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Bank Liquidity Management

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Banks face two central issues regarding liquidity. Banks are responsible for managing liquidity creation and liquidity risk. Liquidity creation helps depositors and companies stay liquid, for companies especially when other forms of financing become difficult. Managing liquidity risk is to ensure the banks own liquidity so that the bank can continue to serve its function. This balancing act between a bank's own liquidity and its role as a liquidity creator, especially in times of financial distress or crisis, is the focus of this paper. There has been a great deal of scrutiny on this issue due to the financial crisis that began in 2007 and is still affecting the economy today.

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Table of Contents

I. Introduction..... 2

II. Literature Review 4

III. Statement of Problem 14

IV. Possible solutions..... 15

V. Conclusion..... 18

VI. Suggestions for Future Research 19

VII. References 20

I. Introduction

The term liquidity is often used in multiple contexts. An asset's liquidity can be used to describe how quickly, easily and costly it is to convert that asset into cash (Berger & Bouwman, 2008). Liquidity can also be used to describe a company by the amount of cash or near cash assets a company has; the more liquid assets, the higher a company's liquidity. Financial ratios that measure liquidity are referred to as a company's liquidity ratios. One such ratio is the current ratio which determines a company's ability to pay short term debts as they come due (Van Ness, 2009). Liquidity risk has many definitions but the one that can be derived from the ratio is the probability that a company will not be able to pay its short term obligations as they come due. This inability can lead a company to face serious financial problems. In addition to this, liquidity risk can also be defined in terms of the counterparty to a transaction. In this sense the term means the risk inherent in the fact that the counterparty may not be able to pay or settle the transaction even if they are in good financial standing, because of a lack of liquidity (Petria & Petria, 2009).

Liquidity risk for a bank is especially prevalent as it is easy for a bank to lose its liquidity because depositors can withdraw funds when they choose. In addition to depositors, banks face another way in which their cash reserves can be strained by fulfilling obligations to companies. These companies have previously established loan commitments, called credit lines, that can be borrowed from the bank when needed (Gatev, Schuermann, & Strahan, 2007). Historically, runs on banks have shown certain banks predisposition to liquidity risk and the severity of impact this risk can have on the

economy. This risk is intricately tied to the nature of banking. This is why banks, governmental entities, and private industry have tried to understand liquidity risk and implement public policy, regulations, and risk assessment policies to mitigate this risk.

Aside from managing their own liquidity, banks play another role with regards to liquidity by creating liquidity for the market. Due to the growth of the commercial paper, equity, and bonds markets in recent decades, the role of banks as the sole provider of capital to large companies has diminished. This results from companies looking for the type of financing that best suits their specific needs. Banks still play a largely influential role in financing. They are a primary issuer of capital to companies who seek loans to fulfill a portion of their financing needs. Many times they act as the fall-back crutch on which companies support themselves in times of difficult financing. Companies can do so by establishing credit lines with banks to secure funding that ensures liquidity when it is needed most.

In summary, banks face two central issues regarding liquidity. Banks are responsible for managing liquidity creation and liquidity risk. Liquidity creation helps depositors and companies stay liquid, for companies especially when other forms of financing become difficult. Managing liquidity risk is to ensure the bank's own liquidity so that the bank can continue to serve its function.

This balancing act between a bank's own liquidity and its role as a liquidity creator, especially in times of financial distress or crisis, is the focus of this paper. There has

been a great deal of scrutiny on this issue due to the financial crisis that began in 2007 and is still affecting the economy today. This paper compares and contrasts several of the ideas and theories presented in academic literature. Section II will provide a review of these ideas and theories presented in the literature; Section III will present the statement of problem; Section IV will present possible solutions and suggestions; Section V will conclude; Section VI will offer further research suggestions.

II. Literature Review

Banks own liquidity and their role as a liquidity provider are intricately connected. The basic relationship is that when banks require more liquidity for themselves, they are able to provide less liquidity to the market. Obviously this is a simplified relationship. By holding more liquid assets, banks decrease their liquidity risk. The holding of liquid assets in excess of requirements is considered a liquidity cushion or buffer which helps banks in times of increased liquidity pressure to meet these liquidity needs. Having a liquidity buffer thus lowers the amount of liquidity a bank can create for the market in normal times. However, as will be discussed, in times of turmoil or crisis this liquidity buffer can actually increase a bank's liquidity creation as it may let these banks capitalize on other banks inability to lend. By creating liquidity in the market, banks serve an important economic role. If markets go illiquid or "dry up" this can lead to a decline in business growth as well as put difficult strains on consumers. This is why the relationship between the two has important effects on the economy and thus has warranted a great deal of academic attention.

There are many factors that affect banks own liquidity and in turn affect the amount of liquidity they can create. These factors have a varying degree of influence on the balance between liquidity risk and liquidity creation, or a bank's liquidity management. A bank's assets and liabilities play a central role in their balancing of liquidity risk and creation. A bank's liabilities include all the banks sources of funds. Banks have three main sources of funds: deposit accounts, borrowed funds, and long term funds. The amounts and sources of funds clearly affect how much liquidity risk a bank has and how much liquidity it can create. The easier a bank can access funds the less risk it has and the higher amount of funds it holds the more liquidity it can create, if willing to do so. Deposit accounts are made up of transaction deposits, also known as demand deposits, savings deposits, time deposits, and money market deposit accounts. The borrowed funds of a bank come from loans from other banks via the Federal Funds market, loans from the Federal Reserve Bank, repurchase agreements, and Eurodollar borrowings. The longer term sources of funds for banks are bonds that banks issue and bank capital (Madura, 2007).

One group of researchers studied liquidity management by focusing on the liability side of the balance sheet analyzing demand deposit accounts and the amount of undrawn credit lines a bank had. These two liabilities are major factors of a bank's liquidity risk. Demand deposit accounts give banks a larger cash base and thus are a form of liquidity. Undrawn credit lines are a liquidity risk that is off the balance sheet; companies with established credit lines can borrow from banks when they need it and thus decrease a bank's liquidity. These two opposing liquidity factors can be analyzed in

times of financial distress, for example by looking at the Russian default of 1998 and its after affects. After the Russian default a major trend unfolded: the spread between Treasury bill paper and commercial paper widened. This signaled investor uncertainty and affected demand deposit accounts and credit lines. With investors no longer wanting to invest in commercial paper, many entrusted their money to the banks. Specifically, investors put this money into demand deposit accounts believing the market distress would be short lived. This led to an increase in cash reserves at banks, and those with more demand deposit accounts enjoyed a more significant increase in liquidity. However, with companies being unable to refinance their commercial paper, or forced to refinance at a much higher cost, these companies turned to their pre-established lines of credit for financing. Banks with more undrawn credit lines faced more liquidity pressure than banks that did not have as many. The 1998 turmoil provides evidence for two important points. The first is that when investors are uncertain they tend to flock to banks as a safe haven. This in turn decreases a bank's liquidity risk by increasing their cash on hand. The other is that in times of uncertainty companies also turn to banks but for the opposite reason: they need financing. This increases a bank's liquidity risk but it is also how banks act as liquidity creators. Studies indicate that banks balance their liquidity risk and their role as a liquidity creator by balancing their demand deposit accounts and their amount of undrawn credit lines; banks that did so fared better financially (Gatev, Schuermann, & Strahan, 2007).

The balancing act for banks between liquidity risk and creation can also be a strategic decision instead of one solely to meet demands and prevent the bank from failing

(Acharya, Shin, & Yorulmazer, 2009). When banks face increasing liquidity risk, many times in the face of financial crisis or turmoil, they also face a downturn in new business. Banks that have the relatively same inflow of cash through increasing demand deposits to the outflow of cash due to fulfillment of credit lines will be unable to originate new loans. A strategic decision a bank can make is to hold more liquidity, or a liquidity cushion. In “normal” economic times, this will cause banks to miss out to some extent on new business. However, in tough economic times this liquidity cushion will give banks a competitive advantage. This is for two main reasons. One main reason is that banks that have higher liquidity before a crisis will be able to act as a liquidity provider for companies who do not have credit lines established or who need additional funding on top of those funds. The second is that the banks that face the most liquidity pressures and have more cash outflow than inflow will have to sell assets. In this situation most other banks will be facing increased liquidity pressures and there will be only a few banks in the market to buy these assets. This lack of liquidity in the market can lead to fire sales of assets. This means the company looking to sell the assets will have to offer them at a large discount because it needs the cash now due to liquidity pressure. Therefore, in crisis periods banks holding more liquidity will be able to both grow in new business and take over business of other banks by buying their assets at low prices. By purchasing assets at fire sale prices banks that are the purchaser stand to make a great deal of profit (Acharya, Shin, & Yorulmazer, 2009). An example of this can be found in the book Citibank, 1812-1970. The authors explain how National City Bank used this high liquidity strategy prior to both the crises of 1893 and 1907. This strategy led to significantly higher growth in new loans and in deposits (Cleveland &

Huertas, 1985). This means that the bank was able to increase its role as a liquidity provider and keep its liquidity risk constant. During the recent financial crisis a somewhat opposing trend played out. Even those banks that experienced an increase in deposits did not originate new loans and instead placed these deposits with central banks (Senior Supervisors Group, 2009). This meant that although they were enjoying an increase in liquidity, they did not want to act as liquidity creators. In essence, the banks wanted to stockpile their liquidity and thus reduce their liquidity risk instead of balancing it with liquidity creation. This was mostly due to the uncertainty surrounding other companies' creditworthiness.

The amount of exposure a bank has to the real or perceived cause of a financial crisis has a significant effect on a bank's liquidity risk and creation. Banks with a higher degree of exposure to the cause will face increased liquidity pressure and thus will not be able to provide as much liquidity to the market. This relationship is evidenced by the near failure of Long Term Capital Management (LTCM) after the Russian default in 1998. Firms that were more exposed to LTCM experienced more volatility and a greater drop in stock prices than those not exposed to the company (Gatev, Schuermann, & Strahan, 2007). Although stock price is not the focus of this paper, a decrease in stock price will signal weakness and increase liquidity pressure on any type of company. Many liquidity pressures can be detailed by examining the current crisis. The degree of exposure companies and banks faced in the current crisis dealt with the amount of complex financial products, especially mortgage related products, held by the company and exposure to firms that came close to or actually did collapse such as Lehmann Brothers

and Bear Sterns. The crisis has decreased banks willingness to finance loans that use collateral. This was especially true for those firms who were perceived as being weak because this weakness could mean being unable to collect on loans issued. Banks that would continue financing did so with stricter requirements. Difficult to value products were less likely to be allowed to be used as collateral, increased margins were required, shorter maturities were imposed, and a general decrease in funding transpired (Senior Supervisors Group, 2009). This meant that banks were much less willing to be liquidity providers during the crisis and if they were willing to be providers it was to a lesser extent.

During the financial crisis the interbank lending market even experienced a significant decrease. Banks have typically been able to rely on other banks to meet short term financing shortcomings due to a lack of liquidity. Banks do this through the Federal Funds market. In this market, banks borrow and lend to each other at a rate roughly .25 to 1.00 percent higher than the Treasury bill rate. The rate is influenced by whether there are more banks looking to lend excess funds or more banks looking to borrow excess funds (Madura, 2007). In the current crisis little or no banks were looking to lend due to their own liquidity pressure. The uncertainty of creditworthiness and exposure to the cause of the crisis caused banks to become hesitant to lend to other banks. The drying up of interbank lending again meant banks were unwilling to provide liquidity for fear of what it might mean for their own liquidity in the future.

A bank's risk management policy evaluates: the amount of demand deposits versus undrawn credit lines, the strategic decision of holding higher or lower liquidity cushions, and companies and other banks creditworthiness, especially those more exposed to a crisis. Risk managers use many models to account for the level of risk they are taking and how this affects the firm's profit and viability in various economic situations. Risk management policies can however have a spiral effect on the amount of liquidity banks are willing to provide. When a bank perceives itself as having higher risk, such as having a higher liquidity risk, it implements stricter risk management policies and will limit the amount of liquidity they provide. This means there will be less liquidity in the market. Less liquidity in the market will increase a bank's risk management policies and again lead to less liquidity provided by banks (Garleanu & Pedersen, 2007). This feedback loop can spiral and lead to serious financing difficulty within the market.

Regulations and governmental agencies can significantly influence a bank's liquidity risk and its role as a liquidity provider. A factor of bank liquidity risk and creation is whether or not the bank is publicly traded. Being publicly traded means that a bank must file with the Securities and Exchange Commission (SEC). The filing requirements are stringent and include both annual and interim financial information and require financial reporting to be completed under specific guidelines. This means that banks which are publicly traded become transparent than banks that are private. Transparency is important because it means there is less information asymmetry between a bank's management and possible lenders to the bank. Lenders are more willing to lend to a bank that has less information asymmetry and is publicly traded than one that has more information

asymmetry and is not publicly traded (Holod & Peek, 2006). This means that banks that are publicly traded and thus more transparent have better access to external financing (Holod & Peek, 2006). This means publicly traded banks are less likely to have as great a liquidity risk because they have an additional avenue in which they can access funds if needed.

The Federal Reserve Bank (FRB) is the central bank for American banks. Its actions are designed to influence the supply and demand of money, impacting liquidity risk and creation. It takes actions specifically to manipulate the Federal Funds rate by influencing the amount of money supply in the banking system. This subsequently affects other rates in the market as well (Madura, 2007). The tightening of monetary policy by the FRB has significant effects on a banks liquidity risk and creation. When the FRB tightens monetary policy banks face a decline in the amount of deposits they hold (Holod & Peek, 2006). In particular, these deposits are the ones held for reserves in order to meet regulatory requirements as many banks do not hold excess reserves. If banks were holding excess reserves prior to the tightening of monetary policy it means they can no longer use these reserves to provide liquidity when such an opportunity presents itself. If not holding excess reserves, the banks themselves must raise additional capital. One way banks can do this is to sell liquid securities that they hold. Another option is to sell more illiquid assets, such as loans, which is not preferable to banks because they are forced to sell these assets at a reduced rate and face a potentially adverse effect on lending relations (Holod & Peek, 2006). Banks can also raise the cash by increasing the liability side of the balance sheet. This is a common

way in which banks deal with the tightening of monetary policy. They raise the funds mainly through uninsured large time deposits (Holod & Peek, 2006). Time deposits are deposits that not allowed to be withdrawn from the bank until a specific date (Madura, 2007). These time deposits guarantee banks liquidity for a specific and measureable amount of time. The tightening of monetary policy means banks must raise additional cash or decrease the amount of excess cash they held, meaning they are unable to provide as much liquidity as before.

The bailout policy by the FRB also greatly influences banks liquidity balance. Acharya, Shin and Yorulmazer target three different policies regarding bailouts and analyze their effects on liquidity management. The three different policies are providing liquidity support to failed banks, providing unconditional support to surviving banks, and providing conditional liquidity to surviving banks based on the percentage of liquid assets in their portfolio. They found that providing support to failed banks, or providing bailouts, will decrease a bank's motivation to hold liquid assets. In this scenario banks that survive will have no opportunity to buy up the assets of a failed bank at the low fire sale prices because these banks won't be allowed to fail. This will therefore decrease the reason for any bank to hold liquid assets because there is no strategic advantage in doing so. In the next scenario, the researchers found that when the FRB supports banks that survive unreservedly, this also decreases the motivation for banks to hold liquid assets. This is because support guarantees the banks that do survive the capital needed to purchase assets at fire sale prices and eliminates the need to worry about holding liquid assets that they can convert quickly to cash to do so. This effect is

especially true for large banks that are “too big to fail” because they need not worry about the possibility of failing either. The third policy examined concerns providing liquidity support to banks based on the amount of liquid assets they already hold in their portfolio. This policy increases a banks incentive to hold liquid assets. The banks holding the highest percentage of liquid assets will receive the most support and thus be able to purchase the most assets at fire sale prices. By providing bailouts or unconditional support the FRB increases the likelihood that banks will not hold liquid assets and therefore have higher liquidity risk. Similar research shows that banks have motivation to be illiquid if others are also illiquid, but liquid if others are also liquid (Ratnovski, 2007). The explanation for this is that if all banks are illiquid than support from the FRB is more likely. However if one bank is liquid and the other is not, then the support for the failing bank will be much less certain because the need to support the failing bank to keep the economy running smoothly will not be as urgent (Ratnovski, 2007).

As evidenced in the previously discussed literature, a banks’ liquidity tends to be counter-cyclic. This means that bank liquidity is low in normal economic times but high in tough economic times, such as crises. A study of U.K. banks from 1983-2003 found that this was accurate and that an approximately 1% increase in GDP lead to an approximately 2% decrease in banks liquidity (Aspachs, Nier, & Tiesset, 2004). This means that in order to ensure its own liquidity, banks do not provide liquidity to the market. This also means when many companies need it most banks do not act as a provider of liquidity.

Another interesting study examines not what banks do during a crises involving liquidity management but what banks have done before such crises. By studying five crises, three market crises and two banking crises, research suggests that there was either too much or too little liquidity creation before all of these crises. However, this idea remained non-conclusive (Berger & Bouwman, 2008). What was most interesting was the data surrounding the current economic crisis. Prior to and during the first portion of the current crisis, the data shows an abnormally high build-up of liquidity creation by banks. Berger and Bouwman refer to this as the “dark side” of liquidity. The idea states that banks may have created too much liquidity in the market and this is what led to such lax lending standards, too much available credit and too many credit lines. This idea is somewhat contradictory to the assumption that too little liquidity causes financial vulnerability and instead posits that too much liquidity can also cause financial vulnerability.

III. Statement of Problem

The problem with bank liquidity management is that when banks get it wrong, there can be drastic consequences for the economy. This can be seen today from the continuing effects of what started in 2007. The economy is still in a rut and although Gross Domestic Product (GDP) has once again begun to pick up, unemployment remains at the extremely high level of 9.7% according to the most recent Bureau of Labor Statistics Report (Bureau of Labor Statistics, 2010). A key issue to ensure progress has to be how to make sure banks successfully balance their liquidity management in order to be

stable and still provide the market with liquidity. Public policy makers will aim to continue strong national economic growth while keeping low unemployment and inflation. Banks themselves have a motive to ensure stability and also increase profits. Economies for years have struggled with liquidity risk. The sheer size and complexity of the modern economy increases the importance of this issue and this is all the more reason it needs to be carefully considered.

IV. Possible solutions

Since the crisis began banks have been under close scrutiny. Regulatory bodies and private industry have been observing banks' behavior and have intervened to make suggestions on changes in best practices. They have also begun to evaluate how these banks are implementing changes.

Internal risk management changes in banks are a key aspect of improving bank liquidity management in the years to come. The role of the Chief Risk Officer (CRO) is an important area targeted by many banks. Traditionally the monitoring of liquidity risk was under the umbrella of the treasury department of banks. Banks plan on integrating the CRO and their team with the treasury department to monitor liquidity risk in the future (Senior Supervisors Group, 2009). This will improve oversight and coordination which was a problem because many banks before the crisis did not have a specific limit for or acceptable level of liquidity risk. This will change as banks need to clearly articulate to the entire organization what their strategy is regarding risk.

To fully achieve articulation, banks will need to make sure they are capable of measuring their liquidity risk. The lack of pertinent data on risks was cited by not only banks but many financial services firms as key to better liquidity and risk management (EYGM Limited, 2009). The information systems in place failed to recognize key risks. Without timely and accurate data, banks continue to struggle to understand the true depths of the liquidity risk and thus will be unable to know optimal level of liquidity creation.

Hand in hand with more accurate data go more accurate risk models. These models will need to be able to better assess the difficulties the bank will face. This will mean more dramatic and gloomy assumptions about the banks conditions, the entire economy's condition, and the length of time of the downturn (Economist, 2009). As presented, a key aspect of a bank's liquidity risk and creation are deposits. Therefore banks will need to test these deposits. This will be in order to determine which deposits are likely to remain at the bank and which ones will go elsewhere when economic conditions change (Senior Supervisors Group, 2009). Banks will need to dissect their business models in terms of sources of funding (EYGM Limited, 2009). As evidenced in the literature, banks could not even rely on financing that traditionally was near fail safe such as the Federal Funds market. Banks have rediscovered the strategic implications and beneficial impacts of larger liquidity cushions and most banks will need to increase these buffers.

Banks alone cannot be expected to fully balance their liquidity risk and creation. They face a conflict of interest and unless given incentive to act otherwise will make sure their

own liquidity risk is taken care of before worrying about liquidity creation for the market. As discussed with the spiral effect there indeed may be incentive for banks to supply liquidity to halt the continued tightening and illiquidity in the market but this alone may not be enough. Public policy makers and regulators including the FRB must examine their policies to determine how to effectively make banks liquidity management achieve banks and markets needs.

Public policy makers and regulators need to begin by reexamining existing policies and regulations. This will enable them to better understand where policies and regulations currently stand and the effectiveness of them. An immediate priority should be capital requirement. This clearly effects how much of a liquidity buffer banks are required to hold and also will influence how much liquidity a bank can create. A major problem identified in the literature is the counter-cyclic nature of liquidity holdings by banks and as a result, liquidity creation. A possible solution could include regulations that would incentivize banks to hold higher liquidity buffers in normal times. Instead of hoarding liquidity in times of crisis, this solution would incentivize banks to provide liquidity to the markets when illiquidity is a cause of stress. This could also help with the abnormal build up of liquidity prior to the crisis that was identified as a probable cause of the crisis. By holding higher liquidity in normal times this would decrease the amount of liquidity creation in the market and thus keep the economy from overheating. This is parallel with the philosophy of William McChesney Martin Jr. on the role of the FRB, "To take away the punch bowl just as the party gets going" and also would implement putting the punch bowl back when the party started to die.

A main policy for the FRB to assess is its bailout policy especially in light of the vast amount of current bailouts. The FRB's actions will need to be closely scrutinized.

Certain research points to bailout policy being a main cause of illiquidity in banks. The FRB should certainly consider the idea of providing support based on the amount of liquid assets a bank holds and weigh the effects this would have on banks. This could indeed incentivize banks to hold more liquid assets and address the issue of too much liquidity being counterproductive.

It is a difficult balance between liquidity risk for a bank and liquidity creation for the markets. Banks will be naturally inclined to serve their own interest and this is why regulators must attempt to counter act this to keep the economy running smoothly.

V. Conclusion

Banks must change how to balance their liquidity risk and their role as liquidity providers, restructuring liquidity management. Liquidity risk exposes banks to financial hardship. Banks attempt to control liquidity risk factors by balancing cash inflows and outflows and some even hold liquidity cushions for strategic purposes. When crisis hits, banks limit their exposure to firms connected to the cause and these firms, including banks, will fare worse. Being exposed to too much liquidity risk can leave banks to face fleeing investors, depositor runs, ratings downgrades, and tougher financing. These consequences are what banks wish to avoid and why they implement policies to protect themselves from liquidity risk. This is also why when banks face the choice of lowering

their liquidity risk, especially in times of crisis, or providing liquidity to the market they will act to protect themselves first and foremost. Banks therefore tend to provide liquidity in counter-cyclic ways: too much when the economy is running hot and too little when the economy takes a turn for the worst. This tends to exacerbate the problem for both banks and the economy. Economies have seen this play out before and entities including banks and regulations have tried to learn from these crises. This has led to the establishment of regulations and internal policies to try to stem such crises. Regulators policies, such as bailing out failed banks and decisions about monetary policy, can greatly influence liquidity risk and creation. However, as evidenced by the current crisis, these steps seem to have failed to be up to the task of ensuring balance between the two. Banks should now return to more conservative policies and aim to improve cracks in their systems including improvement of information systems and more accurate models with more realistic assumptions. Regulators have their work cut out as well. They need to find a way to prevent the counter-cyclic trends of banks and ensure that actions by banks, although meant to secure their own liquidity, don't actually make matters worse for all parties.

VI. Suggestions for Future Research

As banks and regulators change policies there will be a need to evaluate such policies before crisis strikes in an attempt to prevent or limit the intensity of crises. Empirical analyses of the regulators actions and there effects are future research possibilities.

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