

# LIQUIDITY RISK MEASUREMENT STUDY CASE (JORDAN ISLAMIC BANKS)

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## ABSTRACT

*The objective of this study was to develop a liquidity risk measurement model for Islamic banks. Liquidity was calculated using a set of ratios: the investment ratio, the capital adequacy ratio, the financial performance ratio, asset return, and the equity return ratio. The study was based on a simple and multiple linear regression analysis, following the analytical and descriptive research method. This study included the three banks of Jordanian Islamic Bank, and only two banks in Jordan, Jordan Islamic Bank for Finance and Investment and the International Arab Bank, Safwa Islamic Bank, had been excluded due to the absence of sufficient data for the period under study. The study included the study population of Jordan Islamic Banks.*

*The study recommended that Islamic banks issue short-term Islamic financial instruments that tackle the issue of liquidity and use this for interest-free debt rather than the central bank, which is unable to deal with Islamic banks in cases of liquidity deficiency.*

**Keywords:** Liquidity Measurement, Liquidity Ratios, Liquidity Risk, Islamic Banks.

## INTRODUCTION

Liquidity, in particular the lack of liquidity, means that the bank is not able to cope with its cash outflow (Alandejani & Asuay, 2017), whether because deposits have been suddenly withdrawn or loans ceilings have been taken away that lead to banks becoming more vulnerable to the crises that are compelling them. Interest borrowing, which is one solution for conventional banks, but is a dilemma for Islamic banks since it contradicts the principles of Islamic law (prohibiting usury) (Islamic Accounting and Auditing Foundation, 2004).

In December 2010, the Commission issued Basel III Directives on the measurement and the management, by calculating the liquidity coverage ratio (LCR) and the Net Stable Financing Ratio, on the basis of the importance of liquidity risks in banks. NSFR ratio (Loghod, 2010). And in March 2012 the IFSB published the Liquidity Risk Management Guidance Principles (IFSB-12) (Haron, 2012).

The non-use of some long-term Islamic financing formulas such as Modaraba and Musharaka financing which is based on Islamic financing, as well as of fewer risky and liquid financing formulas, such as murabaha finance, is also negative effects of maintaining high liquidity ratios of Islamic banks (Bouanis et al., 2016).

Since a risk of liquidity is of importance, this study will develop a model for liquidity risk measurement in Muslim banks, explain the instruments and difficulties facing Islamic banks to measure liquidity risks and seek solutions and alternatives that enable them to improve their results, invest and improve their role and their contributions to the development of Islamic banks (Cazap, 2011).

In order to meet the liquidity requirements, the study problem consists in the prospection of finding a liquidity risk measuring template in Jordanian Islamic banks like conventional banks, selling some liquidity assets, such as securities: stocks or bond or borrowing from other banks or from the Central Bank (Almazari, 2014). The Central Bank includes interest rates which under Sharia law are considered prohibited and this leads either to a lack of liquidity resulting from investment which could affect the bank's continuity. In the event of sudden resignations, Islamic Banks must retain high liquidity to meet liquidity requirements, which may influence the amount of funds invested, the opportunities for waste investment and the profit opportunities missed, reducing the bank's profits and the profits distributed to holders of an investment account (Gharaibeh et al., 2002).

RESEARCH QUESTION	RESEARCH HYPOTHESIS (STATED IN NULL FORM)
Key question: Can a model be built in Jordanian Islamic banks to measure liquidity risk?	Main hypothesis: The liquidity measurement ratios in Islamic banks have no statistically significant effect on the liquidity risk at the meaning level ( $\alpha - 0.05$ )
Is the liquidity risk ratio at the level of importance significantly positive ( $\alpha \pm 0, 05$ ) affection?	H01: There is no statistical impact on the importance of the Ratio investing on liquidity risks ( $\alpha \sim 0,05$ )
Is the capital adequacy ratio of liquidity risk statistically relevant at ( $\alpha$ to 0.05) levels?	H02: The ratio of capital adequacy to the liquidity risk at the significant level ( $\alpha$ to 0.05) has no statistical impact.
the non-performing liquidity risk financial ratio at the level of ( $\alpha \sim 0.05$ ) have statistically significant implications?	H03: The non-performing liquidity risk ratio ( $\alpha$ to 0, 05) is of no statistical importance for any affection.
Do the return on assets of the liquidity risk at the level of ( $\alpha = 0.05$ ) have a statistically significant effect?	h04: The statistical significance of the liquidity risk return at the significance level ( $\alpha$ to 0.05) is not affected.
Is the renewal of the equity ratio at a liquidity risk ( $\alpha = 0.05$ ) statistically significant?	H05: The statistics of the equity return on liquidity risk at the significance level ( $\alpha$ -to-0,05) have nothing to do with affect.

### PREVIOUS STUDIES

Abdo et al. (2020) studied liquidity risk determinants in Sudan's Islamic banking system, DP1 in this article is the liquidity risk measured in all banks that demand the value-at-risk approach by excess or serious liquidity shortfall; DP2 is bank size, investment, profit and budget deficits. The results showed that bank variables as size, investment and earnings are statistically significant, whereas the budget deficit is negative but not significantly related to liquidity risks.

Liquidity risk assessment by Jaxybekova et al. (2018) The paper seeks to create new instruments for assessing and managing the liquidity risk of second-level banks in Kazakhstan Banks, finding that the model for evaluating and managing liquidity risk is able to simulate bank risk figures, researchers concluded that the liquidity risk factor is the bank accounting indicators, the change in the other banking ban indicators.

The study attempts to assess the role of auditing committers in the management of liquidity risks for commercial banks in Kuwait, by Al-Enazi et al. (2018). Since this study is considered

one of the field studies that followed the descriptive and analysis methodology, the study concluded that a balance is necessary between the audit committee's numbers and the number and quality of tasks assigned to the bank's measurement, and analysis of the liquidity risks, with the importance of audit committee members. Analysis of the liquidity risk in relation to the activities of the bank.

Bu Daiaf (2015) Islamic banks monitoring liquidity risk. Algerian Al Baraka Bank case investigation, in the research, the liquidity risks in Islamic banks were identified because these banks lack opportunities. In order to maintain some liquidity with it, the head department is forced into precautions by the use of both quantitative and qualitative methods while making profits by investing in funds in various projects, and the research recommended finding ways to communicate and permanently coordinate between those responsible for liquids policy and those with information. It moreover focused primarily on the importance of regular liquidity tests and the need to diversify funding sources and rely on long-term investment deposits.

The liquidity management challenges in Islamic banks are addressed by Kamal et al. (2013). In the Islamic Bank Sector known in the legal reserve on investment deposits, the researchers explained and analyzed the major liquidity management problems. The lack of alternative products for liquidity management and, in particular, the lack of an effective cash market between Islamic banks. Therefore, researchers proposed adequate alternatives to facilitate liquidity management in Islamic banks through a number of alternative capital markets and inter-Islamic money markets financial products and tools to manage the relationship between Central Banks and Islamic banks. The researchers also proposed alternatives.

### METHODOLOGY

The analysis and description approach were used in the study to compile information, present it, read its results and draw conclusions for the purpose of the study. Published sources of information, such as reports and six-month and yearly financial statements, are used by Islamic banks in Jordan (Islamic Financial Services Board, 2012). The test within the time frame (2013-2019). All Jordanian Islamic banks, which had four Islamic banks until late 2019, belong to this study population (Islamic Financial Services Board, 2012). While the sample was limited to the Islamic Arab Bank and the Islamic Bank of Jordan (Jordan Banks Association, 2020), Safwa Bank and Al-Rajhi Bank were excluded due to a lack of sufficient study data (2013-2019).

### TEST AND DISCUSS HYPOTHESES

**TABLE 1**  
**RESULTS OF TESTING THE IMPACT OF INVESTMENTS RATIO ON STATUTORY LIQUIDITY**

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculate d	Standard error	β	Independent variables					
0.031	2.314	0.092	0.21	Investment ratio	0.004	7.458	0.415	0.644	Statutory liquidity
0	4.635	0.032	0.15	Bank size					
0	6.44	0.702	4.52	Regression constant					

\* The effect is significance of statistical at ( $\alpha \leq 0.05$ )

To test the study hypotheses and answer questions, the results were as follows: Simple & Multiple Linear Regression The investment ratio has no statistically significant impact on liquidity risk at the level of importance ( $\alpha \sim 0, 05$ ) (Central Bank of Jordan, 2008).

The Table 1 shows that, where the calculated F value is (7.458), and (Sig F = 0.004) less than 0.05, the impact of the independent variables in the reliable variable is statistically significant (the Statutory liquidity ratio), whereas the calculated F is (7.458). While the relationship among variables (R =0,644 correlation coefficient), the value (R2 = 0,415) is that, by reason of the (statutory liquidity) variance (investment ratio and banking size), 41.5% of the variance can be explained), all others are kept constant. All other variables are maintained. Beyond the coefficient of regression = (0,212) is concerned, it is the positive influence of the investments ratio on the statutory ratio of liquidity, which is significant as the value of the t was (2,314) and the significant level (Sig =0,031) is = 0,150( $\beta$ ), and which is a significant impact of the positive impact of the size of the bank on the statutory liquidity ratio. Consequently, the first sub hypothesis is rejected and the alternative that states: the investment ratios have a statistically significant impact on the liquidity risk ( $\alpha$  to 0,05) of this level. The capital adequacy ratio's statistically important effect on liquidity risk at the significant level ( $\alpha$  to 0.05) is not significant.

**TABLE 2**  
**RESULTS OF TESTING THE EFFECT OF THE CAPITAL ADEQUACY RATIO ON THE STATUTORY LIQUIDITY RATIO**

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculate d	Standar d error	$\beta$	Independent variables					
0	5.272	0.324	1.708	The capital adequacy ratio	0.008	6.054	0.366	0.605	Statutory liquidity
0.001	-4.076	0.038	-0.155	Bank size					
0	5.116	0.879	4.496	Regression constant					

\* The effect is significance Of statistical at ( $\alpha \leq 0.05$ ).

The Table 2 above indicates that the statistically significant effect of the independent variables (capital appropriateness ratio and bank size) on dependent variable (Statutory liquidity ratio) is equal to (6,054). Significant F (Sig F = 0, 08) is less than 0, 05 while the coefficient of determination (R2 = 0.366) is indicating the relationship between variables (R = 0.605). In other words, the variation of (the capital adequacy ratio and bank size) can explain 36.6 percent of the variance of the statutory liquidity ratio, the rest of the variables are held constantly.

Besides the regression coefficient ( $\beta$ ) = 1.708, which has a significant positive effect of the capital adequacy ratio on the Statutory liquidity ratio, and t value was (5.272) with (Sig = 0.000), ( $\beta$ ) of bank size = -0.155) has a significant negative effect of the bank's size on the Statutory liquidity ratio, as its t value was (-4.076) and with a significance of 0.0001. The second sub-hypothesis will thus be dismissed and accepted as the alternative: a statistically significant impact on liquidity risk ( $\alpha = 0.05$ ) exists from the ratio of capital adequacy. The non-performing financial ratio of liquidity risk at the level of relevance is not statistically significant ( $\alpha \pm 0.05$ ) (Jordan's Central Bank, 2008).

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculated	Standard error	$\beta$	Independent variables					
0	6.979	0.696	4.86	Non-performing finance ratio	0	18.888	0.643	0.802	Statutory liquidity
0	-11.547	0.022	-0.255	Bank size					
0	15.219	0.443	6.735	Regression constant					

\* The effect is significance Of statistical at ( $\alpha \leq 0.05$ )

The Table 3 above indicates that the effect on the reliable variable (Statutory Liquidity ratio), on the calculated F (18,888), is statistically significant (Sig F = 0.000) and the coefficient of correlation was (R = 0.802) for both independent variables (non-performing financing ratio and banking size). The relationship between the variables indicating that and the determination coefficient values were (R2 = 0.643) means that the variance in (the Statutory liquidity ratio) was explained at 64.3% by the variance in, and all other variables were consistent (the financial ratio of the non-performing and the banking sizes). As for the coefficient of regression ( $\beta$ ) = 4,860 indicate a positive impact of the non-performing financial ratio in the status ratio with a significant level (sig = 0,000), ( $\beta$ ) = 0,255 (this refers to the negative impact of bank size on the statutory liquidity ratio which has a significant effect, as its t value (-11,547) and its sig is a positive effect of the non-performing financial ratio. Researchers thus oppose the third sub-hypothesis, accepting the alternative which says that: The non-performing financial ratio has a statistically significant effect on a significant liquidity risk ( $\alpha$  to 0.05). The return on assets ratio on liquidity risk at the level of significance ( $\alpha$  to 0, 05) has no significant influence (Central Bank of Jordan, 2008).

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculated	Standard error	$\beta$	Independent variables					
0.009	-2.893	6.594	-19.08	Return on Assets	0.011	5.615	0.348	0.59	Statutory liquidity
0	-17.178	0.01	-0.167	Bank size					
0	21.259	0.244	5.183	Regression constant					

\* The effect is significance Of statistical at ( $\alpha \leq 0.05$ )

The Table 4 above shows the statistically significant effect of the two independent variables (asset return and bank size) on the dependent variable (the statutory liquidity ratio); the F values were (5.615) and a significant (Sig F = 0.011) correlation ratio was equal (R = 0.590). That is to say, the value of the coefficient of determination (R2=0.348) has been established as a relationship between the variables indicating that 34.8 percent of variance in (statutory liquidity ratio), all of the other variables have been constant (Return on asset ratio and bank size). The

regression coefficient ( $\beta$ ) = -19.080 has a significant negative impact, as for t-value (-2, 893) and significant (Sig = 0.009), the return of assets ratio on the statutory liquidity ratio, since it was = -0.167. It refers to the negative impact of the size of the bank on the statutory liquidity ratio, which is an important effect, because the t-value of the bank was (-17,178). Researchers therefore reject the fourth sub-hypothesis and accept the alternative: The return on assets at liquidity risk at the level of ( $\alpha \pm 0.05$ ) is statistically significant. Fifth sub-hypothesis: The return of equity ratio on liquidity risk at the meaning level does not have a statistically significant effect ( $\alpha \sim 0.05$ ) (Jordan's Central Bank, 2008)

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculate d	Standar d error	$\beta$	Independent variables					
0	-4.809	0.256	-1.232	Return on Equity ratio	0.016	5.034	0.324	0.569	Statutory liquidity
0.037	-2.234	0.048	-0.108	Bank size					
0.001	3.785	1.025	3.881	Regression constant					

\* The effect is significance of statistical at ( $\alpha \leq 0.05$ )

Table 5 shows the statistically meaningful effect (Sig F = 0.016), the correspondence ratio (R = 0.569) and coefficient values of the determination were (R2 = .324) of the effect of both separate variables, (equity return and bank size), on the dependencies, on the Statutory Liquidity Ratio (the effect of the calculated F is (5.034). As far as ( $\beta$ ) is concerned -1.232, the regression coefficient has negative consequences for equity return, for the statutory liquidity relationship, for the value of t (-4.809) and for the significant amount (Sig = 0.000), for the statutory liquidity ratio it is (B) = -0.108 with significant negative impact of the bank on its size, t is also (-2,234) and has a significance level (Sig = 0.037). Consequently, we reject this fifth sub-hypothesis and accept the alternative that states that "the return on equity ratio has a statistically significant impact on the liquidity risk at level ( $\alpha$  to 0.05).

To examine the main hypothesis and the results, multiple regression analyzes were used: Key hypothesis: It is impossible to construct a liquidity risk measurement model in Islamic banks by studying the relation between liquidity risk and liquidity measures criteria in Jordanian Islamic banks (Central Bank of Jordan, 2010).

The above table demonstrates that the investment ratio effect, the  $\beta = 0.254$ , and the value t (0.251) with a meaning level (sig = 0.805), does not have a significant effect on this dimension.

Practical, on the other hand, First: to discuss the principal hypothesis: Based on the results presented in the results of Table 6 the statutory liquidity ratio and the liquidity measuring criteria have been found to have a major statistical effect.

Regression co- efficient					Sig F*	F	R2	R Correlation Co-efficient	Dependent variable
Sig t*	calculated	Standard error	$\beta$	Independent variables					
0.805	0.251	1.012	0.2615	Investment Ratio	0.043	2.805	0.498	0.706	Statutory liquidity
0	7.543	0.15	1.13066	Capital Adequacy Ratio					
0	6.218	0.756	4.7224	Non- Performing finance Ratio					
0.569	-0.581	60.198	- 35.1382	Return on Assets Ratio					
0.421	-0.825	4.389	-3.5959	Return on Equity Ratio					
0.521	-0.656	0.172	-0.1091	Bank size					
0.404	0.856	4.329	3. 6998	Regression constant					

\* The effect is significance Of statistical at ( $\alpha \leq 0.05$ )

## CONCLUSION

From the theoretical side, most Islamic banks suffer from a glut in liquidity, as their balance sheets show a large number of reserves, both mandatory and optional, due to their fear of the scarcity of liquidity in case of exposure to crises. Lack of short-term Islamic investment alternatives in the Jordanian market, taking into account the issuance of soukuk law. Islamic banks resort to short-term and risky investment instruments such as Murabaha, and move away from long-term and high-risk investments such as participation, so as not to be exposed to unacceptable liquidity risks. Jordanian Islamic banks are committed to prudent methods of managing liquidity risk through periodic monitoring of their levels, whether on a daily or monthly basis, in addition to the process of distributing funds to sectors and reducing concentrations.

Practical, on the other hand, First: to discuss the principal hypothesis: Based on the results presented in the results of the first main hypothesis test the statutory liquidity ratio and the liquidity measuring criteria have been found to have a major statistical effect. The results of the study submitted by Ahmed et al. (2012) on Islamic banks in Bangladesh. Anjum et al (2012) on Islamic banks in 2012 are consistent with this study, and the results of the 2012 study on Islamic banks in Pakistan.

Furthermore, first sub hypothesis discussion: Second: Based on the results shown in Table (1), it was found that the statutory liquidity ratio and investment ratio have statistically significant effect, as can be explained by the fact that an investment ratio increase necessarily involves increasing the liquidity risk, since any investment increase leads to the reduction in the liquidity ratio, which increases the potential for the investment (El Saghir, 2011).

Additionally, the second hypothesis is discussed: Based on the results shown in Table (2), the statutory fluidity ratio and the equity ratio have a statistically significant effect and this can be justified by a rise in the capital adequacy ratio which indicates the existence of liquidity surpluses The results of the 2012 study on Islamic Banks in Bangladesh, Ahmed et al. (2012) on

Islamic Banks in Bangladesh and Anjum et al (2012) are a consistent measure of Rashwan et al. (2020) ability to face liquidity risk.

Therefore, the third underlying hypothesis: The results shown in Table (3) show a statistically significant impact on statutory liquidity and non-performing financial relation and this can be justified because the increased financial ratio of non-performing funds means an increase in funds or investments in high-risk investments that leads to customer default (Naser et al., 1999). And so this increase shows an increase in the liquidity risk of the bank, in line with Iqbal's 2012 study on Islamic banks in Pakistan.

The penultimate sub hypothesis is to be discussed: It was found based on results shown in Table (4), and the fact that increasing the return on assets means expanding investment can be justified by statistically significant impacts between the statutory liquidity ratio and the return on assets relation (Nuhui et al., 2017). The growth of fairly long term, high-return investment which means a decrease in liquidity levels and decreased liquidity risk capacity in the bank, which is consistent with the results of the study on Islamic banks in Bangladesh presented by Ahmed et al. (2012), which disagrees with Iqbal, Islamic b study (2012).

Finally, Fifth underlying discussion: The results showed in Table (5) show that the statutory liquidity ratio and the property rights return rate have a l significant statistical effect. The fact that an increase in the return on equities means the bank expansion can be justified (Rashid & Jabeen, 2016). Invest or expand in relatively long-term, profit-making investment, that is to say a decrease in liquidity levels and reduced liquidity risk capacity in the bank, in line with the results of the study presented in general by Ahmed et al. (2012). Study of Islamic Banks in Pakistan (2012 in Bangladesh) and (Anjum 2012).

## RECOMMENDATION

The results of the study provided some recommendations that would be forested to help enhance liquidity risk aspects in Jordan's Islamic banks as follows:

1. Urging the Central Bank to issue legislation that allows Islamic banks to invest their money in short-term Islamic investments for the purpose of giving them additional methods of managing liquidity and its risks.
2. Allowing Islamic banks to resort to the Central Bank as the last aid by issuing short-term Islamic financial instruments to address the liquidity problem, thus enhancing their ability to increase their share in the banking market of financing without fear of the absence of a source of financing that would help them overcome the deficit in Liquidity.
3. Enhancing cooperation between Islamic banks in the event that one of them encounters a problem of liquidity shortage by establishing a fund of its own.
4. Apply the guidelines issued by the Islamic financial Services Board in the field of liquidity management, and stress tests.
5. Working on benefiting from the Basel decisions in the field of liquidity management and amending them in line with the nature of the work of Islamic banks, which will benefit them in the field of liquidity risk management and so that they are not an unwanted outsider to the banking sector.
6. Considering this study as a seed for building other models for measuring liquidity risks in Islamic banks, to enhance their desired role in building an Islamic banking sector that replaces the traditional banking sector.

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