

The Determinants of Banks' Credit Default at Jordanian Commercial Banks (Internal Perspective)

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Abstract

In this study researchers will examine the factors affecting the default of banks' credit facilities; the reasons behind the defaulting of the bank debts in Jordan, from the internal perspective, and to identify the early indicators appearance of the default of credit facilities. Through a random sample from Jordanian banks, throughout the year 2012.

The research problem was specified to answer the following questions, firstly: What are the effect of (management efficiency, leverage, loan-loss provision, funding cost, and liquidity), factors at the default of credit facilities? Secondly: Which factors are considered to be important and should be monitored?

The data will be analyzed by a use the linear regression to predict the relationship between the dependent variable (ratio of non-performing loans to total loans as at the end of financial year of bank i in time t) and the independents variables (management efficiency, leverage, loan-loss provision, funding cost, liquidity). In order to ensure that all regression assumptions are met, each variable will be tested for homoscedastic, linearity and normality.

The results summaries show a negative relationship between the independents variables (management efficiency, loan-loss provision, funding cost, liquidity), and the dependent variable (ratio of non-performing loans to total loans).

There is positive relationship between the independent variable (leverage), and dependent variable (ratio of non-performing loans to total loans).

The R-squared figure (Explanatory Factor) equal to (0.935), this result is very high and emphasis the assumptions that researcher accept.

Durbin–Watson value was (1.682) which indicates no autocorrelation.

Researcher states the following recommendations:

- Banks have to give more attention to credit risk management to improve bank competitive advantage.
- Banks have to ease restrictions on borrowing process due to negative relation between liquidity and NLP, due to large amount of liquidity in Jordanian banks.

Keywords: Credit Default, Internal perspective, Management efficiency, Leverage, Loan-loss provision, Funding cost, Liquidity, Non-Performing loans.

Introduction

Banks grants credit facilities depending on specific standards and criteria to insure that creditors be able to repaid that facilities, (Abed al Hameed, 2000).

measurements classified it to direct or indirect facilities, direct one include loans, advances and overdrafts, indirect facilities includes Contra Accounts (Irregular) as Documentary Credits and Letters of Guarantee, direct facilities represents (50% – 70%) percent from the bank's assets, this percent generate the most banks' income (Timothy, 1995).

Although the monetary policy framework in most countries places greater reliance on market based policy instruments and the use of market forces to achieve the desired objectives, (Wijayasekera, 2009), it is the main objective of monetary policy to maintain the safety of financial structure, these objectives was redefined in view of the latest developments in global financial crisis.

The new financial literature focus upon the way of how banks manage their risks as default risk which consider the main reason for most bankruptcy throughout the world as including all other aspects of banking activities.

The most common credits facilities, (define as all services that include provides funds to banks' customers (individuals and firms), with the commitments from those customers to repaid the principles and interests according to a specific agreement with bank (banking and finance terminology, 1999).

The Fianacialist simply defined it as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms

In Jordan as it's moving towards a high attractive banking services, the banking become a highly exposed to the probability of credit default risks.

Domestically several factors contributed to increase the degrees of danger of the sovereign debt crisis,

which in turn will increase the degree and continuity of default risk, one of these risk related to continually Euro area financial crisis, which reflect the decrease of confidence in the sustainability to public finance and increase in public debt of Greece, the threatening may extend to MENA(Middle East & North Africa) region, other factor related to the growth of oil and other raw material prices which enhanced inflationary pressures in small and open economy like Jordan.(CBJ, financial stability report, 2010).

In this manner (CBJ as an official authority) developed banking supervisory system to maintain the soundness and safety of banking system in order to protect depositors funds and shareholders' equity through issuing new banking laws(banks law no. 28/2000) , deposits insurance corporation law and temporary law of credit information which this issuance was given their role in the improvement of credit risk management and increasing opportunities for obtaining credits, as will (CBJ) is aware to maintain some ratios (capital Adequacy ratio and coverage ratio...etc.) at their safety level in order to protect the banking system against financial risk (CBJ, financial stability report, 2010).

Furthermore this will increase the effective and efficient credit granting institutions to make safer and more accurate credit risk assessments.

From the point view of banks management, every bank design a credit policy represent the frame and out lines that include the basis and standard that credit management use to manage credit process, (most sovereign and common risk that faces banks is credit risk, which banks manage it through a group of standards that is process of determine, measure and control the credit risk (Mishkin & Eakins, 2006). Such standards provide trust to credit management employees and enough flexibility to act and take actions in limited time,(Chacko & others, 2006).

Every credit decision contains a degree of risk due to uncertainty that relate to future, which make difficult to predict precisely the result of credit decisions. To eliminate such risk bank management have to analysis risk related to credit process to reach to objective points or conclusions, where that the return of such process exceed enough the risk related to it, (Mattar, 2003).

Commercial Banks (as other financial institutions), faces many constraint to manage risks that appears as a result of banks activities due to ahistorical attention that banks were focuses on managing assets and liabilities, but recently management give more and more attention to (how managing banks risk), at the same time (how to reach target returns). So banks must establish risk management system includes standards and measures for specify, describe and control these risks,(UAB magazine,2007),to be sure the successful of such management measures must be, establishing risk management environment, That means the bank board of managers has to accept a certain level of risks and returns which increase the portfolio quality, to specify the kinds of risk dealing with, to establish credit pricing system, to specify the types of accepted collaterals, establish rules for grants credit for prime customers, establishing safety credit policy, which mean to establish information system to evaluate and classify risk, to provide management with information about creditor, characteristics, experience, capacity, capital, type of current and future sector risks, cash inflow and outflow, limits of irregular accounts at balance sheet, and limits for credit grants relative to owner equity.

The four elements to credit policy are: The payment terms offered to customers, the credit standards used to evaluate credit request, the analysis of the creditworthiness of the customer accounts and the monitoring and collection for outstanding receivables, (kaen, 1995).

Establishing safety credit monitoring process measures, that means availability of updated files and record data system; enable bank risk management to check out the bank's employees and client's commitments to credit risk policy, as well as internal credit classification that help management to determine the credit portfolio characteristics and finally availability of risk control procedures that contain independent credit control system to check out the efficiency and effectiveness of credit officials, the safety procedure, portfolio quality, classification safety system, and early warning system for bad debts.

In general banks mitigate credit risk using several methods; In common banks (generally) charge a higher interest rate from borrowers who are more likely to default, this practice called risk-based pricing. Also banks regulate some kinds of legal contract (Covenants) write on, loan agreements force borrowers to provide it to banks like, periodically financial reports information, or refrain him from paying dividends, borrowing further, or other specific, voluntary actions that negatively affect his ability to repaid debt or his financial position.Sometime banks force borrowers to repay the loan in full, at the bank's request, in certain events such as changes in the borrower's debt-to-equity ratio or interest coverage ratio.Recently most banks involve credit insurance and credit derivatives as well as lenders and bond holders who may hedge their credit risk by purchasing credit insurance or credit derivatives. For some type of lenders banks try to tightening credit risk by reducing the amount of credit extended, either in total or to certain situations.Using diversification, because lenders to a small number of borrowers face a high degree of unsystematic credit risk, (concentration risk), so bank reduce this risk by diversifying the borrower pool.Deposit insurance: any governments establish deposit insurance to guarantee bank deposits of insolvent banks, such protection discourages consumers from withdrawing money when a bank is becoming insolvent, to avoid a bank run, and encourages consumers to hold

their savings in the banking system instead of in cash, (IMF Global Financial Stability Report, 2009).

In this study researcher will examine the factors affecting the default of banks' credit facilities, through a random sample from Jordanian banks, throughout the year 2012, the data will be analyzed by a suitable statistical data analyses program like E-views package.

The Importance of study

The banking sector considered a forward sector that other sectors need banks to finance their needs of funds, on the other side banks need these sectors to promote their business and generates incomes.

The importance of this study goes into two directions, first one is derived from the importance of the banking sector itself, the domestic assets of Jordanian banking system equal to 38606 J.D million (CBJ, monthly statistical bulletin, September, 2013), which indicates the large amounts of funds that banks deal with comparing to other sectors in Jordan.

Moreover the value of traded stock at financial sector equal to 3.3 billion J.D compare to 5.5 J.D billion in 2013, number of shares traded about 3.39 billion J.D comparing to 5 billion J.D at all sectors which equal about 67% of total trade, Finally the net Income generated by the financial sector equal JD 391million comparing to 839 million at all other sectors which equal about 47%, (Amman stock exchange, Cumulative Financial Data, 2013)

Second one related to the importance of credit process as main banking mission, the local net facilities that banks promote at the year, 2013 equal to 25173 J.D million (CBJ, monthly statistical bulletin, September, 2013)

The Research questions

In addition to determining the importance of commercial banks in Jordanian economy, the main problem raised by this study is that the examination of factors affecting the default of banks credit facilities, more specification, the study problem is looking into the reasons behind the defaulting of the bank debts in Jordan, from the internal perspective, and to identify the early indicators appearance of the default of credit facilities. Also, the study aims to identify the factors affecting the default of credit facilities and categorize it according to their importance.

The research problem was specified to answer the following question:

1. What are the effect of (management efficiency, leverage, loan-loss provision, funding cost, and liquidity), factors at the default of credit facilities?
2. Which factors are considered to be important and should be monitored?

Literature Review

The banks managements operate under three main basic principles related to banks environment, that are liquidity, profitability, and security which force bank management to balance between these principles to reach banks objectives, which will not happened unless banks mitigate the risks related to banks works as credit risk, interest rate risk,...etc. and to manage factors contribute to that risks.

Although the analysis indicated factors as liquidity and interest, domestic market, international market, business operation increase the ability of banks' risk exposure, banks have to seriously consider these factors to build a solid bank financial position and reach its goals, (Yap, Ong, Chan, Ang, 2010).

Although the effects of credit risk is affects creditors as main loser , banks managements and other business parties in any economy also effected by such risks, this become a truth due to seriously harmful to the credit process, and trade partners,(Achou, Tenguh, 2008).

Concerning this issue many studies investigate reasons of the problem of credit risk previous literature can be classified into three directions the first set of studies, focus at the macro level through analyzing the systematic risk that affect the ability of banks to deal or manage the credit risks or affect the ability of banks customers to repayment loans, most studies at this level adopt comparison studies,in recent comparative study for S&P about South Korea and Taiwan believe that systematic risk are elevated in regions, as armed conflict in instances may lead to increase in general the credit risk in any country, the study notes the similarities between the two issuers, both are nascent democracies, with comparable levels of economic development and strong external creditor positions. In addition, the two East Asian issuers count financial sector vulnerabilities and lax corporate governance environments among their credit weaknesses. Although South Korea has a stronger fiscal position, in sharp contrast to the deterioration in Taiwan's balances, Taiwan boasts a higher rating due to its more robust external position, dynamic small and midsize enterprise sector, (S&P, 2005).

In other comparing study present findings about key determinants of credit risk of commercial banks in emerging economy as India, Korea, Malaysia, Mexico, and Thailand compared with developed economies as Australia, France, Japan and US.

Banking system Credit risk theories and empirical literature suggest eight credit risk determinants. Two to Four factors are alone significantly correlated with credit risk of any one banking system. Regulatory

capital is significant for banking systems that offer multi products; management quality is critical in the cases of loan-dominant banks in emerging economies. Contrary to theory or studies, leverage is not correlated with credit risk in test period. Data transformations and statistical corrections ensured these results are reliable: Model robustness was tested using AIC. The model developed could be applied to test more emerging economy banking systems to generalize findings to other economies, (Ahmad, Ariff, 2007).

Secondly: studies handle micro level of problem specially factors related to banking system and mostly without using comparative levels, in light of this methodology a recent study discuss the effect of Information Asymmetry at baking credit risk, the finding suggest that, the existing of information asymmetry is the root cause of commercial bank credit risk and is certainly a major cause. Credit risk means the possibility to make banks suffer a lot of losses because of the uncertainties in credit activities. The paper firstly analyzed the commercial bank credit risk based on information asymmetry, and then proposed credit risk management measures (Shi, Zhang, 2009).

As well the study of Yuosff at Malaysian banks suggest that the credit risk is sustainable and continuing factor at banks and the way of how to manage these risk is the key answer, the finding that, the loan diversification, risk mitigation, and training and development of staff are three most popular practices implemented by financial institutions at Malaysia, (Izaa, Ho, 2009).

Thirdly: studies handle both factories that related to problem, at micro or macro level, in this manner, study of Haddad, suggest that credit risk at local banks of Jordan related to confusing credit facilities policy, weakness of employee training and the absences of follow up the customer's condition (micro), as well external (macro) factories as economic conditions, natural disasters, foreign political conflicts and central bank policy.

Haddad study findings focus at internal level of banks as a major reason of credit risk and there is good ability of banks to control these reasons, in contrary of external reasons which the state only could mitigate the effects of these factories, (Haddad, 2005).

At the same level a study of Omar suggest that credit risk at local banks of Palestine (from the point view of both banks customers and the credit officers), effected by both macro and micro level, the lack of information about customers condition and financial position, and the weakness of analyzing process consider major reason of internal credit risk.

The army conflict at west bank and Gaza strip, closing policy, Insecurity, and weak ending consider major of external reasons, (AL Daher, 2007).

The sample and its selection criteria

The sample include all Domestic Jordanian commercial banks which are Eight (8) banks, the sample data (panel data of each individual bank balance sheet and income statement items), were obtained from The Bank scope data stream at Central Bank of Jordan (CBJ).

These banks (besides being in same economic settings), are chosen because they operate under same banking systems and market structures.

The researchers employ data of only commercial banks according to availability of these data.

The major hypothesis will be highly correlated with credit risk of banks in each of the selected banks.

The period of this study will extend to 5 years, since the (CBJ) apply Basle accord II.

The Measurements of Variables

The variables used in this study are defined as follows:

- ME** Earning Assets / Total Assets
- LV** Total Liabilities / Total Assets
- L-LP** Loan Loss Provision / Total Loans
- FC** (Interest Expenses + Non-Interest Expenses) / Total Assets
- LQ** Total Loans / (Time Deposits)

Theoretical Model

The model of this study consist Tow type of variables:

The Independent variables (bank-specific factors) which are:

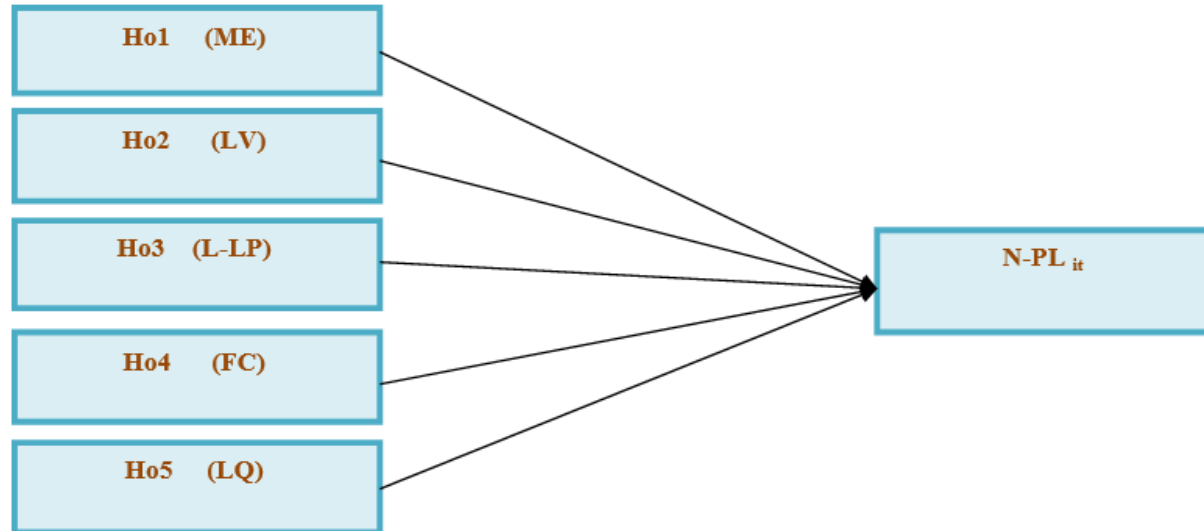
(ME) management efficiency, **(LV)** leverage, **(L-LP)** loan-loss provision, **(FC)** funding cost, **(LQ)** liquidity

And Dependent Variables:

N-PL Ratio of Non-Performing Loans to Total Loans

The Regression equation for the full model used in this study is:

$$N-PL_{it} = \lambda_0 + \lambda ME_{i,t} + \lambda LV_{i,t} + \lambda L-LP_{i,t} + \lambda FC_{i,t} + \lambda LQ_{i,t} + \epsilon_{i,t}$$



Study Hypotheses:

Based on the above conceptual framework, there are five hypotheses constructed in this research:

Ho1: There is no statistically significant relationship between the (ME) and N-PL

Ho2: There is no statistically significant relationship between the (LV) and N-PL

Ho3: There is no statistically significant relationship between the (L-LP) and N-PL

Ho4: There is no statistically significant relationship between the (FC) and N-PL

Ho5: There is no statistically significant relationship between the (LQ) and N-PL

Research Methodology

The researchers will use the linear regression (both simple & multiple) to predict the relationship between the dependent variable (ratio of non-performing loans to total loans as at the end of financial year of bank i in time t) and the independents variables (management efficiency, leverage, loan-loss provision, funding cost, liquidity).

In order to ensure that all regression assumptions are met, each variable will be tested for homoscedastic, linearity and normality.

For Homoscedastic, all variables will transform into first level differences to ensure that the variables are homoscedastic, (all random variables in the sequence has the same variance, and each probability distribution for y (dependent variable) has the same standard deviation regardless of the x-value (independent).

Linearity is a prior test use through (E-views package) to insure that two variables, "independent" and "dependent," are related by a mathematical equation: "y = cx," where "c" is a constant number.

Normality test will used to compute how an underlying random variable is to be normally distributed.

Statistical Result Analysis:

In order to test the study hypotheses formulated , a series of simple and multiple liner regression analyses was conducted to calculate direct and indirect par coefficients.

Hypotheses are considered supported when both coefficient (Beta) are significant at 0.05 level.

The SPSS 17 package was used for all statistical computations.

The results summaries are included in the next table:

Table No. (1)
 Statistical summaries (correlation test, standard error, t-value)

N-PL it = $\lambda_0 + \lambda_{ME} i, t + \lambda_{LV} i, t + \lambda_{L-LP} i, t + \lambda_{FC} i, t + \lambda_{LQ} i, t + \dots$						
N-PL it = -1.632 - 2.158 + 0.116 - 0.031 - 0.112 - 2.423						
SE	2.949	0.436	0.031	0.009	0.020	0.936
t-value	-0.553	-4.956	3.770	-3.481	-5.719	-2.588
p-value	0.5826	0.0000	0.0005	0.0011	0.0000	0.0128

Correlation Test

From the table above (No.1) (first row), we see a negative relationship between the independents variables (management efficiency (ME), loan-loss provision (L-LP), funding cost (FC), liquidity (LQ)), and the dependent variable (ratio of non-performing loans to total loans (NPL)), due to negative sign for the slope, (-2.158, -0.031, -0.112, -2.423).

This relationship is accepted when we know that the profit will decrease (ME), when we deduct the NPL ratio, same as for loan –loss provision, which affect the NPL ratio when management increase this provision, The positive signs of this coefficient for Malaysia at Ahmad and Ariff study was (1.3454 with t= 2.6485) and France (0.0627 with t = 8.2478) suggest that the higher the proportion of earning assets (which largely consist of loans) the greater is the tendency for banks in these countries to incur potentially high credit risk. Conversely, MGT is significantly negatively related to credit risk of banks in India.

The possible explanation for this obverse finding could be that the earning assets of the banks during the test period comprised more interest-earning assets other than loans, (Ahmad, Ariff, 2007).

For funding cost (FC), increase that mean the spread margin for banks decrease, which increase the NPL ratio.

Finally when the liquidity (LQ), increase the management can provide enough provision for non-performing loans.

Another contrasting finding is that we find the coefficient estimate for liquidity ratio (LIQ) is significantly positively related to credit risk in several countries: Australia, India, Korea and the US, (Ahmad, Ariff, 2007).

This conclusion can be administrated through developed countries rather than development one, due to legal constraint that applied strongly in such countries.

There is positive relationship between the independent variable (leverage (LV)), and dependent variable (ratio of non-performing loans to total loans (NPL)), due to positive sign for the slope, (+0.116), this result is logically accepted when knowing that increase in this ratio mean that bank depend more on liabilities (deposits and loans) to finance assets and investments

Which force banks to be in safe side to keep more provisions for bad debts in case for inability or to pay funds to depositors or creditors in panic circumstances.

Such conclusion emphasizes by that fact that borrower's remediation program is funded by additional debt, such ratios will, however, register the failure of a company, (Harvey, 1998).

Standard Error

From the table above(table No.1) (second row), we find that the highest value for standard error for the sample was related to independent factor liquidity (LQ), this can be explained according to variations in size of liquidity because the effect of financial crisis in time scope for this study which force bank to change the level of liquidity every year, also this variation explained due to changes in the level of liquidity between small and large banks, large banks keep enough liquidity more than small ones.

Hypothesis testing

Hypothesel: **There is no statistically significant relationship between the (ME) and N-PL**

From the result in table (No.1) we find that ,for (ME) management efficiency, t- value is (- 4.956), this value is less than the (t) in tables, (1.96 at significance level .05) for that we accept the null hypothesis which state that no effect for the independent variable the management efficiency and dependent variable non-performing loans to total loans ratio.. This leads us to conclude that banks with good credit risk management policies have a lower loan default rate and relatively higher interest income, (Yap, Ong, Chan, Ang, 2010).

In study of Ahmad and Ariff show, evidence for the relationship between spread and credit risk in this study is mixed: negative for banks in India and Thailand but positive for banks in France. This inverse relationship implies that a bank that charges higher interest to its borrower to earn higher spread might deter less qualified borrowers (who are potential loan defaulters) to borrow, thus curtailing the banks' credit risk exposure. (Ahmad, Ariff, 2007).

Hypotheses 2: There is no statistically significant relationship between the (LV) and N-PL:

From the result in table (No.1) we find that ,for (LV) leverage, t- value is (+3.770), this value is bigger than the (t) in tables, (1.96 at significance level .05) for that we reject the null hypothesis which state that there is effect for the independent variable the leverage and dependent variable non-performing loans to total loans ratio, Funding costs of companies problem need remediation, such costs may exceed \$100 million for larger enterprises, (Harvey, 1998), which increase the ability of company NPL ratio increasing.

Hypotheses3: There is no statistically significant relationship between the (L-LP) and N-PL

From the result in table (No.1) we find that ,for (L_LP) loan-loss provision, t- value is (- 3.481), this value is less than the (t) in tables, (1.96 at significance level .05) for that we accept the null hypothesis which state that no effect for the independent variable the loan-loss provision and dependent variable non-performing loans to total loans ratio, (Ahmed et al., 1998) find loan loss provision (LLP to total asset) to be positively significantly associated with NPL. Hence, a higher LLP indicates an increase in credit risk and deterioration in loan quality.

Hypotheses4: There is no statistically significant relationship between the (FC) and N-PL

From the result in table (No.1) we find that ,for (FC) funding cost, t- value is (- 5.719), this value is less than the (t) in tables, (1.96 at significance level .05) for that we accept the null hypothesis which state that no effect for the independent variable the funding cost and dependent variable non-performing loans to total loans ratio.

Hypotheses5: There is no statistically significant relationship between the (LQ) and N-PL

From the result in table (No.1) we find that ,for (LQ) liquidity, t- value is (-2.588), this value is less than the (t) in tables, (1.96 at significance level .05) for that we accept the null hypothesis which state that no effect for the independent variable the liquidity and dependent variable non-performing loans to total loans ratio.

Table (No.2)

Statistical summaries (R-squared, F- statistic, Durbin-Watson stat)

R-squared	0.935
Adjusted R-squared	0.911
F- statistic	39.462
Prob (F-statistic)	0.0000
Durbin-Watson stat	1.682

From the table above(No.2) we see that R-squared figure (Explanatory Factor) equal to (0.935) which mean that change in independents variables explain (93%), in change that occur in the dependent variable, this result is very high and emphasis the assumptions that researcher accept.

Durbin–Watson value which is a test used to detect the presence of autocorrelation (a relationship between values separated from each other by a given time lag), were $d = (1.682)$.

Since d is approximately equal to $2(1 - r)$, where r is the sample autocorrelation of the residuals, $d = 2$ indicates no autocorrelation.

The value of d always lies between 0 and 4, if the Durbin–Watson statistic is substantially less than 2, there is evidence of positive serial correlation.

Recommendations

Researcher states the following recommendations:

- Banks have to give more attention to credit risk management to improve bank competitive advantage.
- Banks have to ease restrictions on borrowing process due to negative relation between liquidity and NPL, due to large amount of liquidity in Jordanian banks.

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Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	33.867664	5	0.0000

Dependent Variable: NPL
 Method: Panel EGLS (Cross-section weights)
 Date: 12/23/12 Time: 15:39
 Sample: 2007 2011
 Periods included: 5
 Cross-sections included: 13
 Total panel (balanced) observations: 65
 Iterate weights to convergence
 Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)
 Convergence achieved after 44 weight iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ME	-2.157827	0.436314	-4.945582	0.0000
LV	0.115770	0.030710	3.769824	0.0005
L_LP	-0.031403	0.009022	-3.480785	0.0011
FC	-0.112463	0.019664	-5.719349	0.0000
LQ	-2.423089	0.936430	-2.587582	0.0128
C	-1.631919	2.949058	-0.553370	0.5826

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.934527	Mean dependent var	17.83657
Adjusted R-squared	0.910845	S.D. dependent var	32.63770
S.E. of regression	1.508599	Akaike info criterion	2.726238
Sum squared resid	106.9659	Schwarz criterion	3.328376
Log likelihood	-70.60275	Hannan-Quinn criter.	2.963821
F-statistic	39.46191	Durbin-Watson stat	1.682433
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.834814	Mean dependent var	5.185231
Sum squared resid	106.9658	Durbin-Watson stat	1.279576

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