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**AUTHORS**

Monal Abdel-Baki

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Monal Abdel-Baki (Egypt)

## Alterations in monetary transmission mechanism in Egypt in the wake of the triple-F crisis

### Abstract

At the turn of the century, the global economy was exposed to soaring food and fuel prices, in addition to the blow of the global financial crisis. All three effects, dubbed the “Triple-F Crisis”, have altered the channels of monetary transmission mechanism (MTM). This research explores the efficacy of the Egyptian monetary agent in cushioning the blow of this multi-facade crisis by focusing on the two most significant MTM channels for Egypt, the interest rate and exchange rate channels. It starts by investigating the effects of the crisis on the Egyptian economy and the attempts to quell the impact of the slowdown. A Structural Vector Autoregressive (SVAR) model estimates the extent of internal and external shocks. The main contribution of the paper is the introduction of the expectations channel based on a field survey administered for a period of 21 months. This inclusion is essential especially in view of the pessimism about future inflation and the impending removal of subsidies. The results of the research not only demonstrate the inability of the Central Bank of Egypt (CBE) to effectively mitigate the friction inflicted by the pessimistic inflationary expectations, but also reveal that some of the policies that it currently employs need to be adjusted to enhance the efficacy of monetary shocks.

**Keywords:** triple-F crisis, inflation targeting, interest rate policy, foreign exchange intervention, monetary transmission mechanism.

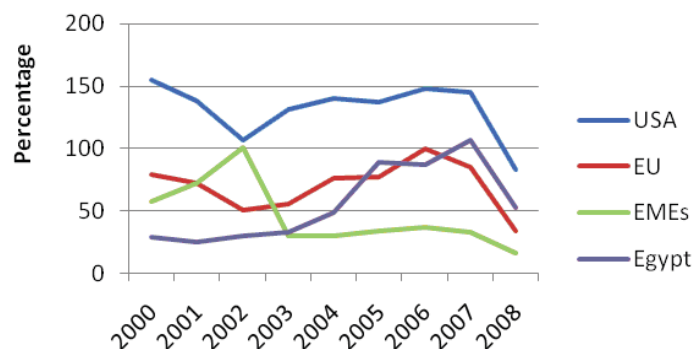
**JEL Classification:** E40, E52, E58, F31.

### Introduction

At the dawn of the new millennium, the global economy was hardly hit on a number of fronts. To start with, prices of key staple food commodities, such as wheat and maize, soared by more than 150% in 2007/08 way above the general global inflation levels. This unprecedented climb in the prices of essential grains is partly explained by an upsurge in fuel prices that reached a peak of \$124.5 in June 2009. Yet, the utilization of agricultural crops for the production of bio-fuels was coupled with a number of long-term negative supply shocks. These are unequivocally attributed to the rising costs of inputs because of soil erosion, global warming and the decline in public expenditure in agricultural R&D. Simultaneous demand shocks were exerted by an escalating global population as well as changes in the consumption patterns of China and India in favor of wheat. Almost immediately, the global financial crisis viciously attacked the world economy further threatening developing nations. The combined effects of the food, fuel and financial crises, currently dubbed the “Triple-F Crisis” have aggravated poverty and inequality and added 60 million individuals to the scores of those who earn less than \$2 per day (Lustig and Walton, 2009).

In countries that are dually over-dependent on exports of services and food imports, such as Egypt,

the crisis is expected to be most aggressively transmitted through job losses, declines in foreign inflows and the propagation of uncontrollable price inflation. In view of the 20% increase in extreme poverty between 2005 and 2009, the Egyptian fiscal and monetary agents are taking rigorous and relentless measures to weather the tripartite aggression on the economy. Being the world’s largest importer of wheat, with an annual import burden of 6.5 million tonnes, the Egyptian economy was undoubtedly injured by the global food crisis. This is due to the fact that the consumer price index (CPI) has reached a thirty-year high of 23.6% in 2008, resulting in mass violent food riots and nationwide strikes. Moreover, with the current surge in oil prices, the fiscal agent shoulders an annual petroleum subsidy bill of LE44 billion (\$7.4 billion), whilst the total revenue of oil exports merely reaps \$10 billion. More despondently, in spite of a highly shielded financial sector and blossoming domestic demand, the ramifications of the global financial crisis hardly hit the tourist, Suez Canal and textile export sectors reducing the foreign currency inflows into the nation. Finally, the excessively high volatility indexes of the debt and equity markets of emerging market economies (EMEs) have habitually resulted in massive and impulsive capital outflows. Such shocks have not enabled their economies to staunch the losses incurred by the hemorrhage of this hot money (Kaminsky, Reinhart and Vegh, 2003). Figure 1 confirms that market capitalization in Egypt witnessed immense fluctuations and a huge slide since the turn of the century.



Source: Data collected from publications of various capital markets.

**Fig. 1. Equity market capitalization as a percentage of GDP (2000-2008)**

The overall effects of the Triple-F Crisis on the Egyptian economy culminated in a serious economic meltdown and the deceleration of the GDP growth rate to 4.7% in 2009, after years of prosperous expansion levels exceeding 7%. In view of all of these calamities, the role of the fiscal and monetary authorities is categorically substantial. Hence, the aim of this paper is not simply geared to measure the efficacy of the set of monetary tools utilized by the Central Bank of Egypt (CBE), but more importantly to determine the potency of the monetary transmission mechanism (MTM) in enhancing the magnitude of the pass-through of these policies to the real economy. The paper instigates by giving a brief literature review and then moves to outline the alternative measures adopted by the government and the central bank to cushion the callous blow that has disproportionately hit the poor. Afterwards, with the aid of a structural vector autoregressive (SVAR) model, the two most effective channels of monetary transmission mechanism are underscored and some of the main policy challenges are delineated. The main contribution of the paper is to take the first steps towards an elementary measurement of the inflationary expectations' impact on MTM. The results of a 21-month field survey are presented, but due to the short period of the survey, they are not inserted in the model. Finally, the paper concludes by showing how future research efforts should be based on the inclusion of the expectations channel that will surely grow to be very important in the next decades. This is not solely due to the anticipated rise in oil and food prices, but principally because of the expectation of the removal of oil subsidy that currently consumes 15% of public expenditure.

## 1. Literature review

Till the late seventies, central banks had unanimously acted as mere agents for the fiscal authority where monetary policy was tuned in with fiscal policy so that they generally focus on bridging inflation and income gaps. Both policies were coordi-

nated in a demand management program since it was to a certain extent speciously believed that they have a long-lasting effect on the real variables of output and employment (Clarida et al., 2000). It is generally claimed that due to their inability to distinguish between real and nominal rates central banks aggravated the business cycle, and next to the surge in oil prices created an additional excessive monetary shock that was held highly responsible for the inflationary pressures of the seventies (Brunner and Meltzer, 1993). In response, central banks instigated a policy of dedication to low inflation, to a large extent abiding by the Taylor rule. Many central banks around the world started by responding to lagged inflation and output rather than expected future values (Taylor, 2003).

In their selection of monetary policy tools, central banks started using future forecasts based on a set of determinants as well as on the past responsiveness of key macroeconomic variables to changes in interest rates and money supply (ECB, 2004). Accordingly, they set the nominal policy interest rate, normally the short-term inter-bank rate, as a function of the deviation of inflation forecasts from their targets and real output from potential GDP (Taylor, 1999). For example, Bernanke and Mihov (1998) report that the Federal Reserve Bank has a goal horizon of one year for its inflation target and of two quarters for GDP since these time horizons are generally in line with the lag with which monetary policy affects either variable. Yet, it must be mentioned at this point that inflation targeting does not carry the implication that it gives unwarranted weight to price stability to the detriment of the growth of the real economy. In reality, inflation targeting is rather flexible comprising an additional measure of adequate resource utilization measured through the output gap (Svensson, 2007).

In general, economists stipulate that there are various essential prerequisites for the successful implementation of inflation targeting that emerging market economies by and large lack. First and foremost,

central bank independence is essential such that it has full discretion to choose the methods of financing its monetary operations. Furthermore, the monetary agent should neither be obliged to give preferentially low interest rates on public debt nor to be requested to sustain a particular nominal exchange rate. Yet, central banks in many EMEs lack sufficient sovereignty in composing their balance sheets and the freedom to use and select the tools needed to achieve their specific goals (Debelle and Lim, 1998). Second, the absence of effectively developed financial institutions in many of the transition and developing nations deprives their central banks of political independence (Mishkin, 2004). Moreover, since financial institutions and markets in EMEs are conjectured not to have acquired adequate levels of development, inflation targeting is apt to lead to poor macroeconomic results (Calvo and Mishkin, 2003).

The last two decades have witnessed a universal employment of monetary policy to reach price stability (Jonas and Mishkin, 2003). In case of an impending economic downturn central banks would instantaneously cut interest rates to stimulate the economy; and conversely whenever prices appeared to be overheating, interest rates were increased. Thus, interest-rate policy and inflation targeting became the central methods of stabilizing business cycle fluctuations (Bernanke and Mishkin, 1997). But, one major consequence of these policies has been asset-price volatility and the ensuing housing bubbles (Hodson and Mabbett, 2009). A large volume of literature elucidates that asset price crashes are manifest in the irrational and herd-behavior of speculators and hence are unavoidable (Campbell, 1999). More recent literature empirically studies the efficacy of conventional interest rate policy in correcting business cycles (Christiano, Eichenbaum and Evans, 2005; Smets and Wouters, 2007). In the wake of the financial crisis, the need arose for the adoption of the further goals of financial stability in addition to price stability (Mishkin, 2007).

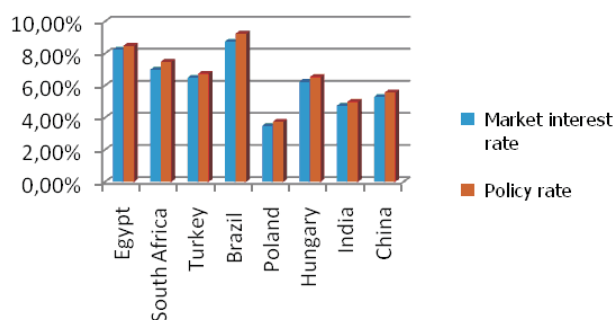
Whilst scattered pieces of research have discussed monetary policy in Egypt (El-Refaie, 2001; Abu El Eyoun, 2003; Hassan, 2003), almost nothing has been written about the changes in monetary transmission mechanism in the aftermath of these combined crises. In true fact, while limited efforts have been exerted to explain the effectiveness of interest rate and exchange rate transmission channels (Mourasi et al., 2007; Al-Mashat and Billmeier, 2009), no studies have so far been undertaken to explain the importance of the expectations channel. This defies the very adoption of explicit inflation targeting by the CBE, which is an endeavor to break through the

pessimistic inflationary expectations that stand as an additional stubborn obstacle to stabilizing prices. Accordingly, this paper aims to set the stage for further studies and surveys to fill the literature gap and to aid the Egyptian monetary policy makers in selecting the most effective policy tools with the highest pass through effects on the real economy.

## 2. Combining fiscal and monetary policies in EMEs

The central banks of many EMEs conduct monetary policy through a combination of direct instruments, namely the policy interest rate, the legal reserve requirement (LRR), open market operations (OMO) in addition to foreign exchange interventions (Buffle, 2004). While the LRR has been gradually cut by most central banks in EMEs during the last decade, the bank-centric nature of these economies renders interest rates the most reliable monetary policy tool especially in the case of moderately developed interbank markets and the wide acceptance of repurchase agreements. But the openness of these economies also attests to the fact that the exchange rate channel is expected to be just as effective.

Bernanke and Gertler (1995) stipulate that the dominance of commercial banks and information asymmetries in many EMEs are liable to make the interest rate channel the most prominent in monetary transmission mechanism. Till the outbreak of the global financial crisis, most central banks around the world used the discount rate to signal a short-term policy rate. By controlling the amount of reserves in the market, the central bank can set the overnight rate by signaling the level of the desired interest rate. As displayed by Figure 2 this has proved successful in signaling market interest rates in many emerging markets.

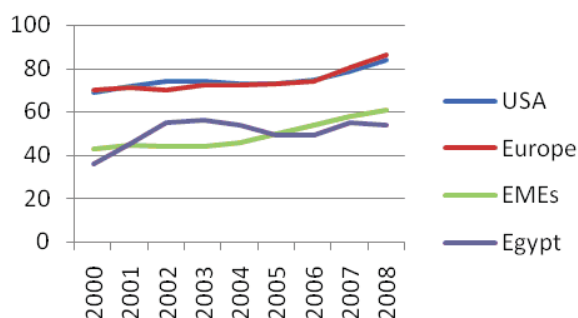


Source: Various websites of central banks.

**Fig. 2. Employment of the policy rate by selected EMEs (2006-08)**

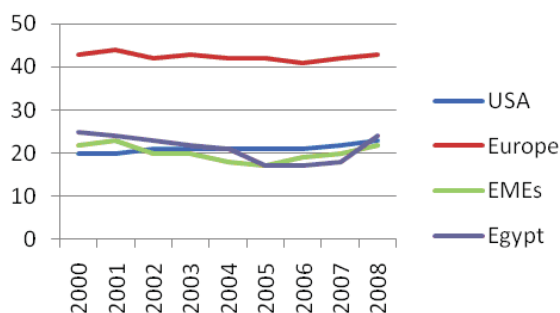
In addition to the deployment of interest rate policy, central banks in EMEs, including Egypt, have resorted to expanding M2 since the turn of the century. Figures 3 and 4 elucidate that all central banks have been consistently expanding their money sup-

ply especially since the outbreak of the global financial crisis. This may be partly explained by the growth of M1 components as well as the exodus of savings from equity markets to the banking sector. Yet, in comparison to the excessive expansion in M2, fiscal stimulus packages do not appear to have been as expansionary as monetary aggregates. One explanation of the increasing reliance on monetary policy is provided by Figure 5 which displays the inability of governments around the world to depend on financing government expenditure through increasing tax collection especially during the financial meltdown.



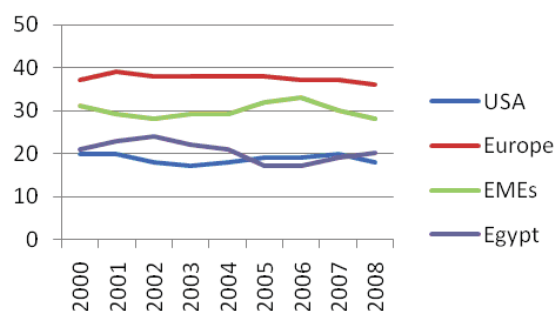
Source: World Bank. *World Development Indicators Online*.

**Fig. 3. M2 (Percentage of GDP)**



Source: World Bank. *World Development Indicators Online*.

**Fig. 4. Fiscal spending (Percentage of GDP)**



Source: World Bank. *World Development Indicators*.

**Fig. 5. Tax revenue as a percentage of GDP (2000-2008)**

### 3. The empirical model

The monetary transmission mechanism, propagated through the dual channels of exchange rate and interest rate, is estimated by employing the Structural

VAR technique. The advantage of using this model is the imposition of minimal restrictions while incorporating internal and external shocks. Another benefit of resorting to this methodology is the need to tackle the problem of the lack of agreement on how MTM operates; this is because the model accounts for the simultaneous movements in the variables resulting from monetary policy shocks as well as the developments in monetary policy reacting to changes in economic variables. The period of the study extends from 2003 till March 2010, which encompasses the phase of the outright shift to inflation targeting in Egypt, in addition to the implicit utilization of the exchange rate as an intermediate monetary target. This period also involves the policy shifts in the midst of the Triple-F crisis. All the data was collected from the databases of the Central Bank of Egypt and the International Financial Statistics.

Since embarking on the Bank Reform Plan in 2004, the CBE has explicitly discarded exchange rate targeting and adopted inflation targeting as its primary objective in anticipation of the surge in the CPI. The interbank overnight rate has been chosen as the operational target, which was enacted by introducing the corridor system or a spread within which the bank lending and borrowing rates are allowed to fluctuate. While initially being notoriously as wide as 3%, this corridor has recently narrowed to 2.5%, indicating a slight improvement in the efficiency of Egyptian banks. However, in order to tame consumer prices, the CBE continued to follow a managed float of its exchange rate, an act that came at the expense of accumulating large foreign exchange reserves. In view of this, the model examines three types of monetary policies: foreign exchange intervention by selling and buying foreign currencies; setting the corridor rate; and changing money supply through the monetary base. The interaction between all three policies is studied and the reverse relationship is also recorded. The following Structural VAR model used in this study is adapted from Kim (2001).

$$Y_t = C_0 + \sum_{j=1}^k A_j Y_{t-j} + u_t, \tag{1}$$

where,  $Y_t$  is a 7x1 column vector of endogenous variables at time  $t$ ,  $C_0$  is a 7x1 column vector of constant terms,  $A_j$  is a 7x7 matrix of coefficients,  $u_t$  is a 7x1 column vector of reduced form error terms.

The study uses a seven variable SVAR where the first three rows of the matrix denote monetary policy shocks, namely the policy rate or the interbank rate (PR), money supply (M), and foreign exchange intervention (FX); the following two rows display

the general price level measured in terms of the consumer price index (CPI) and the level of aggregate output (O); the last two rows measure the nominal effective exchange rate (NEER) and the composite food and oil prices (FO). All variables are in the form of logarithms except for (PR) and (FX) which are in percentage terms. The (NEER) and (FO) were calculated in percentage terms, but converted into log values by accumulating the original data over time to fit with the rest of the variables.

The first two equations show that the central bank contemporaneously sets the PR and M in reaction to one another as well as a direct response to changes in food and oil prices and the NEER. The third equation represents the foreign exchange intervention (reaction function), where the CBE is assumed to respond only in reaction to the current exchange rate. The fourth equation, denoting government expenditure, is seen to react to CPI, O and FO. The following equations represent the real sectors of the economy that are assumed to respond to monetary policy and financial signals with a one month lag due to inertia, adjustment costs and planning delays by producers. The last two equations describe equilibrium in the foreign exchange and commodity market that are assumed to react instantaneously to internal and external shocks.

The following are the VAR estimates in the reduced form:

$$Y_t = \sum_{j=1}^k B_j Y_{t-j} + v_t, \tag{2}$$

$$\Delta y = \sum_{i=1}^m \mu_{i1} \Delta y_{t-i} + \sum_{i=1}^m \mu_{i2} \Delta p_{t-i} + \sum_{i=1}^m \mu_{i3} \Delta r_{t-i} + \sum_{i=1}^m \mu_{i4} \Delta i_{t-i} + \delta_1 y_{t-1} + \delta_2 p_{t-1} + \delta_3 r_{t-1} + \delta_4 i_{t-1} + \xi \tag{7}$$

The calculations reap an F-Test value of 17.98, hence rejecting the null-hypothesis of no cointegration. Table 1 shows a long run relationship between output and each of the exchange rate, interest rate and the price level. The results demonstrate that the long-run relationships are in line with both the theories of the Purchasing Power Parity (PPP) and the Uncovered Interest Parity (UIP). The last row proves that all equations are strongly error correcting.

Table 1. ARDL estimated long-run coefficients (dependent variable – log y)

Variable	Value
Exchange rate	0.312(0.003)
Interest rate	0.474(0.008)
Price level	0.379 (0.002)
ECM(-1)	-0.798(0.001)

**3.2. Impulse responses.** The impulse response functions help explain the dynamics of the variables included in the SVAR model as a result of both internal and external shocks. Appendix A reports the impulse

where,  $v_t$  is the 7x1 vector of residuals with variance-covariance matrix  $E(v_t v_t') = \omega$ . Hence, the reduced-form residuals are thus related by

$$v_t = B_0 \cdot u_t, \tag{3}$$

$$Y_t = \frac{u_t}{\rho - C}, \tag{4}$$

$$Y_t = \frac{v_t}{\rho - B}. \tag{5}$$

From equations (3), (4) and (5), the impulse response to structural shocks can be obtained using the following relationship:

$$\rho - B = \rho - u_t. \tag{6}$$

**3.1. Cointegration tests.** The next step is to investigate the level of cointegration between the set of endogenous and exogenous variables to establish if the trends are long term or transitory. The ARDL approach developed by Pesaran, Shin and Smith (2001) is used to avoid the problem arising when it is not certain that the regressors are I(1). The endogenous variables are: GDP (y), inflation (p), exchange rate against the US dollar (r), and the policy interest rate (i). The exogenous variables are: exports, NEER, and oil and food prices. Then, the F-statistic is computed testing for the null hypothesis of no cointegration. In order to check for cointegration between variables the following error correction model (ECM) is estimated:

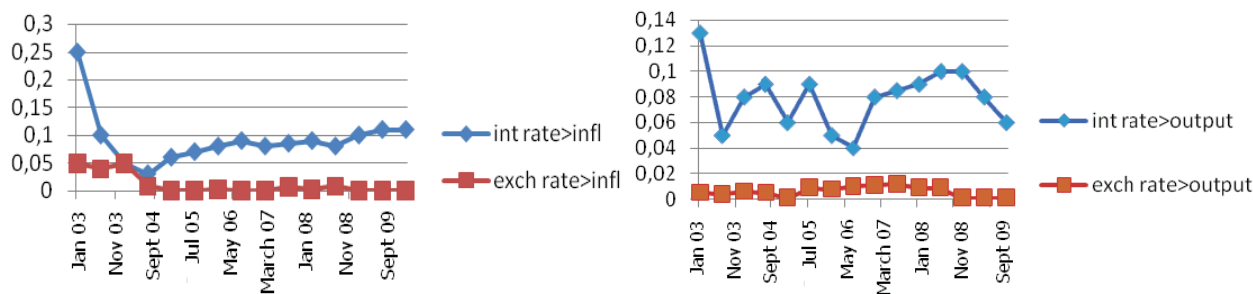
responses of each variable to one-standard deviation policy rate shock over 12 months. The outmost lines are within 90% probability bands or 1.65 standard error bands. In response to contractive policy rate shocks, money stock decreases initially for a very short while before it starts to rise again. Output falls temporarily then it stabilizes, while the effect on the NEER is an appreciation over time. As for both CPI, and oil and food prices the deflationary effect takes a while to settle in, albeit at a slower rate; this implies that the policy rate shock is not that effective in taming the soaring prices. All of these findings are consistent with the effects of monetary contraction predicted by theoretical models and previous results (Gordon and Leeper, 1994 and Christiano et al., 2005).

The money supply contraction, which is primarily enacted through OMO, leads to a rise in the exchange rate after a while, a sharp drop in output and an appreciation of the exchange rate. As for the impact on calming inflation, it takes a while to settle in, yet it reverses with time.

In response to foreign exchange intervention shocks there is a slight decrease in money and a minor rise in the policy rate, indicating that a few foreign exchange policy shocks may not be sterilized. Yet, since the responses are within a 90% probability band, the effects may not be statistically significant. As for the net effective exchange rate, it appreciates on impact, but depreciates back to the original level over time. Yet, it is important to mention at this point that foreign exchange intervention shocks have a larger effect on the exchange rate than both monetary policy shocks. Finally, output and prices tend to decrease due to the subsequent monetary expansion. Accordingly, foreign exchange intervention seems to have the strongest impact of all three shocks on domestic prices. In order to tame prices of imported food items, the CBE intervened through net sales of foreign currencies, drawn from foreign exchange reserves. The results of the SVAR model confirm that this policy is highly justifiable and in harmony with economic theory.

**3.3. Granger causality tests.** In addition to the SVAR model, Granger causality tests are employed to countercheck the relative strengths of both channels. The objective of using this test is to verify whether interest rate changes and exchange rate movements have an effect on inflation and output. Over the same selected period, all variables are transformed to annual growth rates to match the interest rate. The following standard Granger-type equation is used, testing the hypothesis of no Granger causality from  $X$  to  $Y$ , where a common lag order for both sets is employed. Two sets of tests are performed, where in the first set  $Y$  is the annual rate of inflation, while  $X$  is the interest rate and the annual rate of growth of exchange rate. In the second set of tests  $Y$  is the annual growth rate of output.

$$Y_t = a + \sum_{i=1}^n b_i Y_{t-i} + \sum_{i=1}^n c_i X_{t-i} \quad (8)$$



Note:  $\rho$ -values from F-test on the null hypothesis of no-Granger causality.

Fig. 6. Granger tests

The Granger tests displayed in Figure 6 evidently validate previous results confirming that the exchange rate channel is much more stable than the interest rate channel. Domestic currency depreciation can be considered a Granger-cause for inflation. Hence, with the outbreak of inflation, the CBE policy of appreciating the Egyptian pound is decidedly legitimized. In other words, even if the CBE conducts an expansionary monetary policy through lowering the policy rate and expanding money supply, the impact on prices is not that substantial, especially given that the best route to tame prices is through an appreciated domestic currency.

**3.4. Testing the robustness of the results.** To test the robustness of the results, the endogenous variable ordering is reversed. This exercise is driven by the results of the study as well as the recent behaviour of the CBE, which could lead to the conclusion that in the midst of the Triple-F Crisis, the exchange rate may be temporarily treated as a provisional policy target. Accordingly, it can be treated as exogenous to the monetary stance in the short run. Appendix B shows the impulse responses when the foreign exchange variable is

replaced by the two monetary stance variables. This inversion has hardly any effect on the results, indicating the robustness of the model specification.

**4. One last caveat: the expectations channel**

The potency of monetary policy, through the policy instrument, changes in the monetary base and stabilization of the interest rate, highly rests on proper communication tools such as inflation reports and press releases. These methods are crucial elements for the success of the inflation targeting regime since they play a vital role in shaping expectations. Hence, the above analysis is surely incomplete, especially in view of the future expectations of untamable inflation and the gradual removal of the oil subsidy. In a chronically high and persistent inflation environment, such as the case of Egypt, consumers and producers tend to form their own expectations in a backward-looking manner. However, the impact of monetary policy through the expectations channel is quite uncertain, as it depends on the public's interpretation of changes in the monetary policy stance.

The best way to account for this channel is through direct surveys with members of the Egyptian society. Since no such studies have ever been conducted in Egypt, a 21-month qualitative survey was administered from August 2008 till April 2010 with the main aim of assessing how inflation expectations are formed in Egypt. The survey was repeated 6 times during the period of the study and culminated in a sample of 1,872 individuals randomly selected from 11 out of the 26 Egyptian governorates. The response rate was equal to 68.3%. Figure 7 summarizes the results of the survey, where more than 50% of the respondents report high inflation expectations. If anything, the results surely call for the CBE to substantially quell inflation in order to impede the ongoing overwhelming pessimism in the economy.

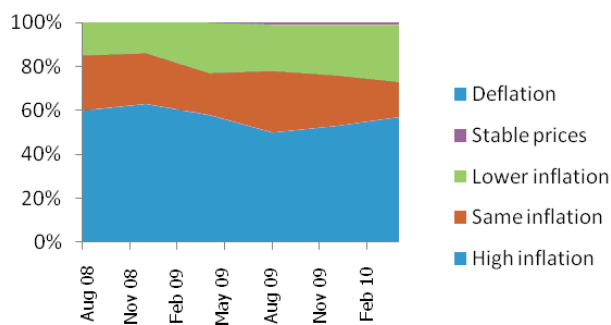


Fig. 7. Results of the survey

The following equation measures expected future inflation.

$$\pi_{t/t-n}^e = \alpha + \beta\pi_t + \varepsilon_t, \tag{9}$$

where,  $\pi_t$  is actual inflation during the period  $t$ .  $\pi_{t/t-n}^e$  is expected inflation at time  $t$  that was made at time  $(t-n)$ ,  $\varepsilon_t$  is a white noise error.

As per the New Keynesian framework, actual inflation ( $\pi_t$ ) is a function of future expected inflation at time  $t+1$  ( $\pi_{t+1}^e$ ) and  $y_t$  is the output gap (Roberts, 1998).

$$\pi_t = \pi_{t+1}^e + \delta y_t + \varepsilon_t. \tag{10}$$

$$\Delta\pi_{t/t-4}^e = -0.012 + 0.715 \cdot \Delta\pi_{t/t-4}^{0-} + 1.207 \cdot \Delta\pi_{t/t-4}^{0+} + 0.018 \cdot S_1 + 0.012 \cdot S_2 + 0.009 \cdot S_3, \tag{13}$$

(0.129) (0.132) (0.014) (0.003) (0.001)

where  $S_1$  is a dummy representing the Egyptian stock market crash,  $S_2$  is a dummy representing the global economic crisis,  $S_3$  is a seasonal dummy at the end of each period.

Equation (13) shows that every one percent fall in prices results in a 71 basis point fall in inflation expectations, while a one percent increase in the price level results in 120 basis points climb in inflation expectations over the following period. From the above analysis, it is quite obvious that the pessimism

However, it should be pointed here that most past research examining similar surveys of inflation expectations have demonstrated that they are not perfectly rational. In order to discover how individuals form their expectations and to what extent they are determined by the current rate of inflation, the following relationship is examined exploiting Johansen co-integration test.

$$\pi_{t/t-4}^e = \alpha_0 + \alpha_1\pi_{t/t-4}^0 \tag{11}$$

where,  $\pi_{t/t-4}^e$  denotes individuals' expectations of inflation at time  $t$  formed 4 months in advance,  $\pi_{t/t-4}^0$  is the rate of inflation at the moment of responding to the survey.

The following result of the regression suggests that Egyptians' inflationary expectations are closely linked to the current rate of inflation. This result is in line with Figure 8, depicting a long-run bias in inflationary expectations.

$$\pi_{t/t-4}^e = -0.214 + 1.198 \pi_{t/t-4}^0. \tag{12}$$

(0.034)

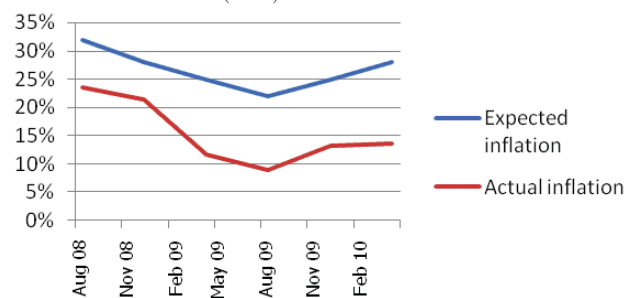


Fig. 8. Respondents' inflationary expectations vs. actual inflation

One other result that can be inferred from Figure 8 is that inflationary expectations of Egyptians are more sensitive to increases in current inflation than to a fall in prices. It is imperative to further test this finding in order to see how this is apt to affect the MTM. This can be done by coupling the long run explanation with an examination of the short run changes in inflationary expectations in reaction to changes in the current rate of inflation.

of Egyptians with regard to inflationary expectations creates friction that may render the impact of monetary policy tools less effective and more costly. In other words, so far the CBE is relatively unsuccessful in influencing prices via the inflationary expectations channel because they are backward-looking. Thus, if the central bank intends to improve the market sentiment with regards to inflationary expectations, the most immediate task on its agenda is to effectively curb inflation.



## Conclusion

The Triple-F Crisis that has infested the global economy since the turn of the millennium resulted in various changes in the structure of the Egyptian economy and the expectations concerning future policy and inflationary pressures. In this respect, the Central Bank of Egypt needs to be alert to the impact of structural change and to be able to continuously reinterpret the transmission channels of monetary policy. Since embarking on the Bank Reform Plan in 2004, the CBE has explicitly emphasized price stability as the single objective of monetary policy in order to dampen the effects of soaring food and energy prices; it had marginalized other goals of growth and job creation on the premise that monetary policy cannot affect the long-term expansion of the economy. This was primarily based on the theoretical principle that efforts to stimulate growth above its potential rate are apt to lead to higher inflation. Yet, the unsolicited advent of the global meltdown obliged the CBE to utilize monetary tools to fulfill the second objective of boosting employment and output. This research paper endeavored to investigate the changes in the two most effective channels of MTM that were brought about by the Triple-F Crisis in order to test the efficacy of the monetary tools currently employed by the CBE.

While previous research has shown that the most effective MTM channels in Egypt are the interest rate and exchange rate channels, the transformation in macroeconomic circumstances and the resultant hyperinflation that is very much feared to be chronic in nature, have resulted in changes in the relative efficacy of these channels. Both the SVAR model and the Granger causality tests confirm that the foreign exchange channel has a strong pass through towards curbing inflation, but its effect is less pronounced on output. In contrast, alterations in the money supply have the exact opposite impacts. As for the utilization of the policy interest rate, the results are idiosyncratic, showing a weak and lagged effect on inflation, yet a moderate consequence on output. Finally, the main caveat is that the enduring pessimism of Egyptians about future expected inflation leads to higher price hikes.

Thus, the results of the study suggest that the CBE has to use a combination of tools to restrain inflation

while simultaneously boosting output. This can be achieved through expanding the monetary base using OMO and maintaining an appreciated domestic currency. Since cutting interest rates will have mild effects on output and a lagged and moderate impact on inflation, the CBE is not highly encouraged to resort to this policy. In view of the backward-looking price expectations, the immediate goal of the CBE has to be price stability. Accordingly, the six successive cuts in interest rates during 2009 may have not been the most fruitful in achieving the mutual goals of the CBE. Yet, the other policies of expanding M2 and of appreciating the Egyptian pound are fully legitimized.

One last point to mention is the bearing of future policies. The results of the study indeed call for the persistence of a managed float, currently geared towards appreciating the Egyptian pound in order to make the price of imported wheat less costly. Yet, this has to be enacted through building an exchange rate system benchmarked against the currencies of the major exporters of wheat to Egypt instead of the US dollar. Second, since the expectations of Egyptians act as a barrier to enhancing the pass-through effects on the economy, more transparency and public outreach are urgently required. Also, as the Egyptian Exchange remains unstable and rudimentary, the CBE must seek to use monetary policy to direct credit to sectors regarded as central to the macroeconomic development strategy. Finally, future research is encouraged to further broach the expectations channel, and to investigate the changes that the Triple-F Crisis may have brought to other MTM channels, such as the balance sheet channel, especially in view of the relentless efforts of the CBE to settle non-performing loans.

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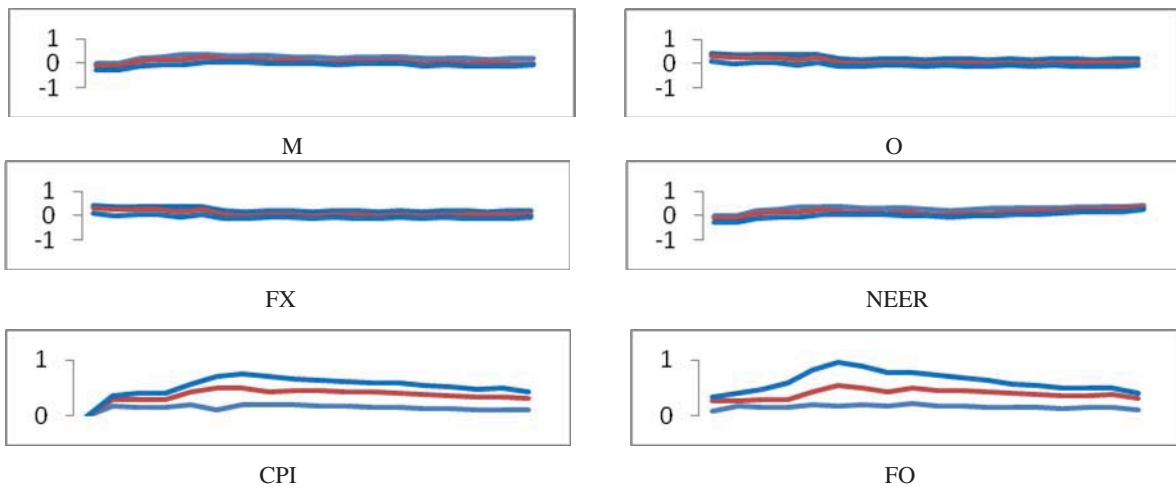
## References

1. Abu El Eyoum, M. Monetary Policy in Egypt: A Vision for the Future // *ECES*, 2003. – Working Paper No. 78, (in Arabic), Cairo: Egyptian Center for Economic Studies.
2. Al-Mashat, R., A. Billmeier. The Monetary Transmission Mechanism in Egypt // *ECES*, 2008. – Working Paper No. 411, Cairo: Egyptian Center for Economic Studies.
3. Bernanke, B., M. Gertler. Inside the Black Box: The Credit Channel of Monetary Policy Transmission // *Journal of Economic Perspectives*, 1995. – No. 9 (4), pp. 27-48.

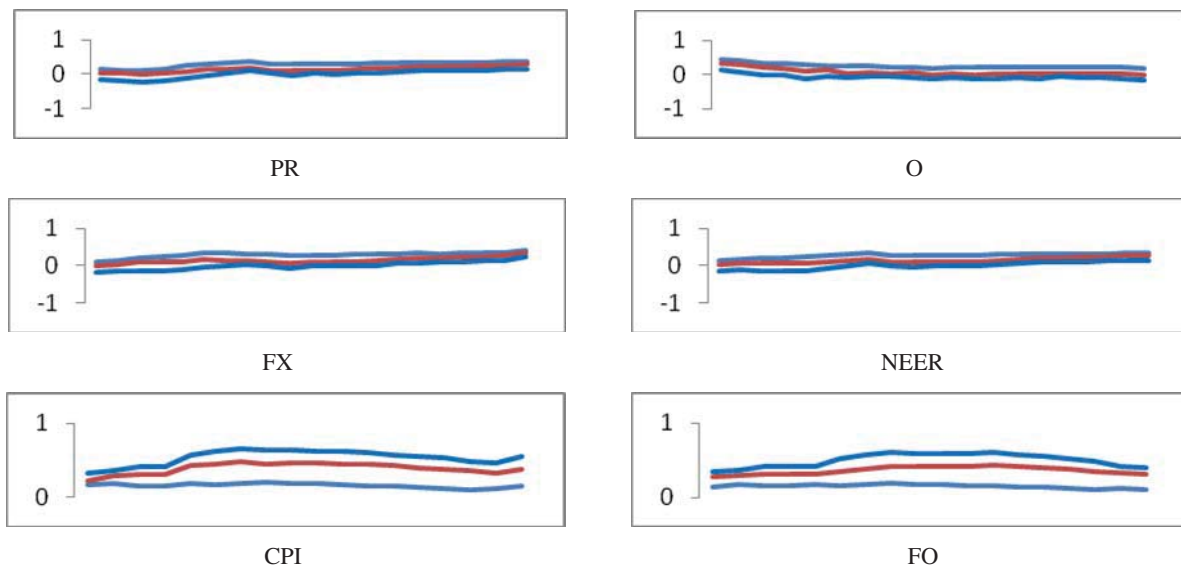
4. Bernanke, B., F. Mishkin. Inflation Targeting: A New Framework for Monetary Policy? // *Journal of Economic Perspectives*, 1997. – No. 11 (2), pp. 97-116.
5. Bernanke, B.S., L. Mihov, L. Measuring Monetary Policy// *Quarterly Journal of Economics*, 1998. – No. CXIII, pp. 869-902.
6. Brunner, K., A.H. Meltzer. *Money and the Economy: Issues in Monetary Analysis*. Cambridge: Cambridge University Press, 1993.
7. Buffie, E. et al. Exchange Rate Policy and the Management of Official and Private Capital Flows in Africa // *IMF Staff Papers* No. 51 (Special Issue), 2004. – pp. 126-160.
8. Calvo, G., F. Mishkin. The Mirage of Exchange Rate Regimes for Emerging Market Countries // *Journal of Economic Perspectives*, 2003. – No. 17 (4).
9. Campbell, J. Asset Prices, Consumption and the Business Cycle. in Taylor, J.B. and Woodford, M., eds., *Handbook of Macroeconomics*, 1999. – Amsterdam: North-Holland.
10. Carlson J., J. Parkin. Inflation Expectations. *Economica*, 1975. – No. 42, pp. 123-138.
11. Central Bank of Egypt. *Monthly Statistical Bulletin*. Cairo: The Central Bank of Egypt, 2010.
12. Christiano, L., M. Eichenbaum, C. Evans. Nominal Rigidities and the Dynamics Effects of a Shock to Monetary Policy // *Journal of Political Economy*, 2005. – No. 113 (1), pp. 1-45.
13. Clarida, R., J. Gali, M. Gertler. Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory // *Quarterly Journal of Economics*, 2000. – No. 115 (1), pp. 147-180.
14. Debelle, G., C. Lim. Preliminary Considerations of an Inflation Targeting Framework for the Philippines // *International Monetary Fund*, 1998. – Working Paper No. 98/39, 1998.
15. El-Refaie, F. The Coordination of Monetary and Fiscal Policies in Egypt// ECES Working Paper No. 54, (in Arabic), Cairo: Egyptian Center for Economic Studies, 2001.
16. European Central Bank. *The Monetary Policy of the ECB*, Frankfurt: ECB, 2004.
17. Gordon, D., E. Leeper, E. The Dynamic Impacts of Monetary Policy: An Exercise in Tentative Identification.// *Journal of Political Economy*, 1995. – No. 102, pp. 228-247.
18. Hassan, M. Can Monetary Policy Play an Effective Role in Egypt? ECES, 1995. – Working Paper No. 84, Cairo: Egyptian Center for Economic Studies.
19. Hodson, D., D. Mabbett, D. UK Economic Policy and the Global Financial Crisis: Paradigm Lost? // *Journal of Common Market Studies*, 2009. – No. 47 (5), pp. 1041-1061.
20. Jonas, J., F. Mishkin. Inflation Targeting in Transition Countries: Experience and Prospects // *National Bureau of Economic Research Working Paper Series*, 2003. – No. 9667.
21. Kaminsky, G., C. Reinhart, C. Vegh. The Unholy Trinity of Financial Contagion // *Journal of Economic Perspectives*, 2003. – Vol. 17 (4), pp. 51-74.
22. Kim, S. Monetary Policy, Foreign Exchange Intervention, and the Exchange Rate in a Unifying Framework // *Journal of International Economics*, 2001. – No. 60 (2003), pp. 355-386.
23. Kwiatkowski, D., P. Phillips, P., Schmidt, Y. Shin. Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: How Sure are we that Economic Time Series have a Unit Root? // *Journal of Econometrics*, 1992. – No. 54, pp. 159-178.
24. Lustig, N., M. Walton. Crises and the Poor: A Template for Action. Washington, DC: World Bank, 2009.
25. Mishkin, F. Can Inflation Targeting Work in Emerging Market Countries? // *National Bureau of Economic Research Working Paper Series*, 2004. – No. 10646.
26. -----, Will Monetary Policy Become More of a Science? // *National Bureau of Economic Research Working Paper Series*, 2007. – No. 13566.
27. Moursi, T., M. Mossallamy, E. Zakareya. Effect of Some Recent Changes in Egyptian Monetary Policy: Measurement and Evaluation // ECES, 2007. – Working Paper No. 122, Cairo: Egyptian Center for Economic Studies.
28. Pesaran, M., Y. Shin, R. Smith. Bounds Testing Approaches to the Analysis of Level Relationships // *Journal of Applied Econometrics*, 2001. – No. 16 (3), pp.289-326.
29. Roberts, J.M. Inflation Expectations and the Transmission of Monetary Policy // *Federal Reserve Paper* No. 43, NYC: Federal Reserve Bank, 1998.
30. Smets, F., R. Wouters. Shocks and Frictions in U.S. Business Cycles: A Bayesian DSGE Approach // *American Economic Review*, 2007. – No. 97, pp. 586-606.
31. Svensson, L. Optimal Inflation Targeting: Further Developments of Inflation Targeting// in Mishkin, F., K. Schmidt-Hebbel, eds. *Monetary Policy Under Inflation Targeting*, Santiago: Banco Central de Chile, 2007.
32. Taylor, J.B. A Historical Analysis of Monetary Policy Rules, in J.B. Taylor, ed., *Monetary Policy Rule*, Chicago: University of Chicago Press, 1999.
33. -----, Discretion versus Policy Rules in Practice // *Carnegie-Rochester Series on Public Policy*, XXXIX, pp. 95-214, 2003.

**Appendix A. Impulse responses to policy shocks (SVAR model)**

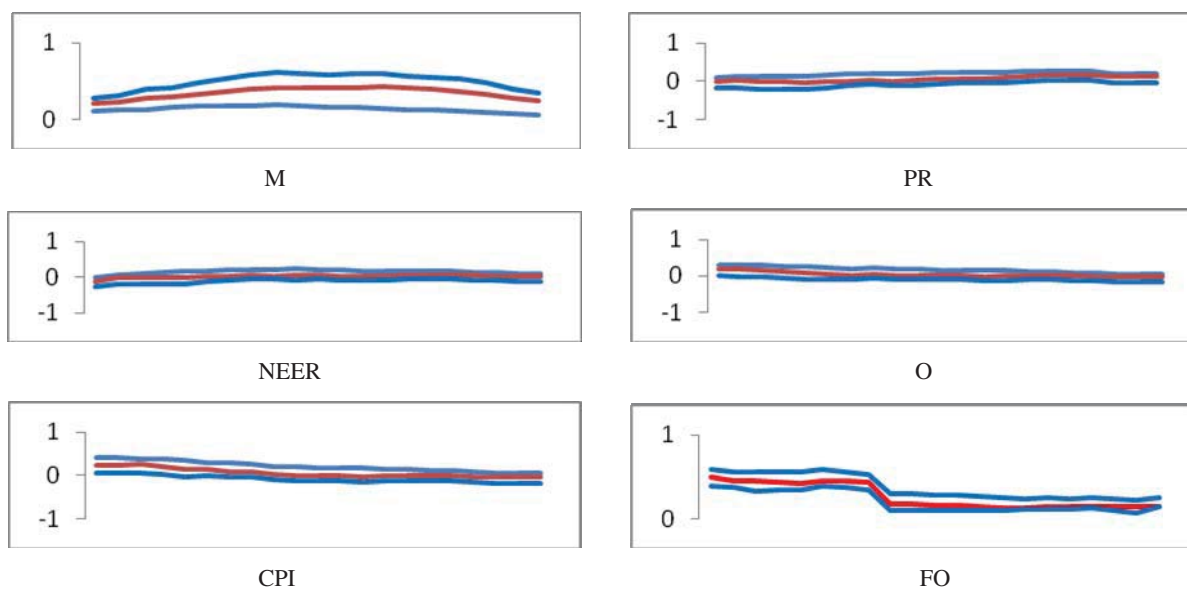
**Policy rate shock**



**Money supply shock**

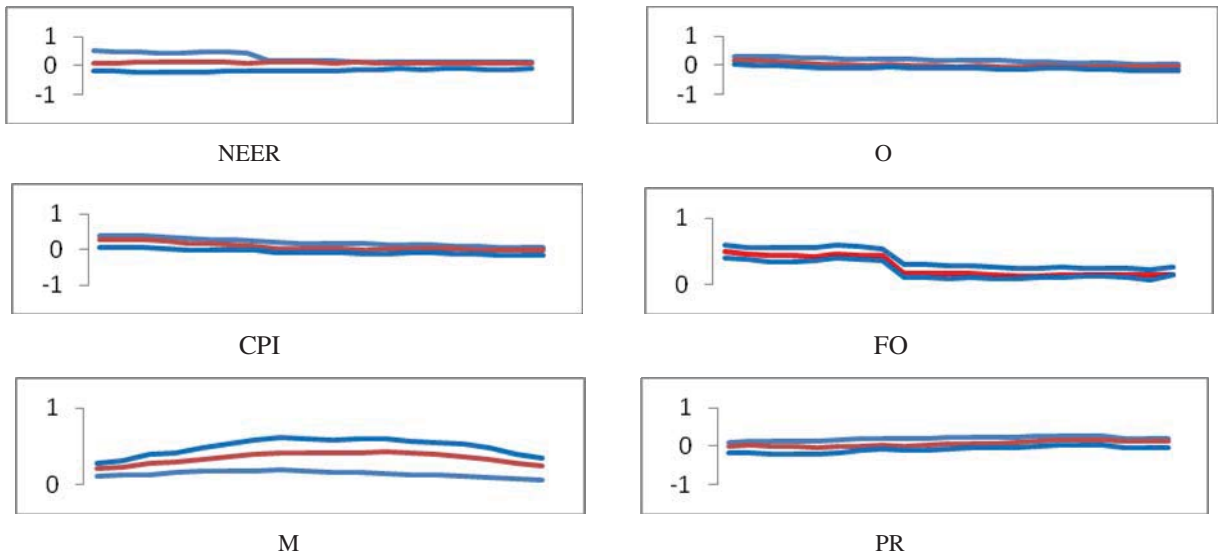


**Foreign exchange intervention**

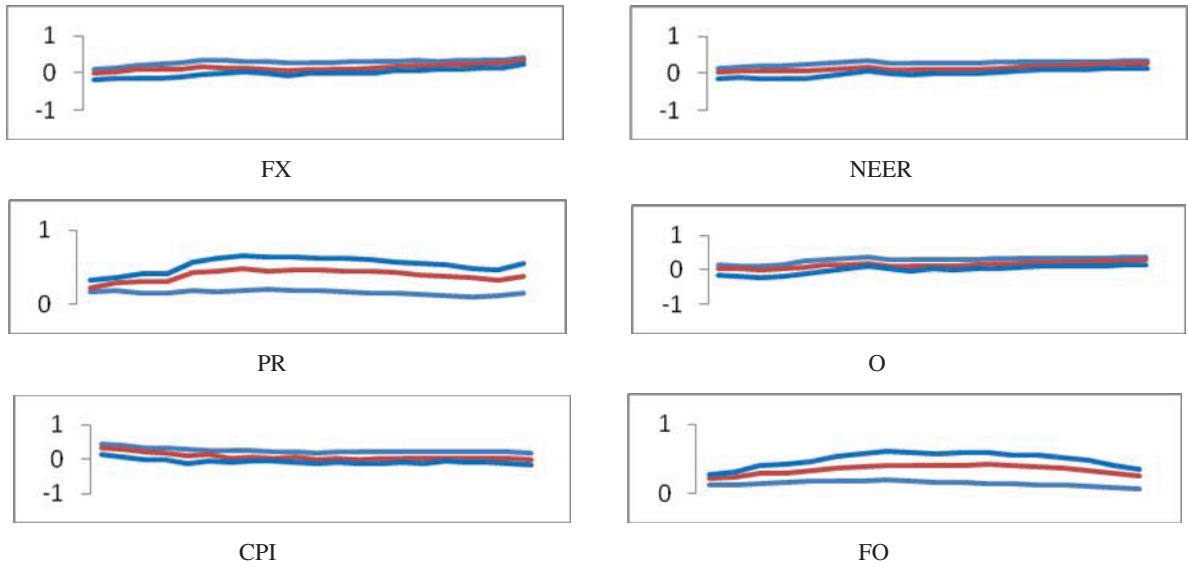


Appendix B. Impulse responses to policy shocks (converting SVAR variable order)

Foreign exchange intervention



Money supply shock



Policy rate shock

