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ANALYSIS THE DETERMINANTS OF CREDIT RISK IN JORDANIAN BANKING: AN EMPIRICAL STUDY

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Abstract

The study presents the results of an analysis of credit risk factors of the Jordanian banking system. The objective of the empirical analysis is to establish which some factors influence the systematic credit risk of the Jordanian banking loan portfolio

The sample consists of a panel of 14 commercial banks that are listed on the Stock Amman Exchange over the period 2006 to 2010. The preceding regression results allow us to shed some lights on the key factors affecting credit risk of Jordanian banking. The findings show that management efficiency, loan loss provision, leverage and loan to deposit ratio have significant influence on credit risk of banking. But not significant the growth rate and size variables on credit risk ,Since hedging is must develop in operations in banking operations, reducing adverse selections and strengthening internal controls are suggested as measures to increase efficiency in mitigating credit risk in banks

Keywords: Hedge Funds, Financial sector, Factors Risk, Loan Portfolio.

1. INTRODUCTION

The factors influencing the systematic credit risk are macroeconomic factors, changes in economic policies, political changes and the goals of leading political parties. Macroeconomic factors include the inflation rate, the employment rate, growth in gross domestic product, stock index and exchange rate movements, and conjuncture fluctuations in the economy. Changes in economic policies are represented by changes in monetary and tax policies, economic legislation changes, as well as import restrictions and export stimulation (Saunders 1997; Temeljotov Salaj 2005)

Financial economists and policy-makers have historically focused on banks as prospective channels of systemic distress through, for instance, bank runs and the concomitant reduction in the supply of credit. This "special" attribute of banks has been the classic policy rationale for regulating them. The ongoing shift toward financial markets, arms-length transactions, and active trading, however, has shifted focus to the potential impact of a hedge fund-led disruption on financial institutions, markets, and the broader

economy. When deciding about new bank customers it is thus important to consider the credit risk of an individual customer, which can nowadays be measured with the help of various modern credit models (Aver 2003). However, in assessing the influence of an individual obligor on the bank operation risk and the influence of capital requirements, the risk of the entire bank portfolio (Asarnow 1996) must also be taken into account. Customer risk and portfolio risk are specified by the expected loss and standard deviation of the loss, which defines the unexpected loss (Ong 2000).

Financial intermediaries, of course, have many ways to reduce their exposure and mitigate the impact of financial market shocks. The first line of defense is the intermediary's counterparty credit risk management (CCRM) system. Banks establish limits, implement risk reporting infrastructures, and define haircut, margining and collateral policies, all designed to assess credit risk and limit their counterparty exposure. Effective CCRM is obviously needed for any counterparty, but hedge funds differ in important ways such as their use of complex trading strategies and instruments, leverage, opacity, and convex compensation structures, all of which increase the challenges to effective CCRM

However, because we believe CCRM remains the appropriate starting point for limiting the potential for hedge funds to generate systemic disruptions. By laying out the issues and highlighting the specific linkages from hedge funds to systemic risk, we hope to highlight areas for further research to better understand when and how markets may fail to yield a desirable outcome. This paper examines how the factors and characteristics of determinants of credit risk in Jordanian banking for the period 2006 to 2010.

2. LITERATURE REVIEW

Hedge funds

Hedge funds, in short, are largely unregulated, private pools of capital. Hedge fund managers can invest in a broad array of assets and pursue many investment strategies such as global macro, market neutral equity, convertible arbitrage, or event-driven. First, hedge funds are not restricted by the type of trading strategies and financial instruments they may use. In particular, hedge funds can and do make use of short selling, derivatives, and options, all of which are complex and potentially nonlinear in payoffs. Second, hedge funds make liberal use of leverage, be it directly through the use of debt or indirectly through leverage embedded in derivatives. This freedom is possible because hedge funds in the United States largely fall outside of the regulatory umbrella by virtue of being open only to accredited investors

and large institutions. (Asness, etc, 2001) Of course, hedge fund investors and counterparties impose some discipline on the amount of leverage actually employed.

Opacity also is not unique to hedge funds as financial institutions generally, and banks especially, are thought to be more opaque than firms in other industries. Financial firms, however, often have traded instruments such as equity shares or bonds outstanding, so they are subjected to further scrutiny by market participants. By contrast, hedge funds, due to their unregulated and private nature, are not subject to such wide scrutiny unless they chose to issue public securities. Moreover, the success of a hedge fund often depends on proprietary trading strategies which, if made public, can be used by others to trade against them. Investors know this and are thus willing to tolerate a degree of opacity not seen in the mutual fund industry in the hope of securing particularly rich returns.(Brown, etc, 1999)

Credit Risk Management (CRM)

Hedge funds interact with regulated financial institutions and intermediaries in many ways including prime brokerage relationships, where regulated intermediaries provide services such as trading and execution, clearance and custody, security lending, technology, and financing through margin loans and repurchase agreements. (Fama, Eugene, and Ken French, 1993) An important part of this relationship is the extension of credit to the hedge fund, so the financial institution is exposed to counterparty credit risk. As a result, traditional counterparty credit risk management (CRM) systems are the first line of defense between unregulated hedge funds and regulated financial institutions. An integral part of CRM is margining and collateral practices, which are designed to reduce counterparty credit risk in leveraged trading by providing a buffer against increased exposure to the dealer providing the financing or derivatives contract. In general, a financial institution may be willing to extend credit to the hedge fund against the posting of specific collateral that is valued no less than the amount of the exposure .This reduction in settlement risk in leveraged trading increases confidence and thereby promotes active financing of leveraged trading. Crouhy, Galai, and Mark (2000),

3. PREVIOUS STUDIES:

Past studies have covered extensively on risk and factors contributing to risks of financial institutions in the conventional banking system (Khan and Ahmed, 2001; Berger and DeYoung, 1997; Angbazo et al., 1998;Ahmad, 2003). Despite its importance to achieving good risk management in Islamic banking, these factors have not been widely investigated and documented. Previous attempts to study Islamic banking mainly evolve on conceptual issues underlying interest free system (Hassan and Bashir, 2002).

The issue of the viability of Islamic banks has not received great attention. Hence, given the unique nature of Islamic banking and the dynamic changes in the global financial markets, which pose numerous risks to banks, there is a need to identify empirically, key factors influencing risk formation in Islamic banks – an area that has not been widely studied

Papers that have taken this approach include Brooks and Kat (2001) and Kat and Lu (2002) and can be traced back to Geltner (1991, 1993) in the real estate literature. Unfortunately, the method employed in these papers is rather ad-hoc and, in fact, sometimes fails to adequately remove the serial correlation that exists for hedge funds operating in the most illiquid markets Papers that use this alternative method include Lo (2002) and Getmansky, Lo, and Makarov (2003). While this second method is theoretically appealing and can be of great benefit, some may still desire to examine the individual, period-by-periodhedge fund returns.

Unfortunately, the approach advanced by these papers does not provide guidance on how to do this Fung and Hsieh (2002) also examine the risk characteristics for five styles of fixed income hedge funds followed by HFR. While our ultimate results are roughly consistent with that found in Fung and Hsieh (2002), we take a significantly different approach.5 In our stepwise regressions, we include well over 100 candidate risk factors and allow the statistical process to identify the relevant factors rather than a priori guesswork.

Hussain and Hassan (2004), in the context of 11 developing countries have also shown a negative relationship between capital ratio and portfolio risk Goldlewski (2004) have found that the regulation of capital and risk are negatively related. In summary, as the ratio of capital and its regulation aim to reduce the levels of bank risk-taking, we expect to find a negative relationship between these two variables.

Wade et al. (2005) have been interested in the analysis of the impacts of financial liberalization on the efficiency of the banking system in Tunisia, using various DEA models and Panel data covering the period 1992 to 1997. Also, Zaghla and Boujelbene (2008) have analyzed the determinants of efficiency of the banking system in Tunisia. Their empirical results have revealed pronounced differences in efficiency depending on the size and structure of bank ownership. In addition, the preponderance of credit activity relative to other outputs represents a source of efficiency. Then, there is a negative relationship between the ratio of equity to total assets and bank efficiency, suggesting that banks are engaged in risky activities. Finally, the share of nonperforming loans represents a source of inefficiency since the charges for bank increase with these types of loans, especially for large banks.

De Nicolo (2001) and Giuliano et al. (2007) have suggested that state-owned banks typically exhibit higher risk than other types of banks. In Russian banks over the period 1999 to 2007, Zuzana and Laura (2008) have found that the effect of state ownership on banks' insolvency risk is positive.

They explain this result by the fact that state-controlled banks tend to be more stable. In order to investigate this result more closely, they add an interaction term of size and state control to their model. This interaction makes the coefficient of state controlled variable become negative, which indicates that only large state-controlled banks are more stable than other state-controlled banks. In the context of a sample of 423 banks in transition countries (Russia, Ukraine, Hungary, Czech Republic etc), Rainer and Paul (2007) have found no indication of excessive risk taking by any specific ownership or size categories of transition banks

The hypotheses for this study are formulated as :

Hypothesis 1: There is no relationship between management efficiency and credit risk

Hypothesis 2: There is no relationship between leverage and credit risk

Hypothesis 3: There is no relationship between loan loss provisions to total loans and credit risk

Hypothesis 4: There is no relationship between size and credit risk

Hypothesis 5: There is no relationship between loan to deposit and credit risk

Hypothesis 6: There is no relationship between growth rate of GDP and credit risk

4. METHODOLOGY:

Data

The purpose of this paper is to analyze the determine factors of credit risk-taking in Jordanian banking .The sample consists of a panel of 14 commercial banks that are listed on the Stock Amman Exchange over the period 2006 to 2010. The data used in this paper are collected from the annual reports

Model and Variables

Based on a survey of related literature on risk factors determinants (Ahmad, 2003; Shrieves and Dahl,1997;Angbazo et al,1998), The estimated predictors consist of seven variables: management efficiency (MGT), leverage (LEV),, loan loss provision (LLP), natural log of total assets (LNTA) and proportion of loan to deposit (LD) , growth rate of GDP (GR)

$CRit = a0 + b1lnMEit + b2lnLEVit + b3lnLLPit + b4LNTAit + b5lnLDit + b6lnGRi\epsilon\ j,t$

CRit = credit risk = non-performing loan for the current year to total loan of bank i in year t

MEit = management efficiency = earning assets to total assets of bank i in year t

LEV = leverage = tier 2 capital to tier 1 capital of bank i in year t

LLPit = loan loss provisions to total loans of bank i in year t

LNTA = size = natural log of total assets

LD = loan to deposit ratio

GR = growth rate of GDP

5. EMPIRICAL RESULTS AND DISCUSSION

The credit risk is one of the main risks that seriously affect banks' stability. The credit risk in banking is commonly defined as the probability of a borrower defaulting his loan commitments. The main goal of a bank is to manage this type of risk because effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization. In this respect, it is essential to identify the main factors causing this risk in order to manage it. In the following, we present the regression results of the main factors influencing bank credit risk in Jordan

TABLE 1 - CORRELATIONS AMONG VARIABLES

Ind. Variables	ME	LEV	LLP	LNTA	LD	GR
ME	1					
LEV	0.0813	1				
LLP	-0.4458	0. 4661	1			
LNTA	-0.1704	0.2808	0.0464	1		
LD	0.3746	0.3007	0.3215	0.0451	1	
GR	-0.1911	0.2639	0.3232	0.8171	0.7362	1

The Pearson correlation analysis results are reported in Table 1. that shows the sign of the relationship between the dependent and independent variables is presented in

The results clearly show that none of the independent variables are highly correlated and no multicollinearity amongst independent variables exist and to avoid the problem of spurious regression.

TABLE 2: REGRESSION ANALYSIS RESULT OF DETERMINANTS OF CREDIT RISK

Ind. Variables	Coefficient	t-Statistic	Probability
Constant	0.0172	0.567	0.357
ME	0.660	2.304	0.031**
LEV	0.146	2.592	0.027**
LLP	-3.071	-1.509	0.048**
LNTA	-0.817	-2.320	0.039**
LD	0.023	1.103	0.089*
GR	-0.014	0.114	0.434
R^2	0.752		
Adjusted R^2	0.462		
Durbin-Watson	1.9523		
F-Statistic	6.781		
Prob(F-statistic)	0.034**		

Note: Asterisks (***) (**) and (*) indicates significance at 1%,5% and 10% respectively.

Table 2 show credit risk (CR) has a negative relationship with MGT, LNTA.GDP Lower efficiency in managing earning assts would probably lead to higher credit risk; size and capital are risk- related as smaller capitalized bank tend to have lower capacity to absorb losses.

On the other hand, LLP, LEV and LD are expected to have positive relationship with CR. A bigger loan loss provision is required if a bank anticipated its credit risk to be higher. Costs related to funding the operations such as loan monitoring, rescheduling and recovery efforts in the event of high problem loans are expected to increase. Similarly, greater exposure to risky sectors and a larger proportion of risk-weighted assets tend to have higher probability of credit risk

Table 2 shows the regression results of the factors influencing credit risk of Jordanian banking. The higher R-square of 75.2 percent and suggests that these variables collectively have a stronger influence on the credit risk

The coefficient for LEV is positive but not a significant predictor of credit risk in banking. This finding is consistent with Berger and DeYoung (1997) and finance theory where higher debt has a high probability of higher credit risk from default payments.

The coefficients for LNTA are both negative and statistically not significantly related to credit risk in banks. The signs are as expected but GDP are positive and not significantly it indicates that banking systems might have incurred high overheads in monitoring and controlling functions to ensure credit risk and problem loans are reduced.

ME coefficient is significant at 5 percent level and negatively related to credit risk of banks. This result supports past findings (Ahmad, 2003; Angbazo et al, 1998). The negative sign denotes that a lower efficiency in managing its earning assets would lead to a higher credit risk. A possible answer for the

opposite signs probably lies in the nature of the earning assets where they are all interest based in banking and loan default is immediately recognized after 3 months of arrears in interests.

The coefficient estimate of LLP is positive and a significant predictor of credit risk in conventional banks. Consistent to past findings (Ahmed, 1998; Ahmad,2003), the result suggest that a larger loan loss provision is required to cover higher non-performing loans and this indicates a deterioration in loan quality as credit risk increases.

6. CONCLUSIONS

This paper has empirically examined the determinants of credit risk held by Jordanian banks over 2006 to 2010 periods. This study takes its importance from the numerous structural changes in the Jordanian banking sector that have exposed them to a number of risks and stated important challenges for their stability. The credit risk is one of the main risks that seriously affect banks' stability.

The credit risk in banking is commonly defined as the probability of a borrower defaulting his loan commitments. The main goal of a bank is to manage this type of risk because effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization

Changes in economic policies, political changes and the goals of leading political parties also influence the range of the investment credit risk. The risk characteristics for various hedge fund strategies specializing in fixed income instruments. Because fixed income hedge fund strategies have exceptionally high autocorrelations in reported returns and this is taken as evidence of return smoothing. The preceding regression results allow us to shed some lights on the key factors affecting credit risk of Jordanian banking.

The findings show that management efficiency, loan loss provision, leverage and loan to deposit ratio have significant influence on credit risk of banking. But not significant the growth rate and size variables on credit risk

Since hedging is must develop in operations in banking operations, reducing adverse selections and strengthening internal controls are suggested as measures to increase efficiency in mitigating credit risk in banks

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