Assess The Long Run Effects Of Monetary Policy On Bank lending,Foreign Asset and Liability In MENA Countries

Ziaei, Sayyed Mahdi

University Putra Malaysia

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1. Introduction

The mechanism by which monetary policy is transmitted to the real economy remains a central topic of debate in macroeconomics. Considerable research has recently examined the role played by banks in the transmission of monetary policy aiming at uncovering a credit channel and assessing the relative importance of the money and credit channels. As the credit or lending channel operates through shifts in loan-supply schedules, uncovering the credit channel implies distinguishing shifts in loan-supply from shifts in loan demand schedules brought about by monetary policy shocks. The importance of the credit channel depends on the extent to which banks rely on deposit financing and adjust their loan supply schedules following changes in bank reserves (for a given bank-dependency of the borrowers). The aim of this paper is to assess the long run effects of monetary policy on bank lending, foreign liability and asset in ten MENA countries. At the empirical level, the most relevant literature has tried to analysis monetary transmission mechanism using unrestricted VAR model in case of MENA countries. This paper with two specific way (Jonhanson cointegration and Dynamic ordinary least squares (DOLS)) try to analysis the long run relationship between bank credit to private sector and monetary policy instrument, meanwhile evaluate if there is any long run relationship between monetary policy instrument and foreign asset and foreign liability. The empirical evidences with aggregate data of depository banks of MENA countries show that bank credit to private sector and foreign assets increasing with a monetary expansion. However, the positions of foreign debts aren't similar for different countries. Hence, the aggregate data show that bank lending channel is likely to be an effective monetary transmission mechanism in MENA countries.

This paper is organized as follows. In addition to the introduction, we focus on literature review and model in section 2, in this section we review credit channel and studies that have done in MENA countries about monetary transmission mechanism specially credit channel, in addition we develop and solve a theoretical model based on Kishan and Opiela (2000) . In section 3, we describe data and methodology of work, the Johanson co-integration and dynamic ordinary DOLS least squares techniques are used to examine long run relationship between variables. In section 4 we summarize empirical result and in Section 5 concludes the findings.

2. Literature review and model

The primary transmission channel is the interest rate channel mechanism. According to this mechanism, the effects of monetary policy are felt through the demand for money and the short term interest rate, which affects investment and output. The credit channel was proposed as an extension to the classical rate interest channel. It was thought indeed that the traditional interest rate channel is not sufficient to explain several facts, which include issues of timing and size of the responses of private spending to monetary policy; therefore, it has proved useful to broaden the analysis to include the banking sector and the particularities which it implies (Mishkin, 1995). The credit channel of monetary policy transmission includes two aspects that purport to analyze the relationship between changes in monetary policy stance and the size of the external finance premium: the bank lending channel and balance sheet channel. The first aspect consists of the narrow credit channel or the bank lending channel described by Bernanke and Blinder (1988). In contrast to the "money view", bank loans and bond issues are considered as imperfect substitutes. An important implication of the lending channel is that monetary policy will have a greater effect on expenditures of smaller firms that are more dependent on bank loans than on large firms that can access the stock and bond markets directly. Under a concretionary monetary policy shock ‘bank lending channel’ operates through the fall in bank reserves, implying a reduction in the supply of loanable funds by the banks. In other words, monetary Policy may have amplified effects on aggregate demand by modifying the availability or the terms of new loans. The bank lending channel is an enhancement mechanism to the interest rate channel. The key point here is that the real effects of higher interest rates may be amplified through the lending channel, beyond what would be predicted were policy transmitted only through the traditional interest rate channel (cost of capital). As market interest rates rise subsequent to monetary tightening, business investment falls not only because cost of capital is high but also due to supply of bank loans to firms (specially small and medium size) is reduced. The lending channel presumes that small and medium-sized firms, facing informational frictions in financial markets, rely primarily on bank loans for external finance because it is not possible for these borrowers to issue securities in the open market. The importance of this channel thus depends on three factors: (i) the degree to which the central bank has allowed banks to extend loans; (ii)

monetary policy stance; and (iii) the dependence of borrowers on bank loans. These factors are clearly influenced by the structure of the financial system and its regulation.

Second aspect of credit channel is balance sheet channel. The balance sheet channel is associated with the effects of a policy induced change in interest rates on the cash flows and, hence, balance sheet positions of no-financial firm that rely heavily on bank loans. Expansionary monetary policy, which lowers nominal interest rates, causes an improvement in firms' balance sheets because it raises cash flow, thereby reducing adverse selection and moral hazard problems. An important feature is that it is the nominal interest rate that tends to affect firms' cash flow the most, because long term debt is typically fixed and thus has little impact on firms' cash flow. In fact Expansionary monetary policy, which causes a rise in equity prices raises the net worth of firms and so leads to higher investment spending and aggregate demand. In contrast contradictory monetary policy leads decrease in investment spending. Small and medium-sized firms are more likely to face a disproportionately larger external financial premium. Therefore, small and medium-sized firms that have relatively poor access to short-term credit markets respond to deteriorated balance sheet positions mainly by drawing down inventories and cutting investment more than large firms.

The operation of monetary transmission channels varies systematically across countries due to differences in the extent of financial intermediation; the size, concentration, and health of the banking system; the development of capital markets; and structural economic conditions (Checetti (1999)). The depth, breadth, and structure of the financial system determines the link between the monetary policy instruments under the control of the central bank (short-term interest rate, reserve requirements) and the variables that drive the conditions in the no financial sector (e.g., loan and deposit rates; asset prices; and the exchange rate). The macroeconomic environment as well as structural features of the economy (e.g., degree of monetization and dollarization; cash-based payments system; size of the informal sector; openness of the economy; and inflows of private and official financing resources) in turn determine the link between financial conditions and spending/investment decisions among households and firms (Créel and Levasseur, (2005)).

2.1. Empirical studies on monetary transmission mechanism in MENA

Compare to North America, Europe, Latin America and East Asia, the economics of the MENA region remain under research in general, this is particularly true of the macroeconomic and

monetary area. There is relatively little research on the nature of monetary policy frameworks of most of MENA countries.

In following we scrutinize some empirical works in this region.

Boughrara (2002) studies the monetary transmission mechanisms, (specifically lending and exchange rate channel) in Morocco and in Tunisia. The empirical results point to the fact that the two countries economies are endowed with different prevailing channels. It was shown that the monetary channel is the dominant one in Tunisia. It stands out also from the empirical results that the lending channel is active neither in Morocco nor in Tunisia.

Poddar *et al*. (2006) estimate four channel of monetary policy transmission mechanism in Jordan. Overall result for Jordan shows evidence of monetary policy affecting output is very weak. Output responses very weak to change in bank lending rates. Furthermore, equity prices and exchange rate are not significant channels for transmitting monetary policy to economic activity also the effect of monetary policy on the stock markets seems insignificant.

Al-Mashat and Billmeier (2007) investigate the four channel of monetary transmission mechanism in Egypt. This research results show the exchange rate channel play an important role in the transmission of monetary stance, as it magnifies the impact of policy shocks crucially. The role of the asset price channel is generally subdued, but explicit modeling of this channel intensifies the response of prices to exchange rate shocks. The bank lending channel points to a stronger transmission of the output through credit (loans and securities) to the public sector compared to private lending. The interest rate channel is underdeveloped but appears to e strengthening since the introduction of the interest corridor in 2005. In a recent empirical paper, Moursi *et al* (2007) compare various strategies developed during the 1990s to identify the monetary policy stance in Egypt. They estimate a structural VAR, paying particular attention to deriving a consistent measure of monetary policy stance. They conclude that the direct impact of monetary policy shocks on real output is negligible supporting the assumption of monetary neutrality but argue in favor of an indirect positive growth effect via the target to achieve long run price stability.

Neaime (2008) investigates how successful MENA countries have been in making a smooth transition to inflation targeting, given the respective monetary policy transmission mechanisms, the exchange rate regimes, and the current targets, instruments, and goals of monetary policy. For catch the result he analysis transmission mechanisms of monetary policy for six countries in

MENA region such as: Egypt, Jordan, Lebanon, Morocco, Tunisia and Turkey. Empirical results have highlighted the fact that for the MENA economies of Egypt and Turkey, the exchange rate played a dominant role in the transmission mechanism of monetary policy, while for Jordan, Lebanon, Morocco, and Tunisia, the interest rate played a dominant role in the transmission mechanism of monetary policy. These results have also pointed to the important role of the exchange and interest rates as policy instruments in the transmission mechanism of MENA's monetary policies. While, the direct linkages between the interest and inflation rates do not appear to be significant for Jordan, Lebanon and Turkey, they are particularly significant for Egypt, Morocco, and Tunisia. In fact, the extent to which the interest rate works through the exchange rate or through GDP to decrease inflation remains substantially uncertain. Also the empirical results indicate that the recent success of Turkey and Egypt in adopting flexible exchange rates has helped those countries shift to and inflation targeting regime. It is also shown that Jordan, Lebanon, Morocco and Tunisia will have to introduce more flexibility into their exchange rates before they can shift to and inflation targeting monetary policy regime.

Al-Raisi *et al*. (2007) examine the relevance of monetary policy independence under fix exchange rate regime in Oman. They apply VAR model in this research, the result show that inflation responds to monetary variables like interest rate and money growth but effect isn't permanent. And highlight the significant weakness in the monetary transmission process to conduct that even with monetary policy independence the goals of output and inflation cannot be pursued effectively by the central bank of Oman (CBO). In explaining the week transmission process, given the Fix peg of Rial Omani (RO) to US dollar, transmission mechanism of monetary policy of Oman should ideally refer to the sensitivity of CBO in policy interest rates to the interest rate stance for Fed. And in return sensitivity of aggregate demand in Oman to change in CBO policy rates.

2.2 The model

the model that we analysis in this section is built by Chu and Lin (2007) modified from the framework in kishan and opelia (2000).

The bank is assumed to have four assets: required reserves(RR), securities(SEC), loans(LN) and foreign assets(FA) ; and three liabilities: demand deposits (DD), bank debentures(BD) and foreign debt(FD). Therefore, the balance sheet constraint requires

$$RR + SEC + LN + FA = DD + BD + FD. \quad (1)$$

On the asset side, banks hold a fraction (α) of (DD) is required reserves, but they hold no excess reserve. To capture the motive for holding securities as buffer stock, securities are assumed to be a fixed proportion of (DD). By assuming that the loan market is imperfectly competitive, banks can increase loans by lowering their loan rates, r_{LN}. Therefore, we have the following equations:

$$RR = \alpha DD. \quad (2)$$

$$SEC = c_0 + (c_1)DD - RR, \qquad Where \quad c_1 < 1 \; and \quad c_1 > \alpha \quad (3)$$

$$LN = d_0 - (d_1) r_{LN} \quad (4)$$

In an open economy with capital mobility, banks can hold foreign assets in their portfolios. The expected rate of returns on foreign assets (r^*) is the sum of foreign interest rate(r_f) plus expected change in exchange rate $\left(\frac{(s^e - s)}{s}\right)$. an increase in r^* relative to the domestic rate will induce banks to raise the position of foreign assets:

$$FA = h_0 + h_1(r^* - r) \quad (5)$$

On the liability side, (DD) are assumed to be inversely related to a market interest rate r as shown in equation 6. We also assume that banks can raise funds by offering a higher interest on bank debentures issued(r_{BD}). Therefore,

$$DD = a_0 - (a_1)r \quad (6)$$

$$BD = b_0 - (b_1)r_{BD} \quad (7)$$

In addition, banks have access to raising funds abroad. The cost of raising foreign funds is assumed to be r^*. Following a rise in the domestic market rate relative to r^*, banks can increase their foreign debts to create the source for loans. Hence,

$$FD = j_0 + j_1(r - r^*) \quad (8)$$

Banks are assumed to maximize profit(π), where

$$\pi = (r_{LN} - \Phi)LN + r_{SEC}SEC + (r^*)FA - (r)DD - r_{BD}BD - (r^*)FD \quad (9)$$

Profits include revenues from the interest income on loans$(r_{LN}LN)$ net of foreign loan losses (ΦLN),the interest on the securities$(r_{SEC}SEC)$, and returns on foreign assets $[(r^*)FA]$,minus the interest paid on demand deposits$[(r)DD]$,bank debentures$(r_{BD}BD)$and foreign debt $[(r^*)FD]$

Equation (10) is maximize with respect to LN after eliminating$RR, DD, BD, SEC, FA, FD, r_{BD}$ and r_{LN}. The first order necessary condition is used to solve for LN. The same process can be employed to solve for BD. Testable hypothesis can be derived by taking the derivative of the LN And BD equations with respect to the market interest rate and expected exchange rate. The response of loan to change in market interest rate is in the following:

$$\frac{\partial LN}{\partial r} = \frac{d_1[(c_1 - 1)a_1 + h_1 + j_1]}{2(b_1 + d_1)} \begin{matrix} > \\ = 0 \\ < \end{matrix} \qquad (10)$$

In contrast to a closed economy of kishan and opiela (2000), the response of bank loans to changes in the interest rate is indeterminate in an open economy. Depending on the magnitude of the parameter of buffer portion in securities, c_1, and sensitivities of demand deposits, foreign assets and foreign debts to the market rate, a_1, $h_1$andj_1. This is inconsistent with the perspective of bank lending channel.

Furthermore if $h_1$and $j_1$are large enough to make$(c_1 - 1)a_1 + h_1 + j_1 > 0$, bank loan will even decrease after an expansionary monetary policy. One of reasons is that a loose monetary policy decreases the domestic rate and increase bank s incentives to hold foreign assets. The other reason is that lower domestic rate could amplify interest rate spreads and then decrease banks position of foreign debts. Both of which reduce funds available for domestic lending even after a money increase. Therefore, the effect of bank lending channel might be reduced or reversed.

The response of loans to change in the expected exchange rate is negative:

$$\frac{\partial LN}{\partial S^e} = \frac{\partial LN}{\partial r^*} \times \frac{\partial r^*}{\partial S^e} = \frac{d_1[-h_1 - j_1]}{2s(b_1 + b_2)} < 0 \qquad (11)$$

If the public anticipates depreciation in the domestic currency, both the expected rate of return on foregn assets and the cost of raising funds abroad would increase. Therefore banks increase their foreign assets and lower their foreign debt position, and vice versa. This is a counter effect to the bank lending channel. It is hard for the authorities to affect real economic activity through the bank lending channel in the open economy.

3. Data and Methodology

3.1 Data:

Quarterly data was used between 1991Q4 – 2006Q4 for analysis long run effects of monetary policy instrument (interest rate (R)) on bank credit to private sectors ($DDCPS$) (proxy of lending channel) and foreign asset(FA) and foreign liability(FL) of ten MENA countries such as: Algeria, Bahrain, Egypt, Kuwait, Lebanon, Morocco, Oman, Qatar, Tunis and Turkey. Also long run effect of exchange rate (ER)on credit to private sector and foreign liability and foreign asset evaluate for these countries. Different Monetary policy instruments use in this paper for different countries such as:

Lending rate for: Qatar, Egypt, Lebanon, Oman.

Money market rate for: Algeria, Bahrain, Kuwait, morocco, Tunisia, turkey.

Also because some countries peg their currency to USD, we use nominal and real effective exchange rate for those countries instead of nominal exchange rate. So Nominal exchange rate use for: Egypt, Kuwait, Lebanon, turkey. And Nominal effective exchange rate use for: Algeria, Oman, Qatar, Morocco. And Real effective exchange rate use for: Bahrain, and Tunis.

This study covers total 60 observations. All data except interest rate are in natural logarithm. The data are accessed from central bank of each MENA countries, the IMF's International Financial Statistics IFS CD-Rom database, World Economic Outlook (WEO) and World Development indicators (WDI) CD-Rom database.

3.2 Methodology

There are two co-integration techniques, the Johanson co-integration and dynamic ordinary least squares (DOLS) techniques are used to examine long run relationship between the variables. Johansen (1991) and Juselius (1990) developed the maximum likelihood estimator for cointegration analysis. We apply the Johansen's cointegration test to examine the long run relationship between domestic credit to private sector, exchange rate(nominal, real effective and nominal effective, depend to country) and monetary policy instrument(interest rate), and cointegrating relationship between foreign assets exchange rate and monetary policy instrument(interest rate). and cointegrating relationship between foreign liability exchange rate and monetary policy instrument(interest rate).

Also The model is estimated separately for each MENA countries using dynamic ordinary least squares (DOLS). DOLS involves regressing the left hand side variable on a constant, the right hand side variables, and lags and leads of the right hand side variables. The individual import equations have the form:

$$DCPS_{i,t} = \beta_0 + \beta_1 ER_{i,t} + \beta_2 R_t + \sum_{j=-p}^{p} \Delta ER_{i,t-j} + \sum_{j=-p}^{p} \Delta R_{i,t-j} + u_{i,t}$$

$$FA_{i,t} = \beta_0 + \beta_1 ER_{i,t} + \beta_2 R_t + \sum_{j=-p}^{p} \Delta ER_{i,t-j} + \sum_{j=-p}^{p} \Delta R_{i,t-j} + u_{i,t}$$

$$FL_{i,t} = \beta_0 + \beta_1 ER_{i,t} + \beta_2 R_t + \sum_{j=-p}^{p} \Delta ER_{i,t-j} + \sum_{j=-p}^{p} \Delta R_{i,t-j} + u_{i,t}$$

Here $DCPS_{i,t}$, represents domestic credit to private sectors from country i, $FA_{i,t}$ represents foreign assets and $FL_{i,t}$ represents foreign liability, $ER_{i,t}$ represents exchange rate, and R_t represents monetary policy instrument or interest rate. p represents the number of leads and lags. Except interest rate, other variables are measured in natural logs. One lead and one lag are used in the DOLS estimation.

4. Empirical finding

Before applying co-integration technique to establish long run relationship, it is imperative to make the series stationary and establish order of integration among variables. That is why, Augmented Dickey Fuller (ADF) method was carried out on the time series levels and first difference form. The results are presented in appendix (for each countries separately) and show that all variables are unit root (non-stationary) at levels and stationary at first difference. Therefore all Variables ($DCPS, FA, FL, ER. R$) are integrated of order of one I (1). In order to see the robustness of the ADF test, the Phillips-Perron (PP) unit root test is also adopted. We can verify the results of the PP test in appendix which indicates that all of the variables are I (1).

We first use Johnson cointegration test for each MENA countries. The test show just in four countries include Egypt, Oman, Lebanon and Turkey, we have long run relationship. But DOLS test emphasize long run relationship in all ten countries. Also results of Johnson test for

mentioned countries again confirm by DOLS test. In below we summarize the result of DOLS (for ten countries) and Johnson test (for four countries).

This empirical work show a lower monetary policy instrument (interest rate) could increase bank credit to private sector in all ten countries. This study is obviously similar from the finding as suggested by the most previous studies on bank lending channel have done for developing countries. So aggregate data show that bank lending channel is likely to be an effective monetary transmission mechanism in MENA countries.

Also lowering interest rate, depreciate of domestic currency, lead to increase of foreign assets, such evidence are consist with the structural setting in equitation 7, it seems, in expansionary monetary policy with decrease of interest rate and increasing rate of return of foreign assets, encourage banks in MENA countries increase their foreign assets. In all ten countries with increase monetary expansion and interest rate decreasing, foreign assets increase, but for Kuwait and Qatar exchange rate movement (proxy of NEER in case of Qatar) isn't accompany with interest rate behavior, or there is no significant relationship between foreign assets and exchange rate (cause their peg their currency to US dollar). Meanwhile after expansionary monetary policy and depreciate of exchange rate bank debt increase in all countries except morocco and Qatar, in these two countries there is no significant relationship between interest rate and foreign debt and exchange rate and foreign debt.

5. Conclusion

bank lending channel analysis show in countries that financial sector lean on banking sectors like most of developing countries, bank lending channel is effective, it means a expansionary or a tightening monetary policy effect on aggregate demand. Disaggregate data shows in developing countries, there are many small banks, with limited concentration, so they have too much dependence to bank reserve and deposit, in that, effects of monetary policy through lending channel more in developing countries than developed countries, in addition because main sources of small firm funds are banking systems in developing countries, firms (specially small firms) also influence by central bank money policy decisions. This empirical work also emphasize in Middle East and North Africa countries, it seems bank lending channel is active channel, because there is long run relationship between bank credit to private sector(proxy of lending channel) and monetary policy instrument. Also this study show a loose in monetary

policy decrease the domestic rate and increase bank incentive to hold foreign assets Meanwhile after expansionary monetary policy and depreciate of exchange rate bank debt increase in all countries except morocco and Qatar.

When a substantial amount of demotic debt in dominated by foreign currency which is the case for most emerging market countries. In these countries monetary expansion often can have negative impact on aggregate demand if it leads to a depreciation of the exchange rate through following mechanism; with debt contracts denominated in foreign currency, expansionary monetary policy which leads to a depreciation at the domestic currency, results in the debt burden of domestic no financial firm to increase since assets are typically denominated in domestic currency and so don't increase in value, there is resulting decline in net worth. and it cause increase in foreign debts.

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Algeria

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPS	-2.009462	-2.030950	DCPS	-6.976916	-7.198862
FA	-1.379049	-1.424279	FA	-7.032054	-7.032054
FL	-1.868155	-2.185632	FL	-6.292266	-6.257178
ER	-5.884144[1]	-5.265845[1]	ER	-12.90350	-12.90350
MMR	-1.682505	-2.145579	MMR	-5.944777	-5.958581

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/17/09 Time: 19:36
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	11.38373	2.785700	4.086489	0.0003
LNER	-1.085194	0.649443	-1.670962	0.1055
MMR	-0.106808	0.014782	-7.225693	0.0000
DDCPS(2)	-0.359074	0.489988	-0.732822	0.4695
DDCPS(1)	-0.636988	0.422130	-1.508983	0.1421
DDCPS	-0.030106	0.429540	-0.070090	0.9446
DDCPS(-1)	0.106818	0.409903	0.260594	0.7962
DDCPS(-2)	-0.132864	0.410137	-0.323951	0.7483
DER(2)	-4.537534	1.614904	-2.809786	0.0088
DER(1)	-4.285258	1.515864	-2.826942	0.0084
DER	-2.704260	1.418459	-1.906478	0.0665
DER(-1)	-0.743816	1.476181	-0.503879	0.6182
DER(-2)	-0.786955	0.916586	-0.858571	0.3976
DMMR(2)	0.001182	0.047167	0.025051	0.9802
DMMR(1)	0.020970	0.045482	0.461049	0.6482
DMMR	0.134021	0.043351	3.091516	0.0044
DMMR(-1)	0.148141	0.044201	3.351494	0.0022
DMMR(-2)	0.130201	0.045096	2.887209	0.0073

R-squared	0.951353	Mean dependent var	5.526198
Adjusted R-squared	0.922836	S.D. dependent var	0.800679
S.E. of regression	0.222416	Akaike info criterion	0.114572
Sum squared resid	1.434598	Schwarz criterion	0.823139
Log likelihood	15.30756	Hannan-Quinn criter.	0.381210
F-statistic	33.36069	Durbin-Watson stat	0.405501
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/17/09 Time: 19:37
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	17.63642	1.746707	10.09695	0.0000
LNER	-3.021974	0.395924	-7.632711	0.0000
MMR	-0.108366	0.012766	-8.488850	0.0000
DFA(2)	-0.741707	0.251606	-2.947896	0.0063
DFA(1)	-0.979020	0.275245	-3.556907	0.0013
DFA	-0.283151	0.278152	-1.017973	0.3171
DFA(-1)	-0.374010	0.246115	-1.519655	0.1394
DFA(-2)	-0.253704	0.242878	-1.044574	0.3048
DER(2)	-3.407005	1.197115	-2.846013	0.0080
DER(1)	-3.878465	0.990218	-3.916780	0.0005
DER	-0.388909	1.006891	-0.386248	0.7021
DER(-1)	0.068574	0.994423	0.068959	0.9455
DER(-2)	-0.087070	0.699646	-0.124449	0.9018
DMMR(2)	0.021573	0.033770	0.638823	0.5280
DMMR(1)	0.026145	0.033473	0.781071	0.4411
DMMR	0.123620	0.032900	3.757472	0.0008
DMMR(-1)	0.125773	0.032806	3.833900	0.0006
DMMR(-2)	0.119727	0.032593	3.673439	0.0010

R-squared	0.917041	Mean dependent var	3.711486
Adjusted R-squared	0.868409	S.D. dependent var	0.464065
S.E. of regression	0.168342	Akaike info criterion	-0.442537
Sum squared resid	0.821828	Schwarz criterion	0.266030
Log likelihood	28.39963	Hannan-Quinn criter.	-0.175899
F-statistic	18.85700	Durbin-Watson stat	0.746682
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/17/09 Time: 19:37
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	13.09450	2.206618	5.934193	0.0000
LNER	-2.045796	0.499287	-4.097436	0.0003
MMR	-0.101218	0.015931	-6.353627	0.0000
DFL(2)	-0.600850	0.235402	-2.552439	0.0162
DFL(1)	-0.691872	0.237888	-2.908387	0.0069
DFL	0.079461	0.225824	0.351872	0.7275
DFL(-1)	0.032371	0.215380	0.150297	0.8816
DFL(-2)	0.013339	0.221861	0.060121	0.9525
DER(2)	-1.026790	1.453952	-0.706207	0.4857
DER(1)	-1.362613	1.184415	-1.150452	0.2594
DER	0.904131	1.174389	0.769874	0.4476
DER(-1)	1.322289	1.150777	1.149041	0.2599
DER(-2)	-0.053580	0.793519	-0.067522	0.9466
DMMR(2)	0.006874	0.039357	0.174664	0.8626
DMMR(1)	-0.013407	0.040392	-0.331918	0.7423
DMMR	0.094557	0.038101	2.481735	0.0191
DMMR(-1)	0.064977	0.040790	1.592954	0.1220
DMMR(-2)	0.086095	0.039952	2.154950	0.0396

R-squared	0.880637	Mean dependent var	3.513933
Adjusted R-squared	0.810666	S.D. dependent var	0.453475
S.E. of regression	0.197318	Akaike info criterion	-0.124890
Sum squared resid	1.129102	Schwarz criterion	0.583677
Log likelihood	20.93492	Hannan-Quinn criter.	0.141748
F-statistic	12.58572	Durbin-Watson stat	0.532993
Prob(F-statistic)	0.000000		

Bahrain

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPC	-1.374820	-1.615014	DCPC	-6.5838816	-5.547647
FA	-0.307729	-0.193523	FA	-7.428419	-7.425489
FL	-1.460830	-1.724483	FL	-6.705744	-6.667390
MMR	-2.201896	-2.013407	MMR	-4.312730	-4.359634
REER	-0.837312	-0.932721	REER	-6.791185	-6.794730

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/17/09 Time: 19:11
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	34.16092	2.566074	13.31252	0.0000
LNREER	-5.765194	0.555385	-10.38054	0.0000
MMR	-0.139803	0.022723	-6.152400	0.0000
DDCPS(2)	-0.677878	0.966677	-0.701245	0.4874
DDCPS(1)	-1.719855	1.008769	-1.704905	0.0964
DDCPS	-1.036330	1.023940	-1.012100	0.3179
DDCPS(-1)	-0.798831	0.982222	-0.813289	0.4211
DDCPS(-2)	-1.349131	0.993997	-1.357279	0.1827
DREER(2)	-5.310325	1.774771	-2.992119	0.0048
DREER(1)	-5.504901	1.646138	-3.344131	0.0019
DREER	1.026017	1.628919	0.629876	0.5325
DREER(-1)	1.575653	1.659271	0.949605	0.3483
DREER(-2)	2.589003	1.502938	1.722628	0.0931
DMMR(2)	-0.047848	0.084514	-0.566160	0.5746
DMMR(1)	-0.135272	0.084953	-1.592320	0.1196
DMMR	0.037034	0.086960	0.425877	0.6726
DMMR(-1)	-0.025440	0.096216	-0.264405	0.7929
DMMR(-2)	0.039536	0.087406	0.452324	0.6536

R-squared	0.834522	Mean dependent var	7.101199
Adjusted R-squared	0.760493	S.D. dependent var	0.438174
S.E. of regression	0.214440	Akaike info criterion	0.013517
Sum squared resid	1.747410	Schwarz criterion	0.664523
Log likelihood	17.62152	Hannan-Quinn criter.	0.265911
F-statistic	11.27283	Durbin-Watson stat	0.378402
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/17/09 Time: 19:12
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	14.82270	1.421623	10.42661	0.0000
LNREER	-1.657837	0.307936	-5.383703	0.0000
MMR	-0.044017	0.010496	-4.193505	0.0002
DFA(2)	0.041870	0.168942	0.247837	0.8056
DFA(1)	-0.041710	0.186848	-0.223227	0.8246
DFA	0.839679	0.182238	4.607603	0.0000
DFA(-1)	0.847105	0.181034	4.679259	0.0000
DFA(-2)	0.534329	0.187890	2.843834	0.0071
DREER(2)	-2.319470	0.879613	-2.636921	0.0121
DREER(1)	-1.736175	0.807022	-2.151337	0.0379
DREER	-0.348518	0.829105	-0.420355	0.6766
DREER(-1)	-0.224778	0.853813	-0.263263	0.7938
DREER(-2)	0.624879	0.800145	0.780958	0.4397
DMMR(2)	-0.065955	0.044007	-1.498747	0.1422
DMMR(1)	-0.053291	0.044552	-1.196159	0.2390
DMMR	0.011903	0.045528	0.261446	0.7952
DMMR(-1)	0.019010	0.049837	0.381437	0.7050
DMMR(-2)	-0.029909	0.044677	-0.669461	0.5072

R-squared	0.789125	Mean dependent var	7.108668
Adjusted R-squared	0.694786	S.D. dependent var	0.199847
S.E. of regression	0.110408	Akaike info criterion	-1.314175
Sum squared resid	0.463218	Schwarz criterion	-0.663169
Log likelihood	54.79690	Hannan-Quinn criter.	-1.061782
F-statistic	8.364780	Durbin-Watson stat	0.428335
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/17/09 Time: 19:14
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	22.81850	1.917944	11.89738	0.0000
LNREER	-3.538774	0.415773	-8.511318	0.0000
MMR	-0.071785	0.015921	-4.508835	0.0001
DFL(2)	-0.117788	0.175624	-0.670681	0.5065
DFL(1)	-0.432897	0.177645	-2.436869	0.0196
DFL	0.525235	0.178763	2.938162	0.0056
DFL(-1)	0.627899	0.193752	3.240744	0.0025
DFL(-2)	0.487283	0.193978	2.512048	0.0164
DREER(2)	-3.929163	1.308656	-3.002441	0.0047
DREER(1)	-3.325141	1.238241	-2.685374	0.0107
DREER	1.070316	1.251777	0.855038	0.3979
DREER(-1)	0.884959	1.243003	0.711952	0.4808
DREER(-2)	2.100668	1.159171	1.812215	0.0779
DMMR(2)	-0.128589	0.066808	-1.924764	0.0618
DMMR(1)	-0.083391	0.067754	-1.230787	0.2260
DMMR	0.028356	0.064964	0.436482	0.6650
DMMR(-1)	-0.035201	0.071297	-0.493729	0.6243
DMMR(-2)	-0.111058	0.065774	-1.688482	0.0995

R-squared	0.823629	Mean dependent var	6.405685
Adjusted R-squared	0.744727	S.D. dependent var	0.319807
S.E. of regression	0.161581	Akaike info criterion	-0.552530
Sum squared resid	0.992119	Schwarz criterion	0.098476
Log likelihood	33.47083	Hannan-Quinn criter.	-0.300136
F-statistic	10.43854	Durbin-Watson stat	0.650143
Prob(F-statistic)	0.000000		

Egypt

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except TB)			**Log first differences**		
DCPS	0.437202	0.430137	DCPC	-7.487259	-7.487207
FA	0.514943	0.424895	FA	-7.159686	-7.189493
FL	-1.653200	-2.007223	FL	-6.477511	-6.543820
ER	-1.518172	-1.665427	ER	-5.885160	-5.885160
LR	-1.837224	-1.825840	LR	-6.829403	-6.800182

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

Cointegration between domestic credit to private sector, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	53.35	29.79	35.99	21.13
$r \leq 1 \mid r = 2$	17.35	15.49	12.31	14.26
$r \leq 2 \mid r = 3$	5.03	3.84	5.03	3.84

$DCPS = 13.65 + 0.775ER - 0.209LR$

Cointegration between foreign asset, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	40.86	29.79	23.26	21.13
$r \leq 1 \mid r = 2$	17.60	15.49	13.55	14.26
$r \leq 2 \mid r = 3$	4.05	3.84	4.05	3.84

$FA = -4.037 + 8.313ER - 0.202LR$

Cointegration between foreign liability, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	27.66	29.79	19.06	21.13
$r \leq 1 \mid r = 2$	8.59	15.49	6.95	14.26
$r \leq 2 \mid r = 3$	1.63	3.84	1.63	3.84

There is no long run relationship between foreign liability, exchange rate and interest rate in case of Egypt

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/17/09 Time: 19:58
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	13.85662	0.176776	78.38528	0.0000
LNER	0.941482	0.073639	12.78507	0.0000
LR	-0.222315	0.007659	-29.02485	0.0000
DDCPS(1)	-2.793505	0.550984	-5.070029	0.0000
DDCPS	-1.608618	0.567878	-2.832681	0.0068
DDCPS(-1)	-0.885794	0.570418	-1.552885	0.1273
DER(1)	0.953297	0.373302	2.553687	0.0140
DER	-0.087735	0.375651	-0.233555	0.8164
DER(-1)	-0.352284	0.364274	-0.967085	0.3386
DLR(1)	-0.060734	0.037019	-1.640601	0.1077
DLR	0.158784	0.034657	4.581645	0.0000
DLR(-1)	0.166171	0.033938	4.896318	0.0000

R-squared	0.987313	Mean dependent var	11.67929
Adjusted R-squared	0.984279	S.D. dependent var	0.732602
S.E. of regression	0.091855	Akaike info criterion	-1.755209
Sum squared resid	0.388122	Schwarz criterion	-1.328910
Log likelihood	62.90106	Hannan-Quinn criter.	-1.589157
F-statistic	325.4341	Durbin-Watson stat	0.899293
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/17/09 Time: 19:59
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	8.265241	0.446300	18.51947	0.0000
LNER	1.197879	0.213059	5.622282	0.0000
LR	-0.041325	0.015860	2.605594	0.0123
DFA(1)	0.008435	0.509495	0.016555	0.9869
DFA	0.766996	0.513832	1.492697	0.1423
DFA(-1)	0.517906	0.519984	0.996004	0.3245
DER(1)	-1.754035	0.805209	-2.178361	0.0345
DER	-2.418888	0.805735	-3.002091	0.0043
DER(-1)	-2.686506	0.787782	-3.410217	0.0014
DLR(1)	-0.069528	0.075185	-0.924763	0.3599
DLR	-0.101691	0.068622	-1.481889	0.1452
DLR(-1)	-0.144760	0.067357	-2.149128	0.0369

R-squared	0.795259	Mean dependent var	10.54249
Adjusted R-squared	0.746299	S.D. dependent var	0.366102
S.E. of regression	0.184401	Akaike info criterion	-0.361417
Sum squared resid	1.564171	Schwarz criterion	0.064881
Log likelihood	22.48110	Hannan-Quinn criter.	-0.195365
F-statistic	16.24311	Durbin-Watson stat	0.479429
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/17/09 Time: 20:00
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	10.42360	0.649487	16.04896	0.0000
LNER	0.771685	0.212389	3.633352	0.0007
LR	-0.143114	0.030006	-4.769482	0.0000
DFL(1)	-1.308863	0.438799	-2.982832	0.0046
DFL	0.140915	0.423995	0.332350	0.7411
DFL(-1)	0.007196	0.432808	0.016627	0.9868
DER(1)	2.455533	1.131844	2.169498	0.0352
DER	0.888262	1.188039	0.747671	0.4585
DER(-1)	0.935306	1.172233	0.797884	0.4290
DLR(1)	-0.076193	0.121353	-0.627859	0.5332
DLR	0.077237	0.107501	0.718477	0.4761
DLR(-1)	0.159465	0.105320	1.514096	0.1368

R-squared	0.770635	Mean dependent var	9.426197
Adjusted R-squared	0.715787	S.D. dependent var	0.536709
S.E. of regression	0.286128	Akaike info criterion	0.517239
Sum squared resid	3.765992	Schwarz criterion	0.943537
Log likelihood	-2.999918	Hannan-Quinn criter.	0.683290
F-statistic	14.05036	Durbin-Watson stat	0.272787
Prob(F-statistic)	0.000000		

Kuwait

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPS	-1.239606	-2.004291	DCPS	-5.320124	-6.970013
FA	-0.182601	-0.182601	FA	-8.173847	-8.173847
FL	-4.107469**	-3.121746	FL	-7.288490	-9.197310
MMR	-1.604543	-1.401356	MMR	-5.832630	-5.843352
ER	1.797582	-2.978714	ER	-8.613922	-14.4600

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 01:16
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	39.50059	6.673997	5.918582	0.0000
LNER	-24.17647	5.481913	-4.410225	0.0001
MMR	-0.325607	0.042692	-7.626806	0.0000
DDCPS(2)	-2.540672	1.955272	-1.299395	0.2016
DDCPS(1)	-1.280217	1.446607	-0.884979	0.3817
DDCPS	0.760813	1.420787	0.535487	0.5954
DDCPS(-1)	-0.381529	1.366703	-0.279160	0.7816
DDCPS(-2)	-0.497041	1.320679	-0.376353	0.7087
DER(2)	-8.084735	8.063692	-1.002610	0.3224
DER(1)	-8.579297	8.780139	-0.977125	0.3347
DER	17.04158	8.079622	2.109205	0.0416
DER(-1)	13.25492	7.296554	1.816600	0.0772
DER(-2)	8.569279	6.805133	1.259238	0.2156
DMMR(2)	0.068244	0.105295	0.648122	0.5208
DMMR(1)	0.103484	0.103585	0.999022	0.3241
DMMR	0.392773	0.104957	3.742238	0.0006
DMMR(-1)	0.404645	0.101547	3.984796	0.0003
DMMR(-2)	0.390307	0.100702	3.875873	0.0004

R-squared	0.827281	Mean dependent var	8.350601
Adjusted R-squared	0.750012	S.D. dependent var	0.721429
S.E. of regression	0.360706	Akaike info criterion	1.053586
Sum squared resid	4.944142	Schwarz criterion	1.704592
Log likelihood	-11.50041	Hannan-Quinn criter.	1.305980
F-statistic	10.70649	Durbin-Watson stat	0.581564
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 01:17
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	7.206492	2.031789	3.546871	0.0011
LNER	0.670559	1.672275	0.400986	0.6907
MMR	-0.060741	0.012640	-4.805369	0.0000
DFA(2)	0.022790	0.379306	0.060083	0.9524
DFA(1)	-0.285242	0.372023	-0.766732	0.4480
DFA	0.530198	0.358389	1.479395	0.1473
DFA(-1)	0.594845	0.338575	1.756908	0.0870
DFA(-2)	0.725917	0.332741	2.181625	0.0354
DER(2)	0.954405	2.663043	0.358389	0.7220
DER(1)	0.214905	2.608143	0.082398	0.9348
DER	0.895907	2.485982	0.360384	0.7206
DER(-1)	0.786030	2.305479	0.340940	0.7350
DER(-2)	1.085366	2.119523	0.512080	0.6116
DMMR(2)	0.013724	0.033779	0.406299	0.6868
DMMR(1)	0.035748	0.034938	1.023170	0.3127
DMMR	0.098757	0.035819	2.757152	0.0089
DMMR(-1)	0.110411	0.036427	3.031019	0.0044
DMMR(-2)	0.099689	0.035483	2.809483	0.0078

R-squared	0.820396	Mean dependent var	7.682946
Adjusted R-squared	0.740047	S.D. dependent var	0.235368
S.E. of regression	0.120004	Akaike info criterion	-1.147494
Sum squared resid	0.547235	Schwarz criterion	-0.496488
Log likelihood	50.12983	Hannan-Quinn criter.	-0.895100
F-statistic	10.21040	Durbin-Watson stat	0.427195
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 01:17
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	32.47214	3.282234	9.893305	0.0000
LNER	-19.96900	2.685181	-7.436745	0.0000
MMR	-0.256276	0.021088	-12.15285	0.0000
DFL(2)	0.234221	0.253099	0.925414	0.3606
DFL(1)	-0.272905	0.272574	-1.001213	0.3231
DFL	0.428809	0.250779	1.709904	0.0954
DFL(-1)	0.594544	0.255838	2.323907	0.0256
DFL(-2)	0.186832	0.273775	0.682431	0.4991
DER(2)	-3.256523	4.212934	-0.772982	0.4443
DER(1)	-5.419938	4.093623	-1.323996	0.1934
DER	14.80252	3.915152	3.780829	0.0005
DER(-1)	9.385710	3.721558	2.521984	0.0160
DER(-2)	4.243256	3.190106	1.330130	0.1914
DMMR(2)	-0.016221	0.059093	-0.274498	0.7852
DMMR(1)	0.054006	0.057331	0.942006	0.3521
DMMR	0.277372	0.056829	4.880780	0.0000
DMMR(-1)	0.277111	0.056712	4.886269	0.0000
DMMR(-2)	0.278659	0.055450	5.025440	0.0000

R-squared	0.890097	Mean dependent var	7.019760
Adjusted R-squared	0.840930	S.D. dependent var	0.506786
S.E. of regression	0.202125	Akaike info criterion	-0.104774
Sum squared resid	1.552465	Schwarz criterion	0.546232
Log likelihood	20.93367	Hannan-Quinn criter.	0.147620
F-statistic	18.10347	Durbin-Watson stat	0.707213
Prob(F-statistic)	0.000000		

Lebanon

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except IR)			**Log first differences**		
DCPS	-2. 004344	-4.382803	DCPS	-3.398386***	-10.09369
FA	-4.237334	-4.508700	FA	-7.680608	-8.740741
FL	-1.908996	-2.571202	FL	8.051715	-8.447283
ER	-3.874664**	-8.535970[1]	ER	-0.941308	-0.1440388
IR	-5.008172[1]	-2.912102	IR	-7.037367	-12.18272

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

Cointegration between domestic credit to private sector, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	149.3179	29.79707	123.8697	21.13162
$r \leq 1 \mid r = 2$	25.44818	15.49471	22.16092	14.26460
$r \leq 2 \mid r = 3$	3.287253	3.841466	3.841466	3.841466

$DCPS = 63.211 - 7.259ER - 0.0076R$

Cointegration between foreign asset, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	136.2494	29.79707	124.1395	21.13162
$r \leq 1 \mid r = 2$	12.10984	15.49471	9.857676	14.26460
$r \leq 2 \mid r = 3$	2.252166	3.841466	2.252166	3.841466

$FA = 100.15 - 12.053ER - 0.115R$

Cointegration between foreign liability, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	164.4980	29.79707	132.3275	21.13162
$r \leq 1 \mid r = 2$	32.17053	15.49471	28.01136	14.26460
$r \leq 2 \mid r = 3$	4.159164	3.841466	4.159164	3.841466

$FL = 140.23 - 17.61ER - 0.094R$

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 10:43
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	51.89359	2.530133	20.51022	0.0000
LNER	-5.681729	0.346000	-16.42119	0.0000
LR	-0.013895	0.001716	-8.098658	0.0000
DDCPS(2)	-1.097273	0.280016	-3.918613	0.0004
DDCPS(1)	-1.523865	0.243539	-6.257177	0.0000
DDCPS	-0.682524	0.228099	-2.992235	0.0048
DDCPS(-1)	-0.099899	0.267918	-0.372871	0.7113
DDCPS(-2)	-0.701614	0.266501	-2.632687	0.0122
DER(2)	26.10336	4.873772	5.355884	0.0000
DER(1)	-7.587925	1.462780	-5.187331	0.0000
DER	1.980626	0.454533	4.357500	0.0001
DER(-1)	0.425684	0.424512	1.002760	0.3223
DER(-2)	0.913220	0.293330	3.113282	0.0035
DLR(2)	-0.002863	0.004476	-0.639769	0.5262
DLR(1)	-0.001307	0.004575	-0.285689	0.7767
DLR	0.010805	0.004407	2.451652	0.0189
DLR(-1)	0.009500	0.004321	2.198639	0.0341
DLR(-2)	0.002862	0.003473	0.824220	0.4150

R-squared	0.997966	Mean dependent var	9.659792
Adjusted R-squared	0.997056	S.D. dependent var	0.528995
S.E. of regression	0.028701	Akaike info criterion	-4.008647
Sum squared resid	0.031303	Schwarz criterion	-3.357641
Log likelihood	130.2421	Hannan-Quinn criter.	-3.756254
F-statistic	1096.795	Durbin-Watson stat	1.108775
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 10:44
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.27377	9.947090	-2.239225	0.0327
LNER	4.496540	1.356837	3.313987	0.0024
LR	-0.072113	0.004048	-17.81607	0.0000
DFA(3)	-0.271257	0.167341	-1.620988	0.1155
DFA(2)	-0.453445	0.178020	-2.547153	0.0162
DFA(1)	-0.389522	0.194165	-2.006142	0.0539
DFA	0.453526	0.188773	2.402493	0.0227
DFA(-1)	0.367339	0.176201	2.084770	0.0457
DFA(-2)	0.221403	0.172204	1.285700	0.2084
DFA(-3)	0.208864	0.160336	1.302659	0.2026
DER(3)	20.23072	16.83074	1.202010	0.2388
DER(2)	26.05939	16.61282	1.568631	0.1272
DER(1)	28.36368	17.28706	1.640746	0.1113
DER	-11.62017	4.914214	-2.364604	0.0247
DER(-1)	-2.974747	1.229583	-2.419313	0.0218
DER(-2)	-2.157731	1.130642	-1.908412	0.0659
DER(-3)	-0.703842	0.674298	-1.043815	0.3049
DLR(3)	-0.008263	0.015275	-0.540956	0.5925
DLR(2)	-0.027711	0.013891	-1.994891	0.0552
DLR(1)	-0.025772	0.013041	-1.976311	0.0574
DLR	0.036145	0.013740	2.630691	0.0133
DLR(-1)	0.035922	0.014434	2.488700	0.0186
DLR(-2)	0.029247	0.016284	1.796115	0.0826
DLR(-3)	0.008865	0.010922	0.811668	0.4234

R-squared	0.983508	Mean dependent var	9.213143
Adjusted R-squared	0.970865	S.D. dependent var	0.420097
S.E. of regression	0.071706	Akaike info criterion	-2.131374
Sum squared resid	0.154254	Schwarz criterion	-1.247381
Log likelihood	81.54710	Hannan-Quinn criter.	-1.790453
F-statistic	77.78756	Durbin-Watson stat	0.377369
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 10:45
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	55.24635	7.023587	7.865832	0.0000
LNER	-6.113733	0.958762	-6.376694	0.0000
LR	-0.070796	0.002107	-33.60100	0.0000
DFL(3)	-0.522807	0.126101	-4.145944	0.0003
DFL(2)	-0.790427	0.119288	-6.626221	0.0000
DFL(1)	-1.017488	0.129548	-7.854159	0.0000
DFL	-0.125376	0.113620	-1.103462	0.2786
DFL(-1)	-0.021063	0.107889	-0.195225	0.8465
DFL(-2)	0.103669	0.102071	1.015647	0.3179
DFL(-3)	0.213986	0.095880	2.231805	0.0332
DER(3)	4.015620	8.978542	0.447246	0.6579
DER(2)	30.25857	7.768472	3.895048	0.0005
DER(1)	14.02875	9.149372	1.533302	0.1357
DER	-10.15794	2.590195	-3.921688	0.0005
DER(-1)	-2.845725	0.644796	-4.413371	0.0001
DER(-2)	-1.674741	0.584621	-2.864661	0.0076
DER(-3)	-0.249964	0.327492	-0.763269	0.4513
DLR(3)	-0.023637	0.007702	-3.068961	0.0045
DLR(2)	-0.037755	0.006819	-5.536513	0.0000
DLR(1)	-0.038085	0.006930	-5.495539	0.0000
DLR	0.009520	0.007859	1.211465	0.2352
DLR(-1)	0.029847	0.009016	3.310647	0.0024
DLR(-2)	0.011938	0.009322	1.280575	0.2102
DLR(-3)	-0.008275	0.005811	-1.424060	0.1647

R-squared	0.998593	Mean dependent var	8.814673
Adjusted R-squared	0.997514	S.D. dependent var	0.753030
S.E. of regression	0.037543	Akaike info criterion	-3.425531
Sum squared resid	0.042285	Schwarz criterion	-2.541538
Log likelihood	116.4893	Hannan-Quinn criter.	-3.084610
F-statistic	925.7464	Durbin-Watson stat	0.726705
Prob(F-statistic)	0.000000		

Morocco

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPS	-1.790840	-1.670044	DCPS	-8.582094	-8.564118
FA	-1451163	-1.226972	FA	-7.974273	-8.984850
FL	-3.549934**	-3.549934**	FL	-8.199636	-9.618819
ER	-1.025503	-1.231368	ER	-6.924980	-6.928118
MMR	-1.898784	-1.434095	MMR	-6.371383	-6.600395

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 10:58
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	6.989443	3.446105	2.028216	0.0507
LNREER	1.300488	0.758300	1.715005	0.0957
MMR	-0.161770	0.009439	-17.13887	0.0000
DDCPS(-2)	0.284013	0.297060	0.956079	0.3460
DREER(2)	1.192730	1.755537	0.679410	0.5016
DREER(1)	2.239965	1.822316	1.229186	0.2277
DREER	1.475178	1.768728	0.834033	0.4103
DREER(-1)	0.316285	1.785638	0.177127	0.8605
DREER(-2)	2.515753	1.806545	1.392577	0.1731
DMMR(2)	-0.070786	0.035676	-1.984167	0.0556
DMMR(1)	-0.085276	0.034424	-2.477228	0.0185
DMMR	0.055974	0.030497	1.835385	0.0755
DMMR(-1)	0.052181	0.031570	1.652845	0.1078
DMMR(-2)	0.052489	0.031432	1.669956	0.1044

R-squared	0.950478	Mean dependent var	12.04698
Adjusted R-squared	0.930969	S.D. dependent var	0.406331
S.E. of regression	0.106759	Akaike info criterion	-1.394388
Sum squared resid	0.376114	Schwarz criterion	-0.843280
Log likelihood	46.76811	Hannan-Quinn criter.	-1.187002
F-statistic	48.72040	Durbin-Watson stat	0.781607
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 10:59
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	73.16676	7.250990	10.09059	0.0000
LNREER	-14.00555	1.595380	-8.778816	0.0000
MMR	-0.067577	0.019814	-3.410638	0.0017
DFA(-2)	0.132116	0.239725	0.551117	0.5853
DREER(2)	-1.640223	3.761083	-0.436104	0.6656
DREER(1)	-5.027241	3.790802	-1.326168	0.1939
DREER	5.941511	3.738664	1.589207	0.1215
DREER(-1)	2.019047	3.798248	0.531573	0.5986
DREER(-2)	4.429812	3.823942	1.158441	0.2550
DMMR(2)	-0.044531	0.076114	-0.585056	0.5625
DMMR(1)	0.033304	0.072656	0.458381	0.6497
DMMR	0.131262	0.063339	2.072370	0.0461
DMMR(-1)	0.071167	0.065420	1.087852	0.2845
DMMR(-2)	0.092675	0.065642	1.411810	0.1674

R-squared	0.832618	Mean dependent var	8.884615
Adjusted R-squared	0.766680	S.D. dependent var	0.464357
S.E. of regression	0.224299	Akaike info criterion	0.090433
Sum squared resid	1.660235	Schwarz criterion	0.641541
Log likelihood	11.87482	Hannan-Quinn criter.	0.297819
F-statistic	12.62722	Durbin-Watson stat	0.641621
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 10:59
Sample (adjusted): 1994Q4 2006Q2
Included observations: 47 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	9.133658	4.933272	1.851440	0.0731
LNREER	-0.197000	1.085430	-0.181495	0.8571
MMR	0.014608	0.013480	1.083624	0.2864
DFL(-2)	0.229755	0.163099	1.408687	0.1683
DREER(2)	-0.920821	2.558884	-0.359853	0.7213
DREER(1)	1.437045	2.579104	0.557188	0.5812
DREER	-0.914387	2.543632	-0.359481	0.7215
DREER(-1)	-0.494449	2.584170	-0.191337	0.8494
DREER(-2)	3.318509	2.601651	1.275540	0.2110
DMMR(2)	-0.103344	0.051785	-1.995646	0.0543
DMMR(1)	-0.006333	0.049432	-0.128107	0.8988
DMMR	-0.009758	0.043093	-0.226450	0.8222
DMMR(-1)	-0.022830	0.044509	-0.512929	0.6114
DMMR(-2)	0.024530	0.044660	0.549260	0.5865

R-squared	0.405366	Mean dependent var	8.340870
Adjusted R-squared	0.171116	S.D. dependent var	0.167617
S.E. of regression	0.152604	Akaike info criterion	-0.679838
Sum squared resid	0.768502	Schwarz criterion	-0.128730
Log likelihood	29.97619	Hannan-Quinn criter.	-0.472452
F-statistic	1.730483	Durbin-Watson stat	1.295186
Prob(F-statistic)	0.100420		

Oman

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except LR)			**Log first differences**		
DCPS	-1.582133	-1. 407827	DCPS	-3.565362**	-3.659253**
FA	-1.235881	-1.654607	FA	-6.783642	-6.779900
FL	-1.602285	-1.518857	FL	-9.293254	-9.290477
LR	-2.006126	-1.278478	LR	-2.871369[2]	-6.968580
Neer	-1.353378	-1.438042	NEER	-7.161611	-7.133106

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

Cointegration between domestic credit to private sector, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	37.23031	29.79707	29.86657	21.13162
$r \leq 1 \mid r = 2$	7.363749	15.49471	7.119723	14.26460
$r \leq 2 \mid r = 3$	0.244026	3.841466	0.244026	3.841466

$DCPS = -45.91 + 13.34ER - 0.78R$

Cointegration between foreign asset, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	38.87359	29.79707	28.83728	21.13162
$r \leq 1 \mid r = 2$	10.03631	15.49471	8.945550	14.26460
$r \leq 2 \mid r = 3$	1.090762	3.841466	1.090762	3.841466

$FA = -29.762 + 9.2560\text{ER} - 0.693\text{R}$

Cointegration between foreign liability, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	27.85332	29.79707	20.52811	21.13162
$r \leq 1 \mid r = 2$	7.325207	15.49471	6.394964	14.26460
$r \leq 2 \mid r = 3$	0.930242	3.841466	0.930242	3.841466

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 11:14
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	-34.60465	3.234102	-10.69992	0.0000
LNNEER	10.26162	0.771071	13.30827	0.0000
LR	-0.472906	0.053063	-8.912081	0.0000
DDCPS(-3)	-1.509744	1.732884	-0.871232	0.3894
DNEER(3)	6.548086	1.795040	3.647878	0.0008
DNEER(2)	5.891853	1.766925	3.334525	0.0020
DNEER(1)	8.150945	1.741609	4.680124	0.0000
DNEER	-3.233315	1.471750	-2.196919	0.0345
DNEER(-1)	-3.228396	1.381464	-2.336939	0.0251
DNEER(-2)	-2.163785	1.369964	-1.579447	0.1230
DNEER(-3)	-2.772100	1.329723	-2.084720	0.0442
DLR(3)	-0.026897	0.145851	-0.184411	0.8547
DLR(2)	0.108431	0.143739	0.754363	0.4555
DLR(1)	0.037112	0.142972	0.259573	0.7967
DLR	0.474777	0.151497	3.133905	0.0034
DLR(-1)	0.552814	0.149231	3.704407	0.0007
DLR(-2)	0.356451	0.147648	2.414200	0.0210
DLR(-3)	0.430835	0.156448	2.753849	0.0092

R-squared	0.857365	Mean dependent var	7.679609
Adjusted R-squared	0.790010	S.D. dependent var	0.418774
S.E. of regression	0.191902	Akaike info criterion	-0.202460
Sum squared resid	1.325752	Schwarz criterion	0.460534
Log likelihood	23.46643	Hannan-Quinn criter.	0.053231
F-statistic	12.72897	Durbin-Watson stat	0.621155
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 11:15
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.53217	3.006913	-6.495756	0.0000
LNNEER	6.716877	0.720017	9.328775	0.0000
LR	-0.538876	0.053239	-10.12190	0.0000
DFA(-3)	0.280435	0.243472	1.151813	0.2570
DNEER(3)	3.601917	1.729349	2.082816	0.0444
DNEER(2)	6.955812	1.734779	4.009625	0.0003
DNEER(1)	8.082274	1.706372	4.736525	0.0000
DNEER	0.036767	1.411919	0.026040	0.9794
DNEER(-1)	0.087466	1.386271	0.063095	0.9500
DNEER(-2)	-0.201620	1.323874	-0.152296	0.8798
DNEER(-3)	-0.032285	1.277888	-0.025264	0.9800
DLR(3)	0.106688	0.131728	0.809908	0.4233
DLR(2)	0.144783	0.139443	1.038301	0.3061
DLR(1)	0.259923	0.126346	2.057230	0.0470
DLR	0.562816	0.143956	3.909631	0.0004
DLR(-1)	0.552242	0.142016	3.888588	0.0004
DLR(-2)	0.354726	0.145385	2.439909	0.0197
DLR(-3)	0.297140	0.146679	2.025790	0.0502

R-squared	0.820113	Mean dependent var	6.084187
Adjusted R-squared	0.735167	S.D. dependent var	0.359667
S.E. of regression	0.185092	Akaike info criterion	-0.274727
Sum squared resid	1.233324	Schwarz criterion	0.388268
Log likelihood	25.41763	Hannan-Quinn criter.	-0.019036
F-statistic	9.654457	Durbin-Watson stat	0.892123
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 11:16
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	-73.41723	7.067551	-10.38793	0.0000
LNNEER	18.37492	1.684935	10.90542	0.0000
LR	-0.478002	0.119203	-4.009987	0.0003
DFL(-3)	0.139991	0.395189	0.354238	0.7252
DNEER(3)	9.617020	4.046092	2.376866	0.0229
DNEER(2)	13.75741	4.057069	3.390972	0.0017
DNEER(1)	15.14314	3.852816	3.930409	0.0004
DNEER	-7.772754	3.204551	-2.425536	0.0204
DNEER(-1)	-4.830902	3.258501	-1.482554	0.1469
DNEER(-2)	-4.015026	3.067778	-1.308773	0.1989
DNEER(-3)	-4.139602	2.973749	-1.392048	0.1724
DLR(3)	0.081758	0.315909	0.258801	0.7973
DLR(2)	0.162398	0.320084	0.507361	0.6150
DLR(1)	0.401439	0.284890	1.409101	0.1674
DLR	0.745109	0.325325	2.290353	0.0280
DLR(-1)	0.915521	0.330799	2.767605	0.0089
DLR(-2)	0.666444	0.343407	1.940682	0.0602
DLR(-3)	0.684915	0.340860	2.009376	0.0520

R-squared	0.804164	Mean dependent var	5.670699
Adjusted R-squared	0.711685	S.D. dependent var	0.801288
S.E. of regression	0.430251	Akaike info criterion	1.412306
Sum squared resid	6.664178	Schwarz criterion	2.075301
Log likelihood	-20.13227	Hannan-Quinn criter.	1.667997
F-statistic	8.695706	Durbin-Watson stat	0.623161
Prob(F-statistic)	0.000000		

Qatar

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except LR)			**Log first differences**		
DCPS	-0.115962	-0. 115962	DCPS	-6.482074	-6.472188
FA	0.99767	-1.169375	FA	-17.23763	-16.76566
FL	-2.313577	-2.818862	FL	-6.725119	-6.720066
LR			LR		
NEER	-1.040986	-1.157031		-6.772465	-6.745412

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/19/09 Time: 11:37
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	6.050827	2.786375	2.171577	0.0362
LNNEER	0.996106	0.618575	1.610324	0.1156
LR	-0.127832	0.014694	-8.699391	0.0000
DDCPS(2)	-0.119957	0.423011	-0.283579	0.7783
DDCPS(1)	-0.081659	0.364142	-0.224250	0.8238
DDCPS	0.877742	0.335922	2.612931	0.0128
DDCPS(-1)	0.882052	0.340825	2.587992	0.0136
DDCPS(-2)	1.153081	0.345861	3.333948	0.0019
DNEER(2)	1.100344	1.671942	0.658124	0.5144
DNEER(1)	2.118379	1.709435	1.239228	0.2229
DNEER	1.988936	1.424283	1.396447	0.1707
DNEER(-1)	3.141063	1.483001	2.118046	0.0408
DNEER(-2)	2.581010	1.786747	1.444530	0.1568
DLR(2)	0.040027	0.079967	0.500545	0.6196
DLR(1)	0.004884	0.071522	0.068283	0.9459
DLR	0.102626	0.074481	1.377888	0.1763
DLR(-1)	0.178871	0.081504	2.194625	0.0344
DLR(-2)	0.100492	0.068014	1.477518	0.1478

R-squared	0.858209	Mean dependent var	9.742566
Adjusted R-squared	0.794776	S.D. dependent var	0.469656
S.E. of regression	0.212762	Akaike info criterion	-0.002194
Sum squared resid	1.720170	Schwarz criterion	0.648812
Log likelihood	18.06144	Hannan-Quinn criter.	0.250199
F-statistic	13.52937	Durbin-Watson stat	0.448860
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/19/09 Time: 11:38
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	8.152393	3.416674	2.386061	0.0221
LNNEER	0.449205	0.766665	0.585921	0.5614
LR	-0.127331	0.022640	-5.624243	0.0000
DFA(2)	-0.204014	0.427521	-0.477202	0.6360
DFA(1)	0.164592	0.425635	0.386698	0.7011
DFA	0.997488	0.437287	2.281086	0.0282
DFA(-1)	1.026420	0.439427	2.335815	0.0249
DFA(-2)	0.741054	0.425296	1.742442	0.0895
DNEER(2)	0.286659	2.493673	0.114955	0.9091
DNEER(1)	1.761433	2.534881	0.694878	0.4914
DNEER	-1.658114	2.179734	-0.760696	0.4515
DNEER(-1)	1.711936	2.133180	0.802528	0.4272
DNEER(-2)	0.209907	2.004183	0.104734	0.9171
DLR(2)	-0.020557	0.101724	-0.202084	0.8409
DLR(1)	0.008290	0.102861	0.080596	0.9362
DLR	0.137573	0.106163	1.295860	0.2028
DLR(-1)	0.127234	0.103481	1.229542	0.2264
DLR(-2)	0.225847	0.087213	2.589607	0.0135

R-squared	0.817597	Mean dependent var	9.377406
Adjusted R-squared	0.735996	S.D. dependent var	0.544246
S.E. of regression	0.279641	Akaike info criterion	0.544470
Sum squared resid	2.971562	Schwarz criterion	1.195476
Log likelihood	2.754836	Hannan-Quinn criter.	0.796864
F-statistic	10.01943	Durbin-Watson stat	0.337165
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/19/09 Time: 11:38
Sample (adjusted): 1992Q3 2006Q2
Included observations: 56 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	-21.39593	7.659635	-2.793335	0.0081
LNNEER	6.541258	1.679645	3.894429	0.0004
LR	0.036632	0.038964	0.940150	0.3531
DFL(2)	-0.459869	0.228030	-2.016705	0.0508
DFL(1)	-0.596277	0.199838	-2.983794	0.0050
DFL	0.234758	0.185300	1.266910	0.2129
DFL(-1)	0.289705	0.192995	1.501102	0.1416
DFL(-2)	0.097630	0.212420	0.459611	0.6484
DNEER(2)	4.864177	4.504028	1.079962	0.2870
DNEER(1)	-0.473714	4.728840	-0.100176	0.9207
DNEER	-10.32045	3.931652	-2.624965	0.0124
DNEER(-1)	-7.962045	4.043123	-1.969281	0.0562
DNEER(-2)	-4.632885	4.661238	-0.993917	0.3266
DLR(2)	0.405214	0.237880	1.703440	0.0967
DLR(1)	0.494579	0.205042	2.412087	0.0208
DLR	0.378407	0.202764	1.866242	0.0697
DLR(-1)	0.227071	0.208233	1.090467	0.2824
DLR(-2)	0.384420	0.185273	2.074881	0.0448

R-squared	0.757544	Mean dependent var	8.167312
Adjusted R-squared	0.649077	S.D. dependent var	0.967508
S.E. of regression	0.573139	Akaike info criterion	1.979716
Sum squared resid	12.48257	Schwarz criterion	2.630721
Log likelihood	-37.43204	Hannan-Quinn criter.	2.232109
F-statistic	6.984098	Durbin-Watson stat	0.507806
Prob(F-statistic)	0.000000		

Tunisia

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPS	-1.917827	-1.875320	DCPS	-3.383071***	-3.510807**
FA	-3.558719**	-3.558719**	FA	-7.731712	-9.797761
FL	-3.043110	-2.854091	FL	-0.065584	-10.38808
ER	-1.727746	-1.760531	ER	-7.541196	-7.544133
MMR	-1.343780	-1.416498	MMR	-6.661300	-6.595340

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 12:37
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	6.199860	0.550523	11.26177	0.0000
LNREER	0.607506	0.108519	5.598167	0.0000
MMR	-0.033082	0.004438	-7.454409	0.0000
DDCPS(-1)	-5.79E-05	2.51E-06	-23.12265	0.0000
DREER(1)	0.406133	0.238739	1.701159	0.0954
DREER	-0.352757	0.235947	-1.495071	0.1414
DREER(-1)	-0.304854	0.236611	-1.288421	0.2038
DMMR(1)	-0.007156	0.010405	-0.687769	0.4949
DMMR	0.033812	0.010349	3.267211	0.0020
DMMR(-1)	0.024983	0.010147	2.461972	0.0175

R-squared	0.996584	Mean dependent var	9.643752
Adjusted R-squared	0.995943	S.D. dependent var	0.334336
S.E. of regression	0.021294	Akaike info criterion	-4.705158
Sum squared resid	0.021766	Schwarz criterion	-4.349910
Log likelihood	146.4496	Hannan-Quinn criter.	-4.566782
F-statistic	1555.898	Durbin-Watson stat	1.079080
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 12:38
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	16.78698	1.883951	8.910521	0.0000
LNREER	-2.071432	0.420045	-4.931456	0.0000
MMR	-0.110427	0.012724	-8.678366	0.0000
DFA(-1)	0.293377	0.186250	1.575179	0.1218
DREER(1)	-0.517041	1.539944	-0.335753	0.7385
DREER	1.636019	1.619969	1.009907	0.3176
DREER(-1)	0.948636	1.624655	0.583900	0.5620
DMMR(1)	-0.078667	0.072908	-1.078990	0.2860
DMMR	0.036650	0.072546	0.505200	0.6157
DMMR(-1)	0.045702	0.066346	0.688847	0.4942

R-squared	0.840121	Mean dependent var	6.544736
Adjusted R-squared	0.810144	S.D. dependent var	0.335106
S.E. of regression	0.146014	Akaike info criterion	-0.854644
Sum squared resid	1.023363	Schwarz criterion	-0.499395
Log likelihood	34.78468	Hannan-Quinn criter.	-0.716268
F-statistic	28.02532	Durbin-Watson stat	0.760170
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 12:38
Sample (adjusted): 1992Q2 2006Q3
Included observations: 58 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	17.80197	1.261518	14.11155	0.0000
LNREER	-1.981662	0.281446	-7.041009	0.0000
MMR	-0.217684	0.008354	-26.05825	0.0000
DFL(-1)	0.097411	0.192885	0.505022	0.6159
DREER(1)	-1.871221	1.051283	-1.779941	0.0814
DREER	0.619827	1.081066	0.573348	0.5691
DREER(-1)	1.299810	1.110959	1.169989	0.2478
DMMR(1)	-0.076266	0.046986	-1.623165	0.1111
DMMR	0.148576	0.046006	3.229522	0.0022
DMMR(-1)	0.074872	0.044705	1.674806	0.1005

R-squared	0.970835	Mean dependent var	7.203576
Adjusted R-squared	0.965367	S.D. dependent var	0.524881
S.E. of regression	0.097680	Akaike info criterion	-1.658656
Sum squared resid	0.457986	Schwarz criterion	-1.303407
Log likelihood	58.10101	Hannan-Quinn criter.	-1.520279
F-statistic	177.5371	Durbin-Watson stat	0.767945
Prob(F-statistic)	0.000000		

Turkey

Variables	ADF	PP	Variables	ADF	PP
	Trend & intercept	Trend & intercept		Trend & intercept	Trend & intercept
Log Levels(except MMR)			**Log first differences**		
DCPS	-0.297522	-0.466358	DCPC	-5.754629	-5.804123
FA	-0.838725	-0.643087	FA	-8.109557	-8.306945
FL	-1.047623	-1.047623	FL	-7.356149	-7.356149
ER	0.429573	0.067390	ER	-5.849184	-5.780863
MMR	-5.285717[1]	-4.154247[1]	MMR	-8.580406	-22.25939

* reject null hypothesis (unit root) at 1 percent level;
** reject null hypothesis (unit root) at 5 percent level;
*** reject null hypothesis (unit root) at 10 percent level;

1 reject null hypothesis (series has no unit root)
2 cannot reject null hypothesis (series has a unit root)

Cointegration between domestic credit to private sector, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	37.23031	29.79707	29.86657	21.13162
$r \leq 1 \mid r = 2$	7.363749	15.49471	7.119723	14.26460
$r \leq 2 \mid r = 3$	0.244026	3.841466	0.244026	3.841466

$DCPS = 12.576 - 0.036ER - 0.869R$

Cointegration between foreign asset, exchange rate and interest rate

$H_0 \mid H_1$	Trace statistic	0.05 critical value	Max-Eigen statistics	0.05 critical value
$r \leq 0 \mid r = 0$	56.39903	29.79707	38.74828	21.13162
$r \leq 1 \mid r = 2$	17.65075	15.49471	9.386081	14.26460
$r \leq 2 \mid r = 3$	8.264671	3.841466	8.264671	3.841466

$FA = 10.658 + 1.004ER - 0.030R$

DOLS TEST

Dependent Variable: LNDCPS
Method: Least Squares
Date: 03/18/09 Time: 13:08
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	11.31153	0.202795	55.77828	0.0000
LNER	1.026545	0.024977	41.09942	0.0000
MMR	-0.020802	0.003413	-6.094537	0.0000
DCPS(-3)	3.98E-06	1.96E-06	2.029242	0.0499
DER(3)	0.403691	0.334802	1.205763	0.2358
DER(2)	0.664857	0.326087	2.038895	0.0489
DER(1)	1.270219	0.322066	3.943974	0.0004
DER	0.271284	0.317411	0.854678	0.3984
DER(-1)	0.858447	0.298376	2.877066	0.0067
DER(-2)	0.701908	0.298819	2.348938	0.0244
DER(-3)	0.491828	0.299182	1.643906	0.1089
DMMR(3)	0.000766	0.001282	0.597655	0.5538
DMMR(2)	-0.000723	0.001647	-0.439167	0.6632
DMMR(1)	-0.002563	0.002224	-1.152518	0.2567
DMMR	0.014777	0.002617	5.646301	0.0000
DMMR(-1)	0.010747	0.002176	4.937934	0.0000
DMMR(-2)	0.005452	0.001473	3.700726	0.0007
DMMR(-3)	0.003508	0.001145	3.064507	0.0041

R-squared	0.994288	Mean dependent var	9.129570
Adjusted R-squared	0.991591	S.D. dependent var	2.009385
S.E. of regression	0.184260	Akaike info criterion	-0.283739
Sum squared resid	1.222259	Schwarz criterion	0.379255
Log likelihood	25.66096	Hannan-Quinn criter.	-0.028048
F-statistic	368.6420	Durbin-Watson stat	0.550462
Prob(F-statistic)	0.000000		

Dependent Variable: LNFA
Method: Least Squares
Date: 03/18/09 Time: 13:08
Sample (adjusted): 1993Q2 2006Q1
Included observations: 52 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	9.680312	0.110780	87.38314	0.0000
LNER	1.146581	0.034627	33.11216	0.0000
MMR	-0.005456	0.003053	-1.786906	0.0829
DFA(-3)	0.103337	0.219143	0.471549	0.6403
DER(3)	0.172649	0.444437	0.388467	0.7001
DER(2)	0.099593	0.390961	0.254738	0.8005
DER(1)	0.534748	0.429523	1.244981	0.2217
DER	-0.486897	0.364670	-1.335171	0.1907
DER(-1)	0.085869	0.334986	0.256335	0.7992
DER(-2)	0.252481	0.323965	0.779345	0.4412
DER(-3)	0.336720	0.321851	1.046198	0.3029
DMMR(3)	0.000618	0.001361	0.453822	0.6528
DMMR(2)	0.000386	0.001762	0.218802	0.8281
DMMR(1)	0.000221	0.002406	0.091751	0.9274
DMMR	0.004637	0.002746	1.688500	0.1005
DMMR(-1)	0.004070	0.002337	1.741599	0.0906
DMMR(-2)	0.001689	0.001605	1.052690	0.2999
DMMR(-3)	0.000950	0.001226	0.774906	0.4438

R-squared	0.992651	Mean dependent var	8.062515
Adjusted R-squared	0.988977	S.D. dependent var	1.887469
S.E. of regression	0.198165	Akaike info criterion	-0.132008
Sum squared resid	1.335160	Schwarz criterion	0.543423
Log likelihood	21.43220	Hannan-Quinn criter.	0.126936
F-statistic	270.1614	Durbin-Watson stat	0.748178
Prob(F-statistic)	0.000000		

Dependent Variable: LNFL
Method: Least Squares
Date: 03/18/09 Time: 13:09
Sample (adjusted): 1992Q4 2006Q1
Included observations: 54 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	9.955983	0.173220	57.47603	0.0000
LNER	1.248202	0.038828	32.14677	0.0000
MMR	-0.007986	0.004350	-1.835980	0.0746
DFL(-3)	0.812386	0.356433	2.279212	0.0287
DER(3)	0.332883	0.512503	0.649524	0.5201
DER(2)	0.504691	0.494812	1.019966	0.3146
DER(1)	1.522524	0.489037	3.113309	0.0036
DER	0.048788	0.491988	0.099165	0.9216
DER(-1)	0.358737	0.465981	0.769854	0.4464
DER(-2)	-0.229296	0.519361	-0.441496	0.6615
DER(-3)	0.073818	0.467512	0.157895	0.8754
DMMR(3)	0.003139	0.001917	1.637686	0.1102
DMMR(2)	0.001726	0.002436	0.708291	0.4833
DMMR(1)	0.002591	0.003131	0.827765	0.4133
DMMR	0.007505	0.004148	1.809187	0.0788
DMMR(-1)	0.006704	0.003426	1.956853	0.0582
DMMR(-2)	0.003316	0.002355	1.407923	0.1677
DMMR(-3)	0.002657	0.001762	1.508140	0.1402

R-squared	0.987538	Mean dependent var	8.126143
Adjusted R-squared	0.981653	S.D. dependent var	2.081063
S.E. of regression	0.281880	Akaike info criterion	0.566532
Sum squared resid	2.860431	Schwarz criterion	1.229527
Log likelihood	2.703639	Hannan-Quinn criter.	0.822223
F-statistic	167.8117	Durbin-Watson stat	0.514183
Prob(F-statistic)	0.000000		