

The Macroeconomic Determinants of Credit Risk: The Algerian Banking System

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Abstract. The aim of the paper is to identify the main macroeconomic factors explaining credit risk in the Algerian banking system. To this end, we conducted an empirical study using macroeconomic data from 1980 to 2014. We have therefore used the Ordinary Least Squares (OLS) method to determine the factors that allow us to explain the credit risk in the Algerian banking system. We also applied the Granger Causality Test.

The analysis of the results shows that credit risk in Algerian banks can be explained at macroeconomic level mainly by financial development, GDP, money supply and political stability. Indeed, these results have shown that non-performing loans are linked, on the one hand, positively with the financial development, the money supply and political stability. On the other hand negatively with GDP.

Keywords: macroeconomic determinant, credit risk, Algerian banking system, abstract.

1 Introduction

The quality of assets in banking institution is statistically a significant indicator of the insolvency of banking institutions (ut-Kunt 1998, Barr and Siems 1994). In fact, these Failing institutions have a high rate of non-performing loans (NPL).

In addition, the accumulation of non-performing loans is likely susceptible to slow economic growth (Nkuzu 2011). This is why the identification of the determinants of credit risk is necessary for assist the authorities in the implementation of preventive measures against crises and vulnerable situations (Agnello and Sousa, 2011; Agnello et al. 2011). Exploring the determinants of credit risk is therefore an important step for good bank management and financial stability.

Theoretically, the determinants of credit risk in banking institutions may be related to the macroeconomic environment, specific to the bank and / or the borrower. On the macroeconomic level, many empirical studies have been conducted on the macroeconomic determinants of credit risk.

In fact, the relation between the macroeconomic factors (GDP, Exchange rate, Interest rate, Inflation rate, Monetary mass, Credit growth, Price indexes...) and credit risk has been highlighted by many studies in many countries (Salas and Saurina 2002, Jimenez, Jimenez and Saurina 2006, Quagliariello 2007, Bohachova 2008, Bonfim 2001, Espinoza, Prasad 2010, Aver Festic et al. 2011, Louzisetal. 2012, Lobna, Ouertani and Ghorbel 2013, Lleshanaku 2015).

To our knowledge few are the empirical studies done on the developing countries in particular on the Algerian banking system. This is why we have focused in this study on the Algerian context.

In fact, according to the International Monetary Fund's report about Algeria, the rate of non-performing loans was 11% at the end of 2012, 10% at the end of 2013, reaching 9% at the end of 2014. However, the proportion of non-performing loans remains high compared to international

standards. The level of the NPLs in the Algerian banking system therefore continues to be a source of preoccupation.

Reason why the main objective of this study is to identify the impact of macroeconomic environment on the production and accumulation of NPLs in the Algerian banking system.

In the next section we have reviewed the literature on the macroeconomic determinants of credit risk. Methodology and results are present in the third section while the last section will contain the conclusion.

2 Literature review

Many studies realized out on the phases of the economic cycle and financial stability highlight the importance of macroeconomic factors in the production and accumulation of nonperforming loans Salas and Saurina 2002 on the Spanish banking system, Quagliariello 2007 on the Italian banking system and Berge and Boye 2007 on the Norwegian banking system. Cifter et al 2009 on the financial system Turk.

Indeed, the expansion phase of the economy is characterized by a rate relatively low of non-performing loans; this is explained by the fact that borrowers have enough income to repay their debts. In addition, this phase is also characterized by the excessive granting of credit to the different sectors of the economy without taking into account the quality of these credits. This subsequently generates the production of non-performing loans.

The macroeconomic environment therefore influences the borrowers' balance sheet and their ability to repay.

In addition, the studies of Lawrence (1995), Rinaldi and Sanchis Arellano (2006) shows that GDP, real interest rate and annual unemployment rate are the main macroeconomic determinants of credit risk. Indeed, unemployment and interest rates have a negative impact on the repayment capacity of borrowers.

Aver (2008) also carried out an empirical study on credit risk in the banking system in Slovenia; its objective was to understand how macroeconomic factors influence credit risk. According to this author, the macroeconomic environment plays an important role in explaining the high rate of non-performing loans. It has a negative effect on banks during a recession phase. Indeed, the unemployment rate, the short and long-term interest rates are the main determinants of credit risk.

Similarly, in order to identify the impact of the economic cycle on the production and accumulation of non-performing loans Jung Hyun Park and Lei Zhang (2012) conducted an empirical study of three sectors (real estate, Industrial, and consumer loans). Thus, they used data from 2670 US banks between (2002-2006 and 2007-2010).

Indeed, according to these authors, the credit risk is correlated on the one hand, negatively with the GDP. On the other hand positively with the unemployment and the interest rate. According to this result we conclude that the economic cycle exercises a strong influence on the capacity of the borrower's repayment.

The academic literature on this subject also provides other macroeconomic explanatory variables for credit risk such as credit growth, inflation rate, money supply (M2) and GDP per capita. According to the studies realized by Gorter and Bloem (2002), Se-Hark Park (2003) and Nelson M. and Victor M (2009) the abuse of borrowing during the phase of economic growth is among the main causes of the accumulation of non-performing loans.

In addition, Vogiatzis and Nikolaidou (2011) exploited monthly data covering the period between December 2001 and November 2010 in the Romanian banking system, the authors confirm that the rate of inflation, the unemployment rate, and the country's external debt and the money supply significantly influences the credit risk in banks in Romania.

Vitor Castro (2012) also analyzed the link between non-performing loans and macroeconomic developments in the country group (GIPSI), which was marked by an unfavorable economic and financial environment.

According to this author, the credit risk in these countries is significantly affected by the macroeconomic environment. On the one hand, the rate of non-performing loans increases when the GDP rate and the price indices decrease. On the other hand, the credit risk decreases when the unemployment rate rises. Moreover, according to the same study, a slight appreciation in the real exchange rate leads to an increase in the rate of non-performing loans.

Another study was also conducted by Ahlem Set Fathi J (2013) on a sample of 85 banks in three countries (Italy, Greece and Spain) over a five-year period (2004-2008). Indeed, the results of this study confirm that there is a negative relationship between the growth rate of GDP and non-performing loans. While this relationship is positive with the unemployment rate and the interest rate.

Dimitrios P. Louzis, Angelos T. Vouldis and Vasilios L. Metaxas (2010) have also attempted to identify the determinants of credit risk by activity sector (individuals, households and firms) in the Greek banking system. For this reason these authors exploited a panel data of the nine largest Greek banks.

According to this study, macroeconomic factors are likely to affect borrowing capacity. Indeed, the results show that the accumulation of non-performing loans in the Greek banking system can be explained mainly by the macroeconomic fundamentals (GDP, unemployment rate, interest rate) and management quality.

Hippolyte F 2005 examined the main causes of the accumulation of non-performing loans recorded during the economic and banking crisis that affected a many countries in sub-Saharan Africa during the 1990s.

The author believes that this increase is attributed to factors internal and external to banks. At the macroeconomic level the changes in the real exchange rate, in the GDP, inflation and money supply are major factors affecting repayment of borrowers. Indeed, this result reflects the impact of the phase of the economic recession on the ability of borrowers to repay.

Gunsel, N (2012) also studied the micro and macroeconomic determinants of the fragility of banks in northern Cyprus, according to this author the inflation rate, the GDP rate are among the major macroeconomic factors influencing credit risk and Led to the deterioration of the credit portfolios of these banks.

Zribi, N (2011) examined the main macro- and micro-economic factors explaining credit risk in the Tunisian banking system. Indeed, at the macroeconomic level, inflation, the GDP rate, the exchange rate and the interest rate are negatively related to credit risk.

Messai and Jouini (2013) also realized a study on the determinants of non-performing loans on a sample of 85 banks operating in three countries (Italy, Greece and Spain) during the period 2004 to 2008. According to this study the non-performing loans are negatively related to the GDP rate, on the other hand, positively with the unemployment rate.

Lobna, Ouertani and Ghorbel (2013) also tried to identify the factors explaining credit risk in the Tunisian context. The authors therefore exploited the data for a period from 2003 until 2013 of 16 Tunisian banks. Indeed the authors estimate that the rate of non-productive claims in Tunisia is explained at macro-economic level mainly by GDP, inflation and the interest rate.

Moreover, by exploiting data from a period of 2000 to 2012 Avenir Lleshanaku (2015) also analyzed the macroeconomic factors explaining credit risk in the Albanian banking system. The results show that on the one hand, the economic growths rate GDP and the money supply M2 have a negative impact on non-performing loans. While the unemployment rate has a positive impact on these NPLs in the Albanian banking system. On the other hand the real interest rate and the inflation rate have a negative impact on non-performing loans.

Also Ozili, Peterson (2017) analysed the relationship between non-performing loans (NPLs) and financial (sector) development. In the pooled full country empirical analysis, the author fined that private credit to GDP ratio is positively associated with nonperforming loans. Also, NPLs are inversely associated with bank efficiency, loan loss coverage, banking competition and banking system stability, and is positively associated with foreign bank presence, banking crises and bank concentration. The result of these study show also that efficient and stable banking sectors experience

higher non performing loans. In the regional empirical analysis, NPLs are negatively associated with regulatory capital ratio and bank liquidity while the graphical analysis show that NPLs are inversely related to financial development and profitability in several regions.

Given the above, there is no exhaustive list of macroeconomic factors explaining the accumulation of non-performing loans. However, the factors previously cited allow us to provide an empirical model that helps to follow the evolution of NPLs in a specific context, our present article focuses on the Algerian context.

3 Methodology

The main objective of this study is to identify the explanatory factors for production and the accumulation of NPLs on the macroeconomic level in the Algerian banking system during the period 1980 to 2014.

The data used in this document are collected from the annual reports of the Bank of Algeria, The IMF and the World Bank.

To answer our research problematic we are therefore heavily inspired by previous studies on the macroeconomic determinants of credit risk in different banking systems (Salas and Saurina 2002, Jakubík 2007, Quagliarello 2007, Aver 2008, Bohachova 2008, Bonfim 2009, Cifter and Kattai 2010, Nkuzu 2011 and Louzis et al., 2012 Badar and Yasmin 2013).

However, the relationship between credit risk and the independent variables selected in the Algerian context is captured by the function:

$$NPLs = c + b1 \text{ unemploy} + b2 \text{ credit} + b3 \text{ fd} + b4 \text{ GDP} + B6 \text{ invest} + B7 \text{ M2} + B8 \text{ polstab} + B9 \text{ rer} + it$$

Knowing that: The dependent variable is credit risk (NPLs), it's a quantitative variable. It's calculated by the ratio of NPLs to total loans granted to the banking sector in year t. The following table presents a summary of the definition of variables and the expected sign:

Table 1: Description of variables:

Variables	Acronyms	Type of variable	Expected sign
Dependant variable			
<i>Non-performing loans</i>	NPLs	Quantitative variable	/
Independents variables			
<i>Unemployment</i>	UMPLOY	Quantitative variable	+
<i>Credit</i>	CREDIT	Quantitative variable	+
<i>Financial development</i>	FD	Quantitative variable	+
<i>Economic Growth Rate</i>	GDP	Quantitative variable	-
<i>Investissement</i>	INV	Quantitative variable	+
<i>Money supply</i>	M2	Quantitative variable	-
<i>Political stability</i>	POLSTAB	Quantitative variable	-
<i>Reel exchange rate</i>	RER	Quantitative variable	-

The steps of the estimation model and the analysis of the results are presented in the following section:

4 Results and discussions

4.1 Stationary test: unit root test

The first step in our data analysis is the stability of the time series to detect properties of the categorical variables in our model.

We therefore applied *DICKEY FULLER TEST* which allows us to test the appropriate slowdown in a standard AIC manner applied this test for each variable separately. The following table shows the results of this test.

Table 2: The results of the test of the unit root

<i>Variables</i>	<i>DICKEY FULLER TEST</i>	
	<i>I(0)</i>	<i>I(1)</i>
NPLs	0.2219	0.0001***
Unemployment	0.9398	0.0064**
Credit	0.9347	0.0155**
Financial development	0.1134	0.0000***
Economic Growth Rate	0.9972	0.0013**
Investissement	0.9578	0.0005***
Money supply	0.0016	0.0404**
Political stability	0.6438	0.0220**
Reel exchange rate	0.0479	0.0002***

Source: Our calculates under Eviews 9.

Note: (***), (**), (*): indicate respectively

The thresholds of statistical meanings of the order of 1%, 5% and 10%.

Each value in Table 01 represents the value of a statistical probability for each variable according to the Dickey-Fuller test. The results show the absence of the unit root for each of our variables. In addition, after the Stationary test of the first class we have observed the Stationary of all the variables with I (1) "first difference".

4.2 Cointegration test: Johansen test

The Johansen simultaneous cointegration test allows us to determine the number of common cointegration vectors at a certain level. The following table presents the results of this test.

Table 3: the results of the cointegration test

<u>Trace</u>			<u>Maximum-Eigenvalue</u>	
	<i>Trace</i>	<i>Prob</i>	<i>Max-eign</i>	<i>Prob</i>
<i>None</i>	340.6107	0.0000***	98.74625	0.0000***
<i>At most 1</i>	241.8644	0.0000***	73.78109	0.0001***
<i>At most 2</i>	168.0833	0.0000***	53.46997	0.0072**
<i>At most 3</i>	114.6133	0.0014**	36.35090	0.1340
<i>At most 4</i>	78.26244	0.0091**	29.49722	0.1526
<i>At most 5</i>	48.76522	0.0410**	25.81118	0.0828**
<i>At most 6</i>	22.95405	0.2483	12.43890	0.5050
<i>At most 7</i>	10.51514	0.2432	7.845461	0.3946
<i>At most 8</i>	2.669681	0.1023	2.669681	0.1023

Source: Our calculates under Eviews 9.

Note: (***), (**), (*): indicate respectively

The thresholds of statistical meanings of the order of 1%, 5% and 10%

The results indicate the presence of cointegration in the long-term relationship between the variables studied in the same class. The alternative hypothesis was therefore retained to the presence of a co-integration relation. So it's significant the existence of the long-term relationship between variables.

4.3 Estimation of the model with VECM

$$D() = A(1,1)*(B(1,1)*NPLS(-1) + B(1,2)*CHOMMAGE(-1) + B(1,3)*CREDIT(-1) + B(1,4)*FD(-1) + B(1,5)*GDP(-1) + B(1,6)*INV(-1) + B(1,7)*POLSTAB(-1) + B(1,8)) + C(1,1)*D(NPLS(-1)) + C(1,2)*D(NPLS(-2)) + C(1,3)*D(CHOMMAGE(-1)) + C(1,4)*D(CHOMMAGE(-2)) + C(1,5)*D(CREDIT(-1)) + C(1,6)*D(CREDIT(-2)) + C(1,7)*D(FD(-1)) + C(1,8)*D(FD(-2)) + C(1,9)*D(GDP(-1)) + C(1,10)*D(GDP(-2)) + C(1,11)*D(INV(-1)) + C(1,12)*D(INV(-2)) + C(1,13)*D(POLSTAB(-1)) + C(1,14)*D(POLSTAB(-2)) + C(1,15) D(NPLs) = A(1,1) * (B(1,1)$$

$$D(NPLs) = A(1,1) * (B(1,1) * NPLs(-1) + B$$

The estimation results indicate that VECM is negative (-0.85) and significant. The condition for error correction is therefore validated.

Indeed, this means that the dependent variable (NPLs) will take a long-term period until stabilization. The results also show that 85% of long-term equilibrium levels will be corrected each year.

In addition, there is no significant relationship between the dependent variable and other short-term independent variables.

4.4 Causality test: Granger Causality Test

The objective of this study and whether the dependent variable (NPLs) non-productive claims has a causal link with the independent variables selected from the literature review.

Table 4: the results of the test. Causality test

<i>Dependant Variables :</i>	<i>Independents Variables :</i>	<i>Chi-sq</i>	<i>df</i>	<i>Probability</i>
<i>NPLs</i>	Unemployment	0.870453	2	0.6471
	Credit	2.232288	2	0.3275
	Financial development	5.523347	2	0.0632*
	Economic Growth Rate	8.124522	2	0.0172**
	Investissement	0.023205	2	0.9885
	Money supply	7.321654	2	0.0257**
	Political stability	3.526229	2	0.1715
	Reel exchange rate	7.370532	2	0.0251**

Source: Our calculates under Eviews 9.

Note: (***), (**), (*): indicate respectively

The thresholds of statistical meanings of the order of 1%, 5% and 10%

The results indicate a causal link between the explanatory variables: FD at 10% GDP, M2 and RER and the dependent variables NPLS at the 5% threshold.

4.5 The estimation method MCO

Table 5: Estimation result

Estimation method MCO			
	(NPLS) $R^2 = 0.682964$, Nombre = 34		
Variables	coefficient	t-statistic	Probability
Unemployment	-0.028547	-0.051974	0.9590
Credit	0.001757	0.023614	0.9813
Financial development	0.211117	2.813717	0.0094***
Economic Growth Rate	-0.004531	-2.078600	0.0481**
Investissement	0.082771	0.258907	0.7978
Money supply	0.272068	2.687587	0.0126**
Political stability	13.22819	3.500613	0.0018***
Reel exchange rate	-0.500431	-1.353402	0.1880

Source: Our calculates under Eviews 9.

Note: (***), (**), (*): indicate respectively

The thresholds of statistical meanings of the order of 1%, 5% and 10%

The results indicate that the correlation coefficient $R^2 = 0.68$. This therefore means a strong link between our explanatory variables and the variable to be explained.

Moreover, according to the results of the estimate, the coefficients representing financial development, political stability and money supply M2 are positive and statistically significant.

Indeed, on the one hand, the coefficients of financial development and political stability are positively significant at the 1% threshold. On the other hand, the coefficient of the money supply M2 is positively significant at the threshold of 5%.

It also finds that the GDP coefficient is negative and statistically significant at the 1% threshold.

In line with the theory, our results show that there is a positive relationship between financial development and credit risk. Indeed, during the expansion phase of the economy, the rate NPLs relatively low. The borrowers therefore have sufficient income to repay their loans. This phase is also characterized by excessive credit to different sectors of the economy without taking into account the quality of these credits. So what causes subsequently the production and accumulation of non-performing loans. Our results are also in line with those found in studies conducted by (Ozili, Peterson 2017).

In addition, our results show a positive relationship between political stability and credit risk. Our results contradicted the research on which political stability and credit risk are negatively related (Alireza T, Mariani A, Aisyah A, Mansor J 2013 and Seema B 2014).

Nevertheless, this positive relationship can be explained by the existence of the long-term relationship between the variables in our model. Indeed, the period of economic expansion is characterized, on the one hand, by political stability. On the other hand by the excessive lending of credit to different sectors of the economy without taking into account the quality of loans. This leads to the production of NPLs (Salas and Saurina 2002, Cifter et al 2009, Quagliariello 2007 Berge and Boye 2007).

As for the relationship between money supply and credit risk, our results indicate that this relationship is positive. An increase in the money supply therefore leads to an increase in the rate of non-performing loans in Algerian banks. Our results are identical to those of the Hippolyte Fofack 2005 study.

In addition, the impact of GDP on credit risk is also identified by our study. Our results show that GDP is negatively related to credit risk in the Algerian context. This finding is consistent with the studies conducted by Lawrence (1995), Rinaldi and Sanchis Arellano (2006), Ahlem Set Fathi J (2013), Messai and Jouini (2013) and Avenir Lleshanaku (2015). Indeed, during the period of expansion of the economy a number relatively low NPLs. This is because borrowers have enough income to repay their loans.

5 Conclusions

The objective of this study is to determine the impact of macroeconomic conditions on the production and accumulation of NPLs in the Algerian banking system. Indeed, the results of this study show that financial development, money supply, political stability and GDP are statistically significant variables of credit risk in Algerian banks.

Financial development, money supply, political stability are positively associated with the rate of NPLs in Algeria. This means that an increase in each of these variables generates production and accumulation of NPLs.

Moreover, according to our results, there is also a negative relationship between GDP and the rate of non-performing loans. Indeed, the period of economic growth is characterized by a relatively small number of NPLs because the borrowers repay their debts.

However, these results indicate that many measures can be used to reduce the rate of NPLs in Algerian context.

We have therefore made a managerial contribution, since the identification of the explanatory factors for credit risk at the level of a banking system proves to be the starting point for credit risk management and therefore a Good credit risk management.

In addition, as a research perspective, it is relevant to broaden the study sample. The study sample. This study can also serve as a basis for reflection on future research, in particular those on the causality test between non-performing loans and on the one hand, other macroeconomic variables (nominal exchange rate, inflation rate, The prices of certain raw materials). On the other hand, the variables specific to the bank (the size of the institutions, the liquidity, the loan volume, the profitability of the assets). It is also pertinent to break down these non-performing loans by sector of activity.

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Annexes

DependentVariable: NPLS Method:
Least Squares Date: 05/27/16
Time: 19:45
Sample (adjusted): 1980 2013
Includedobservations: 34 afteradjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	26.12069	20.89903	1.249852	0.2229
CHOMMAGE	-0.028547	0.549252	-0.051974	0.9590
CREDIT	0.001757	0.074424	0.023614	0.9813
FD	0.211117	0.075031	2.813717	0.0094
GDP	-0.004531	0.002180	-2.078600	0.0481
INV	0.082771	0.319694	0.258907	0.7978
M2	0.272068	0.101231	2.687587	0.0126
POLSTAB	13.22819	3.778821	3.500613	0.0018
RER	-0.500431	0.369758	-1.353402	0.1880
R-squared	0.682964	Meandependent var		5.991826
Adjusted R-squared	0.581512	S.D. dependent var		6.885242
S.E. of regression	4.454105	Akaike info criterion		6.047457
Sumsquaredresid	495.9764	Schwarz criterion		6.451493
Log likelihood	-93.80676	Hannan-Quinn criter.		6.185245
F-statistic	6.731923	Durbin-Watson stat		1.762978
Prob(F-statistic)	0.000104			

VAR Granger Causality/Block Exogeneity Wald Tests Date:
05/27/16 Time: 21:12
Sample: 1980 2014
Includedobservations: 32

Dependentvariable: NPLS

Excluded	Chi-sq	df	Prob.
CHOMMAGE	0.870453	2	0.6471
CREDIT	2.232288	2	0.3275
FD	5.523347	2	0.0632
GDP	8.124622	2	0.0172
INV	0.023205	2	0.9885
M2	7.321654	2	0.0257
POLSTAB	3.526229	2	0.1715
RER	7.370532	2	0.0251
All	28.35790	16	0.0286

Dependentvariable: CHOMMAGE

Excluded	Chi-sq	df	Prob.
NPLS	6.135616	2	0.0465
CREDIT	3.004487	2	0.2226
FD	0.243342	2	0.8854
GDP	0.864845	2	0.6489
INV	0.591659	2	0.7439

M2	0.653808	2	0.7212
POLSTAB	4.593478	2	0.1006
RER	0.178431	2	0.9146
All	29.16423	16	0.0229

Dependentvariable: CREDIT

Excluded	Chi-sq	df	Prob.
NPLS	1.533011	2	0.4646
CHOMMAGE	0.869633	2	0.6474
FD	1.139889	2	0.5656
GDP	2.274068	2	0.3208
INV	1.651848	2	0.4378
M2	0.026557	2	0.9868
POLSTAB	1.837013	2	0.3991
RER	2.465678	2	0.2915
All	9.284617	16	0.9012

Dependentvariable: FD

Excluded	Chi-sq	df	Prob.
NPLS	8.360039	2	0.0153
CHOMMAGE	1.174436	2	0.5559
CREDIT	1.650666	2	0.4381
GDP	4.585656	2	0.1010
INV	3.968984	2	0.1375
M2	0.693789	2	0.7069
POLSTAB	4.773040	2	0.0919
RER	7.755538	2	0.0207
All	26.29759	16	0.0500

Dependentvariable: GDP

Excluded	Chi-sq	df	Prob.
NPLS	1.690965	2	0.4294
CHOMMAGE	2.165517	2	0.3387
CREDIT	1.073566	2	0.5846
FD	2.518252	2	0.2839
INV	0.898900	2	0.6380
M2	1.335779	2	0.5128
POLSTAB	7.823036	2	0.0200
RER	1.631189	2	0.4424
All	30.01658	16	0.0179

Dependentvariable: INV

Excluded	Chi-sq	df	Prob.
NPLS	14.97898	2	0.0006
CHOMMAGE	8.875573	2	0.0118
CREDIT	6.267332	2	0.0436
FD	0.870078	2	0.6472
GDP	0.192886	2	0.9081

M2	7.624152	2	0.0221
POLSTAB	2.681376	2	0.2617
RER	1.025390	2	0.5989
All	70.82188	16	0.0000

Dependentvariable: M2

Excluded	Chi-sq	df	Prob.
NPLS	2.232512	2	0.3275
CHOMMAGE	0.987328	2	0.6104
CREDIT	0.352281	2	0.8385
FD	0.145274	2	0.9299
GDP	4.231730	2	0.1205
INV	4.140078	2	0.1262
POLSTAB	5.911558	2	0.0520
RER	0.069130	2	0.9660
All	20.50370	16	0.1984

Dependentvariable: POLSTAB

Excluded	Chi-sq	df	Prob.
NPLS	0.500384	2	0.7787
CHOMMAGE	1.188251	2	0.5520
CREDIT	0.669760	2	0.7154
FD	3.292201	2	0.1928
GDP	0.335428	2	0.8456
INV	0.634086	2	0.7283
M2	3.686590	2	0.1583

RER	7.169466	2	0.0277
All	21.68886	16	0.1535

Dependentvariable: RER

Excluded	Chi-sq	df	Prob.
NPLS	2.817782	2	0.2444
CHOMMAGE	2.738591	2	0.2543
CREDIT	5.732396	2	0.0569
FD	6.635546	2	0.0362
GDP	4.341747	2	0.1141
INV	0.950405	2	0.6218
M2	12.01803	2	0.0025
POLSTAB	5.557928	2	0.0621
All	34.92310	16	0.0041