Bank lending and interest rate channels in Egypt: An empirical investigation based on SVAR models

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Abstract

A critical issue involved with the transmission of monetary policy subjects is the degree and speed at which changes in the official policy rate are transmitted to other rates faced by firms and households. The paper explores an empirical assessment of the effectiveness of the interest rate channel in correcting troubles in the Egyptian economy by imposing contemporaneous and long run restrictions. Furthermore, the empirical analyses are provided to investigate the long-run relationship and the degree of pass-through of the money supply in stimulating the productivity without altering macroeconomic stability in Egypt.

Using a structural VAR approach with contemporaneous restrictions, we find that after a monetary policy expansion, output is stable in the first period, rises temporarily reaching a peak within the second period, and the global monetary aggregate rises but not significantly. In addition, the price level rises sharply in response to a negative interest rate shock to the global liquidity aggregate. The excess of money supply has a transitory effect on the Egyptian output but it causes inflation pressures.

SVAR Blanchard and Quah estimation reveals contradictory results to the previous findings. This means, last but certainly not least, that the effect of bank lending and the interest rate channels on the economy are limited in time.

The paper shows that the transmission of monetary policy through the interest rate channel has become weak in the short run but more important in the long run. Nonetheless, the banklending channel through the commercial bank lending is not a potent monetary transmission mechanism of Egypt. It is worth noting that there is a decrease in the degree of disintermediation as well as an increase in the roles of other sources of fund.

Keywords: Monetary policy, Banklending channel, interest rate channel, Egyptian economy, SVAR, Contemporaneous restrictions, long run restrictions,

1. Introduction

The empirical properties of the monetary transmission mechanism are often characterized using impulse response functions of an estimated vector autoregressive system (VAR).

The slowdown of the Egyptian Economy over the last few years stimulates a debate over the effectiveness of monetary policy in stimulating the economy and maintaining its stability.

In this paper, an alternative estimation technique is used to special emphasis on the role of the interest rate channel and especially on the banklending channel which has been the recent focus on the literature. It has already been recognized in the literature that determining what bank loans do after a monetary tightening is not as easy as one might think. Gertler and Gilchrist (1994) summarize this as follows:

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Conventional wisdom holds that tightening of monetary policy should reduce bank lending. It is surprisingly difficult, however, to find convincing time series evidence to support this basic prediction of macroeconomic theory.

The structural VAR methodology adopted in this paper will be a trial to clarify this ambiguity. So, we treat in a first time SVAR model with long-run restrictions proposed by Blanchard and Quah (1989), and King, Plosser, Stock and Watson (1991). In addition, we resort to a SVAR model with contemporaneous restrictions. An important contribution of the paper is the methodology for undertaking two techniques inorder to strengthen conclusions taken from estimation results.

To our knowledge, such an empirical tool has not been used to examine the effects of bank lending and interest rate channels in Egypt.

This paper aims at answering these following three questions: (1) What will SVAR model based on short run restrictions tell us about the intensity of banklending and interest rate channels in Egypt? (2) Does SVAR Blanchard and Quah model confirm or infirm previous results. (3) And how does Egyptian monetary policy transmit its effect through banklending and interest rate channels?

The rest of this paper is organized as follows. Section 2 discusses the empirical methodology. Section 3 treats SVAR estimation results and interpretations after an unexpected monetary policy and banklending shocks. The last section concludes.

2. Methodology

The empirical properties of the monetary transmission mechanism are often characterized using impulse response functions of an estimated vector autoregressive system (VAR). The federal funds rate, a price index, and a measure for real activity are almost always included, but other variables may also been considered[3].

Because economic interpretations of reduced form VAR equations are difficult, we adopt SVARs and use eligible economic theory and econometric considerations to impose the structure of the system. In this class of models, identification focuses especially on the error of the system, which are interpreted as linear combinations of exogenous shocks. Our analysis highlights the effects of shocks in the credit supply and short term interest rate on main key transmission variables such us the lending rate, the domestic credit, the money supply, the reserves from the banking survey and two objectives variables such as the consumer prices and the industrial share prices.[4]

The identification scheme and corresponding restrictions are based on the monetary regime of Egypt and also on exigent econometric conditions.

We use monthly data for the period from 1997 M1 to 2003 M11. A logarithmic transformation is applied to all series taken in first difference. All variables were taken from the International Financial Statistics Database. Estimation are concluded using the software JMulti (2005), version 4.04.

To determine the order of integration of the underlying series, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are performed for all the series. In sum, these tests give rather strong evidence that all series in first difference are integrated of order zero.

Our empirical approach is based on a VAR approach which is repatriated into two types, i.e., SVAR AB model and SVAR Blanchard and Quah model. The purpose of this research is to

[3] See Christiano et al. (1999) for examples.

[4] Normally, we should use the industrial. Searching for monthly data, we find that this serie is not available for the Egypt, that’s why, we took the industrial share prices.

give an assessment of the Egyptian bank lending channel and interest rate channel with introducing restrictions in short and long horizons separately inorder to compare their effects.

A reduced form VAR model can be written as:

$$Z_t = A_1 Z_{t-1} + ... + A_q Z_{t-q} + CD_t + u_t \qquad (1)$$

Where q denotes the order of the VAR model. $Z_t = (Z_{1t},...Z_{kt})'$ is a $(K \times 1)$ random vector, A_i are a fixed (K × K) coefficient matrices. C is the coefficient matrix associated with the possible deterministic terms D_t. The $u_t = (u_{1t},...u_{kt})'$ is a K dimensional white noise process with $E(u_t) = 0$. The structural representation of (1) can be expressed as:

$$AZ_t = A_1^* Z_{t-1} + ... + A_p^* Z_{t-p} + C^* D_t + B\varepsilon_t \qquad (2)$$

Here, the structural errors are assumed to be white noise with (0, I_k), the coefficient matrices are different from the reduced form coefficients in (1). The matrix A allows for modeling of the instantaneous relations while B is a structural form parameter matrix. The structural shocks, ε_t , are related to the model residuals by linear restrictions. Omitting deterministic terms because they are unaffected by impulses hitting the system and do not affect such impulses, representation (2) is rewritten as:

$$AZ_t = A_1^* Z_{t-1} + ... + A_p^* Z_{t-p} + B\varepsilon_t \qquad (3)$$

In order to link the reduced and structural form, we multiply (3) with A^{-1}, where by A_j = $A^{-1} A_j^*$ (j = 1,2,…p). According to Breitung et al. (2004), the relation between the reduced-form disturbances and the structural form innovation is expressed as:

$$u_t = A^{-1} B\varepsilon_t \qquad (4)$$

We estimate the AB model of Amisano and Giannini (1997) so that the model for innovations can be written as $Au_t = B\varepsilon_t$. Linear restrictions on A are written in explicit form as vec (A) = $R_A \delta_A + r_A$, where δ_A contains all unrestricted elements of A, R_A is a suitable matrix with **0 -1** elements, and r_A is a vector consisting of zeros and ones. Similarly, linear restrictions on B are expressed as vec (B) = $R_B \delta_B + r_B$. Together, these two sets of restrictions are used to identify the system, i.e. the matrices A and B.

$K^2 + K(K-1)/2$ restrictions have to be imposed for the identification of the system.

Each system estimated includes seven endogenous variables, namely, the deposit rate like a proxy of the short rate denoted (**S**RATE), the lending rate (**L**RATE) to account for the banking financing, the reserve money monetary authorities (**R**ESERVES), the quasi money (**Q**MONEY) to account for the money supply, the domestic credit banking survey (**D**CREDIT), the industrial share prices denoted (**I**NDPRICE) and the consumer prices denoted (**C**OPRICES)[5].

[5] Despite the important number of variables, i didn't find any problem of convergence in estimating each system.

The errors of the reduced form VAR are written as $u_t = (u_t^S, u_t^L, u_t^R, u_t^Q, u_t^D, u_t^I, u_t^C)'$. The structural disturbances $\varepsilon_t^S, \varepsilon_t^L, \varepsilon_t^R, \varepsilon_t^Q, \varepsilon_t^D, \varepsilon_t^I, \varepsilon_t^C$ are short rate, long rate, reserves, quasi-money, domestic credit, industrial share prices, and consumer prices respectively.
The AB model *with contemporaneous restrictions* in the form $Au_t = B\varepsilon_t$ can be written as:

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & a_{43} & 1 & 0 & 0 & 0 \\ a_{51} & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & a_{64} & 0 & 1 & 0 \\ a_{71} & 0 & 0 & 0 & a_{75} & 0 & 1 \end{bmatrix} \begin{bmatrix} u_t^S \\ u_t^L \\ u_t^R \\ u_t^Q \\ u_t^D \\ u_t^I \\ u_t^C \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & b_{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & b_{55} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & b_{66} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & b_{77} \end{bmatrix} \begin{bmatrix} \varepsilon_t^S \\ \varepsilon_t^L \\ \varepsilon_t^R \\ \varepsilon_t^Q \\ \varepsilon_t^D \\ \varepsilon_t^I \\ \varepsilon_t^C \end{bmatrix} \quad (5)$$

The first column of Eq. (5) specifies that consumer prices response to a contemporaneous nominal short term interest rate shock is not null and is denoted (a_{71}); domestic credit responses didn't also take the null value and are denoted (a_{51}). (a_{43}), (a_{64}), (a_{75}) design respectively money supply response to reserve shock, industrial share price response to money supply and consumer prices response to domestic credit.

Following the structural vector autoregressive (SVAR) methodology *with long-run restrictions* proposed by Blanchard and Quah (1989), and King, Plosser, Stock and Watson (1991). The Blanchard and Quah's (1989) model can be presented as follow:

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} & a_{17} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} & a_{27} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} & a_{37} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} & a_{47} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} & a_{56} & a_{57} \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & a_{66} & a_{67} \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & a_{77} \end{bmatrix} \begin{bmatrix} u_t^S \\ u_t^L \\ u_t^R \\ u_t^Q \\ u_t^D \\ u_t^I \\ u_t^C \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 & 0 & 0 \\ b_{21} & b_{22} & 0 & 0 & 0 & 0 & 0 \\ b_{31} & b_{32} & b_{33} & 0 & 0 & 0 & 0 \\ b_{41} & b_{42} & b_{43} & b_{44} & 0 & 0 & 0 \\ b_{51} & b_{52} & b_{53} & b_{54} & b_{55} & 0 & 0 \\ b_{61} & b_{62} & b_{63} & b_{64} & b_{65} & b_{66} & 0 \\ b_{71} & b_{72} & b_{73} & b_{74} & b_{75} & b_{76} & b_{77} \end{bmatrix} \begin{bmatrix} \varepsilon_t^S \\ \varepsilon_t^L \\ \varepsilon_t^R \\ \varepsilon_t^Q \\ \varepsilon_t^D \\ \varepsilon_t^I \\ \varepsilon_t^C \end{bmatrix} \quad (6)$$

Eq. (6) shows that in matrix B, only shocks value in the column_i starting from b_{ii} are different from zero. Outside, the null value is attributed.
It is worth noting that VAR models were submitted to misspecification and stability tests. The former includes the portmanteau and LM-tests for residual autocorrelation, the Jarque-Berra test for non normality, and the ARCH-LM test for ARCH effects in model residual. The tests do not indicate any major concerns about model adequacy.

3. The estimation results

3.1 SVAR with contemporaneous restrictions

The SVAR methodology suggests to impose restrictions on the contemporaneous structural parameters only, so that reasonable economic structures might be derived (Gordon and Leeper

(1994), Sims and Zha (1998), Leeper and Roush (2003); Kim and Roubini (2000), Mojon and Peersman (2003), Dedola and Lippi (2005)). The fact that only contemporaneous restrictions are imposed however does not imply that there is no feedback among variables. In the (S)VAR structure, the lagged values enter each equation and thus all variables are linked together.

The structural parameter estimates of the A and B matrices using an SVAR model with contemporaneous restrictions are displayed in Table 2. To make an interpretation of the contemporaneous coefficients easier, we present the negation of the A matrix.

The instantaneous responses carry limited statistical significance so that more information may be derived from a structural impulse response analysis. Taking advantage of the better small sample properties of bootstrap confidence intervals compared to other asymptotic methodologies, we construct bootstrap percentile 95% confidence intervals to illustrate parameter uncertainty following Benkwitz et al. (2001). Responses up to 10 periods ahead are considered using 1000 bootstrapping replications. We focus on observing the impact of interest rate and credit shocks on all the series. The impacts of these shocks are depicted in Fig. 1 and 2[6]. A depreciation shock in the SR leads to a statistically significant increase in real output only for a single period. Interestingly, the same shock also causes a trial in the price level to join the baseline. However, the magnitude of the impact of the credit shock on prices appears to be low. The point estimates of the impulse responses suggest that a one percent increase in the CR lowers the price level by only 0.03 percent. This maximum impact is obtained after two periods have passed from the shock and had never been attenuated another time.

Due to the low pass-through rate, our results are only weakly supportive of effect of a monetary expansion, output returns subsequently to its pre-shock level. The price level rises not significantly in response to an interest rate shock. The long term interest rate remains persistently negative after the period of the shock. The potency of the interest rate channel is weak; the movements in the nominal interest rate are rather limited and close to the baseline. The figure highlights a clear “price puzzle”: for 3 periods prices increase and only thereafter start to decline[7].

Normally, one possible explanation of the price puzzle that is usually found in VAR studies is the omission of a variable useful in forecasting inflation (such as the commodity price index) which implies that endogenous responses to expected inflation increases will mistakenly be taken as monetary policy shocks (see Giordani, 2004). In our case, we take into account this variable, and the price puzzle phenomenon appears. But what is more important know is to see whether the price puzzle persists even with Blanchard and Quah model.

Fig. 2 depicts the impulse response functions to an unexpected credit shock. We can see that money supply decreases at impact but then tends to recover to its baseline and that consumer prices drops after an decrease in credit but and the effect is short lasting on the share price index which does not respond in the expected way.

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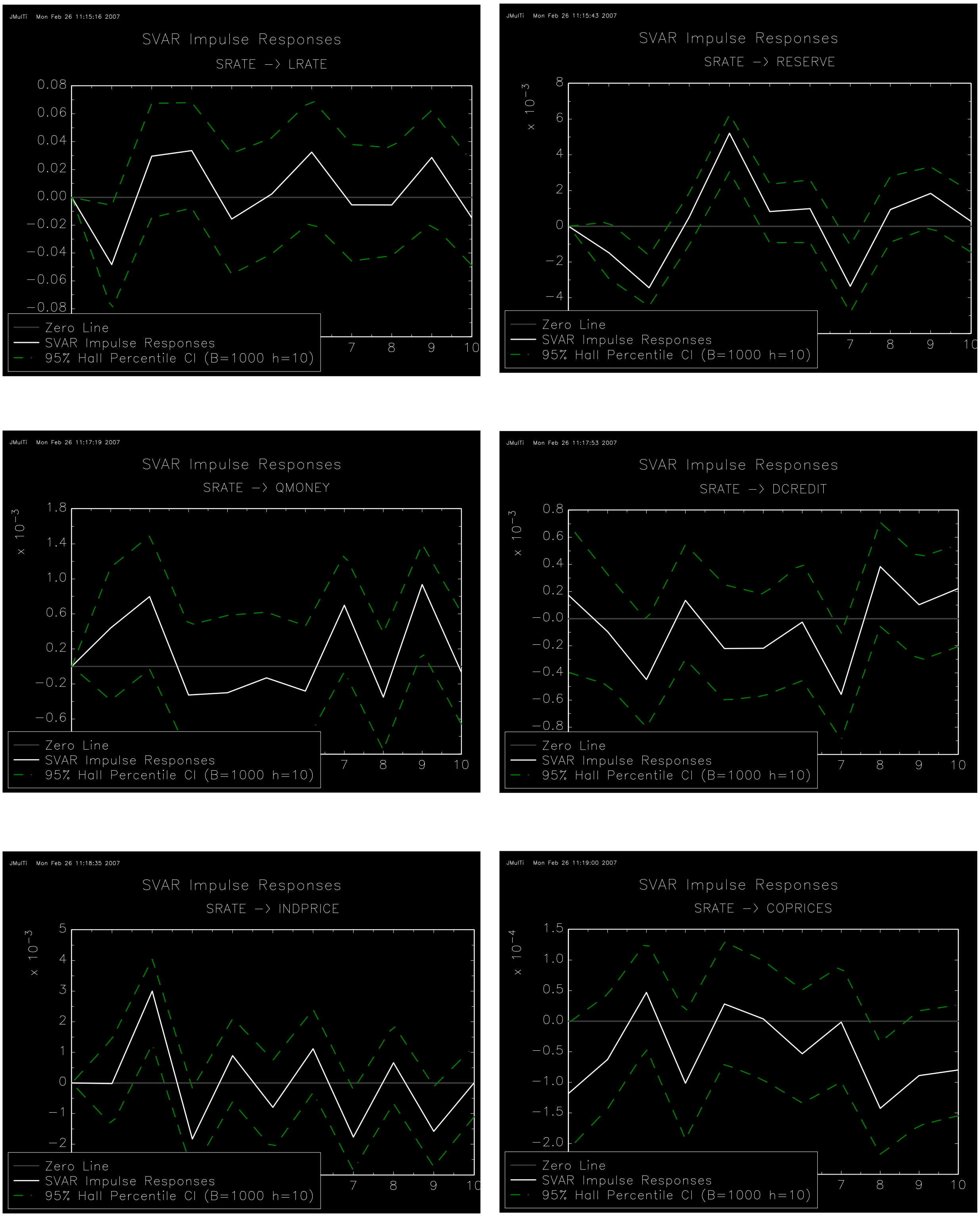
[6] See figure 3 and 4 for SVAR with long run restrictions.

[7] Despite subsequent advances in SVAR modeling, the price puzzle has generally remained a problem for empirical researchers. Some authors have argued that the presence of a price puzzle should serve as an informal specification test of a VAR model: if such an anomalous result is observed, then what one has labeled as ‘‘monetary policy’’ probably has not been correctly identified. Proponents of this view include Zha (1997), Sims (1998), and Christiano et al. (1999). Viewed this way, understanding the price puzzle is a prerequisite for measuring the effects of monetary policy.

Table 1 Structural parameter estimates of –A and B matrices

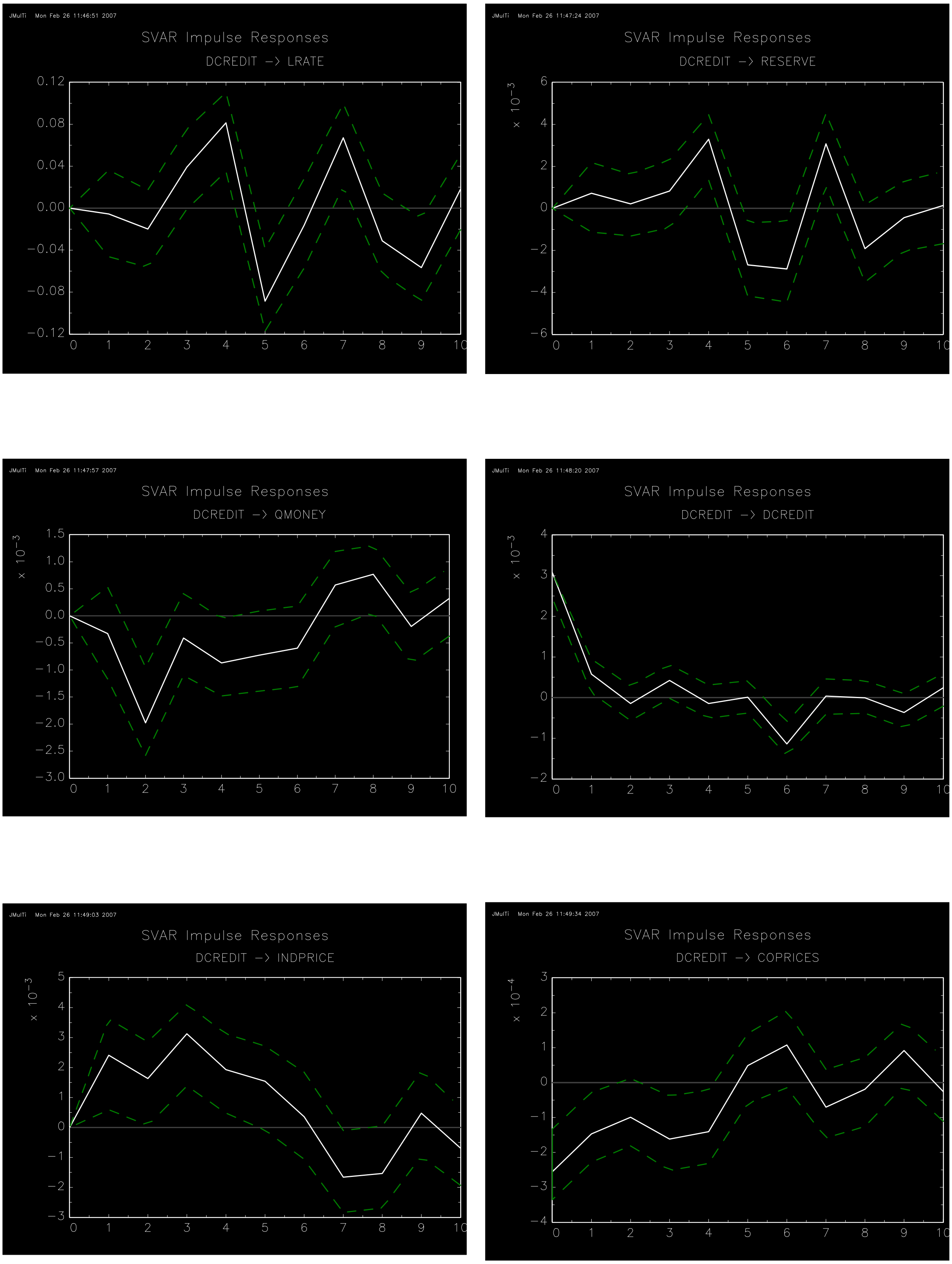
$$-A = \begin{bmatrix} -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1.1602 & -1 & 0 & 0 & 0 \\ 0.0008 & 0 & 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & -0.0494 & 0 & -1 & 0 \\ -0.0005 & 0 & 0 & 0 & -0.0831 & 0 & -1 \end{bmatrix}$$

$$B = \begin{bmatrix} 0.2178 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0.2886 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0.0121 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0.0058 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0.0031 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0.0106 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0.0007 \end{bmatrix}$$



Note. Responses of long interest rate, reserves, quasi-money, domestic credit, industrial share prices, and consumer prices are displayed.

Fig.1. Responses to monetary policy shock



Note. Responses of long term interest rate, reserves, quasi-money, domestic credit, industrial share prices, and consumer prices are displayed.

Fig.2. Responses to a bank lending shock

To examine further the importance of different shocks, we perform forecast error variance decomposition. The procedure calculates the contribution of one variable to the forecast error variance of another variable h periods ahead, Breitung et al. (2004) discuss. As we are interested primarily in the contributions of the various structural shocks on all variables of our research, we report seven shocks in each table.

According to Table 2, the proportion of lending rate shocks in the forecast error variance of short term interest rate is quite high in the short run, but it declines progressively over time. In contrast the importance of reserve shock remains relatively constant and is highest one year after the shock (17%). The proportion of money supply, domestic credit and industrial share prices in the forecast error variance of consumer prices is quite high and similar in the long run (12%).

Table 2: Proportions of forecast error

Proportions of forecast error in "SRATE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.62	0.03	0.17	0.00	0.01	0.01	0.16
3	0.54	0.06	0.16	0.00	0.01	0.01	0.22
4	0.52	0.05	0.17	0.04	0.01	0.01	0.20
5	0.47	0.05	0.15	0.05	0.04	0.03	0.21
6	0.40	0.05	0.13	0.14	0.07	0.03	0.18
7	0.38	0.05	0.13	0.17	0.07	0.03	0.18
8	0.37	0.05	0.14	0.17	0.07	0.03	0.18
9	0.37	0.04	0.14	0.16	0.09	0.03	0.16
10	0.36	0.04	0.15	0.16	0.09	0.03	0.16

Proportions of forecast error in "LRATE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.95	0.00	0.01	0.00	0.01	0.01
3	0.01	0.88	0.00	0.03	0.01	0.03	0.04
4	0.03	0.80	0.00	0.03	0.01	0.04	0.09
5	0.03	0.70	0.00	0.04	0.08	0.07	0.08
6	0.02	0.64	0.03	0.04	0.11	0.06	0.08
7	0.02	0.58	0.06	0.04	0.11	0.11	0.08
8	0.02	0.55	0.06	0.04	0.13	0.11	0.09
9	0.02	0.54	0.06	0.04	0.13	0.11	0.09
10	0.02	0.52	0.07	0.04	0.14	0.11	0.09

Proportions of forecast error in "RESERVE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	0.00	1.00	0.00	0.00	0.00	0.00
2	0.01	0.00	0.96	0.01	0.01	0.01	0.00
3	0.04	0.04	0.84	0.01	0.01	0.03	0.03
4	0.04	0.10	0.71	0.01	0.01	0.03	0.10
5	0.16	0.08	0.58	0.02	0.05	0.03	0.09
6	0.14	0.10	0.54	0.05	0.08	0.02	0.08
7	0.13	0.09	0.52	0.05	0.10	0.03	0.08
8	0.15	0.09	0.46	0.09	0.11	0.03	0.07
9	0.15	0.09	0.46	0.09	0.12	0.03	0.07
10	0.15	0.08	0.45	0.09	0.12	0.03	0.07

Proportions of forecast error in "QMONEY" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	0.00	0.10	0.90	0.00	0.00	0.00
2	0.01	0.01	0.09	0.85	0.00	0.03	0.00
3	0.03	0.04	0.08	0.73	0.06	0.05	0.01
4	0.03	0.04	0.07	0.72	0.06	0.07	0.01
5	0.03	0.04	0.08	0.70	0.08	0.07	0.01
6	0.04	0.04	0.08	0.68	0.09	0.08	0.01
7	0.04	0.04	0.08	0.66	0.09	0.07	0.01
8	0.04	0.04	0.08	0.65	0.09	0.08	0.01
9	0.04	0.04	0.10	0.63	0.09	0.08	0.02
10	0.05	0.04	0.09	0.62	0.09	0.08	0.02

Proportions of forecast error in "DCREDIT" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	0.00	0.00	0.00	1.00	0.00	0.00
2	0.00	0.00	0.10	0.00	0.88	0.01	0.01
3	0.01	0.05	0.09	0.01	0.73	0.10	0.01
4	0.01	0.10	0.08	0.01	0.63	0.11	0.08
5	0.01	0.09	0.08	0.01	0.62	0.11	0.08
6	0.01	0.09	0.07	0.04	0.60	0.10	0.08
7	0.01	0.08	0.09	0.06	0.59	0.09	0.07
8	0.02	0.09	0.09	0.07	0.56	0.09	0.07
9	0.03	0.09	0.09	0.08	0.55	0.09	0.07
10	0.03	0.10	0.08	0.09	0.53	0.09	0.07

Proportions of forecast error in "COPRICES" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	0.00	0.00	0.00	0.00	1.00	0.00
2	0.03	0.02	0.00	0.00	0.03	0.83	0.09
3	0.03	0.07	0.00	0.09	0.06	0.63	0.12
4	0.03	0.11	0.01	0.08	0.09	0.55	0.13
5	0.03	0.11	0.01	0.10	0.09	0.54	0.12
6	0.03	0.11	0.01	0.10	0.09	0.53	0.13
7	0.03	0.13	0.03	0.09	0.10	0.50	0.12
8	0.03	0.13	0.03	0.09	0.11	0.49	0.12
9	0.04	0.13	0.03	0.10	0.10	0.48	0.12
10	0.04	0.13	0.03	0.11	0.11	0.46	0.12

Proportions of forecast error in "INDPRICE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.06	0.00	0.00	0.00	0.03	0.00	0.92
2	0.05	0.00	0.05	0.03	0.07	0.00	0.80
3	0.08	0.00	0.04	0.03	0.08	0.02	0.75
4	0.09	0.00	0.05	0.06	0.13	0.01	0.66
5	0.08	0.01	0.06	0.05	0.17	0.05	0.58
6	0.08	0.03	0.06	0.08	0.17	0.04	0.55
7	0.08	0.02	0.06	0.09	0.16	0.05	0.53
8	0.09	0.02	0.06	0.09	0.17	0.05	0.51
9	0.08	0.03	0.10	0.09	0.16	0.06	0.50
10	0.09	0.03	0.09	0.09	0.16	0.06	0.49

3.2 SVAR with long run restrictions

This approach is originally discussed by Blanchard and Quah (1989) and is in contrast to the more common approach of specifying short-run restrictions among the variables. An advantage of this form of identification is that the imposition of long-run restrictions circumvents the nonuniqueness problems of recursive VARs arising from variable reordering.

Figure 3 shows responses of lending rate, reserves, money supply, domestic credit, industrial share prices and consumer prices to an unexpected interest rate shock. We didn't find any persistence of the price puzzle phenomenon seen before but we couldn't forget that monetary policy was tightened in 2003, but not by enough to contain inflation at single digit rates.

It is worth noting that, in Egypt, annual CPI inflation (12-month rate) stayed close to 12 percent for most of the year. With nominal interest rates remaining in the 10-13 percent range, real interest rates were close to, or below, zero throughout 2004. Recently released data shows a decline in consumer and wholesale prices in the first two months of 2005, bringing 12-month rates of inflation into single digits.

Table 3: Egyptian banking survey

Unit: millions of pounds	1997 M1	1998 M1	1999 M1	2000 M1	2001 M1	2002 M1	2003 M1
Reserves	54174.1	60661.8	74620.1	73668.5	88563.4	101425	118258
Q-money	135721	150805	162179	176012	200424	229360	269475
Dcredit	192158	225012	267880	303070	339164	377754	435550

Source: IFS

The initial impact effect of an increase in credit is negative on money supply and significant only for a short period. This shock is qualified as a transitory shock on reserves, industrial share prices and consumer prices, significant only in the first period and return to the base line temporarily**.** As a possible explanation for this is that an increase in credit does not amplify automatically monetary policy transmission actions in Egypt.

For small and medium sized enterprises banks play a crucial role in the provision of external finance and this gives rise to the bank lending channel, see Bernanke and Blinder (1988). It is assumed that bank loans and alternative sources of finance are imperfect substitutes and that persistent differentials in the spreads emerge because there is imperfect arbitrage. Imperfection in substitutability arises because small and medium sized firms may be unable to access other markets for funds and therefore have a certain dependence on banks for external sources of funds (see Kashyap and Stein, 1993).

The credit excesses of the late-1990s have continued to weigh heavily on banks, hindering their ability to contribute to the recovery. Bank credit to the private sector declined again in real terms in 2004, and most of the recent expansion in banks' domestic claims has been to the government. Nonperforming loans rose to over 25 percent of total loans in September 2004, compared to 20 percent in June 2003.

Table 4: Structural parameter estimates of –A and B matrices

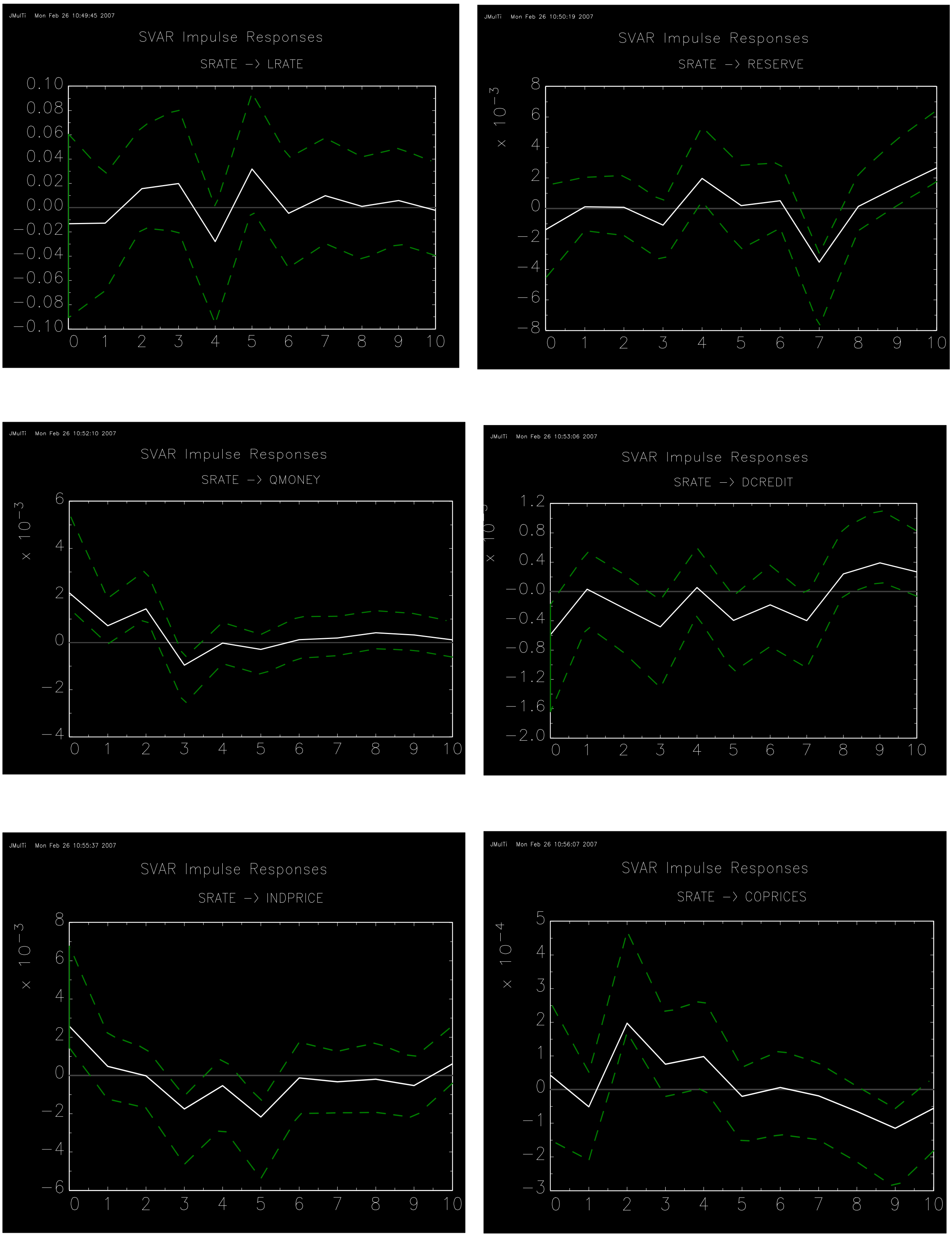
-A =

– 0.0589	0.0007	0.0159	0.0917	0.0468	0.0089	0.0809
(1.5712)	(−0.0254)	(−0.5324)	(−1.9553)	(−1.3767)	(−0.4423)	(−2.0060)
0.0133	– 0.1848	0.0187	0.0087	– 0.0287	0.0344	– 0.0061
(−0.3457)	(2.0028)	(−0.4655)	(−0.2793)	(0.8506)	(−1.1163)	(0.2743)
0.0014	0.0002	– 0.0079	0.0010	0.0003	0.0006	– 0.0003
(−0.8730)	(−0.1168)	(1.9224)	(−0.6989)	(−0.2419)	(−0.5040)	(0.3561)
– 0.0021	– 0.0008	– 0.0021	– 0.0018	– 0.0019	– 0.0006	– 0.0000
(1.4015)	(0.8837)	(1.7608)	(1.9781)	(1.6557)	(0.9418)	(−0.0086)
0.0006	0.0002	– 0.0003	0.0007	– 0.0011	– 0.0013	0.0007
(−1.2189)	(−0.5267)	(0.7840)	(−1.4463)	(2.2690)	(1.7137)	(−1.6438)
– 0.0026	– 0.0029	– 0.0009	– 0.0021	– 0.0036	0.0030	– 0.0028
(1.2556)	(1.6045)	(0.7627)	(−1.2704)	(−1.8306)	(2.1122)	(1.6702)
– 0.0000	0.0001	– 0.0000	0.0001	– 0.0002	0.0003	– 0.0002
(0.4154)	(−0.7928)	(0.4898)	(−1.1476)	(−1.0762)	(−1.7098)	(2.0401)

B =

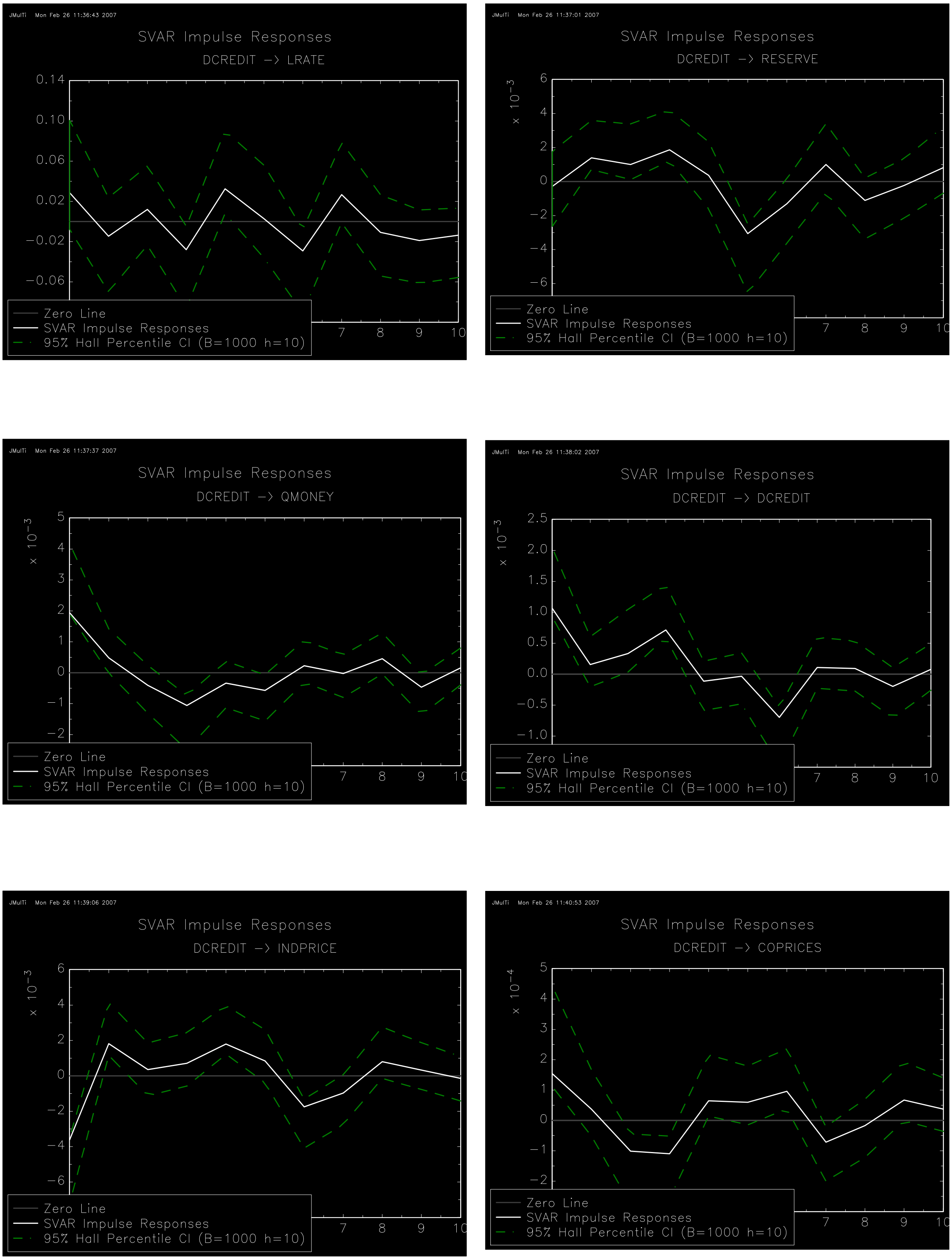
0.1647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
(0.4441)	(0.0000)	(0.0000)	(0.0000)	(0.0000	(0.0000)	(0.0000)
0.0795	0.1406	0.0000	0.0000	0.0000	0.0000	0.0000
(0.3825)	(2.5885)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
0.0058	0.0040	0.0073	0.0000	0.0000	0.0000	0.0000
(0.3379)	(1.1112)	(2.3949)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
0.0055	0.0012	0.0033	0.0027	0.0000	0.0000	0.0000
(0.4166)	(0.6642)	(1.7997)	(2.3525)	(0.0000)	(0.0000)	(0.0000)
– 0.0016	0.0000	0.0000	– 0.0010	0.0017	0.0000	0.0000
(−0.3761)	(−0.0567)	(−0.0643)	(−1.5346)	(2.1589)	(0.0000)	(0.0000)
– 0.0010	0.0017	– 0.0023	– 0.0044	0.0001	0.0039	0.0000
(−0.0846)	(0.7022)	(−1.0106)	(−1.9314)	(0.0892)	(2.0860)	(0.0000)
– 0.0006	– 0.0005	– 0.0002	0.0002	0.0003	– 0.0005	0.0004
(−0.3873)	(−1.2676)	(−0.7261)	(0.7760)	(1.1959)	(−1.7147)	(2.0774)

Note. Bootstrap t-values are presented in parentheses.



Note. Responses of long interest rate, reserves, quasi-money, domestic credit, industrial share prices, and consumer prices are displayed.

Fig.3. Responses to monetary policy shock



Note. Responses of long term interest rate, reserves, quasi-money, domestic credit, industrial share prices, and consumer prices are displayed.

Fig.4. Responses to a bank lending shock

To examine further the importance of different shocks, we perform as done before forecast error variance decomposition.
According to Table 5, the proportion of lending rate shocks in the forecast error variance of short term interest rate is quasi absent in the short medium and long run (1%), but the proportions of money supply, industrial share prices are (40%), (29%) respectively. In contrast to the Table 2, the proportion of credit is more important in the forecast error of reserve, domestic credit, money supply, consumer prices and industrial share prices. We can say that results found with long run restrictions highlight a potent role for the bank lending channel and for the interest rate channel. This means that, Central Bank of Egypt (CBE) has continued work to strengthen the monetary policy framework over the past year. IMF directors encourage the CBE to intensify these efforts, and to continue developing a cohesive and credible monetary policy framework that effectively anchors inflation expectations in the context of a flexible exchange rate, and that relies on a proactive interest rate policy. In this context, the importance of strengthening central bank independence was stressed.

Table 5: Proportions of forecast error

Proportions of forecast error in "SRATE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.17	0.00	0.01	0.40	0.10	0.09	0.22
2	0.10	0.00	0.08	0.27	0.07	0.05	0.43
3	0.10	0.01	0.07	0.25	0.08	0.05	0.44
4	0.13	0.01	0.10	0.23	0.07	0.05	0.41
5	0.12	0.01	0.09	0.29	0.07	0.05	0.38
6	0.18	0.01	0.08	0.30	0.06	0.05	0.32
7	0.18	0.01	0.09	0.29	0.07	0.05	0.31
8	0.19	0.01	0.10	0.28	0.07	0.05	0.30
9	0.19	0.01	0.11	0.26	0.09	0.05	0.29
10	0.19	0.01	0.10	0.26	0.10	0.04	0.29

Proportions of forecast error in "LRATE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.00	0.93	0.01	0.00	0.02	0.03	0.01
2	0.01	0.90	0.01	0.00	0.02	0.03	0.02
3	0.01	0.85	0.01	0.03	0.03	0.03	0.04
4	0.02	0.78	0.02	0.04	0.04	0.06	0.05
5	0.03	0.73	0.02	0.07	0.05	0.05	0.05
6	0.04	0.65	0.05	0.08	0.05	0.08	0.05
7	0.04	0.61	0.07	0.08	0.06	0.09	0.06
8	0.04	0.59	0.06	0.09	0.06	0.09	0.07
9	0.04	0.58	0.07	0.08	0.06	0.10	0.07
10	0.04	0.56	0.07	0.08	0.07	0.10	0.07

Proportions of forecast error in "RESERVE" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.03	0.00	0.95	0.01	0.00	0.01	0.00
2	0.03	0.00	0.91	0.02	0.03	0.01	0.01
3	0.02	0.06	0.78	0.02	0.04	0.03	0.05
4	0.03	0.08	0.69	0.02	0.07	0.02	0.08
5	0.06	0.07	0.57	0.10	0.06	0.07	0.07
6	0.05	0.08	0.54	0.09	0.12	0.06	0.06
7	0.05	0.08	0.53	0.09	0.13	0.06	0.06
8	0.13	0.07	0.49	0.08	0.12	0.06	0.06
9	0.13	0.07	0.48	0.08	0.13	0.06	0.06
10	0.14	0.07	0.48	0.08	0.12	0.06	0.06

Proportions of forecast error in "QMONEY" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.27	0.04	0.25	0.19	0.23	0.01	0.01
2	0.28	0.05	0.24	0.18	0.22	0.02	0.01
3	0.33	0.05	0.21	0.15	0.20	0.05	0.01
4	0.34	0.05	0.20	0.14	0.23	0.04	0.01
5	0.33	0.04	0.21	0.14	0.22	0.05	0.01
6	0.32	0.05	0.21	0.14	0.23	0.05	0.01
7	0.31	0.05	0.21	0.14	0.23	0.05	0.01
8	0.31	0.05	0.21	0.14	0.22	0.07	0.01
9	0.30	0.05	0.20	0.14	0.22	0.07	0.02
10	0.30	0.05	0.20	0.14	0.22	0.07	0.02

Proportions of forecast error in "DCREDIT" accounted for by:

Forecast horizon	SR	LR	RES	QM	DC	CP	IP
1	0.08	0.01	0.02	0.12	0.27	0.48	0.02
2	0.07	0.01	0.09	0.11	0.25	0.44	0.03
3	0.07	0.03	0.09	0.11	0.22	0.46	0.02
4	0.09	0.03	0.07	0.10	0.26	0.39	0.06
5	0.09	0.03	0.07	0.10	0.26	0.38	0.06
6	0.11	0.04	0.08	0.10	0.25	0.37	0.06
7	0.10	0.03	0.07	0.09	0.28	0.37	0.06
8	0.12	0.04	0.07	0.08	0.27	0.37	0.06
9	0.12	0.04	0.07	0.09	0.26	0.36	0.06
10	0.13	0.04	0.07	0.10	0.26	0.35	0.06

Proportions of forecast error in "COPRICES" accounted for by:

Forecast horizon

	SR	LR	RES	QM	DC	CP	IP
1	0.01	0.04	0.01	0.06	0.10	0.78	0.00
2	0.02	0.04	0.02	0.12	0.09	0.69	0.04
3	0.12	0.03	0.03	0.12	0.10	0.55	0.06
4	0.12	0.04	0.03	0.12	0.12	0.49	0.07
5	0.14	0.04	0.03	0.11	0.12	0.48	0.07
6	0.14	0.05	0.03	0.11	0.13	0.48	0.07
7	0.13	0.08	0.04	0.11	0.14	0.45	0.06
8	0.12	0.08	0.04	0.11	0.14	0.44	0.06
9	0.13	0.08	0.04	0.11	0.14	0.44	0.07
10	0.15	0.08	0.04	0.11	0.14	0.42	0.07

Proportions of forecast error in "INDPRICE" accounted for by:

Forecast horizon

	SR	LR	RES	QM	DC	CP	IP
1	0.13	0.17	0.02	0.09	0.26	0.01	0.32
2	0.12	0.15	0.04	0.08	0.29	0.04	0.29
3	0.11	0.14	0.03	0.08	0.26	0.09	0.29
4	0.14	0.14	0.04	0.08	0.24	0.09	0.28
5	0.13	0.12	0.04	0.09	0.26	0.08	0.26
6	0.17	0.11	0.06	0.09	0.25	0.07	0.24
7	0.16	0.11	0.06	0.09	0.27	0.08	0.23
8	0.16	0.10	0.07	0.09	0.26	0.09	0.23
9	0.15	0.10	0.09	0.08	0.25	0.11	0.23
10	0.15	0.10	0.09	0.08	0.25	0.11	0.23

4. Conclusion

In this paper, we investigate the role of the banklending and the interest rate channels in Egypt. We estimate an open Mediterranean country structural vector autoregressive (SVAR) models. First, we use contemporaneous restrictions. Second, we resort to SVAR Blanchard and Quah model.

Our results suggest that in general through two SVAR estimations the interest rate channel and the banklending channel are not playing a preponderant role in the transmission mechanism showing the shortcoming with the price indices and many difficulties for assessing the monetary policy stance. Thus, will urge Central Bank of Egypt (CBE) to strengthen more the monetary policy framework and to continue developing a cohesive and credible monetary policy framework that effectively anchors inflation expectations in the context of a flexible exchange rate, and that relies on a proactive interest rate policy.

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