

The Effect of Liquidity Risk Management on the Jordanian Financial Sector – The Proxy of Commercial Banks

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The purpose of this paper is to determine the effect of Liquidity Risk Management on the Jordanian Financial Sector, as the success of any financial institution depends mainly on how it forecasts its liquidity needs and that might be through the structure of deposits or the surplus amount that determines performance will be at stake. To analyse this effect, liquidity and performance indicators of 13 listed Jordanian commercial banks were calculated and analysed. Results elucidated that loans to total deposit (L2) portrayed a high adverse impact on operating cash flow per share (OCFS) (-2.535) and no effect on earnings per share (EPS). Quick ratio (L1) was able to explain a positive change in banking sector performance indicators, as results indicated 0.543 on EPS and 2.193 on OCFS. Cash and investments to total deposits ratio displayed a positive impact on both performance indicators with a varying degree of impact (0.212 on EPS and 1.734 on OCFS). Regarding loans to total assets indicator, contemplated a negative low impact on EPS (-0.085) and high negative impact on OCFS (-1.569). As a conclusion, the impact of liquidity risk management indicators was higher on OCFS than on EPS, thus cash basis performance indicators are more relevant than accrual basis indicator to be employed for liquidity risk management strategy.

Key words: *Liquidity, Performance, Indicators, Accrual, Risk.*

Introduction

Keynes (1936) in his paper “The general Theory of employment, interest and money” identified three reasons why liquidity is essential: the precautions, the speculative motive, and

the transaction motive. Banking institutions survival depends mainly on its ability to meet its contractual obligations by ensuring the availability of cash or collateral to meet those needs on due time by organising the various sources of funds available under normal and stressed conditions (Federal Reserve, D.B.S.R., 1994). Assets liquidity depends on the convertibility and the ease of conversion to cash with no or little loss (Nader, 2002). Since 2007, the U.S subprime mortgage crisis has enormously affected the global financial system. Furthermore, it rendered a huge challenge to short and long term development for the global banking industry. The crisis has forced banks and other financial institutions to be very discreet about lending in general, as banks encountered lack of liquidity after the subprime crisis, and that is because banks depend heavily on short-term source of finance. The banking sector is vulnerable to liquidity risks; consequently, they should place emphasis on managing their liquidity to enable meeting obligations as they come due, without incurring undesired losses (BIS, 2008). Thus, managing liquidity in terms of maturity and in term of assets and liabilities timing is considered an essential part of the financial management process which is widely known as working capital management.

Assets – Liabilities Management is a process that concentrates on matching the supply and demand of funds through forecasting its dynamics and volatility in a manner that maintains liquidity risk within the set limits (Nader, 2002). Liquidity risk management of the world banking industry has witnessed a development process in which causes for risks turn out to be more complex and banks' management turns to exercise strict supervision (Persaud, 2003). However, existence of liquidity risk will lead to severe consequence to banks especially following the 2007 financial crisis. Moreover, the credit crunch of 2007 provoked many banks to see the importance of liquidity risk management (Matz, 2008). Thus, it is essential for banks to boost liquidity risk management as liquidity has long been considered as the “lifeline” for commercial banks. It not only lays the foundation for commercial bank activities but it also plays an inclusive role in maintaining the economic stability of the whole country.

In general banks have identified various tools and techniques for liquidity management, though many banks still encounter difficulties in managing their liquidity in a prudent way. The global financial crisis 2007 – 2008 explored the importance of a healthy banking sector and how liquidity conditions can quickly reflected on its financial position. In response to these difficulties, the Basel Committee has addressed some principal requisites in liquidity risk management that banks should adhere in order to ensure the soundness of the banking sector (Basel Committee on Banking Supervision, 2010).

The main issue here is why the liquidity issue is a core issue for banks. Adequate liquidity will enable banks to confront three major risks: funding risks; compensation for non-receipt of cash inflows from borrowers' instalments repayment; and finally meeting contingent

liabilities and clients' withdrawals. Thus, keeping a sufficient level of liquidity or quasi cash will furnish the bank with a protection against failure and also will enhance its profitability. Ngwu (2006) defined liquidity management as the act of preserving sufficient cash and raising funds promptly from the market in order to satisfy loan customers, depositors and other parties for retaining public confidence.

Based on the aforementioned discussion, liquidity risk management has a significant effect on banks' financial performance. Banks are trying to adhere to the achievement of financial performance goals by adopting efficient liquidity risk management techniques. This study aims to determine the effect of liquidity risk management on the financial performance of Jordanian commercial banks.

Liquidity Risk Definition and Implications

Managing liquidity risk is a major activity of every financial institution, thus every financial institution endeavours to maintain a specific level of liquidity on a daily basis. This liquidity risk itself is vague but it is possible through adaptable liquidity administration arrangements, to mitigate its negative impacts (Milos 2014, p. 14-16) and there is no financial institution that is not subject to liquidity risk, and it has been noticed recently that it is one of the major contributory factors to bank failure. (Drehmann & Nikolaou 2010) stated liquidity risk is the hazard of running out of cash when cash is needed to meet withdrawals and credit requests.

Risk can be defined as the exposure to uncertainty, while uncertainty is defined as the possibility of occurrence of one or several events (Musoke, 2017). Ismal, (2010) stated that risk is not only uncertain, but also the consequences of this uncertainty should also be taken into consideration. Liquidity is financial terminology that means the amount of capital available for investment. Today, most of this capital is credit, not cash. Bank liquidity simply means the ability of the bank to maintain sufficient funds to meet its maturing obligations. Nwaezeaku (2008) defined liquidity as the convertibility degree to cash or the ease which any asset can be converted into cash.

Basel Committee on Banking Supervision (1997), defined liquidity risk as that which arises from the inability of a bank to absorb decreases in its liabilities or to fund increases in its assets. When a bank has insufficient liquidity, it cannot procure sufficient funds, either by increasing liabilities or by converting assets promptly and at a reasonable cost, thereby affecting profitability. Besides, Decker (2000) pointed out that liquidity risk can be subdivided into market liquidity risk and funding liquidity risk. Literature has defined liquidity risk as the ability of financial institutions to meet its obligations as they become due (Federal Reserve, D.B.S.R., 1994; Chorafas, 2007; Choudhry, 2011; Drehmann, 2013).

The banks' ability to meet its obligations, depends mostly on the macroeconomic environment condition, sector stability and entity specifics (Choudhry, 2011). Further, liquidity risks generated from various resources that is related to daily operations with regards to lending and trading activities (Chorafas, 2007). Thus, the banks' inability to meet their contractual obligations will lead the bank to default (Drehmann, 2013). Accordingly, guaranteeing the availability of required funds to meet the expected and unexpected future without hindering its daily operations or its financial position, which is known as liquidity risk funding (BIS, 2008; Vento & La Ganga, 2009). Saunders & Cornett (2006) argued that during normal conditions, banks rarely face a liquidity crisis and liquidity risk may differ with overall economic environment.

Thus, liquidity risk is the uncertainty surrounding the speed and the availability of convertibility given the presence of a read market in which there is active trading in the asset. It comes mainly from the inability of firms to raise funds to meet financing needs or the incapability to execute transactions at prevailing market prices due to a lack of appetite of other market parties.

Several theories have tackled the issue of liquidity and liquidity management. According to Nzotta (1997) Anticipated Income Theory places emphasise on the earning potential and on borrower's credit worthiness as the extreme guarantee for ensuring adequate liquidity. Nwankwo (1991) also posits that the theory points to the tendency towards self-liquidating commitments by commercial banks. Shiftability Theory proposes that a bank's liquidity is maintained if it holds assets that could be transferred or sold to other investors for cash, provided that that there is an active market that is ready to buy these assets at a discount (Dodds, 1982). Commercial Loan Theory has been subjected to various criticisms by Nwankwo (1992) and Dodds (1982). The main limitation is that the theory is inconsistent with the need for economic development particularly for developing countries as it excludes long term loans which are the engine of economic growth. Also, the theory focuses on the maturity structure of bank assets (loan and investments) rather than its marketability or shiftability. Loanable Funds Theory refers to the volume of funds saved by individuals and institutions in an economy for lending purpose to borrowers rather than being consumed. This theory stated that concentration of loans in a particular sector is one of the main causes of liquidity risk thus loanable funds should be diversified (Bibow, 2005). Liabilities Management Theory pronounces that a bank can meet its liquidity requirement by bidding in the market for further funds. In other words, they can borrow money from the financial markets to meet their liquidity needs instead of presenting self-liquidating loans (Jhingan, 2010).

Generally speaking, if a bank cannot accumulate cash in a timely fashion, it is likely to experience a turndown in earnings and forfeiture of customers. If this cash shortage

phenomenon persists, it may lead to a bank collapse. Liquidity shortage is considered as a red alert for management that the bank is exposed to a serious problem that should be tackled promptly.

High liquidity is normally considered to be a sign of financial strength. Arnold & Schwellnus (2008) stated that holding sufficient cash provides some advantages, such as, meeting daily expenses and demand by various stakeholders and also providing a safety margin for eventual downturns due to the fact that future cash flows are unpredictable. Also Neto (2003) indicated that a high liquidity volume can be as undesirable as holding excess liquidity that could be used for profitable investments to increase rate of returns.

Previous Studies

Previous empirical literature showed that the effect of liquidity risk on bank profitability is inconclusive. Some empirical evidence concluded a positive effect (for example Barth et al., 2003 and Molyneux & Thornton, 1992) others arrived at a negative effect (for example Kosmidou et al., 2005; Kosmidou, 2008). Verlyn & Eugene (1980), posited that liquidity status is important for both investors and managers in order to evaluate company future stability, hence estimating risk involved, return rate and stock market price in one hand and the necessity of ejecting the weaknesses of traditional liquidity indicators (current and liquid ratio) on the other hand. This persuaded researchers to focus on assessing efficiently the significance of liquidity for a company's survival. Arif & Anees (2012) investigated the liquidity risk and its relationship with banks' profitability in Pakistan. The results showed that there is a significant positive relationship between the volume of deposits, liquidity gap, liquidity reserves and profitability of banks. Thomas & Wang (2004) argued that when banks face a credit shock or liquidity shock, it was feasible to handle the risk through adding reserve or capital or by means of asset securitisation. Ismal, (2010) examined the theoretical basis for bank's liquidity risk management in the present inevitable vulnerable financial environments. The current situation requires that banks should set up a framework for liquidity risk management process and focus more on the role of Asset-Liabilities Committee (ALCO).

Another study by Shen & Chen (2014) investigated the impact of liquidity risk management on the banks performance of 12 advance economies' commercial banks for the period 1994 - 2006. They concluded that liquidity risk is the endogenous determinant of commercial bank performance and the reasons behind liquidity risk is mainly attributed to reliance on outside financing. While, Lucchetta (2007) studied the impact of the interest rate and liquidity management of European Union banks. The results indicated that interbank rates positively determine the liquidity.

While monetary policy interest rate is negatively associated with level of liquidity. In Gatev et al., (2009) study on managing bank's liquidity risk, they argued that transaction deposits assist banks to hedge liquidity risk from unexploited commitment of loans. They also concluded that during the inflexible liquidity deposit-lending, hedging becomes more dominant. Bunda & Desquilbet (2008) investigated liquidity risk indices in emerging markets and concluded that profitability, bank size and financial crisis negatively affect liquidity while inflation, capital adequacy and supply of liquid assets reflected a positive association with liquidity.

Data and Methodology

Various scholars and researchers investigated liquidity risk management from different perspectives. For example Verlyn & Eugene 1980; Barth et al., 2003; Shen & Chen 2014 and Arif & Anees 2012), investigated the relationship between bank profitability and liquidity risk management, while Gatev et al. (2009) investigated liquidity risk management relationships with deposit and loans and Schweltnus, (2008) and Neto (2003) analysed the effect of liquidity level on banking performance.

This research is a correlational descriptive-analytical investigation. The objective of the research is: to examine the effect of liquidity risk management practices on the Jordanian commercial banks' performance; and a comparison of different liquidity indicators on Jordanian commercial banks' financial performance. In order to accomplish the research objectives, the authors selected all 13 listed commercial banks in the Amman Stock Exchange. All the data was collected for this research from the secondary source extracted from the annual audited financial reports available from the respective bank official websites. Apart from that, any other source of information employed in this research was also secondary in nature and was collected from different journals, articles and from the Amman Stock Exchange.

Performance variable (Dependent Variable) is represented by three different measures. First the Return on Equity – ROE (accrual basis) which measures the ability of banks' management to generate returns to shareholders from internal finance. The second dependent variable is Earning per Share – EPS (accrual basis) which represents net profit after tax that is available for each stock holder. For comparison purpose, also a cash basis indicator, as a proxy for an independent variable, will be employed by embedding Operational Cash Flow per Share – OCPS (cash basis) that measures the operating cash flows attributable to each common stock. Regarding the independent variable that will represent liquidity risk management, the study will utilise four liquidity ratios (i.e. L1 to L4): L1 (QR) will measure the bank's ability to meet its short term obligations on due time without obstructing its daily normal operation; L2 (LTD) will assess the degree of external funding to total deposit, as any

increase in this indicator ultimately will hinder the bank's ability in obtaining further external funding; L3 (LTA) will calculate the percentage of banks' dependence on external sources to finance its investments; and the last liquidity indicator is L4 (CITD), this ratio will evaluate the percentage of cash and quasi cash that is available for the bank in order to meet any unexpected increase in cash demand by depositors. Table 1 demonstrates the study variables description and its calculation.

Table 1: Variables Description

Variables	Description / Calculation
ROE	(Net profit after Tax – Preferred dividend) / Total Equity – Bank's Performance - Accrual Basis
EPS	(Net Profit after Tax – Preferred dividend) / No. of Outstanding Stock - Bank's Performance - Accrual Basis
OCFS	Operating Cash Flow / No. of outstanding Stock - Bank's Performance - Cash Basis
QR – L1	Current Assets / Current Liabilities
LTD – L2	Loans / Total Deposit
LTA – L3	Loans / Total Assets
CITD – L4	Cash + Investment / Total Deposit

Hypotheses of the Study

The study will be based on the following four main hypotheses as follow:

Ho1: L1: The Quick ratio (QR) does not impact the Jordanian financial sector performance.

Ho2: L2: The Loans/Total Deposits ratio does not impact the Jordanian financial sector performance.

Ho3: L3: The Loans/Total Assets ratio does not impact the Jordanian financial sector performance.

Ho4: L4: The Cash + Investment/Total Deposits ratio does not impact the Jordanian financial sector performance.

Data Analysis

The data base of this research is an outcome of merged sources. First, the ratios of the independent variables, the liquidity ratios (L1, L2, L3 and L4) are calculated for the years 2014 - 2018 and the financial indicators of the performance of the Jordanian financial sector are collected from the financial reports of all Jordanian Banks via Amman Stock Exchange reports for the same period.

The suitable statistical method to find out the impact of the liquidity risk management on Jordanian banking sector is by applying regression analysis. Since the liquidity risk indicators

represent a function of the independent variables; we can express this impact by the following formula:

$$Y = \alpha + \beta(X) + e$$

Where:

Y: represents the dependent variable (L1, L2, L3 and L4)

α : is the constant of the regression formula

β : is the regression coefficient of independent variable

X: is the independent variable

Empirical Results

Analysing Impact of Liquidity Indicators (L1 to L4)

Table 2 presents the empirical results of regression analysis for the pooled data using independent variables as a proxy for liquidity.

Table 2: Regression Results of L1, L2, L3, L4

Independent. / Dependent.	R	R ²	B	Ranking Based on B value
L1/EPS	0.327	0.107	0.543	1
L1/OCFS	0.146	0.021	2.193	2
L2/EPS	0.002	0.000	0.004	4
L2/OCFS	-0.132	0.078	-2.535	1
L3/EPS	-0.066	0.004	-0.085	3
L3/OCFS	-0.136	0.018	-1.569	4
L4/EPS	0.144	0.021	0.212	2
L4/OCFS	0.131	0.017	1.734	3

As indicated in Table 2 and referring to the value of (R²), the quick ratio (L1) explains only 10.7% of the changes in EPS and 2.1 % of changes in OCFS therefore the results reflect a positive relationship between quick ratio and performance indicators of the Jordanian banking sector. The analysis regression coefficients of 0.543 and 2.193 also indicated a positive impact of quick ratio on the financial performance of Jordanian banking sector. These results suggest that banking management should pay more attention to its short term investment in order to avoid any source of liquidity deficit risk. This means that the more banking assets (short-term) possessed, the less liquidity risk faced by banks.

The (R²) value of the loans/total deposits ratio (L2) does not explain any changes in EPS, while it explains 8 % of changes in the OCFS and a negative relationship with performance indicator (OCFS) of Jordanian banking sector. The analysis outcomes demonstrate no impact

of (L2) on EPS but high negative impact on (OCFS) at -2.535. These results suggest that banks' management should pay more attention to maintaining the optimal loans/total deposits ratio and not to over lend in order to avoid any source of liquidity deficit risk. As more lending will expose the banking sector to high default risk which will adversely affect the banking sector returns and ultimately its EPS. This also means that the higher the loans granted by banks, the more liquidity risk faced by them, as it decreases the operating cash flow per share generated by banks is due to an increase in the amount of cash outflow.

Regarding (L3) as the results display, possesses a very low explanation in connection to EPS and OCFS changes as illustrated in Table 2. Moreover, the analysis also shows very weak impact of (L3) on EPS (- 8.5%) and negative impact on OCFS at -1.569. These results suggest that banks' management should not exaggerate in granting loans and they should seek an optimal loans/total assets ratio. The results indicate that L3 is higher which may be as a result of increase in loans amount or decrease in total assets value; this will negatively affect the financial performance indicators of the Jordanian Banking Sector. In this context we can conclude that the more loans granted by banks, the higher is the liquidity risk exposure confronted by them, as it decreases the operating cash flow per share generated by banks.

Finally, (L4) has no ability to explain the changes in EPS and OCFS as illustrated in Table 2 but has a positive relationship with banks performance indicators. The analysis shows weak positive impact of (L4) which amounted to 21.2% on EPS and positive impact on OCFS at 1.734. These results suggest that banks' management should concentrate on financial investment that generates enough cash flow for shareholders so as to avoid any source of liquidity deficit risk. Also (L4) will result in increasing EPS which means maximising owners' wealth in term of retained earning allocation.

Based on regression analysis results of the impacts of liquidity management indicators OCFS we can conclude that: Loans/Total deposits ratio (L2) has the highest negative impact on OCFS, followed by Quick ratio (L1) which has positive impact. Then the Cash + Investment/Total Deposits (L4) come in third rank which positively impacts the OCFS. Finally, Loans/Total Assets ratio (L3) reflects a negative impact. Regarding the EPS indicator, it is noticeable that the impact of liquidity management indicators ranges between 0.543 (highest impact) that is attributed to quick ratio and 0.004 (lowest impact) which is attributed to Cash + Investment/Total Deposits. Thus, the impact of liquidity management indicators does reflect a different impact when it is related to cash basis variable (OCFS) comparing to accrual basis indicator (EPS).

Multiple Regression Analysis

To assure the above results related to liquidity risk indicators effect on Jordanian banking sector performance, multiple regression analysis is applied using the following formula:

$$Y = \alpha + \beta_1(X_1) + \beta_2(X_2) + \dots + \beta_t (X_t) + e$$

Table 3 presents the empirical results of the multiple regression analysis of pooled data using the independent variables L1, L2, L3 and L4.

Table 3: Multiple Regression Results

L1, L2, 3, L4	EPS	B	OCFS	B
R	0.536		0.185	
R ²	0.287		0.087	
L ₁		0.576		1.924
L ₂		3.720		-3.331
L ₃		-1.552		-2.706
L ₄		0.921		0.735

As indicated in Table 3 regression coefficients (B) of L1, L2, L3 and L4 indicate that the impact of liquidity ratios L2, L3 on Jordanian banking sector financial performance of OCFS is greater than the impact of the same indicators on EPS, and thus, the more the loans granted by banks, the more the liquidity risk faced by banks as it decreases the operating cash flow per share generated by banks, while the recommendation according to L1 and L4 is to maintain more current assets and financial investments in their balance sheets. These results comply with the single regression results.

Discussion and Conclusion

We know that risk management in general is crucial in the development and sustainability of the banking sector. Based on regression analysis results, we can conclude that bank's financial performance depends mainly on maintaining adequate liquidity that is necessary for its day to day business operation in the form of withdrawals, loans and other facilities. Liquidity is the core to banks survival and sustainability within an environment where competition and volatility is very dominant.

Regression analysis results implied that all liquidity risk management vectors do have a different degree of impact in two directions (positive and negative) on both performance indicators (EPS and OCFS). As quick ratio (L1) was able to explain a positive explanation of the changes in banking sector performance indicators, as results indicated 0.543 and 2.193 respectively this mean Ho1 is rejected. Also (L3) Loans to Total Deposit indicated a high

adverse impact on OCFS (-2.535) and no effect on EPS, thus Ho2 is accepted. Loans to Total Assets indicator reflected a negative low impact on EPS (-0.085) a high negative impact on OCFS (-1.569), on the other side Cash and Investments to Total Deposits ratio displayed a positive impact on both performance indicators with a varying degree (0.212 on EPS and 1.734 on OCFS). It's worth mentioning that the impact of liquidity risk management indicators was higher on OCFS than on EPS, thus cash basis performance indicators are more relevant than accrual basis indicators. Therefore, banking sectors management should focus more on cash and near cash assets to avoid any liquidity shortage and be able to meet its expected and unexpected demand on money by different parties and win the confidence of both depositors as well as current and potential investors. Adopting a different liquidity risk management strategy by the Jordanian banking sector should be consistent with market condition and the source of liquidity that banks rely on mostly. In a way to avoid any liquidity shortage under different market conditions, this can be realised by banks' management through setting various liquidity defence limits on the basis of liquidity volume required.

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