

## Agency Theory in Banking - 'Lessons from the 2007-2010 Financial Crisis'

**Dr. John T. Donnellan, DPS, MBA**

Assistant Professor  
Department of Management  
School of Business  
New Jersey City University  
Jersey City,  
New Jersey 07305-1597  
Mail: [jdonnellan@njcu.edu](mailto:jdonnellan@njcu.edu)  
USA

**Dr. Wanda Rutledge, PhD**

Assistant Professor,  
Department of Management  
School of Business  
New Jersey City University  
Jersey City,  
New Jersey 07305-1597  
Mail: [wrutledge@njcu.edu](mailto:wrutledge@njcu.edu)  
USA

### ABSTRACT:

*This paper presents an agency theory explanation for certain operational risks and the subsequent impact as a result of the financial crisis starting in 2007, which has been the worst financial crisis in two generations, erasing \$14.5 trillion, or 33 percent, of the value of the world's companies. During the period from 2007 to 2010 banks suffered severe credit and liquidity stress to the point where the US Government implemented bailout programs such as Troubled Asset Relief Program [TARP], and addressed monetary policy in the hope of stabilizing the banking industry. In light of these programs and changes, the aim of this study is to provide additional theory to help understand the financial and reputational impact on the banking industry due to credit risk and the subsequent impact on liquidity.*

Prior papers were studied that focused on the certain risk factors (Aaker, 1987; Bromiley, 1991; Miller, 1990; Wiseman, 1997) and their impact on firm performance. But this study expands prior research by including data from Commercial Banking at the Federal chartered and State chartered level and how credit risk impacts liquidity.

**Table 1-Previous Studies**

Authors	Year	Sample Size	Subject	Findings
Robert Wiseman and Anthony Catanach	1997	3,544	Operational Risk, Credit and liquidity	Performance has a negative impact on credit risk, credit risk has a large negative influence on liquidity risk
Philip Bromiley	1991	228	Risk and performance	Performance has a negative influence on risk
David Aaker and Robert Jacobson	1987	241	Risk and profitability	Both controllable and uncontrollable factors have a positive correlation on profitability
Kent Miller and Philip Bromiley	1990	493	Corporate Risk and Performance	Income stream risk [cash risk] has a negative impact on performance

## INTRODUCTION:

Agency theory argues that agent risk decisions may be influenced by the level of oversight (Jensen, 1976) and this may have been a factor in the financial crisis since there are different levels of oversight depending on how the bank is chartered and this is examined through federal chartered banks versus state chartered banks. While empirical studies have limited findings on the impact of TARP funding and its influence on banking, it is hoped this paper will provide additional theory on the important aspects of this financial crisis. Additionally, moral hazard concepts may be involved since bankers' levels of 'risk taken' may have been elevated due to financial safety nets (Cocheo, 2008) of various government programs [i.e.: TARP, FDIC, SIPC].

Illustrating the impact of credit risk on liquidity, the model utilizes firm performance and asset size as independent variables while controlling for leverage, state regulation, debt rating and TARP exposure. The study then examines the impact of the financial crisis on banks and the resulting \$700 billion dollar government bailout called Troubled Asset Relief Program [TARP], Federal Deposit Insurance Corporation's Temporary Liquidity Guarantee Program.

This study will test whether previous findings for banks risk taking were sufficient to help explain the operations risks involved and if findings and conclusions are robust to agency theory. More specifically, it examines whether federal chartered and state chartered have different risk preferences and impact on credit risk. Credit risk is a major issue in the banking industry and may have influenced the collapse of investment houses such as Lehman Brothers and Bear Stearns (Friedland, 2009). Recent research suggests that credit risk is also influenced by bank size since larger banks have greater borrowing exposure and excessive borrowing by banks was one of the major causes of the financial crisis, leading to catastrophic bank runs in 2008 at firms including Bear Stearns and Lehman Brothers (Kelly, 2010).

## LITERATURE REVIEW:

This paper utilizes agency theory as a platform to build upon and determine how operational risk was an issue within the banking industry and the impact it presented to the banks liquidity position.

Agency Theory has been utilized to study risk trade-off between principal and agent to determine the tolerance that corporations will accept with risk (Wiseman, 1997). Literature broadened the risk relationship description as principal and agents whom may have different objectives with respect for risk taking (Jensen, 1976). Kurkland (1991), the agency theorist, describes the trade-offs necessary to reach the effective solution between the costs of monitoring agents behavior (to resolve adverse selection) and the optimal output (to resolve moral hazard). Additionally, agency theory has also been used in finance to describe the cost impact that risk has on firms (Eisenhardt, 1989).

### *Government and For-Profit-Firms in a Principal-Agency Relationship:*

The U.S. banking industry represents one of the most unique 'laboratories' available anywhere in the global economy to test the fundamental propositions of agency theory. The inability for the principal to fully monitor the actions of the agent is at the core of the problem (Rose, 1992).

The U.S. Government has provided assistance to firms and individuals through the Federal Deposit Insurance Act [FDIC] and the Securities Investor Protection Corporation [SIPC]. These programs provide a guaranteed safety net for risk since agents can fall back on this if strategies are unsuccessful but at times are viewed cautiously by those who set fed policy (Greenspan, 2001). Certain empirical studies of the propensity of banks to increase risk in order to maximize the value of their deposit insurance have produced mix results (Palia, 2007). This poses the question: "Does government assistance move the risk from the banks and

places it back on the government?" If yes then a principle/agent relationship is created and the principle [government] is the risk holder not the agent [bank].

The landscape of governmental regulation changed in 1999 with the repeal of the Glass-Steagall Act of 1933 which effectively removed the separation that previously existed between Wall Street investment banks and depository banks. This action has been cited for part of the blame for the financial collapse of the subprime market since 2007 (Verschoor, 2010).

Many economists feel the U.S Government has taken on the role of a controlling interest in the financial market with the introduction of the Troubled Asset Relief Program [TARP] and this guarantee is providing agents with additional safety nets (Cocheo, 2008). The program was enacted by the U.S. Congress under the Emergency Economic Stabilization Act on October 3, 2008. TARP funds were to be used by the Treasury to purchase mortgage backed securities from financial institutions to enable them to stabilize their liquidity positions and inject capital into the system (Nguyen, 2009). Traditional risk bearing and ownership of capital are repackaged and sold in different proportions to different groups of investors through bonds and common stock (Fama, 1980). The US Government [TARP] tends to go around this traditional view by purchasing high risk junk debt thus taking on the full risk of what the market will allow.

The crisis exposed banks to significant exposure as a result of performance and credit risk. Banks adopted a model that assumed continued access to liquidity and funding in the marketplace which dried up as a result of the crisis (Friedland, 2009). A recent study by Kim (2009) reflects liquidity risk in the market due to mismatching between securities supply and demand to buy those securities. This is an important observation due to the fact that the credit crisis was partially brought about by firms unable to find counterparties to purchase securities. Credit risk exposure increases when firms have limited trading partners (Rich, 2003). This in turn added to increased liquidity risk issues since banks were unable to fund their positions and thus requested government intervention.

Traditional banking credit issues involving rating agencies such as Standard & Poor's that provides ratings on firm debt to determine credit worthiness also contribute the credit crisis. Banks with lower credit ratings have a difficult time in raising capital thus impacting their liquidity exposure (Fielder, 2002). Additionally, firm performance and leverage were also impacted by the financial crisis. Firms within the TARP program have bad debt on their books, thus the reason for government assistance which impacted their debt to equity ratio an indicator of leverage. Firm performance was also impacted by the credit crunch due to lack of liquidity. Thus, banking must have liquid assets in order to transact business. Governments are rapidly ensuring liquidity risk management is part of banking management (Blaha, 2009). Banks must put in place controls to reduce risk and be accountable for financial regulations such as Sarbanes Oxley. Other liquidity measurements include operating cash flows since 'operating cash flow measures more accurately the operating performance of the firm than any other financial measurements (Wiseman, 1997)'.

Agency problems begin to emerge between principles and their agents and in the banking industry this is becoming increasingly an issue (Rose, 1992). Differences in banking regulations occur between Federal and State Banks. The incentive to take additional risk is in part based upon how the bank is chartered with more regulations geared toward Federal chartered banks than State chartered banks (Wiseman, 1997).

### ***Agency Based Influence on Banking:***

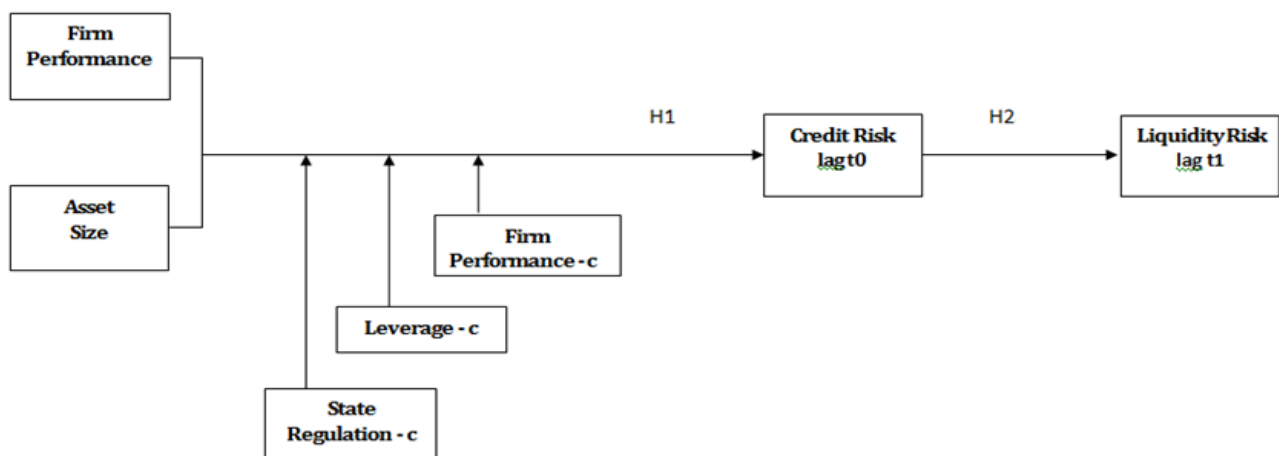
Agency explanations of managerial risk taking behavior helps to explain risk principles within the corporate environment (Hoskisson, 1992). This is further explained visa-a-vis by scholars in finance who have spent considerable time and effort in developing models to explain risk and reward theory. Although liquidity risk has long been considered an important aspect of strategic choice, it is only in recent years that researchers in strategic management have become directly concerned with research on risk (Bromiley, 1991; Sitkin, 1992).

Strategic investment decisions should explicitly consider risk and decision makers should demand a higher return for an investment high risk (Aaker, 1987). The banking industry has regulations and governance around liquidity risk and some agency scholars have argued that risk preference may be influenced by the degree of oversight or leverage present (Fielder, 2002; Jensen, 1976). Post 2007 crisis saw the introduction of new banking regulations under Basel III proposed to prevent liquidity risk. One such proposal focuses on asset liquidity to ensure banks always have a 30-day liquidity cover for emergency situations (Blundell-Wignall, 2010).

Unfortunately these regulations were not around in 2007 and excessive risk taking in the banking sector lead to the financial crisis. Accumulating losses on U.S. subprime mortgages have triggered widespread disruptions in global financial markets. Higher interest rates and falling house prices have led to delinquencies and default by the holders of subprime mortgages. The market for structured finance of subprime residential mortgage-backed securities (MBS), often restructures into collateralized debt obligations (CDOs), has virtually collapsed (Friedland, 2009). This increase in unusable debt leads to credit risk exposure which subsequently turns into liquidity exposure the inability to raise liquid capital. Liquidity in banking is a key measurement of its ability to meet its financial and fiduciary responsibilities. When banks liquidity drops, it places the bank in a possible scenario of bank failure (Segerstrom, 1989). In addition, low bank liquidity has a higher percentage of risk assets in relation to capital (volume-based credit risk); and fewer securities to use in management of its interest rate risk position. Thus, low liquidity is a very strong risk and can quickly place banks in a very bad position (Segerstrom, 1989).

**MODEL - 1**

Operational Risk in the Banking Industry



**HYPOTHESIS:**

Banking is subject to different regulations depending on how the bank is chartered. State chartered banks are regulated by state agencies while federal chartered banks are regulated by federal agencies. State chartered banks tend to be less regulated and thus can engage in more transactional risk (White, 1991). State chartered banks have higher loan limit capability than federal chartered banks which can lead to credit risk since sophisticated credit instruments were introduced into the market (Heap, 2008). With the escalation of credit market risk, the ability for banks to fund their obligations became harder and lead to fewer assets

illiquidity. After June 2007, credit dried up and this illiquidity in turn created an enormous overhang of illiquid assets on banks' balance sheets, triggering or aggravating the credit crunch (Spaventa, 2008).

Wiseman, et al (1997), points out that previous data on the topic suggests that federal investment regulations were more restrictive than many states (White, 1991). This then leads to the argument from agency theorists that less control allows managers to peruse self-interest. In agency theory of capital structure, the financial safety of FDIC may create an atmosphere of limited liability and this leads to an incentive for highly leveraged firms to take excessive risk (Prescott, 2001). Programs such as FDIC also present a safety net for risk taking since the costs of failed banks would fall back on the US Government (Wiseman, 1997).

While federal banks are subject to uniform regulations, each state can have their own agencies to govern banking; granted, since 1989 the banking industry is trying to be consistent the point remains that the market can have separate banking regulations. For example, states such as California and Texas have separate agencies to regulate banks within their state borders. It should be noted that of the 82 bank failures in 2010, 94% were state chartered banks.

Therefore it is expected that state chartered banks will exhibit greater credit risk than federal chartered banks.

*Hypothesis 1. State chartered banks exhibit greater realized credit risk than federal chartered firms*

Liquidity and credit are operational risks tied to investment policy (Catanach, 1993; Wiseman, 1997). Liquidity risk is a measure of the ability a firm has to meet its debt obligation (Hambrick, 1988). Credit risk can be attached to the amount of bad debt banks have on their books which has a direct correlation to liquidity risk, thus, increasing credit risk has an impact on increasing liquidity risk (Wiseman, 1997).

Relatively small shocks to the banking system can cause liquidity to quickly dry up and carry the potential for a full blown financial crisis (Brunnermeier, 2009). The inability for banks to obtain credit through the sale of securities is one way to shock the banking system. This occurred in 2007 onward when banks were unable to sell toxic securities in the open market and had to rely on government programs for liquidity funding (Brunnermeier, 2009).

Accumulating losses on US subprime mortgages triggered widespread disruption to the global financial system. Large losses were sustained on complex structured securities and institutions were over leveraged, thus placing pressure on banks to reduce leverage and increased demand for liquid assets. Many credit markets dried up, hindering credit extension, and the balance sheets of banks were filled with illiquid assets (OCC-Comptroller, 2008). This lack of liquidity contributed to the bankruptcy of Lehman Brothers in 2008 since they were unable to finance their obligations (Friedland, 2009) and contributed to the demise of Bear Stearns in March of 2008 as a result of being unable to secure funding for its obligations (Brunnermeier, 2009).

Therefore, it is argued that increased credit risk in one year will lead to a lack of liquidity in the next unless banks reduce leverage.

*Hypothesis 2: Realized credit risk exhibits a positive influence on liquidity risk in the next year*

Ordinary least square estimation of a finite lag structure is utilized to see the influence from Credit Risk to t1 Liquidity Risk.

**RESEARCH METHODOLOGY:**

*Data Source:*

This study utilized public data from the U. S Department of Labor Statistics and Pro Publica from 2008 through 2010. The data includes the banks that received government funding for this period of time which was approximately \$700 billion to 835 recipients including banks, insurance companies, car companies, government sponsored enterprises, etc.

*Sample:*

The sample of the firms for this study looked at the 702 banks that received TARP funding from 2009 through 2010. The 702 banks were then categorized into commercial banks, then into state or nationally chartered and finally into publically traded and having its long term debt rated by S&P, Fitch or Moody. This created a sub set of 65 banks that received \$220 billion in TARP funding. Table 2 provides a correlation matrix and sample statistics for the combined data used in this study.

**Table 2 - TARP Correlation**

TABLE 2

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Means, Standard Diviations, and Correlations

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Variable	Mean	s.d	1	2	3	4	5	6
Liquidity Risk	0.10	0.11						
Credit Risk	7.43	3.22	-.24*					
Asset Size	1.77	4.52	.60**	-.35**				
TARP Exposure	0.48	0.49	-.26*	.44**	-.29*			
State Regulation***	0.54	0.50	-.17	-.01	.23	-.22		
Leverage	10.08	5.84	.17	.25*	.01	.16	-.25*	
Performance	0.01	0.01	.60**	-.11	.37**	-.22	.08	-.08

\*Correlation is significant at the 0.05 level (2 tailed).

\*\*Correlation is significant at the 0.01 level (2 tailed).

\*\*\*Spearman

N = 65

*Measurement:*

Measurements were taken from the U.S. Department of Labor Statistics and Pro Publica. Ratios utilized are based upon generally accepted accounting principles (GAAP) where possible. Information represented also reflects information that banking risk managers use when determining liquidity and credit risk. All variables are standardized for interpretation of research results.

*Risk:*

A major part of this study and banking concerns in general deal with risk and how banks measure credit and liquidity from an operational risk standpoint. Liquidity and credit risk represent operational risks that can affect the performance of banks (Catanach, 1993). To determine the impact, the study utilized realized risks of the bank which provides a greater view of downside risk (March, 1987). Furthermore, the use of realized risks provides insight into managerial competence in achieving portfolio diversification to mitigate credit risk (Wiseman, 1997).

Following prior research, the study measured realized liquidity risk as the ratio of liquid assets [cash on hand] to total assets (Barth, 1990; Hambrick, 1988; Rudolph, 1988). From an operationalization standpoint the higher the number means lower liquidity risk to the firm.

Credit risk is a measurement of a firm's ability to obtain financing and can be attributed to bad debt on their books (Wiseman, 1997). This study will utilize industry leading credit rating agencies such as S&P, Fitch and Moody. From an operationalization standpoint the higher the number means greater risk to the firm since their long term debt is in question.

### *TARP Exposure:*

Banks that were involved with the government TARP program had to follow strict governmental policy around key business functions such as Top Management Teams compensation. Having the government as a majority shareholder will put serious pressure on the board of directors to ensure proper governance pay matters are traditionally in the hands of the board of directors and not the hands of shareholders directly (Cocheo, 2009). Additionally, having debt on the banks books will go into the firm's ability to obtain credit. From an operationalization standpoint the higher the number means lower risk to the firm since they have paid all or a portion of the debt. Paying the debt in full ends the agency relationship with the US Government.

### *Asset Size:*

The expectation of contingent bailouts tends to create efficiency costs in the economy. In general, a bank tends to become larger and riskier if its uninsured creditors believe that they will benefit from too big to fail (TBTF) coverage (Ennis, 2005). From an agency standpoint the bailout provides a guaranteed safety net for risk (Greenspan, 2001).

### *Control Variables [c]*

#### *State Regulation:*

Banking regulatory requirements reflect that Banking Charters are either federal or state. These charters reflect how banks can invest and to what degree they must operate dealing with credit and liquidity issues such as reserves. This study modeled state regulation using a dummy variable code of State Charter = 0 and 1 = other. State regulations tend to be less restrictive than federal (White, 1991).

#### *Leverage:*

The application of agency theory and corporate finance is a concern regarding over-leveraged firms (Jensen, 1976). Banks within the TARP program tend to have less leverage since their debt to equity ratio is higher. From an operationalization standpoint the higher the number means higher risk to the firm since debt to equity measurement is a good indicator on the firm's ability to obtain financing credit.

#### *Performance:*

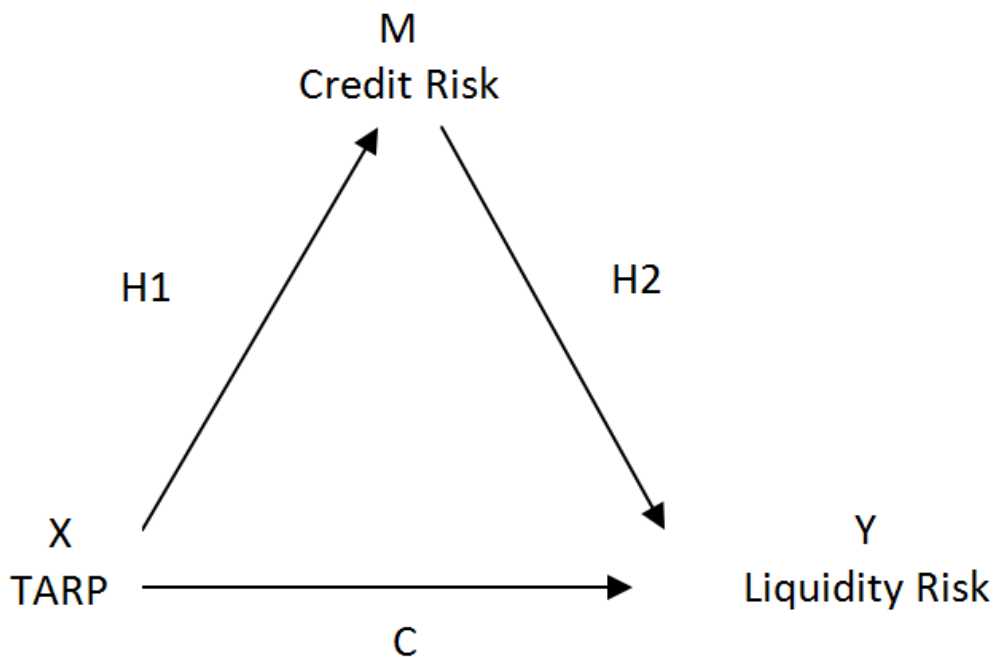
Firm performance was measured as a ratio between the banks operating cash flow and total assets. Studies reflect that management is less able to manipulate this measurement than return on assets (ROA) or utilization of a quick ration which is the ability to use cash on hand to satisfy current liabilities (Wiseman, 1997). This measurement reflects better operating performance of the firm than any other ratio (Catanach, 1993). From an operationalization standpoint the higher the number means lower risk to the firm since it has greater ability to pay short term debt.

**Estimation Procedures:**

This study used a least squares regression approach to estimate and test the relationships suggested by hypotheses 1 and 2. The model covers 2009 through 2010 and models credit risk via firm level factors which in turn will model liquidity risk. The study will also use a lag structure to see if an alternative explanation would be a better fit. This study will also look at the effect or relationship of TARP on Credit and Liquidity. Through Mediation Analysis one can examine the moderators and mediators of these effects (Kenny, 2015). Questions involving moderators address “when” or “for whom” a variable most strongly predicts or causes an outcome variable. More specifically, a moderator is a variable that alters the direction or strength of the relation between a predictor and an outcome (Baron, 1986). Thus, a moderator effect is nothing more than an interaction whereby the effect of one variable depends on the level of another (Frazier, 2004). Model reflects TARP Exposure as the X variable, Liquidity Risk as the Y variable and Credit Risk as the M [Mediator] variable. Results from mediation effect results in no impact to liquidity after credit has been controlled (C=0). While partial mediation reflects that TARP has limited effect on liquidity  $C \neq 0$

**MODEL – 2**

**Mediation Analysis <sup>1</sup>**



**RESULTS:**

Table 3 displays results for realized credit risk. Hypothesis 1 predicted that there would be statistical significance with state chartered banks but as reflected in table 3 this is not the case. This may be as a result of regulations trending to bring about similarity in both state and federally chartered banks. The banking regulatory agencies have taken a firmer stance over the past several years to ensure there are tighter controls around state chartered bank to emulate those of the federal chartered banks.

<sup>1</sup> David Kenny Mediation Analysis 10/29/2014



**Table 3-Realized Credit Risk**

**Table 3  
Realized Credit Risk**

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.644	1.051		4.419	0
Liquidity_Risk	-2.923	4.773	-0.102	-0.612	0.543
Asset_Size	-0.18	.100	-0.253	-1.796	0.078
TARP_Exp	2.309	0.778	0.354	2.968	0.004
State_Reg	0.894	0.765	0.139	1.168	0.248
Leverage	0.144	0.064	0.26	2.23	0.03
Performance	45.04	47.388	0.13	0.95	0.346

a. Dependent Variable: Credit\_Risk

Table 4 displays results for realized liquidity risk. Hypothesis 2 predicted that credit risk of t0 would increase liquidity risk of t1. Analysis reflects that credit risk in one year has a favorable impact on liquidity the following year. Curiously this result may have been influenced by banks adapting and learning and therefore credit risk being high in t0 means managers taking mitigating actions to curb those risks, increase slack, so that liquidity is not a risk anymore the following year.

**Table 3-Realized Credit Risk**

**Table 4  
Realized Liquidity Risk**

Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.161	0.034		4.681	0
Credit_Risk	-0.006	0.005	-0.162	-1.2	0.235
TARP_Exp	-0.043	0.031	-0.19	-1.413	0.163

a. Dependent Variable: Liquidity\_Risk

**CONCLUSION:**

This study reflects that the financial crisis may have been a proving ground for banks to learn and adjust so that credit issues in one year do not turn out to be liquidity issues in the following year. In addition, the mediation affect was also consistent with this view in that credit risk may have had a positive impact on liquidity risk [partial mediation affect from David Kenny 2014 model 2]

Borrowing from Learning Theory, bank management utilized learning efforts and improved performance providing lessons for learning and improvement of initiatives (Roth, 2004). Although learning by doing occurs without explicit resource commitment and intense cognitive effort, articulating and codifying knowledge requires firms to deliberately attempt to improve the odds of success in future repetitions of the task. They can do so only by dedicating time, money, and managerial attention to grasp the causal mechanisms between decisions, actions, and performance outcomes (Zollo, 2004). The lessons taught from the financial meltdown made regulators implement actions to handle future financial issues such as the

Dodd–Frank Wall Street Reform and Consumer Protection Act (2010) forcing management to adjust risk taking in essence to become more risk averse.

Learning has become a prominent concept in organization theory and management strategy (Pennings, 1994). Learning plays a direct and central role in forming competencies needed to enable management to have staff perform effectively (Andreadis, 2009). Based on this study it appears that bank management demonstrated effective leadership and took mitigating actions to curb credit risks, increase slack, so that liquidity was not a big risk anymore the following year.

Finally, this study provides researchers of the 2007-2010 financial crises with arguments around agency theory and how management may have learned how to manage credit risk effectively. In addition, this study presented arguments around the financial bailout and government’s role providing regulatory oversight to the banks that received billions of TARP funds.

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