Political Violence and Excess Liquidity in Egypt: A Note

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Abstract

In this paper we estimate a time-series model of excess liquidity in the Egyptian banking sector. While financial liberalization and financial stability are found to have reduced excess liquidity, these effects have been offset by an increase in the number of violent political incidents arising from conflict between radical Islamic groups and the Egyptian state. The link between political events and financial outcomes provides a rationale for economic policy interventions by the international community in response to increases in political instability.

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Keywords: Egypt; Excess Liquidity; Political Violence; Radical Islamism

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1. Introduction

Recent research indicates that investment and financial market development in LDCs (and particularly in Africa) are sensitive to indicators of political instability (see for example Fedderke and Klitgaard, 1998; Fedderke and Liu, 1999; Fedderke, 2000). However, there is little evidence about the mechanisms through which political instability impacts on investment. In this paper we use Egyptian data to explore one possible route by which instability affects the real economy: by generating excess liquidity in the banking sector.

Early in the 1990s the Egyptian government instituted a reform program – the ERSAP[1] – that was largely successful by many conventional criteria. Domestic capital markets were successfully liberalized, and financially repressive controls on interest rates were removed. One aspect of the liberalization was to reduce banks' reserve requirements on Egyptian pound deposits.[2] The required liquidity ratio (of reserve assets to deposits) was reduced from 30% to 15% in 1990. This change was motivated by orthodox macroeconomic theory: reducing seigniorage taxes on the banking system will promote financial development and growth in the real economy.

The aggregate liquidity ratio of commercial banks did indeed fall after the reform. But it is striking that all through the 1980s and 1990s, actual ratios were much higher than the minimum required by Egyptian law. Figure 1 illustrates the aggregate ratio: it suggests that the minimum reserve requirement – always high by the standards of industrialized economies – was never a binding constraint. In many years banks lent less than half of the money deposited with them. Identifying the reasons for such excess liquidity is essential if we are to understand the factors that inhibit financial development in countries like Egypt.

One hypothesis that deserves attention is that bank lending in Egypt has been limited not only by economic instability but also by political instability. Just as uncertainty in economic conditions might lead banks to behave more cautiously, so also might uncertainty in political conditions, for reasons that we elaborate below. The period of economic reform coincided with an increase in the intensity of violent protest by radical Islamist groups excluded from the Egyptian polity. In this paper we will investigate the possibility that this violence offset some of the improvements in the financial system engendered by the ERSAP. The next section explores the nature of the political violence, and its potential economic consequences.

2. Radical Islamism, Violence and the Egyptian Banking System

Egypt's most recent economic reform has coincided with substantial fluctuations in the level of political violence in the country. The aim of the next section will be to estimate the relative magnitude of the political and economic determinants of bank liquidity. In this section we review the underlying causes of political violence, and explain why they might lead to excess liquidity.

Islamist movements were banned from Egyptian politics in 1954 and went underground in response to government repression. During the 1970s, however, there was a general Islamist revival, spread through mosques, youth clubs and cultural and welfare organisations. There were two main Islamist movements: al-

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[1] Economic Reform and Structural Adjustment Program.
[2] In this paper we will focus on the evolution of reserves and deposits in local currency. Fielding and Shortland (2002) deals with the issue of currency substitution in Egypt.

Ikhwan al-Muslimun (the Muslim brotherhood), which was non-violent and Al-Jama'a al Islamiya, which had no political programme but a preference for direct action. During the 1970s the low-level Islamist violence was mainly directed against the Christian minority, the Copts.

Political violence increased in the 1980s as Islamists opposed the government's rapprochement with Israel and its pro-Western stance and was increasingly directed against the state. The radical wing of the Ikhwan movement gained prominence in the otherwise non-violent movement and Upper Egypt's Jama'a movement joined forces with the radical al-Jihad organisation. The violence culminated in the assassination of President Sadat in October 1981 and the insurrection of radical Islamists in Asyut. The state's draconian response to these events succeeded in lowering the number of violent incidents from 1982 to 1985.

From 1984 the Ikhwan movement became a player in Egyptian politics as it was tolerated as a religious group and cooperated with the Wafd party to gain parliamentary representation. Ikhwan therefore became committed to pluralism, gradualism and non-violence. Violent acts were mainly committed by Jama'a in Upper Egypt, which desired to impose Sharia laws. Attacks were therefore mostly targeted at musical festivals, beer deliveries, cinemas and individuals engaged in "vice". The secular government responded to these incidents with mass arrests and the storming of Jama'a mosques. The violent repression turned public opinion against the government.

From late 1989 Jama'a started to target prominent officials for assassinations. In December 1989 an unsuccessful attempt was made to assassinate the interior minister Zaki Badr and in 1990 the former speaker of parliament Rafat al-Mahjoub was assassinated. From 1992 a vicious circle of incidents of violence and counter-violence began. Through 1992 and 1993 there were almost daily incidents of violence. Jama'a formed an official armed wing using high-tech explosives and military intelligence, which attacked policemen, security forces and prominent government officials. There were also attacks on banks and foreign exchange bureaus. The government reacted by suppressing the Ikhwan movement politically and arrested those Ikhwan members most likely to stand for the 1995 parliamentary election. In response the Islamists began a series of direct attacks on tourists and issued communiqués for Western tourists to stay away from Egypt. Examples of such attacks include those on Greek tourists outside their Cairo hotel in April 1996, German tourists beside Cairo Museum in September 1997, and tourists in Luxor in November 1997.

In conclusion, therefore, the political stance of the Egyptian government towards Israel and its repression of Islamist fundamentalists meant that Islamist violence was increasingly directed against the state. Radical Islamist groups employed a variety of strategies, designed to harm the government directly through assassination attempts or indirectly through undermining tourism, which provided much of the government's revenues and hard currency income. Data presented in Fielding and Shortland (2002) indicate that this strategy was successful in the sense that increases in violence appear to be correlated with reductions in real output in the tourist industry, ceteris paribus.

This correlation with real economic activity means that banks' liquidity ratios are likely to vary with the level of violence. As the level of violence increases, the risk of loan default increases, motivating an increase in liquidity. The effect in Egypt may be magnified because banks are anxious to maintain depositors' confidence in the financial system, which was plagued by weak loan portfolios. Egypt does not

have an official deposit insurance scheme, and capital asset ratios in the 1980s were very low due to previous banking losses (Handy et al., 1998). In times of political turmoil, when depositors suspect that the rate on default on bank loans is going to be very high, higher liquidity ratios may be the only way of preventing banking runs. It is true that the government directly controlled a large proportion of the Egyptian commercial banking system through ownership of commercial banks and stakes in joint venture banks[3]; it is reasonable to assume that these banks were covered by an implicit state deposit guarantee. But the government's resources were affected by the fiscal cost of repressing Islamists and guarding state institutions and tourists sites against attacks and the loss of revenues through deterred tourism. Savers' perceptions of the government's willingness to compensate savers in the event of a public sector bank failure could therefore be undermined by an increase in violence. Runs on the public sector banks also had to be prevented through maintaining higher liquidity ratios.

Estimating the size of this excess liquidity effect depends crucially on measuring accurately changes in the level of violence. Data from Abul'ala (1998) and Hafez (2000) summarize the fluctuations in the level of violence in Egypt over the last 20 years. These data record the number of violent political incidents in Egypt associated with government-Islamist conflict each year, based on reported incidents in the Egyptian press. As Figure 2 shows, the number of incidents is highly variable, reflecting the changing trends described above.[4] These data will be incorporated into an econometric model that will allow us to estimate the impact of changes in violence on banks' behavior.

3. The Model of the Reserve Asset Ratio
3.1 Theoretical background
The theoretical model that underpins our empirical analysis of the aggregate reserve asset ratio in Egypt is outlined by Agénor et al. (1996), who draw on earlier work by Baltensperger (1980) and Prisman and Slovin (1986). In this model, reserves are necessary because banks face liquidity risk. The fraction of deposits that are backed by reserves will depend positively on the conditional variance of the private sector's demand for cash, which under plausible assumptions about the money demand function will be a linearly separable function of the conditional variance of the cash-deposit ratio and the conditional variance of the determinants of total money demand, in particular real output.[5] It will also depend positively on the opportunity cost of borrowing from the monetary authority when customers demand more cash than the bank has available (i.e. on the central bank discount rate), and on the minimum reserve requirement of the monetary authority. In addition, the regression equation for the reserve asset ratio in the Agénor et al. paper includes a term capturing real output relative to trend. The ratio might be pro-cyclical because banks need to build up reserves in anticipation of credit defaults in the next recession.

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[3] In the late 1980s the public sector banks' share of assets was estimated to be around 90% (Roe 1998). The World Bank database on financial structure shows that 60% of assets were held in banks in which the government's shareholding exceeded 50% in 1997.

[4] The figure shows a quarterly interpolation of the annual data (using the method of Lisman and Sandee, 1964) that will be used in the econometric model in the next section.

[5] By assumption, shocks to the share of money made up by cash are orthogonal to shocks to total money demand.

In the case of Egypt, measurement of the level of real output, the discount rate and the reserve requirement is straightforward. (The last of these is in effect a dummy variable, since in our sample period, 1983–96, the reserve requirement changed only once, at the end of 1990, as part of the ERSAP.) The measures of conditional variance are less straightforward as they depend on which variables are chosen to model the cash-deposit ratio (C/D) and the level of output (y). Nevertheless, a wide variety of regression specifications for these two variables – the most parsimonious of which are detailed in Table 1 – produce the same stylised result: there is no autoregressive heteroskedasticity in either $\ln(C/D)$ or $\ln(y)$.[6] The only source of heteroskedasticity is a correlation between the residual variance in the $\ln(y)$ equation and a dummy for the ERSAP reform at the end of 1990. Figure 3 illustrates the squared residuals from the Table 1 regression equations. Aside perhaps from a reduction in the conditional variance of income after the reform, the stochastic elements of $\ln(C/D)$ and $\ln(y)$ are homoskedastic. So, controlling for the reform, there ought to be no variation in the reserve asset ratio associated with changes in the conditional variance of asset demand.

However, such measures of conditional variance might not capture all of the risk facing banks in a country like Egypt, even after political factors have been taken into account. Bahaa Eldin and Mohieldin (1998) point out that commercial banks (especially those that are state-owned) are often under political pressure to lend to ailing companies, regardless of their creditworthiness. Roe (1998) notes that commercial banks' loan portfolios are typically characterised by limited diversification and high rates of non-performing loans, especially in the case of publicly owned commercial banks. The fraction of non-performing loans is variously estimated to be 30% to 45% cent of the total.

It is likely that the risk banks face from such loans rises with the magnitude of macroeconomic distortion in the Egyptian economy. Those companies with privileged access to commercial bank loans though the patronage of a particular government ministry are also likely to have privileged access to rationed foreign exchange. The larger the distortion in the foreign exchange market, the more likely it is that these companies will become insolvent once the market has been liberalized and the cost of foreign currency has increased to its market-clearing level. (Figure 4 indicates that the number of bankruptcies in Egypt did increase in the wake of the reform programme.) So we will allow the liquidity ratio of commercial banks to depend on the rate of depreciation of the black market exchange rate of the Egyptian pound against the US dollar. This variable is depicted in Figure 5, which shows that the foreign exchange market became increasingly distorted during the fixed exchange rate period 1985–1989. During the 1990–91 reforms the foreign currency market was liberalized, and the black market rate remained constant at a trivially small premium over the official rate. We conjecture that part of the impact of the economic reform on the liquidity ratio can be captured by changes in the black market exchange rate. (The other part, relating to the change in reserve requirements and the decrease in income volatility, will still be captured by the ERSAP dummy.)

3.2 The econometric model
On the basis of the preceding discussion, we will estimate a regression equation for the logarithm of the reserve assets ratio, $\ln(R)$, conditional on the following quarterly time-series:

[6] The source for y is given in footnote 7. C is taken from IFS and D from the Central Bank of Egypt Quarterly Bulletin.

1. REFORM : a dummy for the post-reform period (1991 onwards);
2. ln(y): the logarithm of real GDP;
3. Δln(b): the rate of parallel exchange rate depreciation;
4. r: the central bank discount rate;
5. ln(v): the index of political violence.

Data are available for the period 1983-96.[7] Augmented Dickey-Fuller tests for stationarity of the data (available on request) produce mixed results. Δln(b) is clearly stationary. For the other variables, the null of difference stationarity cannot be rejected at the 5% level, although the test statistic for ln(y) is very close to the 5% critical value. For this reason we will estimate the regression equation using the approach advocated by Pesaran et al. (2001); this allows us to remain agnostic about the order of integration of the series. Our regression equation is of the form :

$$\Delta \ln(R)_t = b_0 + f\,t + q\,\text{REFORM}_t + \sum_{i=1}^{i=T_R} b_i\,\Delta \ln(R)_{t-i} + \sum_{i=0}^{i=T_s} g_i\,\Delta \ln(y)_{t-i} + \sum_{i=0}^{i=T_b} d_i\,\Delta \ln(b)_{t-i}$$

$$+ \sum_{i=0}^{i=T_r} z_i\,\Delta r_{t-i} + \sum_{i=0}^{i=T_v} h_i\,\Delta \ln(v)_{t-i} + b^*\cdot \ln(R)_{t-1} + g^*\cdot \ln(y)_{t-1} + h^*\cdot \ln(v)_{t-1} + e_t \qquad (1)$$

where e_t is a regression residual.[8] The lag order of each variable z, T_z, is chosen so as to minimize the Schwartz-Bayesian Information Criterion.[9] Under the assumption that all variables are stationary in levels, the t-ratios on the starred levels coefficients will have a standard t-distribution. If all are I(1) this is no longer true, but Pesaran et al. (2001) calculate an upper bound for the F-statistic testing their joint significance.

The regression equation is reported in Table 2 below. The coefficients on each of the explanatory variables are statistically significant and their signs are consistent with the theory discussed in Section 2. The diagnostic statistics reported in Table 2 suggest that the regression is statistically robust. The reported F-test for the joint significance of the levels variables is greater than the upper bound of the 5% critical value reported in Pesaran et al. (2001).

Rather than interpreting individual coefficients in the regression equation, we will refer to Figure 6 below. This figure depicts the response of ln(R) to a unit shock to each of the four explanatory variables: ln(y), ln(v), r and ln(b); the response is charted over ten quarters, by which time the responses are very close to their respective asymptotes. The impulse responses chart the consequences of a permanent shock to the level of each variable, i.e., a temporary shock to the growth rates Δln(y), Δln(v), Δr and Δln(b). One measure of the impact of a "typical" shock to each variable is this impulse response scaled by the standard deviation of the growth rate of the variable. Figure 5 notes these standard deviations.

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[7] R is the ratio of commercial bank reserve assets reported in IFS to domestic currency bank deposits as reported in the Central Bank of Egypt Quarterly Bulletin; y is a quarterly interpolation of nominal annual GDP as reported in World Development Indicators deflated by the quarterly consumer price index in IFS; b is taken from the World Currency Yearbook; r is taken from IFS.

[8] In equation (1) there is no term in the level of the discount rate, r. When a levels term is included, the estimated coefficient is very close to zero (and statistically insignificant). Implicitly, changes in the discount rate have only a short-run effect on the reserve ratio.

[9] As can be seen in Table 2 below, the lag orders selected are $T_R = 0$, $T_s = 0$, $T_b = 3$, $T_r = 3$ and $T_v = 1$.

Figure 6 shows that both shocks to the level of political violence and shocks to GDP have permanent effects on the reserve asset ratio. In the case of GDP, the impulse response profile is monotonic: a (positive) unit shock to output leads to a 72% increase in the ratio on impact, rising to 166% in the long run. Since the standard deviation of $\Delta \ln(y)$ is 0.025, this means that a typical shock to output would eventually change the reserve asset ratio by 4.2% in the absence of further shocks. In the case of the political violence index the adjustment path is not monotonic, but the effect of a (positive) unit shock is to increase the ratio by 15% on impact, and by 13% in the long run.[10] Since the standard deviation of $\Delta \ln(v)$ is 0.313, this means that a typical shock to the level of violence would eventually change the reserve asset ratio by 4.1% in the absence of further shocks. In other words, the long-run consequences of economic and political shocks are of approximately equal magnitude.

Permanent shocks to the level of the discount rate (r) and the black market exchange rate (b) both have a temporary impact on the level of the reserve asset ratio. The impact effects of standard deviation shocks to these two variables are of the same order of magnitude: a positive shock to r raises the ratio by 4.8% on impact; the corresponding figure for $\ln(b)$ is 2.5%. These effects are roughly halved by the fourth quarter after the shock, and have virtually disappeared by the eighth quarter.

These findings are consistent with the theoretical model of the reserve assets ratio discussed above: the ratio is pro-cyclical, and responds positively to increases in the discount rate (although this response seems only to be temporary). Moreover, it also responds positively to the degree of macroeconomic instability, as captured by the rate of parallel market exchange rate depreciation. The removal of this source of instability in the 1990-91 ERSAP, along with the financial reforms proxied by our REFORM dummy, was one reason for the substantial reduction in the average reserve deposit ratio, as seen in Figure 1. The difference between the logarithm average level of the reserve asset ratio in the pre-reform period (1983-90) and that in the post-reform period (1991-96) is 48%. Our regression results imply that of this, 23% is due to the reform measures captured by the REFORM dummy, and 8% is due to a lower rate of parallel market exchange rate depreciation.[11] However, the regression results also imply that the fall in the ratio would have been much greater, were it not for the increase in political violence. In fact, the reserve asset ratio in the post-reform period is estimated to be 35% higher than it would have been if the level of violence had not increased.[12] (A large part of the observed fall in the actual ratio is because interest rates have been falling post-reform, and that there is an underlying downward deterministic trend in $\ln(R)$, as seen in Table 2.)

The bottom line here is that the beneficial consequences of the improvements in the Egyptian financial system for excess liquidity were of the same order of magnitude as detrimental consequences of the increase in political violence. In the light of our regression results, it is not at all surprising that the current reserve asset ratio is around 60% higher than the minimum required ratio.

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[10] There is no ready theoretical explanation for the non-monotonicity of the $\ln(v)$ impulse response profile. The non-monotonicity arises from the negative coefficient on $\Delta \ln(v)_{t-1}$ in Table 2, which is significant at the 10% level.

[11] The figure of 0.23 comes from our estimate of q/b^* in equation (1). The figure of 0.08 comes from multiplying our estimate of $\Sigma_i q_i/b^*$ by the difference between average $\Delta \ln(b)$ in the pre-reform period and average $\Delta \ln(b)$ in he post-reform period.

[12] This figure comes from multiplying the difference between average $\ln(v)$ in the pre-reform period and average $\ln(v)$ in the post-reform period by our estimate of h^*/b^*.

4. Conclusion

In the early 1990s the Egyptian government undertook a substantial monetary reform program that included a liberalization of foreign currency and capital markets: the authorities removed financially repressive interest rate controls and eliminated the black market exchange rate premium. Although these reforms did lead to some improvements in the efficiency of the financial sector, large inefficiencies remain; one of the most prominent of these is the large degree of excess liquidity in the commercial banking sector. We have shown that one of the main reasons for the excess liquidity is the increase in the intensity of political conflict between the Egyptian state and radical Islamist groups.

These stylized facts lead to two conclusions. First, reform packages that concentrate solely on financial and economic factors are unlikely to be effective in promoting confidence in the local economy if they do not also deal with the causes of political conflict in the country concerned (in this case Egypt). Second, successful political reform will lead to a reduction in the fraction of commercial banks' assets made up of reserve money. This will generate extra inflationary pressure. While there are likely to be substantial long-term benefits from an increase in bank lending to the private sector, there may be higher inflation in the short run. This may place extra political pressure on the government during an attempt to introduce political reforms. To the extent that the international community has an interest in seeing a reduction in radical Islamist violence, it should indicate that its financial institutions stand ready to support political as well as economic reform programs.

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Table 1: Regression Equations for ln(y) and ln(C/D)

$D\ln(C/D)_t$ equation (The regression includes a seasonal intercept and trend.)

variable	coeff.	std. err.	t ratio	h.c.s.e.	partial R^2
REFORM	−0.06673	0.01682	−3.969	0.01913	0.2432
ΔREFORM	0.14951	0.03391	4.409	0.02053	0.2841
$\Delta\ln(C/D)_{t-1}$	−0.02350	0.13516	−0.174	0.11999	0.0006
$\Delta\ln(C/D)_{t-2}$	0.31138	0.13970	2.229	0.13538	0.0921
$\Delta\ln(C/D)_{t-3}$	−0.21017	0.14894	−1.411	0.13217	0.0391
$\ln(C/D)_{t-1}$	−0.10353	0.04168	−2.484	0.04586	0.1118
$\Delta\ln(D)_{t-1}$	−0.30441	0.11616	−2.621	0.11882	0.1229
$\Delta\ln(D)_{t-2}$	0.21423	0.11383	1.882	0.10242	0.0674
$\Delta\ln(D)_{t-3}$	−0.37523	0.12399	−3.026	0.11994	0.1575
$\ln(D)_{t-1}$	0.11501	0.03175	3.623	0.03515	0.2113

$R^2 = 0.67670$ $\sigma = 0.02506$
LM test for residual autocorrelation (order 1): $F(1,48) = 0.9990$ [0.3226]
LM test for residual autocorrelation (order 4): $F(4,45) = 2.1512$ [0.0900]
LM ARCH test (order 1): $F(1,47) = 0.9248$ [0.3411]
LM ARCH test (order 4): $F(4,41) = 0.6584$ [0.6244]

$D\ln(y)_t$ equation (The regression includes an intercept and trend.)

variable	coeff.	std. err.	t ratio	h.c.s.e.	partial R^2
$\ln(y)_{t-1}$	−0.30864	0.08929	−3.457	0.09370	0.1423

$R^2 = 0.14372$ $\sigma = 0.02266$
LM test for residual autocorrelation (order 1): $F(1,71) = 0.0495$ [0.8246]
LM test for residual autocorrelation (order 4): $F(4,68) = 0.3973$ [0.8099]
LM ARCH test (order 1): $F(1,70) = 1.6197$ [0.2073]
LM ARCH test (order 4): $F(4,64) = 1.4778$ [0.2193]

Table 2: Regression Equation for $D\ln(R)_t$

variable	coeff.	std. err.	t ratio	h.c.s.e.	partial R^2	ins.
intercept	−4.61710	0.02319	−1.991	3.00680	0.0945	0.04
trend	−0.01543	0.00445	−3.469	0.00608	0.2405	0.04
REFORM	−0.11717	0.03621	−3.236	0.02994	0.2160	0.03
Δr_t	0.05387	0.01192	4.520	0.00728	0.3496	0.06
Δr_{t-1}	0.03359	0.01210	2.776	0.00904	0.1686	0.05
Δr_{t-2}	0.02925	0.01169	2.503	0.00683	0.1415	0.03
Δr_{t-3}	0.02388	0.01147	2.082	0.00966	0.1024	0.05
$\Delta\ln(b)_t$	0.36554	0.12715	2.875	0.11718	0.1786	0.03
$\Delta\ln(b)_{t-1}$	0.33868	0.14191	2.387	0.10078	0.1304	0.08
$\Delta\ln(b)_{t-2}$	0.41241	0.15556	2.651	0.14042	0.1561	0.07
$\Delta\ln(b)_{t-3}$	0.32774	0.14122	2.321	0.10090	0.1241	0.03
$\Delta\ln(v)_t$	0.14722	0.06229	2.364	0.06822	0.1282	0.02
$\Delta\ln(v)_{t-1}$	−0.09076	0.05279	−1.719	0.05458	0.0722	0.04
$\Delta\ln(y)_t$	0.72055	0.44174	1.631	0.56570	0.0654	0.06
$\ln(R)_{t-1}$	−0.51171	0.09199	−5.563	0.10770	0.4488	0.03
$\ln(v)_{t-1}$	0.06779	0.01884	3.597	0.02133	0.2540	0.04
$\ln(y)_{t-1}$	0.84860	0.44303	1.915	0.57469	0.0881	0.04

h.c.s.e.: heteroskedasticity-corrected s.e. ins: Hansen (1992) parameter stability stat.
$R^2 = 0.66637$ $\sigma = 0.05306$
Hansen (1992) joint parameter instability test statistic = 2.6103
LM test for residual autocorrelation (order 1): $F(1,37) = 1.1366$ [0.2933]
LM test for residual autocorrelation (order 4): $F(4,34) = 0.6437$ [0.6351]
LM ARCH test (order 1): $F(1,36) = 0.7459$ [0.3935]
LM ARCH test (order 4): $F(4,27) = 1.2098$ [0.3296]
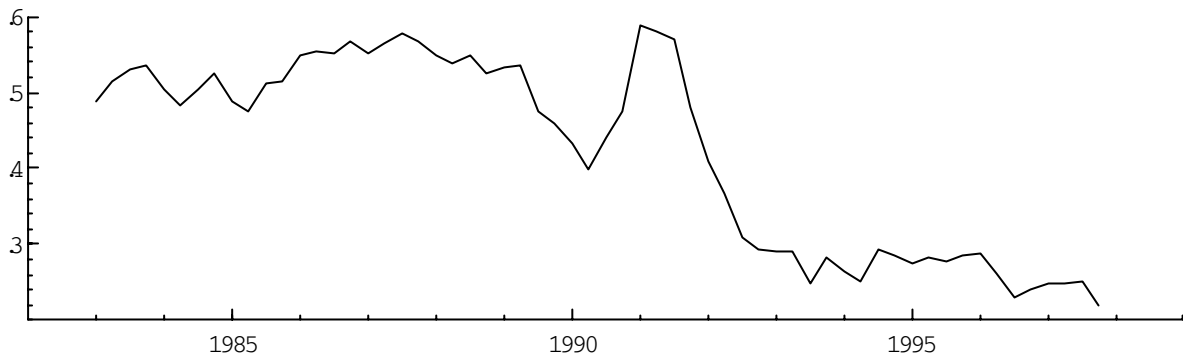Joint significance of levels variables: $F(3,35) = 9.8059$

Figure 1: The Ratio of Commercial Banks' Reserve Assets to Domestic Currency Balances

Figure 2: The Log of Annual Violent Political Incidents in Egypt (Quarterly Interpolation)
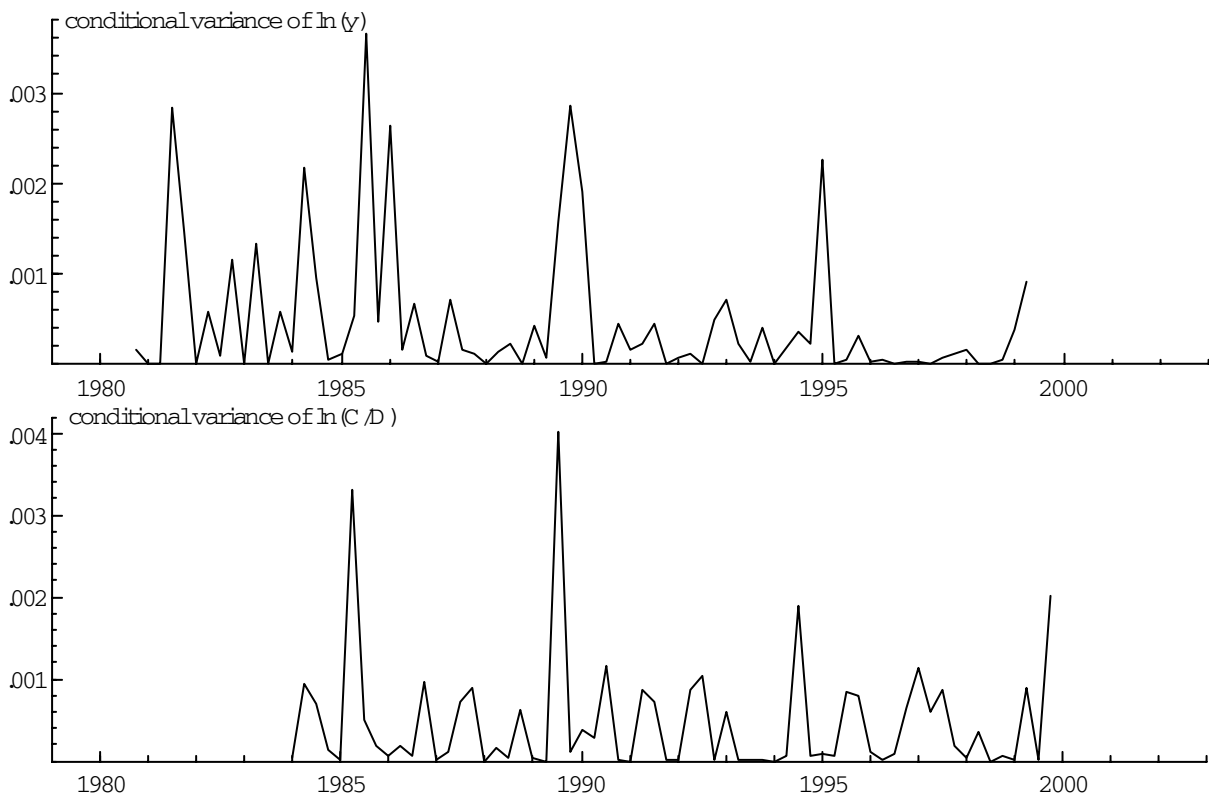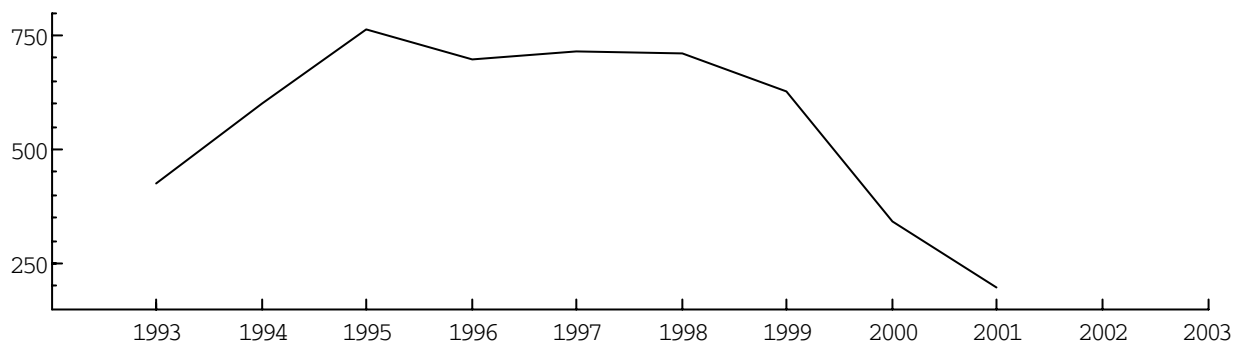

Figure 3: Conditional Variances of ln(y) and ln(C/D)

Figure 4: Annual Total Bankruptcies

Figure 5: Quarterly Rate of Black Market Exchange Rate Depreciation

shock to D ln(v)
(s.d. = 0.3129)

shock to D ln(y)
(s.d. = 0.0253)

shock to D r
(s.d. = 0.8882)
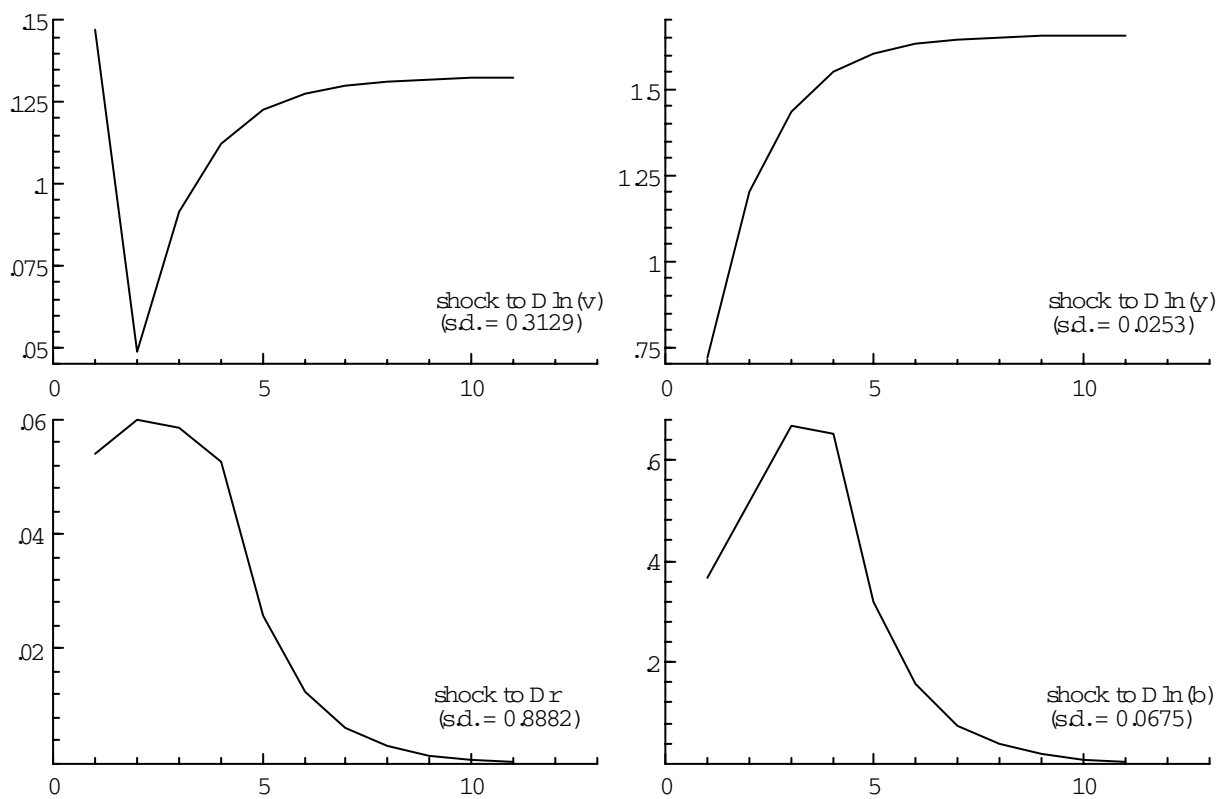
shock to D ln(b)
(s.d. = 0.0675)

Figure 6: Response of ln(R) to Unit Shocks to Explanatory Variables, by Quarter
Standard Deviations of Variables are Shown in Parenthesis