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The Impact of Policy-Induced Changes in Nominal Interest Rates on the Exchange Rate: Lessons Learned in Egypt

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1. <u>Introduction</u>

A very common –though highly controversial- policy stance of several central banks has been to raise interest rates in the face of disorderly movements in the exchange rates, however, the empirical validation of its effectiveness remains inconclusive.

This controversy became highly charged during the Asian crisis. As the crisis erupted and countries experienced large exchange rate depreciations, the International Monetary Fund (IMF) argued strongly that a significant tightening of monetary policy was necessary to stabilize the exchange rate and restore confidence.

This policy is in line with the traditional belief that raising interest rates support the exchange rate in a crisis. This view stresses that higher interest rates raise the return that investors obtain by investing in the country and therefore reduce capital flight. Also, by increasing interest rates it will be very costly for speculators to take short positions in the currency under attack and therefore speculation may be discouraged. Tight monetary policy can also signal the commitment of the monetary authority to defending the currency which helps in restoring confidence. These together support the currency and lead to exchange rate appreciation. (Huang *et al.* 2010)

However, the continued depreciation of the exchange rates in Asian countries began to raise doubts about the efficiency of raising interest rates to defend the currency.

Critics of tighter monetary policy defended a revisionist view arguing that raising interest rates during crises may further weaken the currency. High interest rates worsen the financial position of debtors, inducing bankruptcies and raising the default probabilities. Thus, even though higher interest rates may make investment in local currency denominated assets more attractive, higher default probabilities and riskiness may offset this effect and discourage foreign investors resulting in capital flight and exchange rate depreciation. (Gould and kamin, 2000)

This debate remains unresolved, with empirical literature unable to detect a clear systematic relationship between interest rates and exchange rates.

As for Egypt, the rise in capital outflows, the decline in foreign direct investment (FDI) and the dollarization of deposits together with the increased political risk after the revolution caused a depreciating trend of the Egyptian Pound.

The importance of the study to the Egyptian economy appears in light of the recent announcement of CBE in its press release that the MPC will not hesitate to adjust the key CBE rates to ensure price stability over the medium term. The paper's findings are expected to help assess the effectiveness of raising the policy controlled interest rates to defend the exchange rate in Egypt.

The paper will examine the relationship between interest rates and exchange rate in some developed and developing countries, with special attention given to two country experiences, Turkey and India, since they are more relevant to the current situation in Egypt and hence will be able to draw lessons and policy implications which can offer guidance to the Egyptian economy that is about to embark on a similar experience.

The paper shall be organized as follows. Section two provides a literature review for the theoretical debate regarding the relationship between interest rates and exchange rate, as well as the transmission mechanism of a higher interest rate policy to the exchange rate. Section three reviews the empirical evidence on the relationship between interest rates and exchange rates in some developed and developing countries, in addition to the Turkish and Indian experiences. Some stylized facts about Egypt's monetary and exchange rate policy are presented in section four. The Last section presents the concluding remarks and policy implications.

2. <u>Theoretical Debate on the Relationship Between Interest Rates and Exchange Rates</u>

This section presents the theoretical underpinnings regarding the nature of the relationship between interest rates and exchange rates.

The theoretical rationale for raising interest rates to defend the exchange rate relies on the uncovered interest rate parity (UIP) condition:

$$i_t = i_t^* + (e_{t+1}^e - e_t)$$

Where i_t and i_t^* are the domestic and foreign interest rates at time t on similar financial assets. e_t is the nominal exchange rate at time t (local currency per unit of foreign currency) and e_{t+1}^e is the expected exchange rate at time $t+1$. In other words;

$$e_t = (i_t^* - i_t) + e_{t+1}^e$$

According to the UIP condition, a rise in the domestic interest rates will lower e_t i.e. appreciate today's exchange rate if i_t^* and e_{t+1}^e are kept constant. This is the effect suggested by the traditional view. (Gumus, 2002)

Fruman and Stiglitz (1998) stated that there might be some problems with the notion that an increase in the interest rate should bring about the appreciation of the exchange rate:

- When the interest rate is raised, the parity condition itself creates expectations for the currency to depreciate to equalize the return on homogenous financial assets; these expectations may be amplified if the higher interest rate policy is perceived as inducing recession.

- It is not the promised interest rate that matters but the expected return, which must take into account the probability of default. An increase in the nominal interest rate increases the probability of default leading to a rise in the risk premium.

These two effects can be combined in a revised uncovered interest parity equation:

$$i_t = i_t^* + (e_{t+1}^e - e_t) + RP_t$$

Where RP_t is the risk premium at time t, it incorporates both the exchange rate risk premium and the default risk premium. (Gumus, 2002)

When these two effects turn out to be significant, a higher interest rate may accompany a depreciated -and not an appreciated- exchange rate. This is the perverse effect that is defended by the revisionist view. (Sitikantha and Mitra, 2001)

This debate is evident in theories of exchange rate determination –namely; Mundell-Fleming model, the flexible-price monetary model and the sticky-price monetary model (Sarno and Taylor, 2002)- where the relationship between interest rates and exchange rate differ greatly.

- **Mundell-Fleming Model**

In the early 1960s, Mundell and Fleming independently extended the Keynesian income-expenditure model to incorporate the role of capital flows.

At that time, the prevailing open economy analysis was that of James Meade. Mundell and Fleming refocused Meade's analysis and concluded that higher interest rates may cause a significantly larger increase in capital inflows giving rise to exchange rate appreciation. (Boughton, 2003)

- **Flexible-Price Monetary Model**

The monetary approach to exchange rate determination emerged as the dominant exchange rate model at the start of the float in the early 1970s. The flexible-price monetary model makes predictions about the long run impact of changes in money market on the exchange rate. The model is based on purchasing power parity (PPP) and a stable money demand function. It assumes that prices are perfectly flexible. (Taylor, 1995)

The model tends to indicate that there should be a positive relationship between the interest rate differential (defined as the domestic interest rate minus foreign interest rate) and the exchange rate. (Hacker *et al.* 2010)

The monetary approach starts with the definition of the exchange rate as the relative price of two monies and attempts to model that relative price in terms of the relative supply and demand for those monies. Using the Cambridge money demand function, the demand for money, M_d, is given by: $M_d = kPY$,

Where P is the aggregate price level, Y is real national income, and k is the desire to hold money which is a negative function of the interest rate.

Setting money supply equal to money demand and solving for P we get:

$P = M_S/(kY)$, which acts as an aggregate demand function.

An increase in the interest rate, all else equal, causes k to drop and P to rise.

Through purchasing power parity (PPP)[1], the rise in the price level will increase the exchange rate i.e. the domestic currency will depreciate.

Thus, an increase in the domestic interest rate, all else equal, will drive down money demand in the country and drive up its aggregate demand, resulting in higher domestic prices. This in turn will lead to a depreciation of the domestic currency. (Hacker *et al.* 2010)

- **Sticky-Price Monetary Model**

The sticky-price monetary model, due originally to Dornbusch, allows short term overshooting of the nominal exchange rates above their long run equilibrium levels (long run purchasing power parity equilibrium). It assumes that there are jump variables –exchange rates and interest rates- compensating for the stickiness in other variables -good prices- in the short run.

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[1] Absolute purchasing power parity implies that the nominal exchange rate is equal to the ratio of the two relevant national price levels. According to the law of one price (the fundamental building block of the PPP) $e_t = P/P^*$, where P_t is the domestic price level at time t, P_t^* is the foreign price level at time t and e_t is the nominal exchange rate defined as the domestic price of foreign currency at time t. The assumption of perfect sustainability between goods across different countries is crucial for verifying the law of one price. In this case, the condition of no profitable arbitrage should ensure equality of prices in highly integrated goods markets. (Sarno and Taylor, 2002)

A cut in the nominal domestic money supply implies a fall in the real money supply -since good prices are sticky in the short run- and a consequent rise in domestic interest rates to clear the money market. The rise in the domestic interest rates leads to capital inflow and appreciation of the nominal exchange rate.

As long as the expected foreign loss (the expected rate of depreciation of domestic currency) is less than the capital market gain (the interest rate differential) risk-neutral investors will continue to borrow abroad in order to buy domestic assets.

Short run equilibrium is achieved when the expected rate of depreciation is equal to the interest rate differential, i.e. when uncovered interest parity holds. In the medium term, however, domestic prices begin to fall in response to the fall in the money supply. This alleviates pressure in the money market and domestic interest rates start to decline. The exchange rate then depreciates slowly towards the long run purchasing power parity. (Sarno and Taylor, 2002)

Hence, the model indicates that in the short run, there should be a negative relationship between the interest rate differential and the exchange rate and that monetary tightening should lead to an immediate exchange rate overshooting. This means that the purchasing power parity (PPP) would only hold in the long run. (Wilson, 2009)

The actual period over which the positive relation between interest rate differential and exchange rate dominates the negative relationship depends on the expectations and risk premia. Strong fundamentals and sound financial system improve market expectations and reduce risk premium demanded by investors and hence the positive relationship will only be obtained in the long run. However, weak fundamentals and fragile financial system may result in a positive relationship even in the short run. (Sitikantha and Mitra, 2001)

The actual impact of a high interest rate policy would, however, depend on the dynamic interactions among several variables through which the transmission mechanism operates. Thus, it is important to review the channels through which interest rates affect the economy.

An increase in the policy-controlled interest rate has three key effects; a money demand effect, an output effect and a fiscal effect. First, higher interest rates are likely to raise the demand for domestic currency denominated assets. This is likely to have a strengthening effect on the

currency. Second, higher interest rates raise the borrowing costs for businesses and reduce their net worth thereby reducing output, investment and growth which may weaken the currency. Third, higher interest rates also raise the fiscal burden on the government which might end up weakening the currency.

The transmission of monetary tightening to the exchange rate will depend on the net effect of these opposing pressures. If the money demand effect dominates the other two, then higher interest rates will lead to an appreciation of the currency. If the money demand effect is dominated by the other two, the currency will depreciate. (Hnatkovska *et al.* 2012)

3. <u>Empirical evidence on the relationship between interest rates and exchange rates</u>

Although enormous literature has attempted to document the relationship between interest rates and exchange rates, the results have been inconclusive and couldn't resolve the theoretical debate.

This section presents the empirical evidence from a number of developed and developing countries detailing the mixed results on the relationship between interest rates and exchange rates, and focuses on two developing countries –Turkey and India- that have some characteristics in common with Egypt.

The Empirical literature is organized as follows; studies targeting the relationship between interest rates and exchange rates in developed countries, studies targeting developing countries, studies on the relationship in Asian countries during the crisis and finally studies combining both developed and developed countries.

Addressing the empirical relationship between interest rates and exchange rates in developed countries, **Eichenbaum and Evans (1995)** investigated the effects of shocks to U.S. monetary policy on exchange rates using unrestricted vector autoregression (VAR). They considered three measures of shocks; one of them is shocks to the federal fund rate, and computed the impulse response function of nominal exchange rate to the shock. Their results suggest that a contractionary shock to U.S. monetary policy leads to an appreciation in U.S. nominal exchange

rates, which provide support for the conventional wisdom in which exchange rates should appreciate in response to monetary tightening.

Hacker *et al.* (2010) used the wavelet decomposition analysis to investigate the relationship between the spot exchange rate and the interest rate differential for seven pairs of countries (the U.S. dollar; the Japanese yen; the Euro; the Pound sterling; the Swiss franc; the Norwegian krone; and the South Korean won) with a small country[2], Sweden (Swedish krona) included in each of the cases.

Their empirical results show that there is a negative relationship between the spot exchange rate (domestic-currency price of foreign currency) and the nominal interest rate differential (approximately the domestic interest rate minus the foreign interest rate) at the shortest time scales, while a positive relationship is shown at the longest time scales, which is consistent with the sticky-price model.

To investigate the relationship within developing countries, **Fruman and Stiglitz (1998)** Identified a set of "temporarily high" interest rates episodes in nine emerging markets – Argentina, Brazil, Czech Republic, Ecuador, Indonesia, Korea, Mexico, Philippines and Slovakia. Using a simple regression analysis, they find that interest rate hikes are associated with exchange rate depreciation.

In the aftermath of the East Asian currency crisis, **Dekle *et al.* (1998)** examined the relationship between the increase in interest rates and the behavior of exchange rates by employing a vector autoregression (VAR) and uses weekly data for Korea during the crisis and its aftermath. The results indicate that raising interest rates has the traditional impact of appreciating the nominal exchange rate.

Cho and West (2003) conducted an empirical study of the relationship between exchange rates and interest rates during the 1997-98 exchange rate crises in Korea, the Philippines and Thailand. Using weekly data, the results indicates that an exogenous increase in interest rates caused exchange rate appreciation in Korea and the Philippines, and depreciation in Thailand. These

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[2] "Small country" means that the developments in that country do not induce any perceptible effect on the rest of the world, thereby justifying in economic modeling the treatment of foreign variables as being given. (Hacker *et al.* 2009)

contrasting results are based on the sensitivity of risk premiums to interest rates. In Korea, risk premiums were inversely related to the level of interest rate. In the Philippines, risk premiums were modestly increasing in interest rates. In Thailand, on the other hand, risk premiums were strongly increasing.

Huang *et al.* **(2010)** investigated the role of short-term interest rate in stabilizing the exchange rates in Asia during the financial crisis in the 1990s. They decomposed the effect of the interest rates on the exchange rates into a direct effect and an indirect effect. The direct effect exists so that a contractionary monetary policy can have an appreciation impact (the traditional view). The indirect effect refers to the higher default risk induced by a monetary policy tightening, which on the contrary generates a depreciation pressure (the revisionist view). Using weekly data from Indonesia, South Korea, and Thailand from 1997:7 to 1998:12, and employing a time-varying-parameter model, they find that even though increases in interest rates lead to exchange rate appreciation in Indonesia and Korea via the direct channel, the effect is highly insignificant. By contrast, an increase in interest rates has a significant negative impact on exchange rates via the indirect channel in Thailand.

Combing both developed and developing countries in one study and using vector autoregression (VAR), **Hnatkovska** *et al.* **(2012)** reveal that in response to a monetary tightening; the nominal exchange rate tends to appreciate in developed countries but depreciate in developing countries. The paper builds a monetary model of a small open economy using cross country data on 72 countries with flexible exchange rates over the period 1974:1-2010:12. The model incorporates three key channels of monetary transmission: a liquidity demand channel, a fiscal channel and an output channel. The paper identifies the liquidity demand effect as being key to the contrasting responses generated. Deposits respond much more in developed countries due to the larger steady state value of demand for deposits in these countries.

In an earlier version of the paper (2011), they studied a sample of 25 industrial and 49 developing countries over the period 1974-2009 and showed that the fiscal effect and the output effect are typically larger in developing than in industrial countries. The fiscal effect is larger because, traditionally, developing countries have larger fiscal deficits. The output effect is larger because firms in developing countries need to rely more on bank credit as they are mostly unable to raise funds by issuing commercial paper.

Hnatkovska *et al.* (2008) estimated a four-variable VAR for a sample of ten countries - six developing (Brazil, Korea, Mexico, Thailand, Peru, Philippines) and four developed (Canada, Germany, Italy, the United States) focusing on periods of floating exchange rate until 2001. The impulse response of the nominal exchange rate to a one standard deviation innovation in the interest rate differential reveals mixed results, with currency appreciating within the set of developed countries, while depreciating for the developing group expect for Thailand which shows significant appreciation in response to an increase in interest rate differential. And that even in the developed countries the relationship is not stable over time.

They developed a simple model to rationalize the mixed results, where higher interest rates have three effects: they raise the fiscal burden on the government, reduce output due to higher working capital costs and raise the demand for domestic currency assets. While the first two effects tend to depreciate the currency, the last effect tends to appreciate it. The model shows that in Thailand, where the share of private credit is larger, the money demand effect dominates and thus the exchange rate appreciates.

They concluded that a temporary increase in the policy controlled interest rate has a non-monotonic effect on the exchange rate: for small increases in the interest rate the exchange rate appreciates but for larger increases it depreciates.

Reviewing all these studies implemented on developed and developing countries covering different time horizons reveal the contradicting results regarding the relationship between interest rates and exchange rates.

Two small open emerging economies -Turkey and India- are selected for an in depth case study analysis. The selection procedure depended on the characteristics and conditions these countries have in common with Egypt. Turkey experienced high levels of budget deficit during 1986-2001 and depended on short term borrowing to finance public sector requirements. This resembles the current situation in Egypt which depends on treasury bills. India on the other hand, avoids large movements in exchange rate by intervening in the foreign exchange market through reserves and resorts to the high interest rate option during major episodes of significant pressures on the Rupee, which resembles the current monetary stance implemented by the CBE. They are also chosen due to the fact that a higher interest rate policy resulted in different exchange rate

response in each country; with Turkey experiencing depreciation of the Turkish Lira while India showing appreciation.

Turkey experienced a chronic budget deficit during the period 1986-2001 leading to the crisis of 1994 and 2000-2001. In 1989, the capital account was liberalized and high capital inflows were achieved causing appreciation of the currency. To support the value of the real exchange rate and prevent it from depreciating. The Central Bank of the Republic of Turkey (CBRT) increased interest rates to attract more capital inflows. During this period, a primary deficit was observed and the public sector borrowing requirements were financed with short term domestic borrowing. With the increase in interest rates, domestic debt grew largely and expectations for devaluation increased by 1993 which gave rise to the 1994 currency crisis. (Berument and Dincer, 2004)

Gumus (2002) examined the relationship between interest rates and exchange rates during the 1994 currency crisis in Turkey. Using weekly data for the period from November 1993 to the end of June 1994 and applying a vector error correction model, the results show that higher interest rates are associated with exchange rate depreciation in the long run, supporting the revisionist view. Even though the initial impact of an interest rate increase is exchange rate appreciation which lasts for two periods, this effect is insignificant. They conclude that interest rate defense has not been successful in appreciating the exchange rate in the 1994 Turkish crisis.

Aysoy and Kipici (2005) used quarterly data covering the period from 1987:1 to 2002:3. They constructed a model of four blocks and find that an increase in the overnight interest rate results in a depreciation of the Turkish Lira. Their justification is based on the fact that higher interest rates will bring about capital inflows and result in the appreciation of the Turkish Lira, in the short run under normal conditions in which worries about the sustainability of domestic debt stock are at minimum. However, in the case of Turkey that experienced various crises during the estimation period, the role of risk premium is apparent.

India, on the other hand, implemented a "managed floating with no fixed target" exchange rate regime during the period 1995-2001. Such a policy stance has enabled India to avoid large disruptive volatility. Besides forex market interventions and use of several administrative measures, the Reserve Bank of India has occasionally resorted to the high interest rate option

during major episodes of significant pressures on the value of the rupee. (Sitikantha and Mitra, 2001)

Sitikantha and Mitra (2001) developed a three variable unrestricted vector autoregression (VAR) for India using monthly data on nominal exchange rate, average call rates and net interventions covering the period from June 1995 to March 2001. Impulse responses derived from the VAR model suggests that one standard deviation shock to call rate (overnight interbank interest rate) appreciates the Rupee in the second month. Despite modest subsequent depreciation, the overall impact over a period of time shows an appreciation.

Their results indicate that the impact of a higher interest rate policy appears to be more permanent, even though the interest rates generally decline in the aftermath of the pressure episodes, indicating that interest rate measure has been used in India essentially to stem speculation and such a policy stance appears to have worked.

4. Egypt's Monetary and Exchange Rate Policy 2003-2013

This section gives an overview of the monetary and exchange rate policy implemented in Egypt and presents some evidence about the attempt of raising policy controlled interest rates to defend the exchange rate.

Throughout this period, the Central Bank of Egypt (CBE) has focused on achieving the primary objective of price stability, while being committed to achieve low rates of inflation -over the medium term- that are essential for preserving high rates of investment and economic growth.

In 2005, the CBE announced its intention to adopt a full-fledged inflation targeting regime once the fundamental prerequisites are met. The CBE uses short term interest rates in the transition period to meet its inflation targets. (Mabrouk and Hassan, 2012)

Consistent with this end, the CBE moved from a quantitative operational target (excess reserves) to a price target (overnight inter-bank rate) and introduced a corridor system with two standing facilities, the overnight lending and deposit facility, that the CBE uses as its main monetary policy instrument to achieve the operational target. The interest rates on the two standing facilities define the ceiling and the floor of the corridor, respectively. By determining the rates on

the standing facilities, the Monetary Policy Committee[3] (MPC) provides the corridor within which the overnight rate can fluctuate. Steering the overnight inter-bank rate within this corridor is the operational target of the CBE. (Al-Mashat and Billmeier, 2007)

In terms of the regime, the CBE announced in January 2003 the float of the Egyptian pound in an attempt to resolve the deteriorating situation in the foreign exchange market[4] (Selim, 2009). However, the de facto arrangement identified by the IMF staff in 2012 differs from the officially announced de jure arrangement. According to the IMF report, Egypt is classified as pursing a stabilized arrangement[5] with no explicitly stated nominal anchor (IMF, 2012).

Since 2003, the CBE has used a combination of market intervention (changes in foreign reserves) and interest rate adjustments to face pressure on the exchange rate and avoid large disruptive volatility.

Following the floatation, the exchange rate was still far from its market equilibrium; this induced expectations of future depreciation and resulted in a depreciating trend of the Egyptian pound that lasted until October 2004 recording LE/US$ 6.23 (Selim, 2009). In December 2004, the CBE launched a new inter-bank foreign exchange market that accommodates all foreign exchange transaction between banks in an attempt to restore confidence and achieve a smoothly functioning foreign exchange market (Mabrouk and Hassan, 2012).

The improvement in foreign exchange management led to the appreciation of nominal exchange rate and stabilized around LE/US$ 5.7 between September 2005 and September 2006. During the period from 2005 till 2008, Egypt benefited from the plentiful global liquidity. The increase in oil prices (Egypt is a net oil exporter), the increased traffic in the Suez Canal on the back of the

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[3] The CBE established a Monetary Policy Committee which meets on Thursday every six weeks to decide on key policy rates. (Al-Mashat and Billmeier, 2007)

[4] The Egyptian pound was pegged to the U.S. dollar until 2000, however, it became subject to a series of external shocks during that period (the East Asian crisis, falling tourism revenues, and the slowdown of world trade in 2001) that led to a significant capital flight imposing downward pressure on the exchange rate. In an attempt to defend the Egyptian pound, the CBE reduced significantly its foreign reserves, but the attempt was insufficient. In 2001, the exchange rate was devalued and set to crawl with currency band of ±1 percent that was later widened to ±3 percent, however, the magnitude of devaluation was insufficient to restore confidence in the market. (Selim, 2009)

[5] Classification as a stabilized arrangement entails a spot market exchange rate that remains within a margin of 2% for six months or more and is not floating. It requires that the exchange rate remains stable as a result of official action. The classification does not imply a policy commitment on the part of the country authorities. (IMF annual report on exchange arrangements and exchange restrictions, 2102)

trade boom in addition to the FDI inflows allowed the CBE to accumulate high levels of international reserves alleviating much of the upward pressure on the exchange rate.

The downturn in the global economy in August 2008 and the decline in external demand reduced exports and tourism revenues and led to large portfolio outflows. The CBE intervened in the foreign exchange market to ease the downward pressure and the impact of capital outflows on the Egyptian pound was minimal. Starting from March 2009, the exchange rate stabilized at LE/US$ 5.62 allowing the CBE to accumulate international reserves (Selim, 2009).

Since January 2011 revolution, Egypt has suffered from unstable political and security conditions, rise in capital outflows, decline in tourism revenues and foreign investments, continuous credit rating downgrades and dollarization of deposits causing a depreciating trend of the Egyptian pound against the U.S. dollar as illustrated in **Figure 1**.

**Figure 1 EGP/US$ Nominal Exchange Rate**

Source: International Financial Statistics IFS.

In an attempt to defend the Egyptian pound, the CBE reduced international reserves. **Figure 2** shows that the CBE has lost about 16 billion U.S. dollars of international reserves over the past 31 month following the revolution. As a result, net international reserves declined from 32 billion U.S. dollars in January 2011 to 19 billion U.S. dollars in July 2013 after accounting for

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the extra reserves that Egypt received from Turkey, Libya and Gulf countries. (African Development Bank Group, 2013)

Figure 2 Egypt's International Reserves
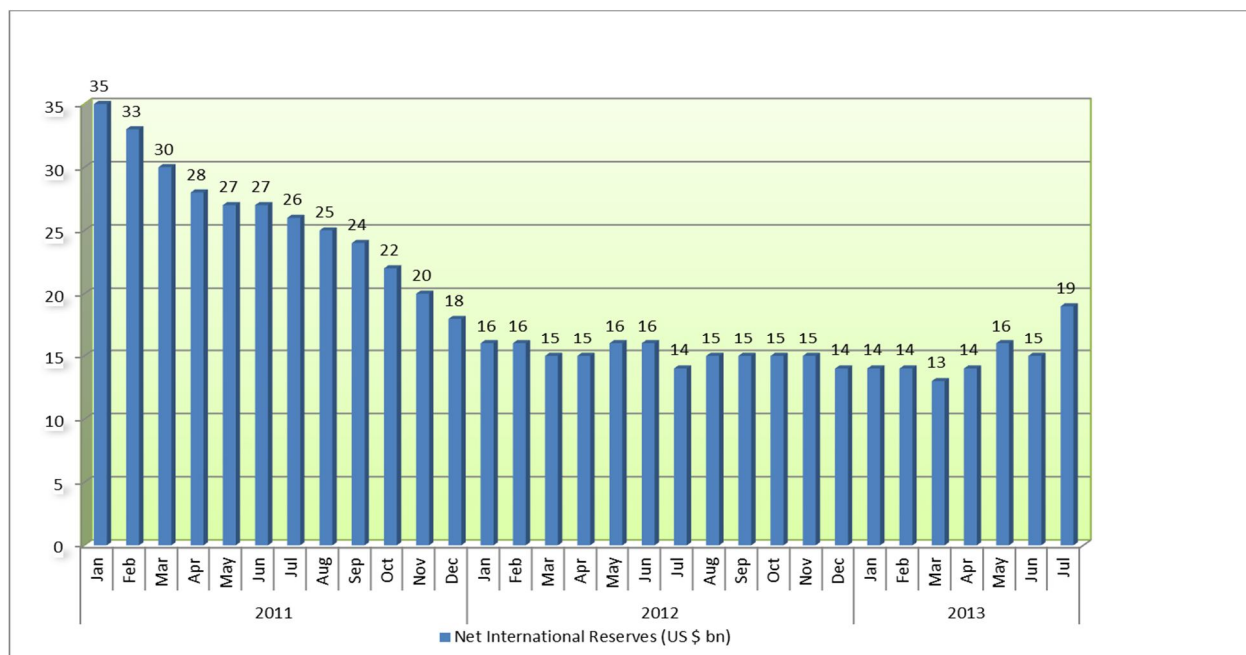
Source: African Development Bank Group (2013)

With the continuous decline in international reserves –falling below 15 billion U.S. dollars[6] in some months- the CBE introduced a new dollar auction system offering local banks periodic auctions for selling or buying U.S. dollars in an attempt to protect the foreign reserves from the rapid decrease while directing the remaining reserves to cover strategic imports and service the external debt.

To control currency depreciation, the Monetary Policy Committee (MPC) raised CBE rates[7] in March 2013 to control inflation development that were largely driven by increases in food and non-food prices on the back of the recent movements in the exchange rate and diesel distribution bottleneck across the country and slow down the dollarization of deposits. The overnight deposit and lending rates were raised by 50 basis points to 9.75 percent and 10.75 percent respectively. (CBE, 2013a)

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[6] The minimum level required to support three months of imports.
[7] Two standing facilities: overnight lending facility and overnight deposit facility.

However, in August 2013 the Monetary Policy Committee (MPC) cut the CBE rates by 50 basis points to 9.25 percent and 10.25 percent respectively in an attempt to stimulate growth by lowering cost of production. The MPC stated that the risks on GDP outweigh the risks of higher inflation levels thus interest rates must be lowered. (CBE, 2013b)

5. <u>Conclusion and Policy Implications</u>

The paper looks at one of the key issues in responding to currency crisis: the use of temporary high interest rates to stabilize the exchange rate. While the rationale for raising the interest rate to defend the exchange rate under attack is well grounded in economic theories, the empirical validation of its effectiveness remains inconclusive.

Looking at the Egyptian economy, increasing CBE key rates failed to absorb the currency depreciation as the Egyptian pound continued to depreciate despite the rise although at a slower pace. And the cut in interest rates by the MPC reveals that the costs associated with higher interest rate far exceeds the benefits of defending the currency.

Studying the Turkish experience reveals that higher interest rates will bring about capital inflows and result in the appreciation of the exchange rate, in the short run under normal conditions in which worries about the sustainability of domestic debt stock are at minimum. However, in the case of Turkey that experienced various crises during the estimation period, the role of risk premium is apparent. They concluded that in order to use the interest rate as an effective policy variable, it is important to implement structural reforms to eliminate the concerns about the debt sustainability, which is highly relevant to the Egyptian case given its growing domestic debt.

Reviewing empirical literature on the relationship between interest rate and exchange rate revealed that the response of developing and developed countries to higher interest rate might differ. The demand effect is larger in developed countries due to larger steady state value of demand deposits in these countries, while the fiscal effect and the output effect are larger in developing countries because they have large fiscal deficit and because firms rely more on bank credit thus increasing interest rates may further harm the economy and this can vbe sen in the Egyptian economy. (Hnatkovska et al. 2012)

The effectiveness of interest rate defense of exchange rate depends on two factors; the information that higher interest rates signals about the monetary authority and the degree to which high interest rates harm the economy.

In Highly segmented credit markets, increasing the policy interest rates may not affect the interest rate faced by borrowers and hence would be costless. But when firms are highly indebted and much of the debt is in short term then raising interest rates would prove to be costly and would increase the probability of bankruptcies. (Fruman and Stiglitiz, 1998)

Countries have to compare the costs associated with a free fall of exchange rate on the one hand and the costs associated with triggering a recession resulting from higher interest rate on the other. Both exchange rate depreciations and interest rate increases create winners and losers and one need to look at the net impact.

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