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Switching to the Inflation Targeting Regime: The case of Egypt

Ibrahim L. Awad*

Abstract: The purpose of this paper is to answer the question of whether the switching to the Inflation Targeting (IT) regime is necessary for the Egyptian case or not? Our judgment of applying IT regime in the Egyptian economy is established on doubled criterion. That is, the practical experience of the inflation targeters, and the efficiency of Monetary Targeting Regime (MTR) in the case of Egypt. Defining the efficiency of a monetary policy regime by the efficiency of the embedded nominal anchor to send the right message to all practitioners about the potential behavior of the price level, I assessed the efficiency of MTR in Egypt by measuring; whether there is a relationship between money and prices, the stability of the velocity of circulation, and the stability of the demand for money function. The study concluded that MTR is not efficient to tie down individuals expectations about the future path of inflation in Egypt. Taking into account that IT regime is a way to reform monetary policy and it does not worsen economic performance it becomes necessary for Egypt to switch to the IT regime once the prerequisites for IT regime have been met.

Keywords: inflation targeting, demand for money function, monetary policy in Egypt

JEL Classification: E310, E410, E510, E520, E580, E590

Introduction

Beginning of the 1990s decade and after the first adoption of Inflation Targeting (IT) by New Zealand, an increasing number of developed countries and emerging market economies adopted IT as a framework for their monetary policy. The numbers of prospective candidates for IT are also increasing. A recent survey by IMF staff (Batini, Nicoletta, et al., 2006, p. 5, and p. 8) revealed that the number of non-industrial countries intending to change their monetary policy frameworks to the IT is increasing in the near, medium, and long-term.

* Ibrahim L. Awad is at Institute of Economic Studies, Faculty of Social Science, Charles University, Prague, Czech Republic.

IT has been introduced as a framework for monetary policy under the assumption that the main goal of monetary policy is to achieve a low and a stable rate of inflation. Such an assumption is widely accepted today. Paul R. Masson, et al. (1998, 34) and Truman, E. M. (2003, 5) indicated that the reason such an assumption became widely accepted may refer to the general agreement on the following assumptions: (i) money supply is neutral in the long-run. That is, in the long-run money supply dose not affect the real variables. Conversely, money supply is not neutral in the short-run. That is monetary policy has transitory effects on the real variables in the short-run; (ii) monetary policy lags are long and variable. Consequently, the Central Bank (CB) will find it difficult, if not impossible, to conduct monetary policy to control inflation upon a period-by-period basis; and (iii) high and variable inflation is costly in terms of the long-term growth rate of the real output.

Upon the aforementioned survey by IMF staff, Egypt is one of the prospective candidates to apply IT regime in the near-term (1-2 years). The main objective of this paper is to answer the question of whether the switching to the IT regime is necessary for the Egyptian case or not? Our judgment of applying IT regime in the Egyptian economy will be established on doubled criterion. That is, the practical experience of the inflation targeters, and the efficiency MTR in the Egyptian case.

IT Regime: Definitions, Preconditions, and Motives

Definitions of IT

Generally speaking, there is no standard definition of IT[1]. However, we may think of IT as a way to reform monetary policy through anchoring individuals' expectations about inflation around an announced target. In a flexible IT regime the short-term interest rate serves as the operational target of the monetary policy. The connection between the operational target and the ultimate target (s) is the inflation forecast level, which serves as the intermediate target of monetary policy. The inflation forecast, for this reason plays a pivotal role in the process of targeting.

IT as a constrained discretion is a way of implementing the optimal policy reaction function[2]. The CB or the government determines the targeted level/range of inflation. Upon the forecasted level of inflation the CB moves the short-term interest rate to drive the expected, and consequently the actual, rate of inflation towards the targeted level. The targeted level of inflation should be publicly announced to serve as an 'anchor' for individuals expectations about the future behavior of inflation. The announced target of inflation is expected to play the role of anchoring the individuals' expectations as long as the CB's credibility is higher. That is why CB's

credibility represents the corner stone in a successful IT regime. Accountability, transparency, and independency are three basic pillars for CB's credibility.

Preconditions of IT

To date, there are considerable debates among economists about 'preconditions' that countries have to meet before applying IT. These debates reflect the fact that there is no generally agreed set of preconditions[3]. The disagreement among economists is mainly in regards to the question, 'what are the initial conditions or preconditions that have to be met before applying IT, particularly in an emerging market economy? In the vast majority of literature addressed this point; there are always three elements are generally demanded before applying IT, especially in the developing countries and emerging market economies. That is; (i) factual (de facto) independent of central bank[4]; which include three basic pillars: legal instrument independent of CB, nonexistence of the government representatives in the MPC as voting members; and absences of fiscal dominance including no obligation for CB to finance budget deficit, and domestic financial markets should have enough depth to absorb placements of public debt such as treasury bills; (ii) commitment to price stability which requires two basic elements: CB should not target any other variables rather than the rate of inflation, and CB should be transparent to the public about the exemptions of its inflation target. Such a transparency is a practical device to make CB accountable to the public for achieving the inflation target; and (iii) forecasting capabilities which include: a model for inflation forecasting and inflation projections, CB has to have clear idea about monetary policy transmission mechanisms and the associated lags, and an inclusive and updated database has to be available.

Motives to the IT Regime

A rapidly widespread of IT regime in different countries led to the question of 'Why some countries decided to switch their monetary policy regimes to the IT regime?' Two factors are standing behind such evolution; IT is a way to reform monetary policy, and IT does not worsen economic performance[5].

IT is a way to reform monetary policy; it is widely accepted today that a monetary policy regime is efficient as long as such a monetary policy regime is able to achieve the goal of price stability[6]. In this respect, a nominal anchor of monetary policy is necessary for price stability because it ties down individuals' expectations about the price level[7]. Thus, the efficiency of a monetary policy regime is determined, in the first of all, by the efficiency of the embedded nominal anchor to send the right

message to all practitioners about the potential behavior of the price level. In this context, IT is a way to reform monetary policy by anchoring individuals' expectations of inflation around an announced target of inflation.

One lessons from the experience of some emerging market economies during the second half of the nineties decade is that countries like Czech Republic, Poland, and Brazil (hereafter CPB) were forced to float their currencies on the aftermath of the economic crises in order not to lose influential part of their foreign reserves. The decision of floatation came on the aftermath of speculative attacks on domestic currency triggered by both economic crises and external imbalances of current accounts. The imbalances of current accounts emerged as a result of pegging foreign exchange rate in conjunction with high domestic inflation thereby real appreciation occurred. After floating their currencies, the CPB found that IT regime is the only available alternative to achieve the goal of price stability upon forward-looking bases. On one hand, monetary policy regime without explicit nominal anchor was not the appropriate alternative to tie down individuals' expectations about the future path of inflation especially CBs in these countries did not have track record of credibility. On the other hand, a monetary targeting regime was not also an appropriate alternative especially after the liberalization of capital flows and financial markets which undermined the relationship between money supply and price level (Schaechter, Andrea, et al. 2000; Jonas, Jiri and Mishkin, Frederic S., 2003; Fraga, Arminio, 2000; Arestis, Philip, et al., 2008).

IT does not worsen economic performance; in literatures there is no agreement among economists about the contribution of IT in the economic performance, e.g. Truman (2003, 33) refers the widespread of IT especially during the nineties decade to the suitable global macroeconomic environment during this period which gave a good name and a good start to the inflation targeting regime.

However, disagreement among economists about the contribution of IT in the economic performance may be referred to the conflicted results of the empirical studies. On one hand, Mishkin and Schmidt-Hebbel (2000) found that IT is beneficial especially on reducing the rate of inflation, reducing the sacrifice ratio and output volatility, guiding inflation expectations and dealing better with inflation shocks, reinforcing central bank independency, and mutually reinforcing communications, transparency, and accountability. Neumann, Manfred J.M., and Jurgen Von Hagen (2002) found similar results regarding the volatility of inflation and output. Also, Landerretche, Oscar, et al. (2001) found similar results about the output sacrifice, the volatility of industrial output, and reducing inflation forecast errors based on country VAR's models.

On the other hand, some studies found that IT did not contribute in economic performance. Bernanke, et al. (1999), show that the adoption of IT did not make a difference with regard to the cost and speed of price stabilization. Cecchetti, S.G.,

and Ehrmann, Michael (1999) find that the degree of inflation aversion and consequently the degree of output volatility in the inflation targeting-countries in average is not higher than those of non-targeters. Comparing 7 inflation targeters to 13 non-targeters, Laurence, Ball, and Niamh, Sheridan (2003) found that Performance improved in both groups after the early of 90s and there is no evidence that IT improved performance.

However, Hu, Yifan (2003) takes medial stance through results of empirical study about 66 countries for the period 1980-2000. The author found limited support for the proposition that the adoption of IT improves the trade-off between inflation and output variability although IT does play a beneficial role in improving the performance of inflation and output.

Nevertheless, the clear point in the empirical studies is that IT does not worsen economic performance in the inflation targeters.

Measuring the Efficiency of Monetary Targeting Regime (MTR) in Egypt

The economic circumstances occurred in Egypt during the nineties decade were very similar to those in the CPB. The application of the economic reform program with the advent of the nineties decade and the pegging of foreign exchange rate for long periods of time are two common aspects between Egypt and the CPB. The main deference, however, was the reaction of the Central Bank of Egypt (CBE) to economic crises encountered the economy in the second half of the nineties decade. While CBs in the CPB reacted to economic crises by switching their monetary policy regimes to the IT regime immediately after floating domestic currency the CBE did not[8]. Although, domestic currency (Egyptian Pound) subdued to successive devaluations during 2000-2002 and formally floated in 2003 the CBE did not switch to the IT regime. The CBE announced in several occasions about its intention to adopt IT regime as a framework for its monetary policy once the fundamental prerequisites are met (CBE, 2005; Batini, Nicoletta, et al., 2006; IMF, 2007). One of the fundamental questions has to be answered before the switch to the IT regime is the question of 'is there existing relationship between money and prices in the Egyptian economy? The rest of this paper will be devoted to answer this question through considering whether MTR is efficient in the case of Egypt or not.

As mentioned, the efficiency of a monetary policy regime is determined by the efficiency of the embedded nominal anchor to send the right message to all practitioners about the potential behavior of the price level. Thus, we may assess the efficiency of the MTR in the Egyptian economy by measuring; whether there is a relationship between money and prices, the stability of the velocity of circulation, and the stability of the demand for money function[9].

The Relationship between Money and Prices in the Egyptian Economy

The variables and data; as the CBE targets the rate of growth of M2 I employed the variable M2 to measure the movements of the supply of money in the Egyptian economy. As a measurement of the rate of inflation, I used the change in the CPI. The adoption of the CPI rather than the other measurements of inflation refers to two considerations. The first concerns the data, where the quarterly data about the CPI is available for long periods. The second consideration is the wide use of the CPI. Although the CPI may involve some bias upward, it represents the most measurement commonly used for inflation in both empirical studies and monetary policy analysis. The source of quarterly data of both M2 and CPI is the IFS, CD-R 2008.

The analysis covers the period's 1991Q1-2007Q1. The choice of the year 1991 as a point of departure of the analysis refers to the fact that the periods as of 1991 are completely distinguished from the other previous periods. The Economic Reform and Structural Adjustment Program (ERSAP) endorsed by IMF and WB in 1991 represents a watershed between two different epochs of the economic regimes and consequently economic policy in the Egyptian economy[10].

The stationarity of the time series M2 and CPI; Plotting both time series CPI and M2 against time gives the perception that they are nonstationary. Plotting the autocorrelation function (ACF) through the correlogram asserted our initial clue about the nonstationarity of both CPI and M2 where the first values are close to one.

One of the most popular tests of time series stationarity in the past several years is the unite root test. Beside the ACF, I used the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests to determine the stationary time series of both CPI and M2. I performed the unit root test on the two time series CPI and M2. The two time series CPI and M2 are found to include a unit root, but the first differences of both logarithm CPI (Ä LnCPI) and logarithm M2 (LnM2) are found stationary process.

The long-run relationship between money and prices in the Egyptian economy; Does a relationship exist in the long-run between money and prices in the Egyptian economy? The answer to this question depends on the cointegration relationship between money and prices. According to Granger's representation theorem, if two variables, say Y and X, are individually integrated of order one but the residuals from the cointegrating regression are stationary then there is a long-run relationship between these two variables.

In the light of this, the first differences of both logs CPI and M2 are stationary. Therefore, the time series of both LnCPI and LnM2 is integrated of order one, i.e. LnM2 ~ I (1) and LnCPI ~ I (1). To determine whether there is a cointegration relationship between money and prices we may simply regress LnCPI on LnM2 and

test the stationarity of the residuals. In other words we may apply the unit root tests on the residuals of the following regression:

$$LnCPI \quad _0 \quad _1 LnM2 \quad _{t1} \tag{1}$$

Testing the residuals of equation 1, the ADF unit root test does not reject the null hypothesis, i.e. the residuals are not stationary. According to the Breusch-Godfrey (LM) test for serial correlation, the residuals are serially correlated which means that the residuals from regression 1 are nonstationary. The first value of the ACF is found close to one, which indicates nonstationarity of the residuals with high probability. Therefore, the behavior of the residuals of equation 1 exhibits a nonstationary behavior.

In the light of these results, we may conclude that the variables LnCPI and LnM2 are not cointegrated. Consequently, there is no long-run relationship between money and prices in the Egyptian economy.

The short-run relationship between money and prices in the Egyptian economy; the nonexistence of a long-run equilibrium relationship between money and prices in the Egyptian economy does not contradict with the fact that a short-run relationship may exist between the two variables. We may express the short-run relationship using the stationary variables LnM2 and LnCPI.

Regressing LnCPI on LnM2, a positive serial autocorrelation is found where the value of Durbin-Watson statistic was very low. Using the following transformed form[11]:

$$LnCPIW \quad _1 \quad _2 \; LnM2W \quad _{t1} \tag{2}$$

The estimation results indicated that there is no short-run relationship between money and prices in the Egyptian economy.

The causality relationship between money and prices within an unrestricted VAR model; I considered different method to explore the relationship between money and prices in the Egyptian economy. Detecting causality relationship between the two variables is indicator that a relationship exists. I checked the causality relationship between money and prices in the Egyptian economy using an unrestricted VAR model with the following form:

$$LnCPI_t \quad _0 \quad \sum_{i\ 0}^{k} i(LnCPI)_{t\ i} \quad \sum_{i\ 1}^{m} i(LnM2)_{t\ i} \quad _{1t} \tag{3}$$

$$LnM2_t \quad _0 \quad \sum_{i\ 1}^{k} _i(LnCPI)_{t\ i} \quad \sum_{i\ 1}^{m} _i(LnM2)_{t\ i} \quad _{2t} \tag{4}$$

Where, $_{1t}$ and $_{2t}$ ~ iid (0, ^{2})

I estimated the above model for the period 1991:1-2007:1. According to the stability test, the model does not satisfy the stability condition. At least one root is found outside the unite circle. One of the possible reasons of such instability in the VAR estimations is the change of the economic policy during this period as mentioned above. Such a change of the economic policy might have impacted upon the parameters of the model.

I estimated the above VAR model for the period 2002:4 - 2007:1(the period beginning of the floating of FX rate). The model satisfies the stability condition where all the roots were lying inside the unit circle. Also, the model satisfies the normality test of the residuals according to the Jarque-Bera test.

Testing for the causality relationship, the Wald test of Granger causality indicated that there is no causality relationship between money and prices in the Egyptian economy.

The Stability of the Velocity of Circulation

The determinants of the velocity of circulation (V), and consequently its stability, are a subject of controversy among economists. In the light of the quantity theory of money, price level (p) is determined only by the nominal supply of money (M). The explicit assumption is that the real output (Q) is constant in the long-run whereas the implied assumption is that the individuals' expectations about the price level are stable. If individuals' expectations are adaptive then the previous change in the price level (not because of the change in the supply of money but because of some other exogenous factors) will lead to direct changes in the velocity of circulation.

Consider the simple quantity theory that yields the ex post relationship given as:

$$MV \quad PQ \tag{5}$$

If V is found stationary then the variables in the quantity equation are stationary, or are not stationary but cointegrated. Whereas, the nonstationarity of V is indicator not only that the variables in the quantity equation are nonstationary, but also that the long-run relationship between the nominal supply of money and the nominal GDP (NGDP) (=PQ) has broken down. The break down of the relationship between the nominal supply of money and the NGDP may happen if at least one of the three variables (P, Q and M) was moving separately from the other two variables (no cointegration relationship). In the last case we may find also that the relationship between both M and P, or the real GDP (RGDP) has broken down[12].

In the light of this I will check the stationarity of V and the cointegration relationship between M2 (= M) and NGDP in the Egyptian economy. Since the quarterly data about the NGDP is not available in our source (IFS, CD-R 2008) I will use the time series available on the website of the CBE[13], which covers the periods as of 2002. Therefore, the analysis in this part will cover only the period 2002Q4 – 2007Q1.

The ADF and PP unite root tests on the variables V, RGDP and NGDP revealed that these variables are nonstationary. The second difference of Logarithm NGDP (^{2} Ln NGDP) is stationary while the first difference of RGDP (RGDP) is stationary. The ADF unite root test on the variables M2 and CPI during the current period showed that the first difference of Log M2 is stationary whilst the second difference of CPI (^{2} CPI) is stationary.

To test whether there is a cointegration relationship between NGDP and M2 I followed the same procedures as in section 3.1. The residuals of the regression Ln NGDP / Ln M2 (where both of them are integrated of order 1) are nonstationary. According to the Johansen cointegration test the variables Ln M2 and Ln NGDP are not cointegrated. Granger causality test indicates that there is no (Granger) causality relationship between the two variables.

In the light of these results, we may interpret the nonstationary of V in the Egyptian economy by the break down of the long-run relationship between NGDP and M2.

To answer the question why such a long-run relationship between NGDP and M2 does not exist in the Egyptian economy? We may check the cointegration relationship between M2 and either P or RGDP[14].

To test whether there is a cointegration relationship between M2 and RGDP I estimated the regression RGDP / Ln M2 where the two variables are integrated of order 1. The residuals of this regression are stationary. According to the Johansen cointegration test, and the Granger causality test the variables Ln M2 and RGDP are cointegrated, and Ln M2 (Granger) cause RGDP.

To test whether there is long-run relationship between M2 and P during the current period I estimated the regression CPI / Ln M2 (where the two variables are integrated of order one). The residuals of this regression are found nonstationary. According to the Johansen cointegration test, the variables Ln M2 and CPI are not cointegrated. The Granger causality test indicated that there is no causality relationship between the two variables.

Our conclusion from the above analysis is that; while the nonstationary of V in the Egyptian economy is interpreted by the break down of the long-run relationship between NGDP and M2, the break down of the relationship between M2 and NGDP is interpreted by the break down of the relationship between M2 and P in the long-run.

The Stability of the Demand for Money Function

One of the fundamental assumptions of the MTR is a stable relationship has to be existed between money supply and prices. Under this assumption, the CB can achieve the goal of price stability by moving money supply to affect the actual price levels. The other, and related, assumption of the MTR is that the demand for money function has to be stable. Without a stable demand for money function the CB will not be able to predict the demand for money. Consequently the CB will not be able to determine how much change in the money supply is required to meet the demand for money. As a result, the CB will not be able to achieve the goal of price stability.

The instability of the demand for money may be illustrated by the instability of the velocity of circulation. More frequently, the instability of the demand for money is illustrated in terms of the demand for money function. Anderson, Palle S. (1985) identified three sources of the instability in the demand for money; (i) the change of the velocity of circulation in response to fluctuations in the interest rates as well as the movements in the other arguments of money demand function rather than real income; (ii) the money demand function itself may shift. For instance, financial innovations and deregulation of interest rates may shift the demand of money at the prevailing levels of the nominal interest rates; (iii) over shorter periods the money stocks actually held may not correspond to the money balances desired. If the speed of adjustments is low then such discrepancies will induce large and unexpected changes in the velocity of circulation.

In this section our objective is to consider the stability of the demand for money function in terms of its determinants. Besides to the RGDP, the nominal interest rate (R) affects the real demand for money because of its effect on the opportunity cost of holding money. Hetzel, Robert L. (1984) used a typical equation expressing the public's demand for real money balances (M*) in the following form:

$$M^* \quad F(X) \quad e^k e^{\ at} R^{\ b} Y^c \tag{6}$$

M*, the desired real money balances, is a function of nominal interest rate (R) and real income (Y). Where, (k) is constant, and (at) is the trend rate of growth in income velocity of money. Practically, measuring the stability of the demand for money function is performing by checking the stability of the following regression (Hetzel, 1984; Mehra, 1993):

$$Ln(M / P)_t \quad _1 \quad _2 LnY_t \quad _3 LnR_t \quad _t \tag{7}$$

Wagner, Jun R.(1981) indicated that once the interest rate appears in the demand for money function, a stable demand for money function no longer implies a stable

monetary multiplier. The main defect of the equation 7 is that it does not take into account the effect of the expected change in the price level on the real demand of money. Al-Sowaidi, Saif S. and Darrat, Ali F. (2006) included the expected inflation in the demand for money function. Where, both expected inflation and nominal interest rate affect the opportunity cost of holding money. The lagged values of the rate of inflation are used as measurement for the expected inflation.

In the light of this, we may check the stability of the following form of the demand for money function in the Egyptian economy

$$(M / P) \quad _1 \quad _2(RGDP)_t \quad _3(R)_t \quad (\ ^e)_t \quad _t \tag{8}$$

Where, ^{e} is the expected rate of inflation, equal to the lagged value of the inflation rate (= $_{t\ 1}$).

The period of the study is constrained by the availability of data. As mentioned, the quarterly data available for the nominal GDP is only for the period's 2002Q4-2007Q1, therefore our analysis will cover only this period.

Which rate of interest might be used? As the Egyptian economy became more liberalized, especially after liberalizing exchange rate and the deregulation of the domestic interest rates, the structure of domestic interest rates is dominated by the directions of the international interest rates. Therefore, we may use either the LIBOR rate or, an average of the domestic interest rates as a measurement of the nominal interest rate included in equation 8.

Despite the Treasury Bills (TBs) rate is mostly laying between both lending and depositing rates the use of the TBs rates as a proxy for the nominal interest rates is cancelled where the TBs rate, in contrast with the other included variables, seams stationary. According to the ADF unite root test the TBs rate is integrated of order zero. As the time series of the TBs rates is found stationary, i.e. I~ (0), we could not include it in our analysis to estimate the long-run demand for money function. The individual time series of both CPI and LIBOR are integrated of order two while Ln (M2/P) is integrated of order one. As mentioned, RGDP is integrated of order one.

In the light of the above analysis we may measure the stability of the demand for money function in the Egyptian economy through two steps. The first step is to estimate the long-run demand for money function. The second step is to consider whether such a long-run relationship is stable or not.

The long-run demand for money function may be estimated in the Egyptian economy through the following form, where all the included variables are integrated of order one;

$$Ln(M / P)_t \quad _1 \quad _2 RGDP \quad _3 \ LIBOR_t \quad (\ CPI)_{t\ 1} \quad _{t1} \tag{9}$$

Since the individual variables of equation 9 are integrated of order one then the existence of a long-run relationship depends on whether the residuals of 9 are stationary or not. According to the ADF unit root test, PP unit root test and the Q-statistic test the residuals of equation 9 are stationary. Consequently, equation 9 captures the long-run demand for money in the Egyptian economy.

The second step is to check whether the existing long-run demand for money function is stable or not. Different tests of stability may be used. Specifically, to check the stability of the long-run relationship depicted by 9, I used Chew's Breakpoint test, Chew's forecast test, and the recursive residuals test.

Using the point 2005:1 to check for structural change in 9, Chow's tests indicated for structural change. Where, the null hypothesis is rejected in the two tests according to the value of both F-statistic and the likelihood ratio-statistic. According to the Recursive Residuals test the parameters of equation 9 are not stable through the time

Conclusion

This paper intended to answer the question of whether the switching to the Inflation Targeting (IT) regime is necessary for the Egyptian case or not? Our judgment of applying IT regime in the Egyptian economy is established on doubled criterion. That is, the practical experience of the inflation targeters, and the efficiency of Monetary Targeting Regime (MTR) in the case of Egypt. Defining the efficiency of a monetary policy regime by the efficiency of the embedded nominal anchor to send the right message to all practitioners about the potential behavior of the price level, I assessed the efficiency of MTR in Egypt by measuring; whether there is a relationship between money and prices, the stability of the velocity of circulation, and the stability of the demand for money function.

The results of the study came as follows: (i) the relationship between money and prices in the Egyptian economy is loosened either in the short-run or in the long-run; (ii) the velocity of circulation (V) is found nonstationary, and there is no cointegration relationship between the supply of money (M2) and the nominal GDP (NGDP); and (iii) by estimating the demand for money function in the long-run and checking its stability the results indicated that the demand for money function is not stable in the Egyptian economy.

In the light of the above results the study concludes that MTR is not efficient in the Egyptian case to tie down individuals expectations of inflation. Taking into account that IT regime is a way to reform monetary policy and it does not worsen economic performance in the inflation targeters, it becomes necessary for Egypt to switch to the IT regime once its prerequisites have been met.

NOTES

[1] In literature there is no standard definition of IT, rather there are different definitions; see for example: Debelle, Guy, et al. (1998, 2), Svensson, Lars E.O. (1998, 13), Batini, Nicoletta, et al. (2005, 161), Bernanke, Ben S., and Woodford, Michael (2005, 1), and King, Mervyn (2005, 13).

[2] In fact, most economists look to the IT as a constrained discretion. The constraint is the inflation target and the discretion is the scope to take account of the short-run economic and financial considerations. For more details see; Truman, E. M. (2003) and Bernanke, Ben S., and Fredirec S. Mishkin (1997).

[3] See for example; Khan, Mohsin S. (2003, 10), Truman (2003, 49), and Batini, Nicoletta, et al. (2006, 18)

[4] See Truman (2003, 49-51), Paul R. Masson, et al. (1998, 35), Batini, Nicoletta, et al. (in IMF, 2006, 18), Debelle, Guy, et al. (1998, 11-13), Fraga, Arminio, et al. (2003, 22-25), and Mishkin, Fredric S., and Schmidt-Hebbel, Klaus (2007).

[5] Of course there are different factors for the rapid widespread of IT, but these factors are related with the two mentioned factors in the text. Epstein, Gerald (2007), for instance, think that the widespread of IT refers to the IMF increasingly using the loan conditions and technical assistance to promote the use of IT in developing countries and emerging market economies.

[6] An operational definition of price stability that is now broadly accepted among economists is the definition presented by Alan Greenspan; price stability is obtained when economic agents no longer take account of the prospective change in the general price level in their economic decision making (Batini, Nicoletta, et al., 2005, 161).

[7] Mishkin, Frederic S. (1999, 1) defines a nominal anchor as a constraint on the value of money. It provides conditions that make price level uniquely determined. A nominal anchor for this reason is a device to bind individual's expectations about the nominal price level.

[8] For more details about stance of the CBE of these crises See; Panizza, Ugo (2001) and Kamar, Bassem and Bakardzhieva, Damyana (2003).

[9] The details about the econometric analysis of this section are available upon request.

[10] For more details about the ERSAP see Korayem, Karima (1997) & Awad, Ibrahim L. (2002).

[11] The easiest way to explore the relationship between the two variables in such a case is to estimate the regression LnCPI on LnM2 with AR (1), or higher order, to eliminate the autocorrelation and then to assess whether there is a significant relationship between the variables. I applied this method with AR (1) where the serial autocorrelation is eliminated. However, the relationship between LnCPI on LnM2 was not significant.

[12] For empirical analysis about the relationship between money and prices in the context of a mean-reverting velocity of circulation see; Hollman, Richard D., et al. (1991), and Crowder, William J. (1998).

[13] Available at: http://www.cbe.org.eg/timeSeries.htm

[14] The theoretical base of analyzing the cointegration relationship between M2 and P depends on the monetarists' hypothesis which implicitly assumes that the economy approaches full employment. In the case of Egypt where the formal rate of open unemployment is higher than 11 % in the past five years it will be valid to analyze the cointegration relationship between M2 and real GDP.

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