Can Monetary Policy Play an Effective Role in Egypt?

Mohamed Hassan

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Mohamed Hassan is professor of economics at Cairo University and advisor at the Egyptian Center for Economic Studies. The author would like to thank Ahmed Galal and Samiha Fawzy for their help and encouragement. He would also like to thank Nada Massoud for valuable research assistance. All errors remain the responsibility of the author.

Abstract

The slowdown of the Egyptian economy over the last few years and the floatation of the pound in January 2003 stimulated a debate over the effectiveness of monetary policy in activating the economy. This paper contributes to this debate by focusing on monetary policy transmission mechanisms and addressing the following questions: Was there a bubble in the construction sector? How significant is the effect of interest rate on domestic credit to the private sector? Does a reduction in nominal interest rate cause international reserves to deteriorate? The paper concludes that there was a bubble in the construction sector; that nominal interest rate does not have a significant impact on real domestic credit going to the private sector; and that the relative importance of interest rate in explaining movements in international reserves is small compared to that of real domestic credit and real exchange rate.

ملخص

لقد أدى تباطؤ الاقتصاد المصري على مدار السنوات القليلة الماضية، بالإضافة إلى تعويم سعر الصرف في يناير ٢٠٠٣، إلى إثارة جدل هام حول فعالية السياسة النقدية في تحفيز الاقتصاد. وتقوم هذه الورقة بالإسهام في هذا الجدل من خلال التركيز على الآليات التي من خلالها يتم انتقال آثار السياسة النقدية، وكذلك من خلال تناول الأسئلة التالية: هل كان الرواج الذي شهده قطاع التشييد والبناء في مصر رواجا حقيقيا أم كان رواجا مصطنعا لا يستند إلى أسس حقيقية؟ ما مدى تأثير التغيرات في سعر الفائدة على مستوى الائتمان الحقيقي الموجه للقطاع الخاص؟ وهل يؤدي انخفاض سعر الفائدة الاسمي إلى تدهور الاحتياطيات الدولية؟ وتخلص الورقة إلى أن الرواج الذي شهده قطاع التشييد والبناء كان رواجا مصطنعا، كما أن تغيرات سعر الفائدة لا تمارس أثرا ذا بال على مستوى الائتمان الحقيقي الموجه للقطاع الخاص، وأخيرا فإن الأهمية النسبية لسعر الفائدة في تفسير التغيرات في الاحتياطيات الدولية تعد من الضآلة بمكان إذا ما قورنت بالأهمية النسبية لكل من الائتمان الحقيقي الموجه للقطاع الخاص وسعر الصرف الحقيقي في هذا الشأن.

I. Introduction

In an attempt to attain high and sustainable growth in GDP with a gradual decline in inflation, Egypt embarked on an economic reform program in May 1991. The program aimed to increase the competitiveness of the economy through executing a sequence of structural adjustment measures, and to ensure that fiscal and current account deficits are brought under control. Achieving exchange rate stability and fiscal discipline were at the heart of the stabilization program.

On one hand, the program succeeded in bringing the inflation rate down to 2-4 percent, achieving a growth rate of about 5 percent during the mid-1990s (Table 1), and reducing fiscal and current account deficits[1] (Tables 2, 3).[2] On the other hand, it resulted in an excessively overvalued real exchange rate (Figure 1). And since it was not announced that the fixed exchange rate regime was a temporary arrangement and that it would be abandoned according to a careful exit strategy once inflationary pressures were contained, there was a justified fear of floating. The appreciation also led to a current account deficit, albeit the rise in that deficit in the last three years of the 1990s was mainly due to an increase in investment rather than consumption (Table 5). Moreover, although this current account deficit as a ratio of GDP is not considered too high by international standards, the fact that Egypt is still unable to attract significant private capital flows makes financing this deficit problematic.

Toward the late 1990s, a severe credit crunch hit the economy and led to a notable slowdown starting from the fiscal year 1999/2000.[3] This was coupled with a deterioration in the banking sector. While accurate data on nonperforming loans are lacking, there is no denying that a problem does exist and that it needs to be addressed effectively. Hence, one

[1] There was a current account surplus during the early and mid-1990s (see Table 6).

[2] Nevertheless, structural adjustment was less successful. Some measures have been taken on the road to trade liberalization, privatization and financial liberalization. Because of the bias toward political stability, the rate of privatization was slower than expected.

[3] During the period 1998–2000, the local currency came under notable pressure. Trying to defend the overvalued exchange rate, policymakers heavily relied on international reserves. Therefore, international reserves dropped by almost 25 percent. Consequently, a large amount of liquidity has been pulled out of the market. The situation was aggravated by the unfavorable external shocks in the late 1990s (Asian crisis in June 1997; Luxor incident in November 1997; and oil prices deterioration starting from late 1997).

might wonder if the achieved growth rate of about 5 percent during the mid-1990s was sustainable. It looks as if growth has been financed by non-performing loans.

In an attempt to reactivate the economy, the government has allowed the budget deficit to increase to about 5-7 percent since the late 1990s. It has also slowly and gradually moved toward a more flexible exchange rate regime since July 2000. While this was the right path to pursue, the adoption of it was late. Appendix 1 includes an analytical framework showing the dilemma that faced policymakers in the second half of the 1990s.

Toward the end of 2002, the situation was characterized by an overvalued real exchange rate; a budget deficit of about 6 percent; a vulnerable current account situation (the current account still shows a volatile deficit once net exports of oil and private remittances are excluded—Table 4); a critical level of international reserves; a less than healthy banking system, segmented consumption markets, and finally a protracted economic slowdown.

To address that situation, the government seems to have reached a consensus that fiscal policy has been overly exploited;[4] and that it is time to utilize monetary policy. However, it was impossible to have an active monetary policy while adopting an almost fixed exchange rate regime and an open capital market. This impossibility is often summed up by the idea of the "the impossible trinity" or "inconsistent trinity." This principle states that a country cannot simultaneously maintain a fixed exchange rate and an open capital market while pursuing a monetary policy oriented toward domestic goals (Frankel, 1999; Eichengeeen, 1999; Dornbusch, 2001). In other words, the government was faced with two tough choices toward having an active monetary policy. One choice was to impose restrictions on the capital market while maintaining the exchange rate peg to the dollar. The other was to opt for a flexible exchange rate regime while maintaining an open capital market. Based on a cost/benefit analysis, the government decided to pursue the second choice. Hence, the prime minister of Egypt announced the flotation of the pound on January 28, 2003.

Now that the exchange rate is no longer the nominal anchor, the Central Bank of Egypt (CBE) can have an active monetary policy. According to the governor of the CBE, the inflation rate is now the nominal anchor (Abu El Eyoun, 2003). This is also consistent with the recent trend in conducting monetary policy in emerging markets. That trend puts emphasis

[4] Moreover, there is limitation on the ability of policymakers in Egypt to conduct a counter-cyclical fiscal policy (Ugo Panizza, 2001).

on smoothing both inflation measure and real output without too much reaction to the exchange rate (Taylor, 2000). In the case of Egypt, however, one has to assign a larger weight to smoothing real output in the short run such that the inflation rate must not exceed an upper limit.

The slowdown in the Egyptian economy over the last few years and the room for active monetary policy have triggered important debates concerning the transmission mechanisms of an active monetary policy, the best way to conduct monetary policy, and the potential side effects of such policy. Addressing these issues has gained even more importance following the announcement of the new exchange rate regime.

In this context, the paper attempts to address the following questions: Was there a bubble in the non-tradable sector (i.e. construction sector) that might prevent monetary policy in the future from relying on that sector to have a significant impact on the real side of the economy? How significant is the effect of interest rate on domestic credit that goes to private sector? Does a reduction in nominal interest rate cause a deterioration in international reserves?

These questions are quite interrelated. Conducting a successful monetary policy requires a good understanding of the transmission mechanisms of monetary policy. Such mechanisms include both the short-term and long-term markets. As for the latter, in a country where the financial market is not fully developed and where there are few long-term securities (like Egypt), the construction sector emerges as a crucial channel for monetary policy. For the former, the credit market is deemed the most important mechanism monetary policy can rely on. Both markets are related through the interest rate term structure. Hence, monetary authorities can exercise an impact on the real side of the economy through nominal interest rates, which in turn affect the short- and long-term markets. In addition, an expansionary monetary policy will eventually lead to a reduction in nominal interest rate, which might have a negative effect on the level of international reserves. Therefore, investigating the likelihood of a negative impact of nominal interest rate on international reserves seems justified.

The empirical evidence provided below indicates the following: First, there has been a bubble in the construction sector. In other words, businessmen consider this sector more profitable than it actually is, which reduces the likelihood of utilizing this market to activate the economy. Second, nominal interest rate does not have a significant impact on the level of

real domestic credit going to private sector. This is because businessmen seem to have been operating under a soft budget constraint, which made changes in interest rate less important for investment decisions. Finally, it is real domestic credit, rather than the interest rate, that affects international reserves. Those results have important policy implications as we will see later in this study.

The paper is organized as follows. Section 2 presents the methodology and data. Section 3 includes the empirical results and interpretations arranged in a question-answer format. Section 4 offers conclusions and policy implications. Section 5 states preconditions for the proper implementation of active monetary policy.

II. Methodology, Data Sources, and Variable Definitions

This section discusses briefly the adopted methodology, with more details given in Appendix 2. It also discusses the data sources and defines the variables used in the analysis.

Methodology

When it comes to understanding monetary policy transmission mechanisms, one cannot rely on reduced-form models to obtain dynamic interpretations. Therefore, to achieve the purpose of this research, the study will rely on structural vector autoregressive (SVAR) models. The SVAR model, which allows us to identify the structural shocks that hit the system, consists of two groups, namely, non-policy and policy groups. The former includes international reserves, real domestic credit that goes to private sector, and real effective exchange rate. The latter only includes the monetary policy stance[5] (nominal interest rate). The identification restrictions are used to retrieve the structural dynamic system. Once the structural model is retrieved, variance decompositions and impulse responses are computed. The variance decompositions present the percentage of the error variance at different forecast horizons that are attributed to each of the individual shocks. Generally speaking, variance decompositions show the relative importance of endogenous variables in explaining changes in each other at various forecast horizons. The impulse responses present the dynamic responses of the variables to one standard deviation shock to the structural innovations. In other words, they measure the time profiles of the effects of shocks at a given point in time on the future values of variables in the dynamic system. Hence, they provide causal interpretations between

[5] See Appendix 2.

variables. The impulse responses are plotted with two standard deviation bands. Monte Carlo simulations with 1000 iterations have been conducted to construct the impulse responses' confidence intervals.

Data Sources

We used monthly data for the period 1992 through 2002. The data have been obtained from sources such as International Financial Statistics, IMF's Direction of Trade Statistics, Central Bank of Egypt, Ministry of Planning, Ministry of Finance, and Ministry of Foreign Trade.[6]

Definition of Variables

The variables used are international reserves, real domestic credit extended to private sector, real effective exchange rate, and nominal interest rate. Investigating the dynamic interactions among these variables is expected to provide answers to the questions addressed in this paper.

Due to the unavailability of monthly data on the real effective exchange rate, we constructed our own measure, which is defined as the relative price of foreign goods (in domestic currency) to the price of domestic goods. First, we constructed the weighted average of the nominal exchange rate of OECD countries with weights equal to Egypt's trade share with each of these countries. We computed the trade shares from the IMF's Direction of Trade Statistics. Second, we constructed the weighted average of foreign prices using the consumer price indexes of these countries with the same weights used in the first step. Finally, we derived the real effective exchange rate from the multilateral nominal exchange rate index, adjusted for relative consumer price indexes.

Caveats

- The SVAR model, unfortunately, does not include any variable that represents the level of real economic activity (i.e. monthly data on real GDP). Including the real GDP could have shown how interest rate and domestic credit channels affect the real side of the economy.
- The real domestic credit that goes to the private sector is not disaggregated to the credit that goes to business sector and the credit that goes to household sector. Again, the lack of data does not make such disaggregation possible.

[6] See Appendix 3.

III. Empirical Results and Interpretations

Was there a bubble in the non-tradable sector (construction sector) that might prevent monetary policy in the future from relying on that sector to have a significant effect on the real side of the economy?

As mentioned previously, monetary policy exercises its impact through short-term and long-term markets. If there is a bubble in the long-term market, monetary policy cannot exercise its effect through this market. This is because market agents are not likely to respond to the monetary policy signals that accompany changes in interest rate. Hence, the importance of investigating whether or not there was a bubble in the non-tradable market.

The nature of the relationship between real domestic credit going to private sector and real effective exchange rate as well as the sensitivity of real domestic credit to changes in interest rate provide useful clues to answering this question. First, if the direction of influence goes from real effective exchange rate to real domestic credit, one cannot argue that there was a bubble in the construction sector. An appreciation in real effective exchange rate means an increase in the relative price of a non-tradable good, which in turn reallocates investment into the construction sector. Hence, investing heavily in the construction sector would be considered a rational behavior. Under this scenario, monetary policy can have a crucial effect on the real side through the construction market. An increase in interest rates will make this market less profitable and as a result businessmen will reduce investment directed to this market.

However, there is a case for a bubble in the construction sector if the direction of influence goes from real domestic credit to real effective exchange rate. In other words, an increase in real domestic credit causes the relative price of a non-tradable good to increase and therefore real effective exchange rate to appreciate. Assuming that businessmen expect a boom in the construction sector, a notable increase in real domestic credit —used to buy inputs needed for the expansion in this sector— will cause prices of these inputs to increase, consequently raising the price of the good that uses these inputs. This is the converse of the

famous Stolper-Samuelson theorem.[7] As a result, the real effective exchange rate will appreciate, something which can be attributed to self-fulfilling expectations. In this case, monetary policy cannot use this market to exercise a significant impact on the real side of the economy. This is because businessmen, driven by their own self-fulfilling expectations, will ignore the monetary policy signals embodied in interest rate changes.

Table 5 clearly shows that the direction of influence goes from real domestic credit to real effective exchange rate. While real domestic credit plays a sizable role in explaining the movements in real effective exchange rate (it explains about 25 percent of real effective exchange rate at a 24-month time horizon), real effective exchange rate explains less than 5 percent of real domestic credit at all considered time horizons. The impulse response function (Figure 6) shows that an increase in real domestic credit causes the real effective exchange rate to appreciate.[8]

If one adds to this that real domestic credit is not sensitive to changes in the nominal interest rate, which otherwise could have been a crucial factor, one can conclude that there was a bubble in the construction sector.[9] Again, when businessmen are not driven by fundamentals, changes in one of the most important fundamentals (nominal interest rate) will not be that important. More elaboration on this point is given next.

How significant is the effect of interest rate on real domestic credit going to private sector?

As expected, the impulse response function shows that a decrease in interest rate has a positive effect on real domestic credit (Figure 6). However, the variance decompositions shown in Table 5 suggest that the nominal interest rate movement accounts for the smallest fraction of the monthly forecast error variance of real domestic credit at all considered forecast horizons (less than 1 percent out of 100 percent). In fact, real domestic credit is

[7] The theorem states that a change in relative product prices benefits the factor used intensively in the industry that expands. However, the underlying logic in case of the converse is the same as in the Stolper-Samuelson analysis (see chapter 4 in Obstfeld and Rogoff, 1996).

[8] One standard deviation shock to real domestic credit (about 0.7 percent) causes the real effective exchange rate to appreciate by about 0.7 percent at about a 9-month horizon. The effect decreases at longer forecast horizons.

[9] If unjustified risk had not been taken in choosing artificially profitable projects in the construction sector (i.e. soft budget constraint did not exist), the nominal interest rate could have had a significant effect on the cost of financing this long-term investment. More details on this point can be found in the answer to the second question.

driven by its own shock.[10] In other words, changes in real domestic credit that goes to private sector are mainly explained by the changes in the variable itself.

This could be explained by two important factors that accompanied the 1990s economic reform program. First, the 1990s saw the liberalization of the financial system.[11] This liberalization, however, was not preceded by strengthening the supervisory and regulatory framework and increasing transparency and enforcement.[12] For relevant experiences, see Mckinnon and Huw, 1997, 1999; Huang and Xu, 1999; and Dias-Alejandro, 1985. This contributed to the creation of a bubble in the construction sector that has been financed by nonperforming loans. The excessive risks taken by businessmen can be explained by the "soft budget constraint," which refers to a state where businessmen and bankers prefer short-term debt that is continually renewed to equity. In this case, one is risking other people's money rather than one's own. A soft budget constraint is indicated by large conglomerates and banks playing dominant roles in carrying out/financing highly uncertain projects. Large conglomerates in Egypt were convinced that under the worst case scenario, the government would not allow the banking system to fail and jeopardize the entire reform process. This encouraged them to discount the risk of unfavorable collective outcomes and therefore overly invest in less profitable projects (luxurious housing projects). Therefore, it is not unexpected to find out that the real domestic credit is mainly driven by its own shock. That is, interest rate could have had a significant impact on domestic credit going to private sector had the private sector been working under a hard budget constraint.

Moreover, there was a delay in pursuing the structural adjustment component of the economic reform program.[13] Further, the pace of the structural adjustment process has been slow in recent years. Other distortions, especially in the price system, did not sufficiently increase the sensitivity of economic variables to changes in prices. With a distorted price system, it is expected that factors other than the price level (institutional factors such as

[10] About 85 percent of movement in real domestic credit is explained by its own shock at a 12-24 month horizon.

[11] Financial liberalization mainly focused on: liberalizing capital flows, eliminating credit controls, deregulating interest rate, ensuring free entry into financial services industry, and banking autonomy.

[12] Bahaa Eldin and Mohieldin (1998) identify certain regulatory weaknesses in the case of Egypt such as the lack of adequate rules. Even when these rules exist, they are not binding. In addition, various regulatory agencies are suffering from a chronic lack of resources and training.

[13] Structural adjustment measures are related to trade and financial liberalization, privatization, and streamlining the government.

excessive regulations, weak enforcement of contracts, and policy uncertainty) play a significant role. For details on the most binding institutional constraints, see Galal (1996).

Does a reduction in nominal interest rate cause a deterioration in international reserves?

There is legitimate concern that a decrease in nominal interest rate will cause a deterioration in international reserves. The reason behind this fear is that economic agents usually compare the return on a domestic asset with that on a foreign asset, assuming that they are complete substitutes. A reduction in interest rate is expected to render domestic assets less attractive. This is likely to increase pressure on international reserves due to possible dollarization or capital outflows.

As illustrated in Figure 6, a decrease in nominal interest rate causes a temporal deterioration in international reserves.[14] Nevertheless, the variance decompositions of international reserves show that interest rate explains less than 5 percent of this variable at 1-24 month horizons. In fact, the relative importance of interest rate in explaining movements in international reserves is so small compared to real domestic credit and real effective exchange rate, which explain about 34 and 20 percent of international reserves at 24-month horizon, respectively.

The crucial role of real domestic credit is explained by the monetary approach to the balance of payments. According to this approach, in a small economy the changes in international reserves are mainly due to the changes in domestic credit. Hence, the IMF recommended establishing a ceiling on domestic credit in the early 1990s in Egypt (Table 2). This ceiling has later been gradually removed. In fact, the greatest part of international reserves has been accumulated during the period when domestic credit was restricted. The impulse response function (Figure 6) shows that there is a negative relationship between real domestic credit and international reserves.[15]

Moreover, Figure 6 shows that a standard deviation shock to real effective exchange rate (about 1.5 real depreciation) causes international reserves to increase by about 1 percent.

[14] This effect is reversed after about 6 months.
[15] An increase of about 1 percent in real domestic credit will cause a deterioration in international reserves of about 1.3 percent after about 18 months of the shock (the prediction of the monetary approach to the balance of payments is a one-to-one relationship).

Naturally, eliminating the appreciation in real effective exchange rate calms down speculators and creates a chance for accumulating more reserves provided the elimination is sustainable and is accompanied by a sizable portion of capital inflows.

IV. Policy Implications

Three main findings were highlighted by the analysis. First, there was overinvestment in the non-tradable sector (i.e. the construction sector) that created a bubble. Second, the nominal interest rate does not have a significant impact on real domestic credit going to the private sector. Third, it is real domestic credit extended to private sector, rather than nominal interest rate, that affects international reserves.

Those findings indicate that as long as there is a soft budget constraint, monetary policy cannot exercise its crucial effect on domestic goals through the construction market (a long term market). This is because businessmen operating in this market will ignore the central bank signals embodied in changes in interest rate. The findings also show that the effect of monetary policy through the credit market (short-term market) is limited. Therefore, policymakers need to first reactivate these two markets. Also, measures need to be taken to get businessmen to work under a hard budget constraint. It is worth noting that the effect of an expansionary monetary policy on international reserves is limited through a nominal interest rate channel, but is significant through domestic credit. Hence, more attention should be paid to the possible negative impact on international reserves of an expansion in domestic credit due to following an expansionary monetary policy.

V. Preconditions for Active Monetary Policy

The following are important measures to be taken in the short and medium terms prior to the implementation of an active monetary policy. Fulfilling these conditions will help increase the effectiveness of monetary policy and its transmission mechanisms.

Short-term Measures

- Granting the central bank independence in terms of instruments and the numerical representation of targets. For example, the central bank may decide that achieving a mean inflation rate of 3 percent, with a standard deviation of perhaps 1 percent around the target, would represent a good policy under an inflation-targeting strategy.

However, the targets themselves should be jointly agreed upon by the central bank and the government. In case of a possible conflict between the government and the central bank, the independence of the central bank and its credibility must not be jeopardized under any circumstances.

- Following the adoption of an inflation-targeting strategy, the central bank needs to decide whether it will conduct this strategy using a rigid rule, or through a flexible one with discretion that allows for smoothing real output during periods of economic slowdown provided that inflation does not exceed a certain limit.
- Taking the required steps that will allow the banking system to develop new instruments to hedge against exchange rate volatility (i.e. forward contracts, futures, options). This will make it possible for the central bank to control inflation, and occasionally output level, without too much reaction to the exchange rate. This is because noise trading in the foreign exchange market is expected to decrease once the uncertainty decreases.
- Because of the lag between changes in monetary policy and their effect on the economy, the monetary authorities have to be forward-looking.
- Finally, gradually restoring fiscal discipline in order to make it clear that monetary policy is not going to be a reflection of loose fiscal policy the way it used to be prior to the 1990s.

Measures to be taken in the medium and long runs

Important measures to be taken in the medium and long terms include the following:

- Establishing an active bond market. This is expected to eliminate the duration mismatch commercial banks suffer from. It will also make monetary policy more effective because it will create and activate the term-structure channel.
- Establishing a strong and transparent regulatory and supervisory system that will ensure the soundness of the banking sector. This is expected to transform the soft budget constraint into a hard budget constraint.
- Establishing a "stabilization fund" to smooth out external shocks (Figure 5). This fund is expected to be fed by extra returns (above the average) of tourism, remittances from Egyptians working abroad, and net oil exports. This will make the possibility of adopting an inflation-targeting monetary rule more likely in the medium and long

runs. Hence, sharp volatility in the exchange rate will be eliminated, and monetary policy's reaction to the exchange rate will be reasonable. This fund could also be connected to certain categories of government budget to serve as an automatic stabilizer.

Table 1: Output Growth Rate, Real M2 Growth Rate, and Inflation (1992-2002)

	Output Growth Rate (%)	M2 Real Growth Rate (%)	Inflation Rate (%)
1992	1.9	14.0	21.1
1993	2.5	16.3	11.1
1994	3.9	12.8	9.0
1995	4.7	10.9	9.3
1996	5.0	10.4	7.3
1997	5.3	15.0	6.2
1998	4.0	8.5	3.8
1999	5.4	11.4	3.8
2000	5.9	8.8	2.8
2001	3.4	11.4	2.4
2002	3.2	15.5	2.4

Source: CBE website, www.cbe.org.eg; and the Ministry of Foreign Trade website, www.economy.gov.eg.

Table 2: Budget Deficit and Domestic Credit as % of GDP (1991-2002)

	Budget Deficit	Domestic Credit				
		Domestic Credit to Government	Domestic Credit to Public Sector	Domestic Credit to Private Sector	Domestic Credit to Household Sector	Total
1991	-17.2	54.4	15.1	30.5	1.7	101.8
1992	-4.4	37.6	11.6	22.2	1.8	73.3
1993	-3.9	33.4	13.0	23.3	5.1	74.7
1994	-2.5	30.8	16.2	27.2	6.3	80.5
1995	-1.6	26.8	16.1	34.0	8.6	85.5
1996	-1.8	26.1	17.5	41.9	9.8	95.3
1997	-1.3	25.3	18.6	51.0	11.5	106.4
1998	-1.0	16.4	10.3	39.3	8.0	74.0
1999	-4.2	18.8	10.5	47.3	8.8	85.4
2000	-5.1	20.3	10.4	52.2	9.3	92.2
2001	-7.8	26.0	9.1	55.8	9.6	100.6
2002	-7.6	26.3	8.6	55.1	9.2	99.2

Source: CBE website, www.cbe.org.eg.

Table 3: Current Account, Gross Capital Formation, and Consumption as % of GDP (1992-2002)

	Current Account	Gross Capital Formation	Consumption
1992	1.9	20	83
1993	1.6	22	84
1994	0.3	22	83
1995	0.2	22	83
1996	-0.1	19	82
1997	0.1	22	85
1998	-0.9	24	84
1999	-0.6	25	83
2000	-0.4	24	81
2001	-0.01	19	81

Source: CBE website, www.cbe.org.eg.

Table 4: Current Account with and without Net Oil Exports and Workers' Remittances (1990-2002)

	Current Account Balance (1)	Current Account Balance Excluding Net Petroleum and Private Transfers (2)	(1) / (2)
1990	-4243.9	-9215.1	46.1
1991	3819.9	-487.1	-784
1992	2669.9	-1669.7	-159.9
1993	2295.1	-2831.6	-81.1
1994	409.9	-4053.1	-10.1
1995	385.9	-5069.1	-7.6
1996	-185.4	-4354.8	4.3
1997	118.6	-4319.0	-2.7
1998	-2478.6	-6534.9	37.9
1999	-1723.8	-5358.7	32.2
2000	-1163.1	-4795.3	24.3
2001	-33.4	-2466.8	1.4
2002*	-8.5	-2412.7	0.4

Source: CBE website, www.cbe.org.eg.
* Preliminary.

Table 5: Variance Decomposition (monetary stance is nominal interest rate)

Months	Lending				International Reserves			
	IR	L	REER	R	IR	L	REER	R
1	3.807	96.193	0.000	0.000	100.000	0.000	0.000	0.000
2	4.990	94.441	0.432	0.137	97.938	0.658	0.846	0.558
3	6.361	92.208	1.217	0.214	94.486	0.509	0.717	4.288
6	8.237	88.419	3.119	0.225	94.093	0.759	1.311	3.838
12	9.923	85.417	4.453	0.207	80.923	6.336	9.482	3.259
18	10.278	85.108	4.253	0.361	54.490	21.410	20.819	3.282
24	10.432	84.860	4.194	0.514	42.051	32.241	20.891	2.816
Months	**Real Effective Exchange Rate**				**Nominal Interest Rate**			
	IR	L	REER	R	IR	L	REER	R
1	0.029	16.864	83.107	0.000	0.008	0.764	0.826	98.401
2	0.622	12.301	87.077	0.001	0.013	1.555	3.616	94.816
3	0.871	12.557	86.262	0.310	0.218	1.461	5.343	92.978
6	5.855	11.731	81.970	0.444	1.077	0.859	21.521	76.544
12	14.312	18.963	65.548	1.177	0.809	11.541	31.702	55.947
18	15.320	23.720	59.708	1.251	0.720	31.860	28.559	38.860
24	15.127	24.818	58.731	1.325	0.925	44.131	26.452	28.492

Figure 1: International Reserves (IR), Real Effective Exchange Rate (REER), and Nominal Exchange Rate (NE) Indexes

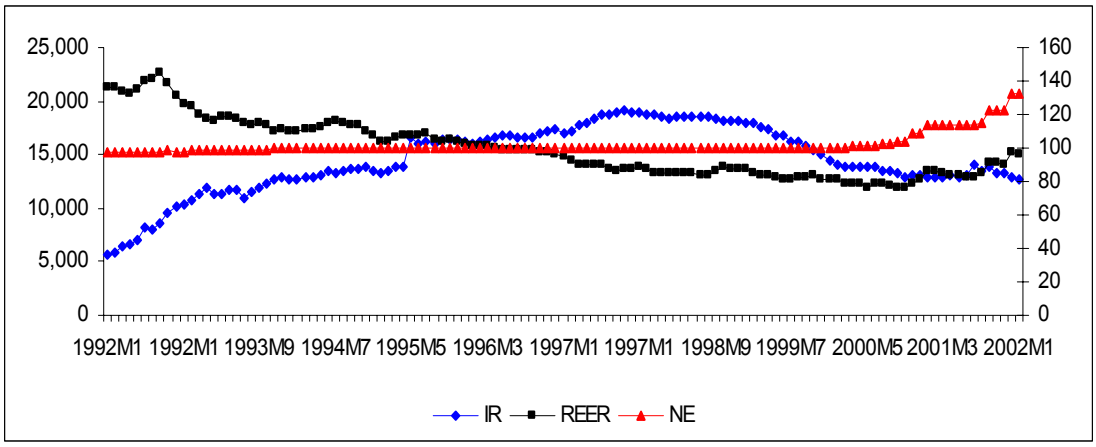


Figure 2: International reserves (IR) and Real Domestic Credit That Goes to Private Sector (L)

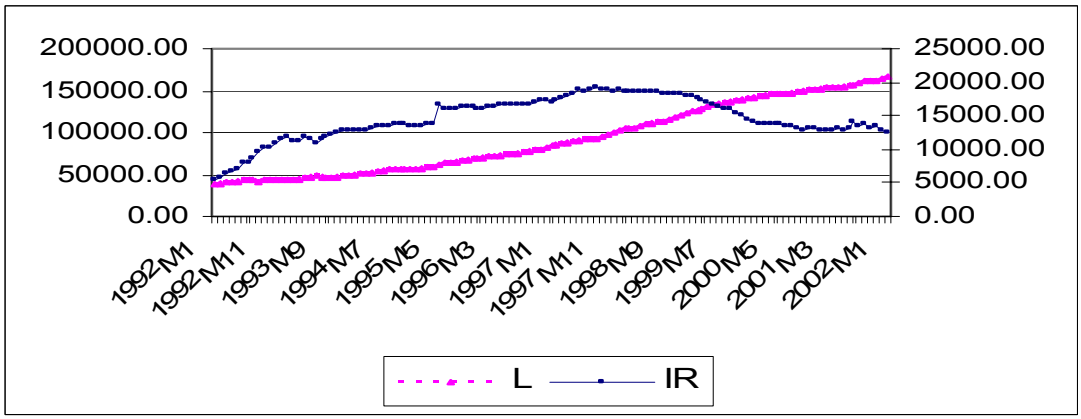
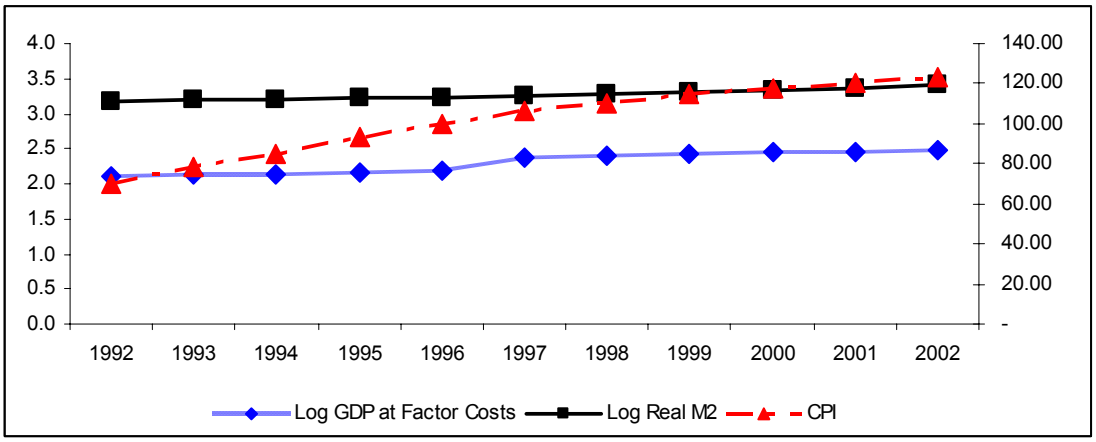
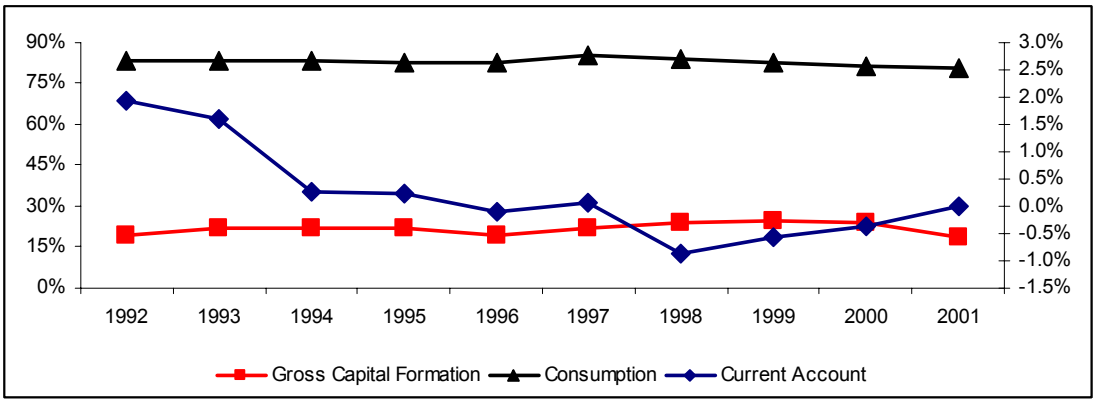


Figure 3: Real Output, Real M2, and CPI (1992-2002)



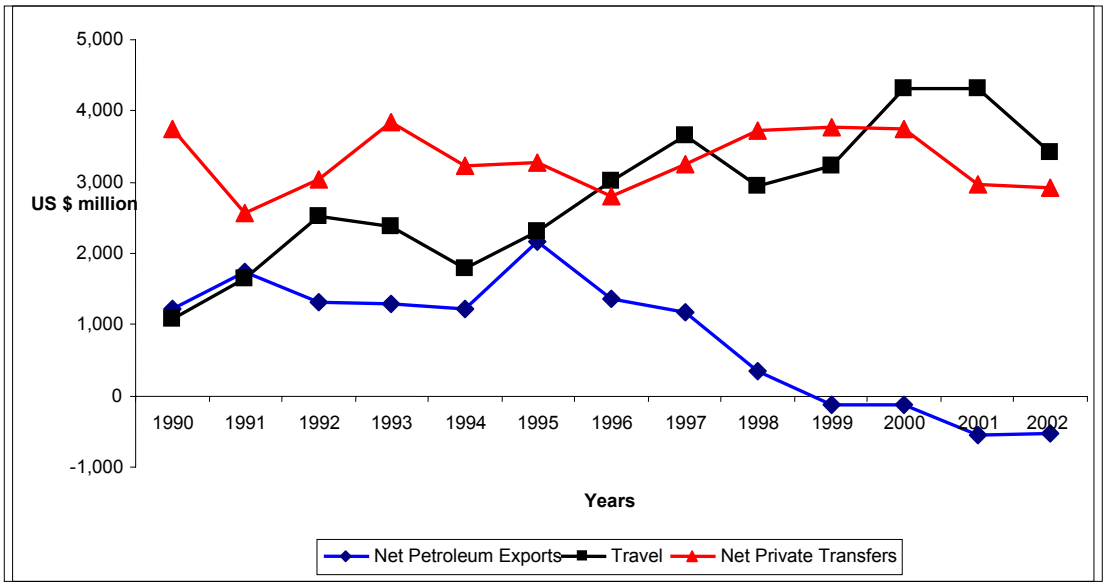
Source: CBE website http/www.cbe.org.eg and the Ministry of Foreign Trade website www.economy.gov.eg.

Figure 4: Current Account, Gross Capital Formation, and Consumption as a % of GDP (1992-2001)



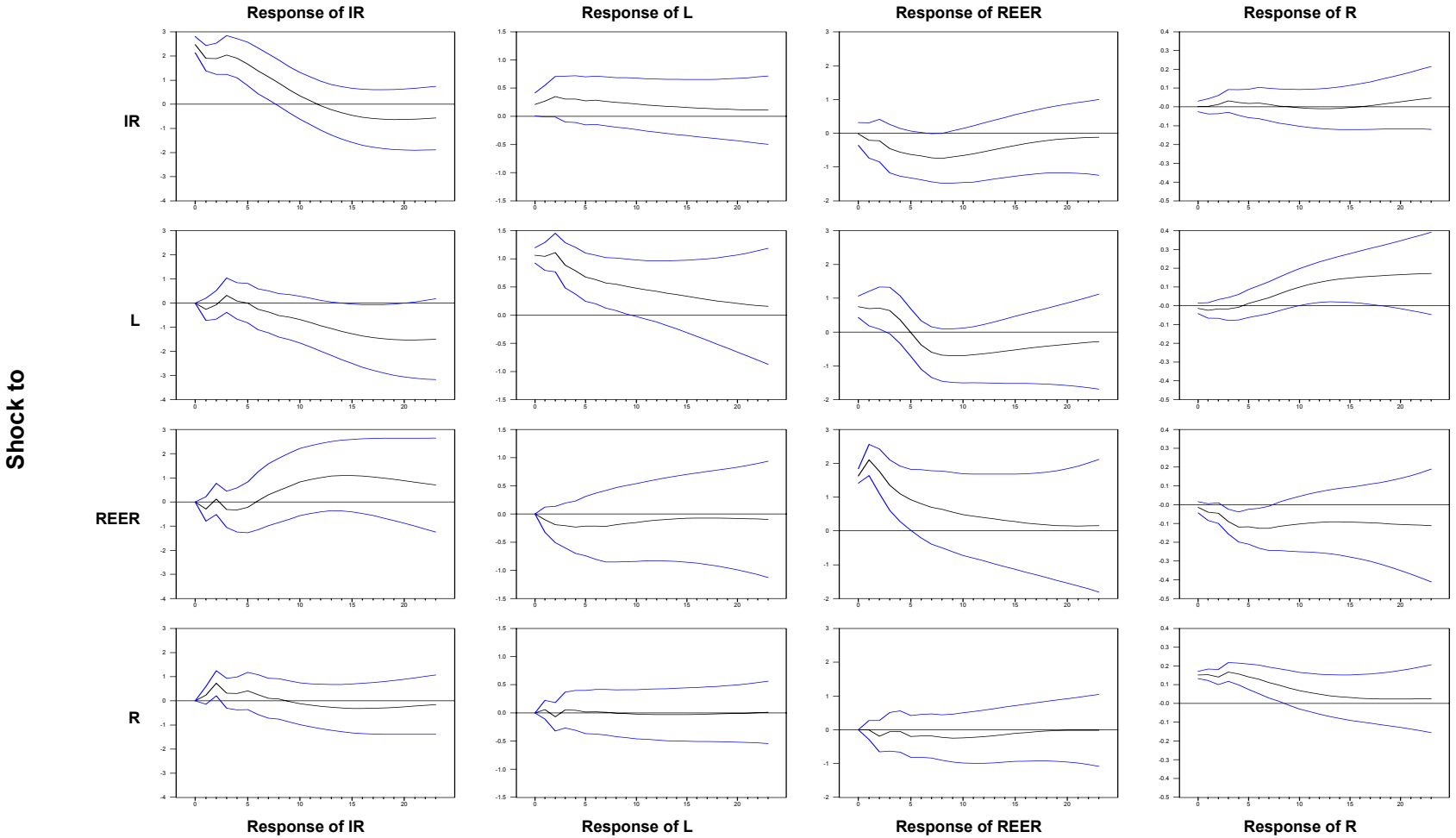
Source: CBE website http/www.cbe.org.eg and the Ministry of Foreign Trade website www.economy.gov.eg.

Figure 5: Net Oil Exports, Tourism, and Workers' Remittances (1990-2002)



Source: CBE website http/www.cbe.org.eg, the Ministry of Foreign Trade website www.economy.gov.eg, and the National Bank of Egypt, Economic Bulletin, Volume 55, Number 2, October 2002.

Figure 6. Impulse responses for Egypt: 1992-2001



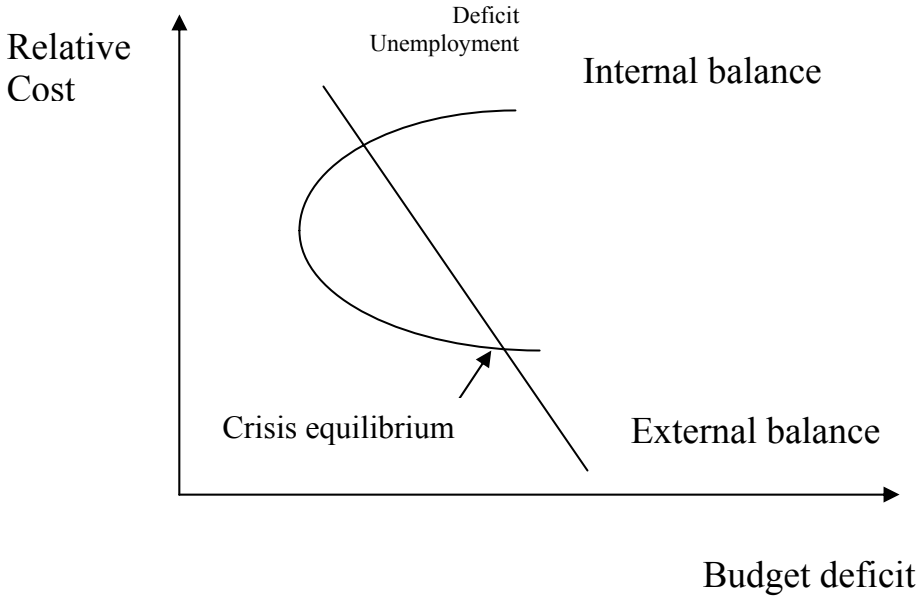
Appendix 1

An analytical framework showing the dilemma that faced policymakers during the mid-1990s

We can use a modified Swan diagram to show the dilemma that faced policymakers during the mid-1990s. As usual, the external balance curve slopes downward. This is because an increase in spending, other things equal, increases current account deficit. To offset this deterioration in the current account, the relative cost of production needs to fall (devaluing the local currency). Any point below or to the left of this curve refers to current account surplus. The new feature we introduce to this diagram concerns the internal balance curve.[16] An important characteristic of the Egyptian economy during the mid-1990s was loan dollarization. Loan dollarization reached about 40 percent of bank credit at that time. Suppose that many firms are highly leveraged and under some circumstances their investment will be constrained by their balance sheets. Then aggregate demand equation will have to include a direct dependence of domestic demand on real exchange rate. At a favorable real exchange rate, few firms would be balance-sheet constrained. On the contrary, at a very unfavorable real exchange rates, firms with foreign currency debt would be unable to invest at all. At an intermediate range of real exchange rates, the direct negative effect of large real devaluation on demand will notably exceed its positive effect on export competitiveness, so that over that range depreciation of the currency would be definitely contractionary. We might expect the internal balance curve to have a backward-bending segment. As shown in the Swan figure, we could have multiple equilibriums. One with a normal exchange rate, and one with a largely depreciated exchange rate and a corporate sector that is almost bankrupt. Therefore, while the massive devaluation in the mid-1990s could have thrown the Egyptian economy into crisis, a devaluation of about 15-20 percent could have pulled the economy to the right direction.

[16] It is supposed to slope upward. An increase in the relative cost will cause exports to decrease and imports to increase and thus reduce employment. To keep employment at a constant level, an increase in budget deficit is needed. Any point to the right or below this internal curve refers to inflationary pressures.

A modified version of the Swan diagram that fits the Egyptian case



Appendix 2

Methodology and Research Design

Methodology

We can express the VAR system as a reduced form:

$$X_t = B(L)X_{t-1} + \mu + \upsilon_t \quad (1)$$

where X is a vector of endogenous variables that includes both non-policy and policy variables, $B(L)$ is a lag operator of the order L , μ is a vector of constants, and υ is a vector of reduced-form residuals.

The structural form is given by

$$A(0)X_t = A(L)X_{t-1} + A(0)\mu + \varepsilon_t \quad (2)$$

where $A(0)$ is the matrix of contemporaneous interactions, and ε_t is a vector of Niid structural errors.

We impose contemporaneous block recursive restrictions (the Choleski decomposition), which implies a lower block triangular $A(0)$ matrix.

We assume that monetary policy stance enters the non-policy block of the system only with a lag. This is justified by the fact that the monetary policy measure takes more than one month before it affects the non-policy block variables (see Christiano, Eichenbaum, and Evans, 1999). However, the monetary policy stance is allowed to contemporaneously react to all innovations.

Real effective exchange rate is allowed to contemporaneously respond to the innovations in the international reserves, real domestic credit, and its own innovation. This is justified by the following. The international finance theory has demonstrated that the movements of real exchange rate in the short run is well explained by capital inflows and outflows. International reserves has been used in the literature as a proxy for capital inflow (see Calvo et al. 1993). Moreover, the very recent literature has underscored that over-lending

leads to the overpricing of assets, especially real estate or property which are non-tradable goods. This in turn means an appreciation in real exchange rate.

Real domestic credit is assumed to contemporaneously depend on international reserves and its own shock. An increase in international reserves is expected to increase the loanable capacity unless the monetary authority practices an aggressive sterilization process. The reason for the lack of a contemporaneous response of real domestic credit to real effective exchange rate is as follows. While the overpricing of non-tradable good, and hence an appreciation in real exchange rate, tends to squeeze investment toward the non-tradable sector (i.e., construction sector), which feeds the bubble in this sector, the investment decisions are assumed to be sluggish with regard to the realization of the change in relative price.

Finally, we assume that international reserves are predetermined with respect to all other variables. The economic agents never react contemporaneously to an appreciation in real exchange rate. They only react after the resolution of the crisis if the real appreciation results in a currency crisis. Moreover, they do not react contemporaneously to real domestic credit that goes to the private sector. When a lack of liquidity emerges and translates into a credit crunch, economic agents usually need more than one month to realize this new situation.

The reduced-form residuals depend on the structural innovations and the contemporaneous relationships among the endogenous variables.[17]

$$\upsilon_t = A(0)^{-1}\varepsilon_t = C(0)\varepsilon_t \qquad (3)$$

where $C(0)$ describes the contemporaneous relationships among the endogenous variables. Since $C(0) = A(0)^{-1}$, the matrix $C(0)$ is also a lower block triangular.

Of course our aim of adopting this methodology is to compute variance decomposition and compute and graph impulse response functions.

[17] The results are robust to different identification restrictions.

Research Design

The sample covers the period 1992:1 – 2002:12. We created a dummy variable that takes one over the period 1997:12-1998:12 and zero otherwise to capture the unfavorable external shocks.

VAR specifications are selected by a sequential search using likelihood ratio tests modified by the small-sample correction of Sims (1980). Each of the reduced-form equations includes a constant as stated in (1). We start with a maximum of k lags and test the null specification of k-1 lags against the alternative of k. If this test fails to reject, we proceed to test k-2 versus k-1 and continue until we reject a lag specification or until we test the null hypothesis of one lag versus two. At the first instance where the test rejects we halt our specification search and select the relevant number of lagged dependent variables for the VAR. We choose the VAR with one lag if we arrive at the test of one lag versus two and fail to reject the null. The number of lags selected is four.

Because we are interested in the short-run analysis, and because of the nonstationarity problems that some time series can pose, we filtered all series using Hodric-Prescot filter (see Baxter and King, 1995; Raven and Uhlig, 1997). The filtered series capture stochastic trends and allow us to focus on the cyclical behavior. For convenience, the changes in all variables are measured directly in units of percentage change.

Appendix 3

Data

The appendix describes the construction of the data presented in the text. Line references in parentheses are to the International Financial Statistics CD-ROM.

International reserves

We used international reserves minus gold (line 1LD)

Real domestic credit that goes to private sector

We used the claims on private sector (line 32D) divided by CPI (line 64).

Real effective exchange rate

We obtained the nominal exchange rates and consumer price indexes needed for the construction of this index from IFS. The data needed for the calculation of the weights have been obtained from Direction of Trade Statistics.

Nominal interest rate

We used 3-month treasury bill rate provided by the Central Bank of Egypt.

Ratios of gross capital formation, total consumption, private consumption, and government consumption

We used gross capital formation, private consumption, and government consumption, and divided each of them by nominal GDP. Total consumption is, of course, the sum of private and government consumptions.

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