THE ASSOCIATION BETWEEN RISK TAKING AND CAPITAL REGULATION AND PERFORMANCE OF COMMERCIAL BANKS IN JORDAN

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Abstract - This paper empirically scrutinizes the effect of capital regulations on risk-taking and the financial performance of listed commercial banks in Jordan. It is based on the view that the effect of capital regulations on emerging economies such as Jordan has not received much attention in the literature..The issue is evaluated using a panel data of all Jordanian commercial banks listed on the Amman Stock Exchangeof(13) banks covering the period 2006 to 2019. The hypotheses were tested using the Generalized Method. Overall risk and default risk for the banks was used in distinguishing the different models in the regression equations. The results indicate that the imposition of capital regulations has a positive effect on financial performance and a negative impact on the risk-taking behavior of the firms. The level of risk held by the banks was also found to be negatively associated with the financial performance of the banks. The study suggests the need for better capital adequacy regulations and risk management for policymakers to improve the performance and stability of the banking sector in Jordan. and at the global and local level, there is great interest in taking reform measures and applying regulatory standards to contain risks and enhance financial stability

Keywords - Capital Regulations; Financial Firms; the Stability of Banks; Commercial Banks.

I. INTRODUCTION

Banking and financial institutions are central to the performance and stability of an economy. In order to ensure the effectiveness and stability of financial institutions, the Basel Accord was signed in 1988. The regulations have been revised with the latest ones being introduced in 2010 in response to the challenges and high risk exposure associated with the global financial crisis of 2008/2009. The regulations present significant liquidity and capital requirements that are meant enable the institutions absorb unexpected losses. The solvency of banks is of critical importance to financial institutions according to the Basel III regulations (Lee & Hsieh, 2013). In response to the global financial crisis, the regulatory capital requirements were introduced in order to ensure the stability, liquidity and soundness of the institutions. This is essential in preventing the potential adverse effects that may arise from the high risk premium that would be transferred to its liability subscribers. According to (Rahman, Chowdhury, & Dey, 2018), the capital requirements imposed on financial institutions have many impacts on banking activities such as strategic decision making, competitiveness, their balance sheets, growth of the banking industry and performance. This essay focuses on the question of whether there is a significant association between risk taking, capital regulation and performance of commercial banks listed in the Amman Stock Exchange.

1.1. Background

The focus of this study is the banking and financial services sector in Jordan. The economy of Jordan is classified as an emerging one with moderate growth of about 8% annually between 1999 and 2008 with the introduction of liberal economic policies. By the end of 2019, Jordan had a GDP of US$ 44.4 billion making it 89th in the world. However, the economy experienced slowed growth of 2% since the Arab Spring in 2011. The economy is strongly supported by the services sector, which accounts for 70% of GDP and employs 75% of the workforce in the country. The banking sector in Jordan can be regarded as advanced by international and regional standards. Although the sector is relatively small, it has attracted a lot of interest from the GCC countries as well as Lebanon. New regulations by the central bank and a stronger fiscal policy environment coupled with political stability have played a major role in promoting the growth of the sector (CIA World Factbook, 2020). Capital regulations are critical to the performance of the financial sector because they determine the effectiveness of the institutions in addressing the needs of the economy. The financial crisis raised concerns in the minds of policy makers regarding the effectiveness of the capital regulations. The issue of financial regulation has been identified as presenting a major difference between the outcomes of advanced and emerging economies. Considering these distinctions, it has become essential for policy research in developing and transition economies to evaluate how the implementation of the policies has influenced their outcomes. Prior research on bank capital regulation suggests that bank capital regulation has an uncertain effect on risk taking. Early studies on this relationship indicate that capital regulations are likely to have the effect of encouraging financial institutions to take more risks (Kim and Santomero, 1988). Others have showed that capital regulation strategies can reduce

the motivation of banks to increase their holding of risky assets (Furlong and Keeley, 1989). The lack of consistency in this relationship indicates a need for the issue to be evaluated in research in order to determine the right policy responses.

1.2. Research Problem and Questions

The significant role of banks and financial institutions in economic growth and development in Jordan is an issue that has resulted in interest from scholar and policy makers on the factors that can enhance its performance. The stability and financial performance of banks has been shown to be significantly influenced by a wide range of factors such as liquidity, leverage and the market to book ratio. The regulatory environment can play a critical role in determining how financial institutions operate and function since it is associated with the level of capital that is available to the organizations. The regulatory environment can result in an environment where the risky assets and level of leverage can substitute each other. The current regulatory pressure on capital regulation and risk taking may not be capable of producing an immediate effect on the performance of banks as cited in Agoraki et al. (2010). For example, if the market structure changes, the regulatory policies are likely to produce a time delay effect. They found that market forces were closely related to lower degrees of credit and default risk. This means that strengthening the market forces in a particular period can lower credit and default risk in the following one. The performance of financial institutions is highly critical to the success of the economy. This is highlighted by the strategies and policies implemented by the central bank of Jordan. The bank implements regulations such as those proposed by Basel III to strengthen the stability of the sector. The problem that this study seeks to address is how regulation for the financial sector influences the performance of banks and their risk taking behavior. The key issue here was to evaluate how the different aspects of financial institutions are associated with each other. The specific research questions that the research seeks to address are:

1. What is the relationship between risk taking and capital regulation in listed commercial banks in Jordan?
2. Is there a relationship between the performance and capital regulation of listed commercial banks in Jordan?
3. Is there a relationship between the performance of commercial banks and the level of risk in their operations?

II. EMPIRICAL REVIEW

2.1. Risk taking and Capital Regulation of financial firms

Previous literature has evaluated the issue of capital regulation and risk for commercial banks in other economies. The regulatory requirements are designed to limit risk taking by banks in order to protect them from insolvency. The evaluation of the relationship is considered to be critical because it shows whether the projected objectives are being achieved as cited in Lee and Hsieh (2013). A major assumption of the regulations according to Lee and Chih (2013) is that having higher capital requirements in the sector will have a positive impact on risk although empirical results are mixed. For example, Guidara et al. (2013) used the contingent claims model and found that there was no strong evidence that changing the capital buffer produces changes in the level of risk.no significant association was found and the authors concluded that the drive to Have an excess capital buffer was a result of market discipline as opposed to the risk faced by the banks. Some earlier studies such as Calem and Rob (1999) have found that capital and risk taking have a U-shaped relationship. As the capital held by the bank increases, it first takes less risk but increases it after some time.

The results have also been found to differ considerably for underutilized and undercapitalized banks. For undercapitalized banks, the deposit insurance premium surcharge may motivate them to take more risk. Hussain and Hassan (2005) concluded that regulations do not increase the capital adequacy ratio for banks operating in developing countries but they lower their portfolio risk. Iwatsubo (2007) sought to evaluate the capital adequacy requirements and their effect on under-capitalized banks. They concluded that capital adequacy requirements do not stop banks from taking more risk. Instead, they choose to issue more subordinated debt to meet their capital requirements. Laeven and Levine (2009) concluded that the relationship between risk taking and the capital requirements was influenced by the banks' ownership structure. In Lin, Hwang, Wang, and Xie (2013), the impact of capital adjustment and risk taking for US and non US firms was evaluated. They used panel data for the period 2003-2009 and focused on the impact of governance control, financial freedom and concentration. The results indicated that capital and risk adjustment were positively related in line with the capital buffer theory in both cases. Capital and risk adjustment were found to be negatively correlated for banks with low capital adequacy ratios. They also concluded that banks with lower capital adequacy ratios would be faster in adjusting their risk taking behavior compared to those with higher capital ratios.

2.2. Risk taking and performance of financial firms

The literature on risk taking and performance of banks and financial institutions has also produced mixed results. One critical issue is that the capital regulations have been shown to have a significant impact on the level of risk taking by banks in line

with different theories such as the capital management and portfolio theories. The puzzle between capital regulations and risk has been shown by Altunbas et al. (2007) as being influenced by the profitability of banks. In their study, they concluded that profitability acts as a key determinant of the relationship between the level of risk taking by the banks and their capital regulations. These ideas mirror those of Goddard et al (2004) who argue that most of the highly capitalized banks ace lower risks and have higher profitability. In (Majumder & Li, 2018), the case of a banking sector in the emerging economy of Bangladesh was used. The generalized method of moments was applied in the analysis and showed that bank capital was positively associated with bank performance. Bank capital was also found to have a negative and significant impact on risk-taking for the bank.

2.3. Hypotheses Development

Based on the empirical literature evaluated in this case, it is apparent that the performance of banks and their stability can be affected by the capital regulation policies. It is essential to note that most of the studies have not been consistent regarding how these aspects are related. Some such as Agoraki et al (2011) have indicated a relationship that is mediated by the structure of the firms as well as the industry in which they operate. Issues such as the types of capital that they use and the structure of their boards have been found to be significant factors in determining how their profitability and risk taking are affected.

On the link between capital regulation and risk taking, the moral hazard hypothesis is one of the approaches that have been used to provide the necessary explanation. It posits that banks that are undercapitalized are likely to take more risks in order to benefit from the horizontal deposit insurance schemes. However, using the mean variance approach, Koehn and Santomero (1980) showed that single capital regulations are insufficient in controlling risk. In this study, similar to Rahman, Chowdhury, and Dey (2018), risk-based as opposed to equity based capital is used and a negative association is hypothesized.

H1: There is a significant negative association between risk-taking by commercial banks in Jordan and capital regulations.

Studies such as Lee and Hsieh (2013) and Mbizi (2012) have reported a positive relationship between the capital regulations and profitability. They argue that the need for banks to hold more capital improves their profitability hence the stricter the re capital regulations, the better the banks in termsof generating profits. As a result, the hypothesis is:

H2: Banks' capital regulations are positively associated with the profitability of the firms.

H3: There is a significant negative relationship between risk-taking and performance of the banks in Jordan.

III. RESEARCH METHODOLOGY

3.1. Sample

The focus of this research is on listed companies in the Amman Stock Exchange. As a result, it uses secondary data sources derived from the annual reports and statements of the banks. Additionally, the information about the companies was also derived from their websites. The sample period was listed banks in the Amman Stock Exchange from the year 2005 to 2018. This means the sample was sought from listed banks in the country over the period. There are 15 listed commercial banks in the ASE and these were followed through for each year between 2003 and 2018. The financial statements of the banks and their websites were perused to gather the relevant data that was used for calculating the variables.

3.2. Variables

This section defines the variables used in the methodology of the research study. Bank capital regulation was measured using the Capital Adequacy Ratio (CAR) in Jordan. This was measured for the banks for each period.

The risk taking behavior of the banks was measured using two variables of non-performing loans to total loans (NPLTL) and the loan loss provision as a proxy for total risk(loan loss provision to total loans). The performance of the banks was assessed using their Return on Assets (ROA) ratio. Liquidity (LIQ) [total loans to assets]and leverage ratios (LEV) [Total liabilities to total assets] of the banks were also used as control variables to assess the mediators of the associations being tested in the research hypotheses.

The empirical models to be applied in this study are presented below.

$$RISK_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 ROA_{it} + \beta_3 LIQ_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \ldots\ldots\ldots (i)$$

$$ROA_{it} = \beta_0 + \beta_1 RISK_{it} + \beta_2 CAR_{it} + \beta_3 LIQ_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \ldots\ldots (ii)$$

The first equation tests whether risk taking by the banks is influenced by their capital regulations and financial performance as well as the measures of liquidity and leverage. In this equation,It represents the cross sectional dimension for the banks while t refers to the years. It represents banks' risk taking activities as a function of the capital adequacy ratio, profitability, liquidity and leverage.

In the second equation, the profitability (ROA) is presented as a function of risk taking, capital regulations, leverage and liquidity.

3.3. Procedure

The first step in the methodology was to access the Amman Stock Exchange website and use it to identify the banks that would be included in the sample. For each bank, the annual reports were sought and the necessary data for determining the individual variables was gathered in raw form and put in a Microsoft Excel sheet. After calculating the variables such as ROA, liquidity, Risk, and leverage, the data was imported to the SPSS datasheet for regression analysis. Since the equations were being solved simultaneously, the two-stage least squares regression was applied instead of the OLS regression. The two-stage least squares regression was run using SPSS-22 with the initial testing of the equations to see whether it is over-identified or not.

V. FINDINGS AND DISCUSSION

After the initial correlation analysis, the problem of multicollinearity was not identified in the sample. The highest correlation was between NPLTL and the LLPTL at 0.65, which indicated that the problem was not apparent in the equation. The results of the correlation analysis are presented in table 1.

	CAR	NPLTL	LLPTL	ROA	LIQ	LEV
CAR	1					
NPLTL	-0.38*	1				
LLPTL	-0.41**	0.65**	1			
ROA	0.53**	-0.38*	-0.39*	1		
LIQ	0.31*	-0.09	-0.11	0.26*	1	
LEV	-0.19*	0.22*	0.29*	-0.33*	-0.42*	1

Table I: Pearson Correlation

The first 2 equations used bank risk taking as measured by the NPLTL and the LLPTL as influenced by the CAR and the ROA. The impact of the capital adequacy ratio on the risk taking activities of banks was tested in equations 1 and 2. The coefficient indicates that the CAR has a negative and significant effect on risk-taking behavior as shown by the NPLTL and LLPTL.

Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	.013	.036		3.354	.014
	CAR	-.124	.099	-.182	2.258	.021
	ROA	-.235	.110	-.299	-2.130	.036
Dependent variable = NPLTL						
Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 2	(Constant)	.013	.036		3.354	.014
	CAR	-.131	.082	-.274	2.751	.019
	ROA	-.213	.108	-.302	-2.021	.020

Table II: 2 Stage Least Squares Regression (ROA, CARon Risk)

These findings are similar to those of Hao and Zheng (2016) and Bougatef and Mgadmi (2016) who have reported that raising the capital adequacy ratio improves the risk taking behavior of banks and hence lowers their risk exposures. As a result, we cannot reject the null hypotheses since it is supported by the findings of the study meaning that capital regulations affect the risk taking behaviors of the banks by improving them.

In equations 3-4, the regression shows the effect of banks capital (CAR) and risk (NPLTL and LLPTL) affecting the profitability (ROA) of the banks. The regression results presented in table III below indicate that the main independent variable (CAR) had a significant and positive impact on the performance of the banks using the 2 measures of risk as adopted in the models.

Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	.021	.053		3.193	.015
	CAR	.524	.137	.529	2.687	.005
	NPLTL	-.235	.110	-.299	-2.130	.036
Dependent variable =ROA						
Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 2	(Constant)	.023	.061		3.201	.022
	CAR	.509	.091	.492	2.751	.031
	LLPTL	-.213	.108	-.302	-2.021	.020

Table III: 2 Stage Least Squares Regression (Risk, CAR on ROA)

Dependent Variable = ROA

The higher the capital ratio, the higher the performance of the banks as shown by their ROA.These findings are consistent with those of Zheng et al. (2017), and Casu et al. (2017) who found that improving the capital ratio had the beneficial effect of improving the financial performance of the banks. The findings are in support of the second hypothesis, which posits that improving the capital regulations by making them more strict has the effect of making banking operations more profitable. In the third and fourth models, the impact of the different variables on the ROA of the banks was evaluated. The measures of risk in the model were found to have a negative impact on bank performance indicating that default and total risk of banks was negatively associated with their overall performance. The negative association between bank performance and risk taking behavior is similar to those of Rahman, Chowdhury, and Dey (2018). Since the association is negative and signifcant, the third null hypothesis is also supported by the findings and indiates that reducing risk taking in the banks improves the qualityof the assets that they have, hich in turm impoves the profitabiltiy of the institutuions.

The control variables of leverage and liquidity were found to have a significant effect on bank performance and risk. The liquidity ratio (LIQ) was found to have a positive effect on bank performance and an insignificant one on risk. This means a lower level of liquidity leads to higher profitability for the bank. Leverage (LEV) was found to be positively related to risk taking behavior by the banks in models 1 and 2. This means higher holding of liabilities in the balance sheets of the banks increases the risks they faced. The liquidity and leverage ratios have been shown to be significant covariates that can mediate the effect of the capital regulations in the country on the performance of the banks and their risk taking behavior.

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VI.CONCLUSION AND RECOMMENDATIONS

The focus of this study was to test the relationship among capital regulation, risk taking and financial performance of listed commercial banks in Jordan. We used a panel dataset of listed commercial banks in the country from 2003 to 2018. The data was collected from the internal reports and statements of the banks to determine their internal aspects as well

as the effect they have on performance and stability of the sector. The results indicate that the capital regulations adopted in Jordan have the effect of improving the performance of the industry as well as lowering the risks that the banks faced in their operations. An interesting element of the finding is that it was consistent when using both the overall risk and default risk. It is clear that the banks listed in the Amman Stock Exchange have benefited from the imposition of capital regulation ratios by the central bank. The regulations have played a significant role in improving the performance of the banks in terms of their profitability. This may be associated with the fact that the higher CAR means that banks have to be more prudent in their lending activities hence they choose borrowers who are less likely to default.

On the association between capital regulation and risk, the negative association indicates that the policies adopted by the government in making the CAR more stringent has had a positive impact by lowering the risk faced by the banks. This in turn means that the capital adequacy ratio and policies are beneficial; in promoting the banking sector in Jordan by improving it profitability capabilities while at the same time making it less prone to risks. The management of the economy by the monetary authorities has been positive in terms of improving the CAR to make the sector more stable and to improve the return hence promoting economic development. The findings mean that policy makers need to consider the strategies they can adopt for making the sector more resilient. The model is robust and indicates that the policy strategies are beneficial to the economy as a whole. Further research may be undertaken using different measures of risk, performance and capital regulations to identify whether the effect is stronger in some aspects than others.

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