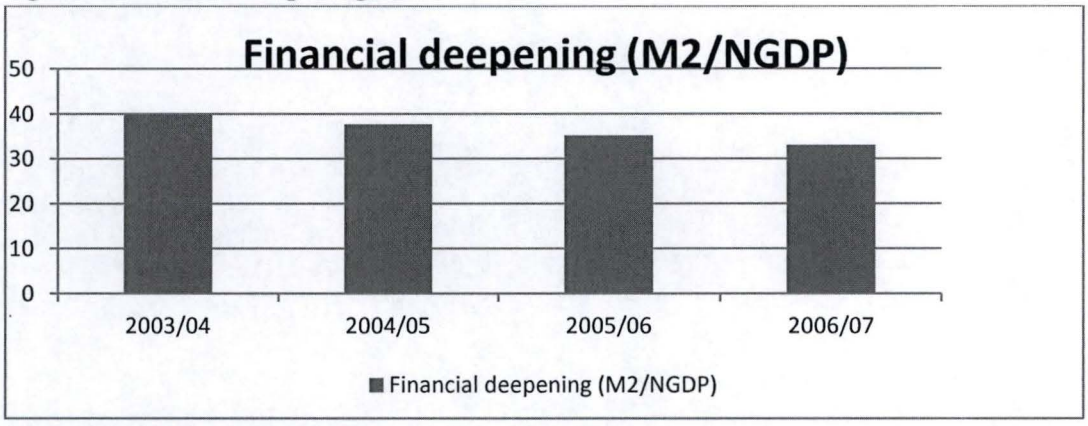


Source: IMF, own computation

[6]*Output gaps are estimated with a Hodrick-Prescott filter on the quarterly real GDP from IMF IFS (2010=100), Constant Prices.*
When the economy is running an output gap, either positive or negative, it is thought to be running at an inefficient rate as the economy is either overworking or underworking its resources

However, with regard to monetary aggregates, the growth in broad money is anchored to be in tandem with nominal GDP growth and in line with the objective of price stability. Accordingly, broad money supply grew by 22.2 percent during fiscal year 2006/07 compared with 2005/06 that was lower than the 29.8 percent nominal GDP growth registered in 2006/07 showing prudent monetary policy (Figure 10). The ratio of M2/NGDP, an indicator of financial deepening went down by 5.9 percent to 33.1 against the previous year. It reflects the tight monetary policy measures pursued during the period despite the strong demand for money in line with the expansion of the economy (Figure10).

Figure: 10 financial deepening



Source: NBE, own computation

In spite of the prudent monetary policy pursued by the government, FY 2006/07 witnessed continued build-up in inflationary pressures amidst remarkable economic growth that, reflecting or responsible for an increase in the transaction demand for money. This leads the NBE to raise the reserve requirement from 5 percent to 10 percent and the minimum interest rate on savings and time deposits from 3 percent to 4 percent towards the end of 2006/07

From Accommodation to Effective Actions

Even if NBE has conducted a tight monetary policy by rising reserve requirement from 5 percent to 10 percent and minimum interest rates from 3percent to 4 percent effective from July 2007, throughout the year 2007/08however, the problem of inflation has continued daunting challenge in the country where, annual average headline inflation reached 36.4 percent in 2007/08 against 6.1 percent in 2004/05 which was unprecedented in a low inflation country like Ethiopia (figure 6). It was mainly due to the consequences of continuing rising

world commodity prices and internal factors including rapid economic transformation accompanied by structural changes and supply side constraints.

Moreover, in response to NBE's upward revision of the minimum interest rate on savings and time deposits from 3 percent to 4 percent effective from July 4, 2007, commercial banks revised their minimum deposit interest rates on saving and time deposits upward by one percentage point from 3.08 percent to 4.08 percent. However, considering the high headline inflation, all deposit rates and average weighted yields on T-bills were negative in real terms (Figure 7) which can imply ineffectiveness of monetary policy to bring down inflation to a target of single digit, even though it could decrease the pace of inflation.

In addition to those instruments implemented as of July 2007, the NBE further took various policy measures during the fourth quarter of 2007/08 that could help mitigate inflationary pressures, witnessed in recent years. Accordingly, it has further raised the reserve requirement ratio from 10 percent to 15 percent (by 500 basis points) for the second time since July 2007 and liquidity requirement from 15percent to 25percent (by 1000 basis points) effective from April 7, 2008.

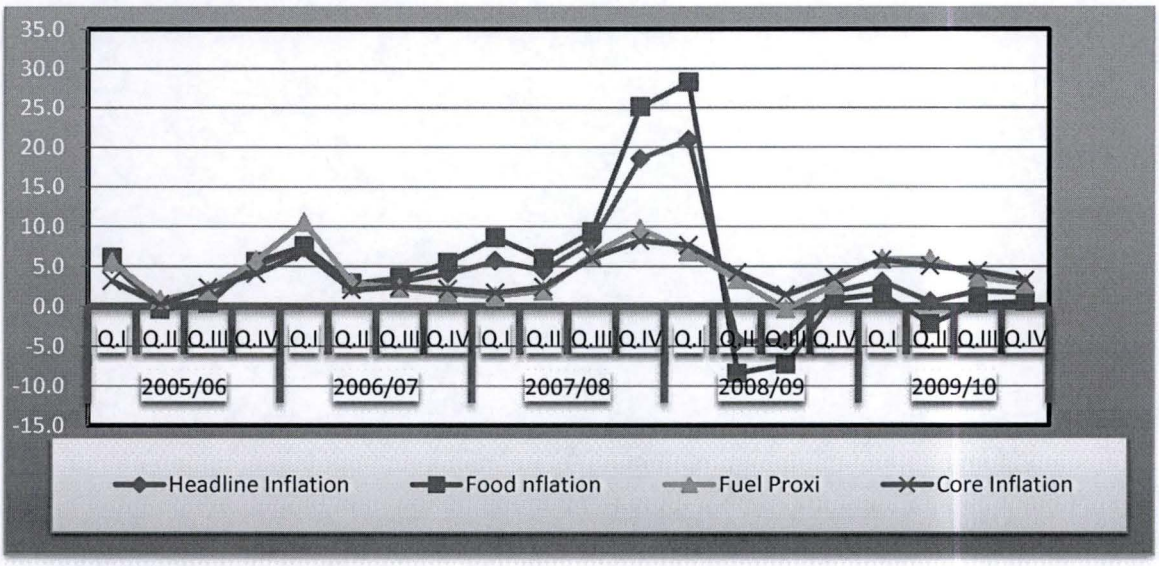
During the same period, there were also various fiscal and administrative actions of the government including subsidizing domestic fuel retail prices despite persistent rise in international market, supplying wheat and edible oil at lower prices to low-income households in Addis Ababa and other towns in the regions and introducing Ethiopian Commodity Exchange (ECX) and others. The primary objective of those actions was to mitigate the impact of inflation on the low income groups of the society and to contribute towards slowing down the pace of inflation and inflationary expectations.

6.2 Changes to Macroeconomic Indicators

Immediately after implementation of tight monetary policy, (supported by fiscal and administrative policies), nonfood inflation exhibits a decreasing trend until it becomes stable for the next year 2009/10. On the other hand, the tight monetary policy starts to be effective on headline inflation and food inflation starting from the second quarter of 2008/09 where both decreased to reach negative levels of -0.1 %and -8.4 % respectively (Figure: 10). The one-

quarter lag in the response of food inflation can be attributed to the ineffectiveness of fiscal and administrative measures of the government concerning food policies, which was unlikely to be the case for fuel prices.

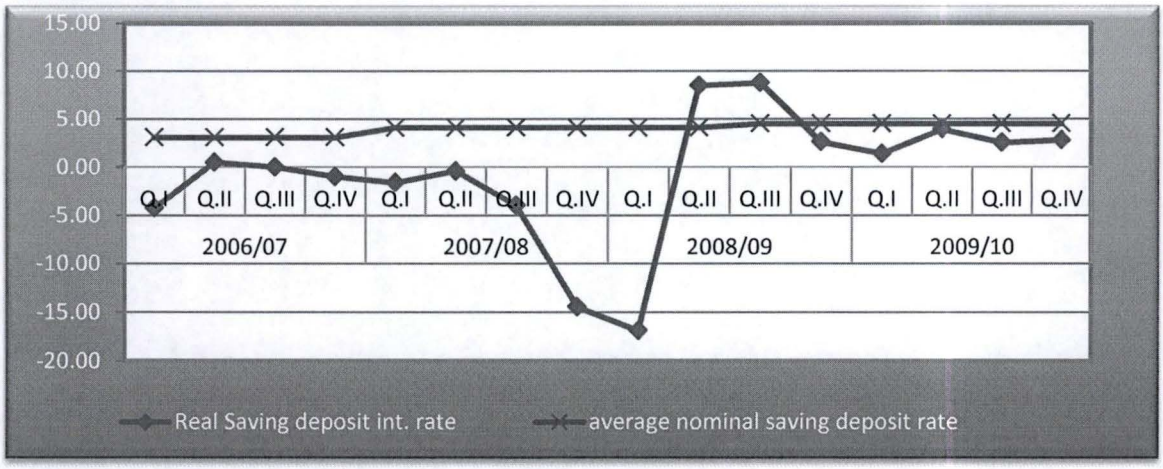
Figure: 10 Responses to inflations



Source: NBE, own computation

Moreover, the tight monetary policy (rising in the RRR and liquidity ratio) has also contributed for the increase in the average saving deposit rate from 4.08 percent in 2007/08 to 4.5percent in 2008/09. In addition to this, considering the core inflation, the real interest rate rises to be positive starting from the second quarter of 2008/09can largely be attributed to the decrease in inflation following the tight monetary policies (Figure: 11).

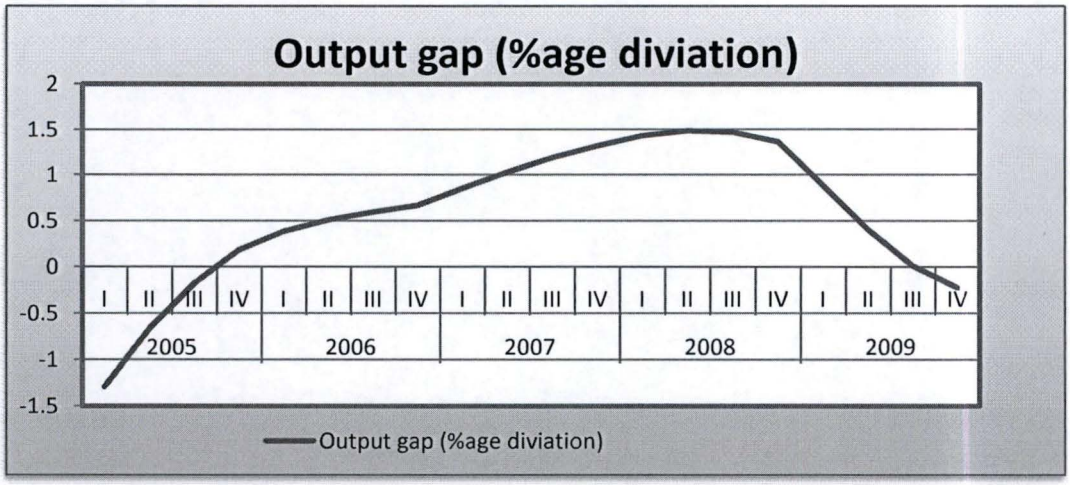
Figure: 11 Responses to real interest rate



Source: NBE, own computation

The output gap which is an economic measure of the difference between the actual output of an economy and the potential output (efficient output) of the economy starts to become cold following the tight monetary policy measures (Figure: 12).

Figure: 10 Output gap



Source: IMF, own computation

6.3 Inside the Black Box

6.3.1 Reserve Requirement and Money Supply

Basic Process

The central banks reserve System can use, in theory, reserve requirements as a monetary policy tool for controlling the money supply and interest rates. The process would work like this:

- First, after evaluating the state of the economy, the CB determines whether the money supply needs to increase or decrease and by how much.
- Second, if the CB wants to increase the money supply it lowers reserve requirements and if it wants to decrease the money supply it raises reserve requirements.
- Third, the higher or lower requirements mean commercial banks have to keep fewer or more reserves to back up deposits. If reserve requirements are higher, then banks have to keep more reserves. If reserve requirements are lower, then banks can keep fewer reserves.
- Fourth, the change in reserves that banks have to keep induces a change lending activity. If reserve requirements are higher, then banks have fewer reserves available for lending. If reserve requirements are lower, then banks have more reserves available for lending.
- Fifth, the change in bank lending affects the creation of checkable deposits, which are an important component of the money supply. More loans mean more deposits and an increase in the money supply. Fewer loans mean fewer deposits and a decrease in the money supply.
- Sixth, the change in bank lending also affects interest rates. If banks are willing to lend more, then interest rates fall. If banks are willing to lend less, then interest rates rise.
- Finally, interest rates, an important variable to link real sector to the financial sector will start work on.

6.3.2 Channels of Monetary Policy

It is obvious that monetary policy is a powerful tool, but one that sometime has unexpected or unwanted consequences. To be successful in conducting monetary policy, the monetary authorities, must have an accurate assessment of the timing and effect of their policies on the economy, thus requiring an understanding of the mechanism through which monetary policy

affects the economy. Specific to developing countries, where the financial sector is not well developed, channels through which monetary policy is transmitted includes money channel, interest rate channel, exchange rate channel and credit channel.

Money Channel: This channel is perhaps the oldest one that effectively assumes that changes in reserve money are transmitted to broad money via the money multiplier that banks are in the business of creating inside money. When the central bank changes the reserve requirement that banks should keep in it, the amount of many available for banks to lend will be changed. This changes the capacity of banks to create money via lending in the economy. But this argument also assumes a role for individuals holding components of broad money, currency in circulation, and various forms of deposits.

It is still a significant channel in countries where financial depth is low and money is still a major asset in people's portfolios as in Ethiopia.

Interest rate channel: This channel works through and assumes the standard Keynesian IS-LM framework, where prices are rigid in the short run. The change in monetary policy stance through the short term nominal interest rate affects real interest rate, which in turn impacts aggregate demand and prices by changing firms and household's investment and consumption decisions. In line with these, a tightening of the monetary policy stance translates into higher interest rates, lower aggregate demand and reduced inflationary pressures. The reverse will be true for expansionary monetary policy stance.

***Exchange rate*:** with the growing internationalization of countries economy, once the monetary policy affects the reserve money and in turn the real interest rate, change in real interest rate can affect the flow of capital to and from a nation. An increase in real interest rate attracts capital investment to the nation and subsequently induces an appreciation of the domestic currency[7]. In the contrary, a decrease in real interest rate leads outflow of capital investment and induces a depreciation of the domestic currency. In turn, movements in the

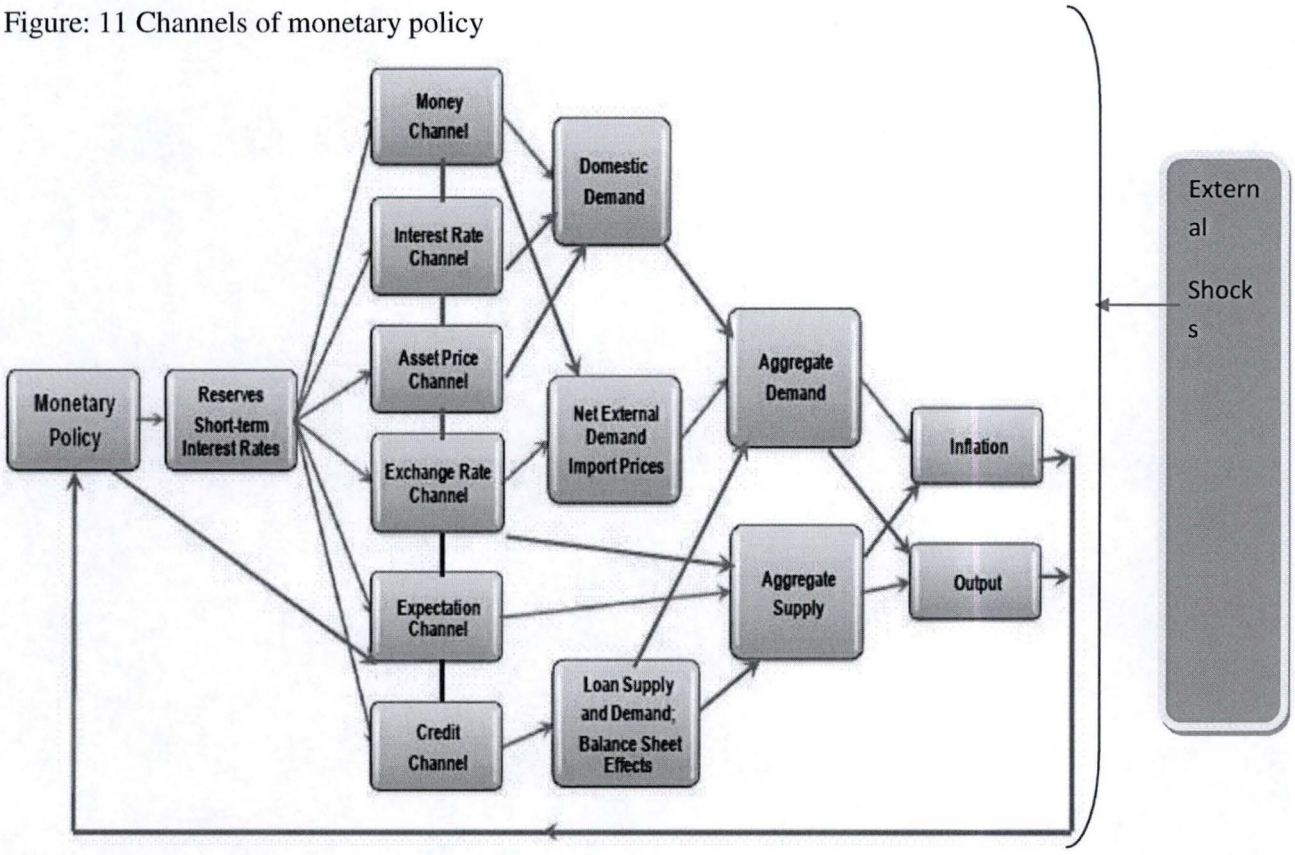
[7] *It is by considering the definition of exchange rate as the amount of domestic currency required to purchase a foreign currency.*

exchange rate will directly affect inflation by changing the cost of imports and will, by moving the real exchange rate, affect net exports and aggregate demand. Accordingly, a restrictive monetary policy would translate into an appreciation of the currency, lower pressure of inflation, lower net exports and aggregate demand (opening up a negative output gap), and lower inflation (Andrew *Berg, 2013)*

The credit channel: A restrictive monetary policy, can induce banks to use non-price mechanism to limit their supply of credit. It operates via two main channels, which are the bank lending channel and the balance-sheet channel. In bank lending channel, a decrease in money supply leads to a decrease in bank deposits, which further decreases the volume of money that banks have to loan out. This, in turn, decreases investment and, ultimately, aggregate demand. Credit rationing as a byproduct of credit channel may also arise, when borrowers are denied to loans even if they are willing to pay high interest rate that leads to adverse selection and moral hazard problems as loan is curtailed to good quality borrowers

The balance-sheet channel and the cash-flow channel on the other hand, work through changing the value of collaterals held by households and firms that can be pledged to get credit. Accordingly, a restrictive monetary policy raises the interest rate, which in turn decreases the value of collaterals that makes access to credit tight, and results in lower aggregate demand and inflation (Andrew *Berg, 2013).*

Figure: 11 Channels of monetary policy

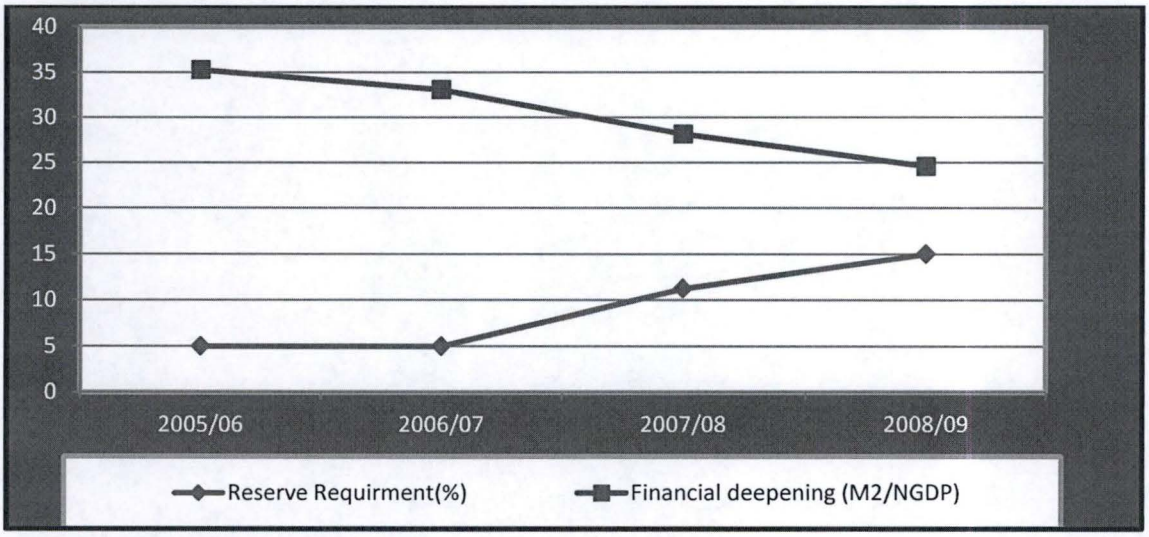


Source; Davoodi H., S. Dixit and G. Pinter (February, 2013)

6.3.3 Channels to Monetary Policy Shocks In Ethiopia

Monetary channel: The pass-through from the tight monetary policy to the financial deepening is quick and effective. When the RRR increases, it shows the ratio of broad money supply to nominal GDP (financial deepening) continues to decrease immediately. This indicates the effectiveness of the monetary channel, as expected in countries like Ethiopia where financial depth is low and money is the major asset in the people's portfolios.

Figure: 12 monetary channels



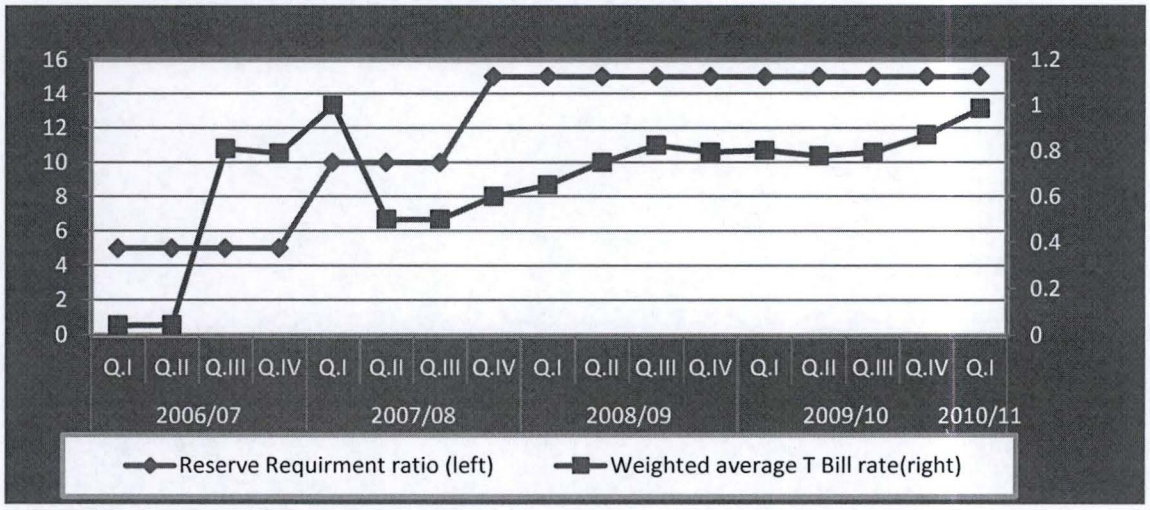
Source: NBE, own computation

Interest rate channel: the policy stance influences interest rates both in the financial market as well as in the intermediaries. Accordingly, the contractionary monetary policy induced by rising RRR and liquidity ratio is expected to have an increasing effect on money market interest rate as well as banking rates.

Money market Rate: Data indicate the pass-through from the policy rates (RRR) to the money market interest rate (using weighted average Treasury bill rate[8]).It shows the transmission from the policy rate to money market interest rate is quick and consistent (following the second policy shock). The weighted average Treasury bill rate composed of 28 day bill, 91 day bill and 182 day bill responds starting from the first period policy shock and continues to the second policy shock.

[8]*Due to the absence of inter-bank money market transactions (most periods), no sufficient data is available for Inter- Bank Money Market rate.*
Further, weighted average T-bill includes T-bills issued for 28 days, 91 days and & 182 days maturity.

Figure: 13 RRR and Money market interest rate (percent).

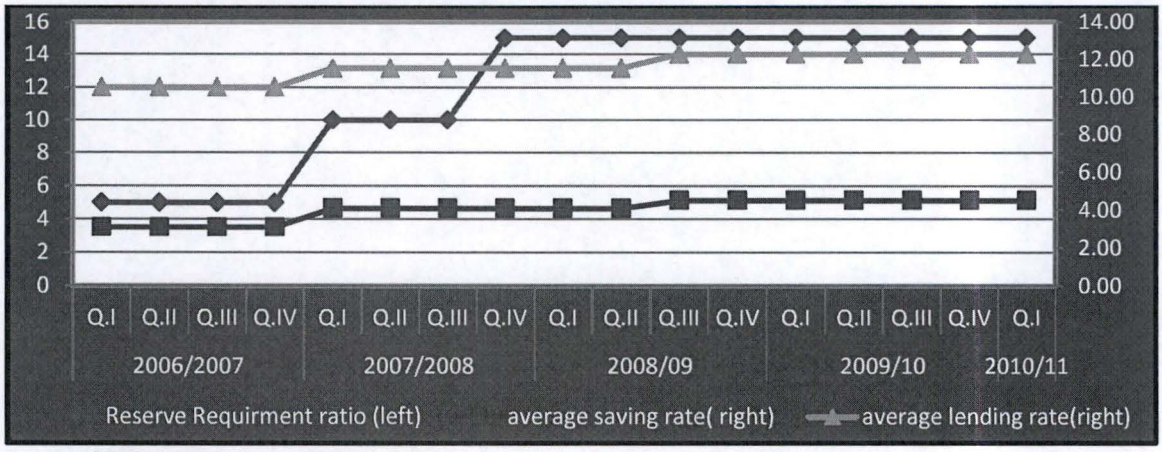


Source: NBE, own computation

Bank rate

The data also shows, the transmission from the policy rate to the banking rate (comprising average saving rate and average lending rate) is also evident even though it looks slow to transmit. It indicates, banking rate responds to restrictive monetary policy slowly with a lag of between three and four quarters[9].

Figure: 14 RRR and Bank interest rate (percent).



Source: NBE, own computation

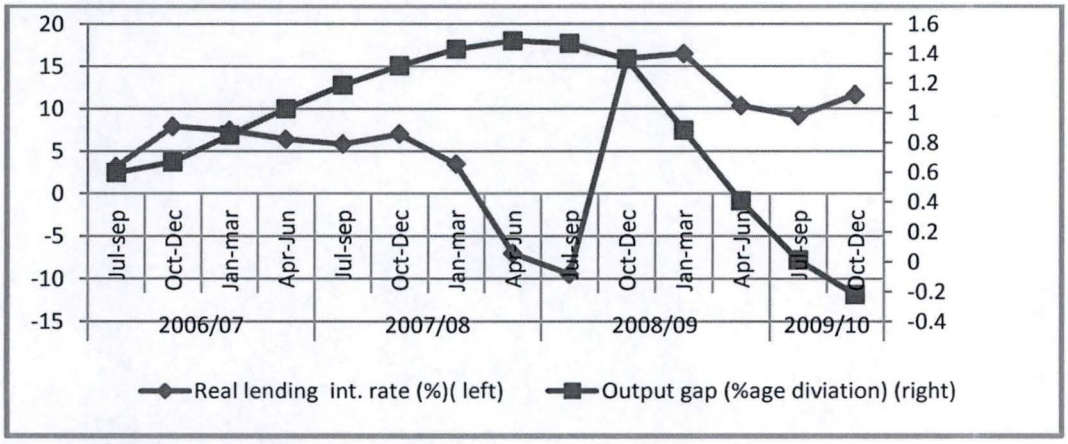
[9]*The rise in lending and deposit rates during the first quarter of 2007/08 is due to policy shock of rising of minimum deposit and lending rate.*

Aggregate Economic Activity (output gap)

What matters the most is probably the real interest rate that can determine private consumption decision of households' vis-à-vis its effect on saving decision. It also determines the investment decision of firms' vis-à-vis the cost of capital decision. Those decisions can be captured through interest elasticity of aggregate demand.

In line with this, the study suggests that the tight monetary policy has contractionary effects on aggregate economic activity where the negative real lending interest rates are associated with output above the potential level and positive real lending interest rates are associated with output gap calm down to its potential level (figure15). Furthermore, it shows that the transmission goes fast nearly after one-quarter lag.

Figure: 15 real lending interest rate and output gap (percent)[10]



Source: NBE, IMF, own computation

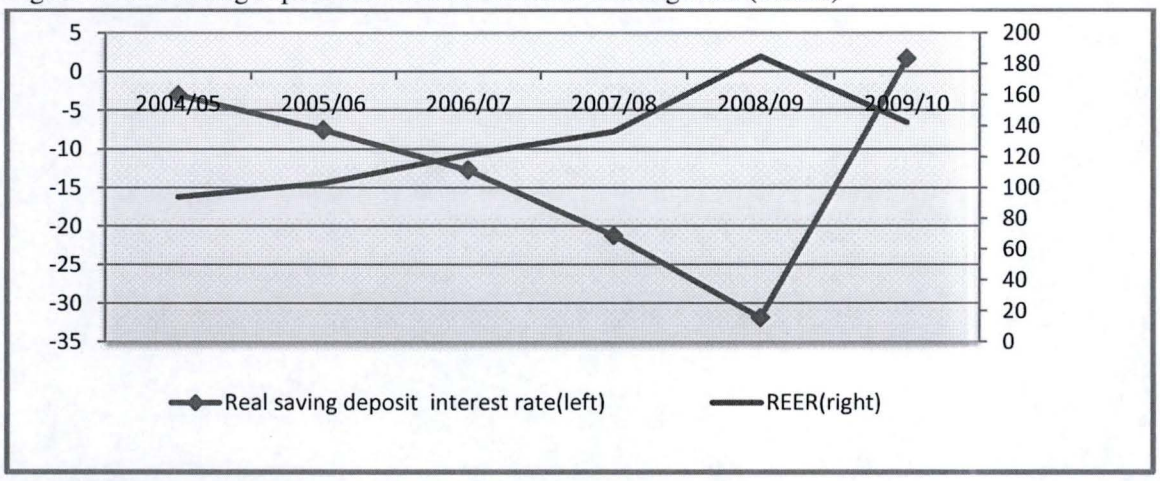
Exchange Rate Channel

The pass-through from real saving deposit rate[11] to appreciation and depreciation of real effective exchange rate looks correlated. The change in real saving rate shows a significant link to the movement of the real effective exchange rate. Also the real effective exchange rate

[10] *Real interest rate is calculated by using real lending interest rate in the World Bank data as well.*
[11] *Real saving deposit is selected due to absence of interbank rate and the relative strength of real saving interest rate to capital movement.*

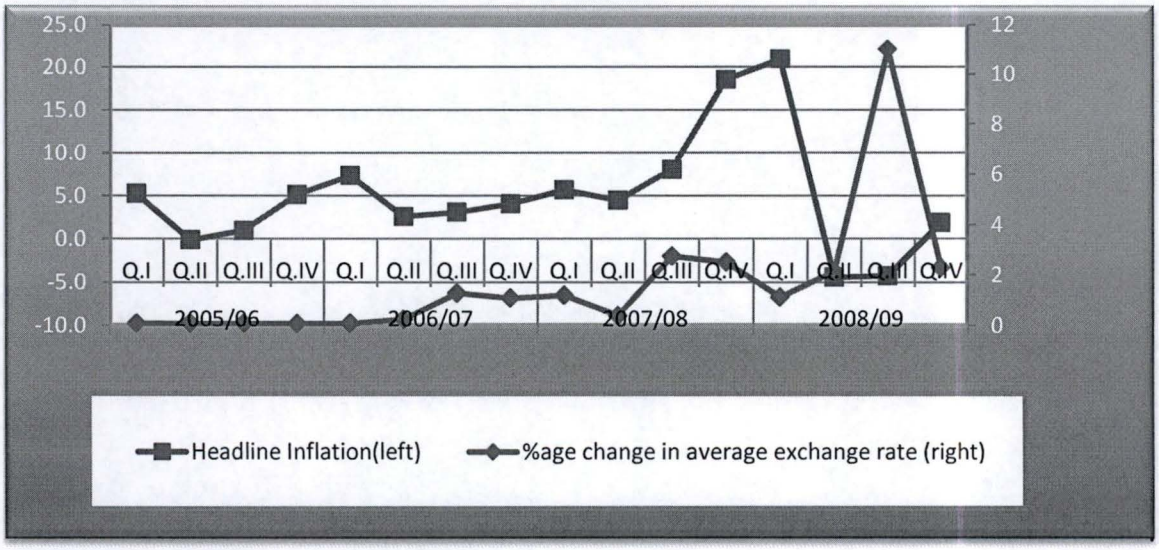
continuously rises with the decrease in the real in interest rate and when the real interest rate increases, the real effective exchange rate show an appreciation (figure 16). The pass -through from percentage change in exchange rate to inflation (headline) also looks apparent. The evidence suggests the pass through took one quarter lag (Figure 17). Furthermore, across the period the continuous appreciation and depreciation of the real effective exchange rate shows the decrease and increase in the competitiveness of the home economy relative to the main trading partners.

Figure: 16 real saving deposit rate and real effective exchange rate (annual)



Source: NBE, own computation

Figure: 17 Percentages change in exchange rate and headline inflation

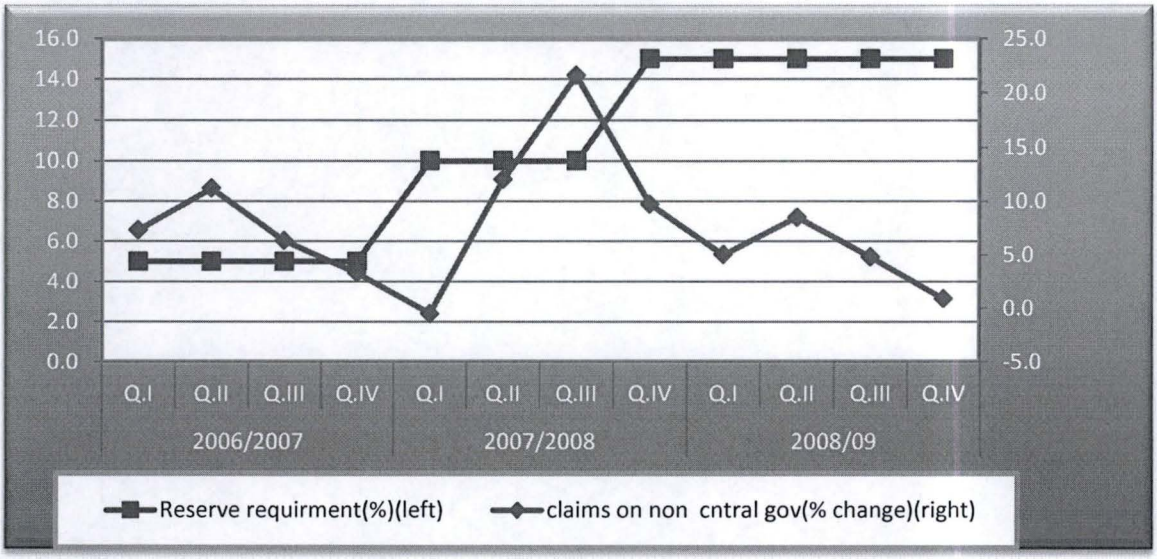


Source: NBE, own computation

Credit Channel

The study also shows the existence of a credit channel which is fast to pass-through from the policy rate to the credit to non-central government. Starting from an increase in the reserve requirement ratio from 10% to 15%, growth in credit to the private sector exhibits decrease in growth rate (Figure 18).

Figure: 18 RRR and claims on non-central government (percent)



Source: NBE, own computation

7. SUMMARY AND CONCLUSION

External shocks through the rising of the international oil and food price become a permanent reality, with oil price attaining its climax in 2008, followed by the increase in food price over the same period. Depending on its characteristics, these shocks unless properly managed will have adverse consequences of dislocating the economy of a given nation. Theoretical considerations reveal that the rising of international oil and food prices raises dilemmas to monetary authorities through its adverse supply and demand shocks.

External price shock to the commodities prices of 2007/08 is highly correlated to movements in price of energy and food in Ethiopia. Both consumer price index and pump price for diesel fuel exhibit similar trends with global food price and global energy price indexes. During the period, inflationary pressure has also reached its peak with the headline inflation about 36.4 percent during July 2008. Given the accommodative nature of monetary policy, and vagarious economic activity, output gap has become positive and real saving interest rate exhibits negative rate until effective monetary policy has been conducts as of April 2008.

The monetary policy responses conducted during July 2007look ineffective as inflation continued to increase; real interest rate exhibit negative value and output gap shows above the potential level. The National Bank of Ethiopia supported by fiscal and administrative strategies, has conducted effective monetary policies by raising the reserve requirement ratio by 500 basis points and the liquidity requirement by 1000 basis points effective April 2008. This has brought significant decrease to inflation; an increase in real interest rates and cool down the vigorous economic activity to its potential level. Clear transmission of monetary policy is found for all channels.

7. SOMMAIRE ET CONCLUSION (French)

Les chocs externes par le soulèvement de l'huile et des prix alimentaires internationaux deviennent une réalité permanente, avec le prix du pétrole atteignant son point culminant en 2008, suivie par l'augmentation prix des denrées alimentaires sur la même période. En fonction de ses caractéristiques, ces chocs à moins que bien géré aura des conséquences néfastes de la dislocation de l'économie d'une donnée nation. Des considérations théoriques montrent que la hausse des prix du pétrole et des produits alimentaires soulève des dilemmes aux autorités monétaires à travers ses offre et la demande des chocs défavorables.

Prix externe choc pour les prix des matières premières de l'exercice 2007/08 est très corrélée à mouvements de prix de l'énergie et de la nourriture en Ethiopie. Les deux indice des prix à la consommation et de la pompe prix pour le carburant diesel présentent des tendances similaires avec des prix alimentaire mondiale et le prix mondial de l'énergie les index. Au cours de la période, la pression inflationniste a également atteint son apogée avec le titre l'inflation environ 36,4 pour cent en Juillet 2008. Compte tenu de la nature accommodante de la la politique monétaire , et l'activité économique vagarious , l'écart de production est devenu positif et réel taux d'intérêt d'économie présente taux négatif jusqu'à ce que la politique monétaire efficace a été conduite comme d' Avril de 2008.

Les réponses politiques monétaires menées au cours 2007look Juillet inefficace que l'inflation continué à augmenter ; taux d'intérêt réel présentent une valeur négative et l'écart de production ci-dessus montre le niveau potentiel. La Banque nationale d'Éthiopie soutenue par fiscale et administrative stratégies, a mené des politiques monétaires efficaces en augmentant les réserves obligatoires rapport de 500 points de base et l'exigence de liquidité de 1000 points de base à compter d'avril 2008. Cela a entraîné la diminution significative à l'inflation ; une augmentation des taux d'intérêt réels et refroidir l'activité économique vigoureuse à son niveau potentiel. Transmission claire de la politique monétaire est trouvée pour tous les canaux.

REFERENCES

Ahmed, A. H (2007), "The Implications of Rising Oil Prices on the Ethiopian Economy," In *Proceeding of the joint panel Discussion on Impact of Price Escalation of Petroleum Fuels on the Ethiopian Economy & Mitigating Measures,* Addis Ababa, Ethiopia.

Andrew Berg et al *(2013),* The Monetary Transmission Mechanism in the Tropics: A Narrative Approach, *IMF Working Paper*, September 2013

Anteneh Geremew, (June, 2014), "The Effects of Shocks to Ethiopian Monetary Policy On Price And Output: SVAR Approach", *A Project Submitted To The School Of Graduate Studies Of Addis Ababa University.*

Anthony Simpasa and Daniel Gurara (2011), "Inflation Dynamics in selected East African countries: Ethiopia, Kenya, Tanzania and Uganda", African Development Bank Brief.

Burbidge, John, and Alan Harrison (1984), "Testing for the Effects of Oil-Price Rises Using Vector Auto regressions," International Economic Review, 25, pp. 459-484

Birouke Tefera, Frehiwot Fantaw, and Zewdu Ayalew, (2012)"Implications of Oil Price Shocks and Subsidizing Oil Prices to the Ethiopian Economy: A CGE Analysis" Ethiopian Development Research Institute, *EDRI Working Paper* 008 September 2012 Addis Ababa, Ethiopia

Dick Durevall and Bo Sjö, (August 2012) "The Dynamics of Inflation in Ethiopia and Kenya", AFRICAN DEVELOPMENT BANK GROUP, *Working Paper No. 151*

Elisa Ticci (2011): Can inflation be a good thing for the poor? Evidence from Ethiopia, Development in Practice, 21:4-5, 629-641

Fekadu, K (2005), "Impact of Oil Price Increase on the Ethiopia's Inflation."*Biritu* 93, National Bank of Ethiopia.

Fernando Pérez de Gracia (2003), "Do Oil Price Shocks Matter? Evidence from Some European Countries," Energy Economics, 25,

Frederic S. Mishkin, (2007), "Housing and the monetary transmission mechanism," Proceedings – Economic policy symposium –Jackson Hole, Federal Reserve Bank of Kansas City, Pages 359-413

George A. Kahn and Robert Hampton, Jr, (1990) "Possible monetary policy responses to the Iraqi oil shock", Federal Reserve Bank of Kansas City, Economic review, November 1990.

Getnet Alemu Zwedu (2013), "Financial inclusion, regulation and inclusive growth in Ethiopia", shaping policy for development odi.org working paper 408

Gilligan, D. O., J. Hoddinott, N. Rati Kumar, and A. Seyoum Taffesse (2009) "Impact of Social Protection on Food Security and Coping Mechanisms: Evidence from Ethiopia's Productive Safety Nets Program", paper presented at the CSAE Conference 2009, Oxford, 22–24 March, 2009.

Hamid R. Davoodi, Shiv Dixit and Gabor Pinter (2013), "Monetary Transmission Mechanism in the East African Community: An Empirical Investigation", African Department, February 2013

Hamilton, James D. (1983), "Oil and the Macroeconomy Since World War II," Journal of Political Economy, 91,

International Energy Agency (IEA), (2004). "Analysis of the Impact of High Oil Prices on the Global Economy." http://www.iea.org/textbase/npsum/high_oil04sum.pdf

International Monetary Fund (IMF), (2008), Food and Fuel Prices—Recent Developments, Macroeconomic Impact, and Policy Responses An Update, September 19, 2008

Legesse, T. (2012), "Establishing financial markets in Ethiopia: the environmental foundation, challenges and opportunities," *Journal of Business and Administrative Studies*, 4(1), 1–44.

Masami Kojima (2009), Government responses to oil price volatility, experience of 49 developing countries, Extractive Industries for Development Series, # 10 the World Bank

Michal Andrle *(2013),* "Forecasting and Monetary Policy Analysis in Low-Income Countries: Food and non-Food Inflation in Kenya", IMF Working Paper, March 2013

Munn, G. Glenn, F.L Garcia and Charles J. Woelfel (1991), the Encyclopedia of Banks and Finance, McGraw-Hill Book Company, London

National Bank of Ethiopia (NBE), (February 2009), NBE's Monetary Policy Framework, *Economic Research and Monetary Policy Process, NBE*

National Bank of Ethiopia, Annual reports 2003/04 to 2009/10

National Bank of Ethiopia, quarterly reports 2003/04 (QI) to 2009/10 (QIV)

*Noureddine Krichene*May (2008), "Recent Inflationary Trends in World Commodities Markets", *IMF Working Paper*, African Department, May 2008

Nora Lustig, (2009), "Coping with Rising Food Prices: Policy Dilemmas in the Developing World," Institute for International Economic Policy WP20094 George Washington University, February 15 2009

Romer, Christina D. and David H. Romer (1989), "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz", in: Blanchard, Olivier J. and Stanley Fischer, eds.*NBER Macroeconomics Annual 1989* (Cambridge: MIT), 121-70.

The Federal Democratic Republic of Ethiopia: 2008 Article IV Consultation, July 2008 IMF Country Report No. 08/264, International Monetary Fund, Washington, D.C.

The Federal Democratic Republic Of Ethiopia, Central Statistical Agency, Country and Regional Level Consumer Price Indices 2000/01 to 2009/10

Tiruneh Legesse1 (2012), "Establishing financial markets in Ethiopia: the environmental foundation, challenges and opportunities", JBAS Vol. 4 No. 1 June 2012 1

United Nation Conference on Trade and Development (UNCTAD) (2008), *"Trade and Development Report, 2008, Commodity prices, capital flows and the financing of investment"* New York and Geneva: United Nations.

United Nations Office of the High Representative for Least Developed Countries, (2014) "The vulnerability of Land locked developing countries for external shocks", Report prepared in preparation for the second united nations conference on land locked developing countries Vienna, November 2014

Zwedu, (2014), financial inclusion, regulation and inclusive growth in Ethiopia