Assessing Liquidity Ratios:

Are the numbers real?

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ABSTRACT

After the financial crisis of 2008, many in the business and private sectors were left wondering what happened. One of the many issues identified as a cause of the crisis is the use of derivatives as assets. While this is not the first time that this issue has created financial crisis, it is one of the first since the depression of the 1930s where the government intervened to the extent it has. In exploring the crisis, a process that continues to appear in government and private assessments is the use of stress tests. One of the first “popular” instances is when Treasury Secretary Geithener of the United States presented the case of stress testing the banks regulated by the United States. Most recently, the European Union conducted a stress test of banks under its regulation. One of the most poignant points that have come about as the result of these stress tests is the lack consistency, trust and understanding of the stress methods. This paper presents the key hypotheses that the stress tests, unless focused do not provide adequate visibility of the asset/debt mixes companies maintain nor do the tests provide consistency of information when compared with the debt ratings from popular ratings agencies. Journals targeted for this paper are in the following order; *Journal of Financial Economics, Journal of Financial Management, Journal of Accounting Research.*

INTRODUCTION

The freezing of credit during the recent 2008 financial crisis stressed the global financial framework, exposing weaknesses never before seen. These weaknesses have been the topic of many editorial reviews and pundit discussions. An aspect of the crisis that does not receive much attention however is what did work. In fact, many financial institutions and non-financial institutions survived this crisis successfully and continued to grow. A common thread between these institutions was an effective risk management strategy (Shapiro, A.C. and S. Titman, 1986).
These strategies came in many forms. The most common strategy was an effective liquid asset and asset management process. Governance and enforcement of these processes started at the top, with the board and officers of the company (MacKay, P. and S. Moeller, 2007). While the quantitative processes varied widely, depending on industry, many rely on proprietary models, research driven and demonstrated models or quantitative/qualitative models that are decades old. One consistency throughout each company was modeling of the asset mix at risk. Key to this success was the establishment of a clearly defined risk appetite and effectively managing on and off balance sheet assets/liabilities using information systems and other mechanisms (Guay, W. and S.P. Kothari, 2003; Carter, D.A., D.A. Rogers, and B.J. Simkins, 2006). By using strategies of this sort, many companies not only survived the freezing of credit and financial markets but continued to grow. Results of this type of financial management are clearly better than the alternatives that resulted from the crisis.

In place of strong risk management processes that preserve liquidity enabling growth, many companies choose to either ignore good practices or take an all or nothing approach to risk management. When the crisis hit, many were left asking questions about this risk practice. While this statement alone is disturbing, what is even more distressing is the amount of literature promulgated that justifies the over-leveraged, debt laden, derivative driven markets that failed (Bartram, Brown, and Fehle, 2009). Many non-financial people often associate these issues strictly with bank holding companies. However, during the most recent crisis, liquidity issues were not isolated to the banking industry. In fact the contagion spread rapidly from the financial industry, eventually consuming companies representing all industries, whether they be financial or non-financial.

The prime reasons for not having available liquid assets include inadequate risk management, liquidity/debt ratios that may not present the entire picture and risk/reward practices that are not scaled for losses. What is surprising is that the importance of liquidity and the changing risk picture has not
been very well explored in recent history. Much of the work on liquidity was completed in the 1970s and 1980s, typically after significant financial crises. This in itself would require another dissertation to explore the issues of accounting, economic or financial history.

Even though each of the crises shares similar failure patterns, the issues and usage of liquidity seems to differ each time. One of the suggested reasons is the financial instruments that are at the root of the collapses are different. The 1970’s crises stems from commodity leveraging, the 1980s crisis from over leveraged derivatives and the 2008 crises, at least preliminarily, stems from credit swap derivatives used as liquid assets. The risk involved with hedging intangible derivatives to create a liquid asset is significant and has raised legal, ethical and regulatory questions of the practice. Questions regarding the accounting of these assets are important, this research however avoids the policy implications and instead focus on historically acceptable measures of liquidity.

The measures analyzed include the debt-liquidity ratios, on and off balance sheet indicators and debt/asset maturity ratios. Each of these indicators describes a corporate debt position; however adequacy of the description is in doubt after the recent crisis. One of the many surprises was the inadequacy of the rating agencies data and assignment of debt ratings.

An example is the public trust lost in Moody’s and other credit rating bureaus. Bureaus assigned ratings based on the same data but using a proprietary formulary yielding very similar results.

If the variation amongst the credit rating bureaus is insignificant, how might the current metrics better avail stakeholders of the risks? One of the methods suggested by PricewaterhouseCoopers in their assessment of the liquidity issue is for companies to internally stress test the current liquidity management processes (PricewaterhouseCoopers, 2010). This research plans to modify the currently accepted stress test models to use publicly available data. In doing so, a framework is created for
external observers to understand and assess a corporation’s asset and debt risk management. In creating an investor managed rating system the elimination of shopping for ratings as well as other issues pointed out by Skreta and Veldkamp are avoided as well. One of the primary issues is rating complex securities. Skreta and Veldkamp state that

“an increase in the complexity of recently issued securities could create a systematic bias in disclosed ratings, despite the fact that each ratings agency produces an unbiased estimate of the asset’s true quality. Increasing competition among agencies would only worsen this problem. Switching to an investor-initiated ratings system alleviates the bias, but could collapse the market for information.”

In this study a comparison of the ratings agencies to the stress test provides an indicator for misleading investors based on different proprietary or insider information. The initial data sample will be 100 of the largest by market share, unduplicated companies listed on the NYSE, NASDAQ and S&P 500. This sample size will provide a variety of company size, revenue and type. Further, the sample covers many sectors, providing potential insight into relations between debt structures within sectors as well as potential hedging and other financial derivative practices. Breadth of the markets also provides comparisons of what should be highly rated companies by the credit bureaus, thus providing possible links between actual liquidity and the rating.

One of the unique aspects of liquidity valuation versus asset valuation is when the question is asked; What assets are we talking about? While a factory can fairly easily identify core assets such as tools and factory space and storage space, other assets such as ADR (American Depository Receipts) are much more difficult to assess. In a study by Chan, Hong and Subrahmanyam, they found that the liquidity affects no matter the control within their study was strong and continued ot influence the outcomes of the asset/liquidity ratios. This was particularly evident when the ADR was cross-border and influenced
by exchange rates and other variables, particularly transparency of government and opacity of corporate governance and reporting.

While much research conducted on the methods of hedging and other derivative instruments for financing debt influences the financial markets, the research ignores the issue of liquidity. During stable financial periods the issue of liquid assets is rarely discussed. During unstable periods, liquidity is also ignored. Only when financial markets freeze, where credit is unavailable and liquid assets lose value, is the topic mentioned. Even then, the topic of liquidity is rarely discussed as a survival mechanism since hope springs eternal that the next day will return a market boon. The 2008 crisis demonstrated that a credit freeze is a real occurrence and even though short lived, significantly impacts corporation’s operational abilities. Further, realistic disclosures also avail investors of the real risks involved.

Some of the objectives of the study are the establishment of a risk stress testing framework that utilizes publicly available data, identification of weakness or strengths in the current liquidity ratios and correlation of the debt ratings to measured liquidity and risk management metrics from the framework. It is important to note a significant aspect of the data will be used to create the model, however two sets of data are held back to determine if the model is valid in volatile and non-volatile markets within the aforementioned stock valuation exchanges.

In doing so the following hypotheses are assessed directly:

H1: Validate debt rating agency models with respect to publicly available debt/asset stress models currently used.

The purpose behind this analysis is to establish if the publicly available agency models and debt asset data is; one consistent, and two how consistent. Answers derived from this information are intended to establish an opacity index between the agency models and the debt and assets reported for each
company. With this information and opacity index is verified using a comparison with hold back data sets to establish potential relations between multiple data and liquidity information for non-privileged investors to determine if the rating agency information is providing a valid information. It is important to reiterate this designed experiment and regression will be tested to 3 degrees of freedom. From the data for H1, an experimental design for valuation of publicly available asset information for testing will be conducted.

H2: Validate that publicly available asset and liquidity data misleads the valuation of a corporation.

Using the opacity data from H1, an experiment will be designed to determine if the opacity is misleading and influences the corporate stock market valuation. The anticipated result is that asset and liquidity of the corporation does not influence the corporate stock valuation. However, if there is influence, or correlation between the assets and the liquidity that is correlated with valuation, a second experiment using holdback data will be conducted to determine if the model holds. Second, corporate valuation not correlated to asset liquidity, and more closely related to other items based on the opacity from H1 may drive towards alternative indicators. H3 explores the alternative indicators.

H3: Validate the corporate valuation from H2 with the bid/ask spread to determine market response.

From H1 and H2 the opacity factor and the valuation comparison from H2, the comparison with the bid/ask spread is used to validate daily trading response, to the quarterly information to create a comparison between privileged and non-privileged information. One of the key components resulting from this hypothesis is the elimination of the variable of privilege vs. non-privilege information within the trade and comparison to the availability of the information at the day of release and the progression valuation.
METHODOLOGY

In this section, regression analysis is employed to first examine the relation between opacity and credit rating as well as information asymmetry of 10-K and other financial information. Of the literature from Amy P. Hutton, Alan J. Marcus, Hassan Tehranian and Jin and Myers, who have explored the relations of opacity and the relation to market crashes as well as the transparency of data.

Once the data has been sorted for relational impact, the data points will be compared using traditional control theory to establish a viable test for asset liquidity stress. Modern optimization theory will then segregate the variables that control or optimize. Without going into the details of modern control theory and optimization, there are tools and mathematical capabilities that have been applied to financial problems during the last few decades. For a reference that details the capabilities and provides a comprehensive dissertation of Control Theory and Optimization please refer to Donald Pierre’s republication. While there are many newer texts in the area of control theory, none explore the applications of control methods to financial problems more thoroughly.

Using Nyquist plots to demonstrate the relation between the variables to provide guidance for asset liquidity stability or optimality, . One important note however is that companies should not strive for stability or optimality. Like any object under control, the company should use the plot as a guide for adjustment. Campbell and Kracaw provide a different perspective to the need for optimality and stability in their discussion of valuation and using hedging as insurance for corporate valuation (1987).

For the regression, the primary proxies are the liquidity and asset ratio assessed to three degrees of freedom. The reason for three degrees of freedom is based on computational limitations for each topographical map for each variable for this experiment. If there are indications that greater than three
degrees of freedom are necessary for assessment, then pursuit of each variable combination will be pursued. With this information Hypothesis 1 should be verified.

Once the topography of each variable has been understood and the variables have been identified with relation to opacity and information asymmetry related to the debt rating agencies correlated, H2 will be addressed.

The processes associated with H2 to determine how the publicly available asset/liquidity information is misleading uses the previously identified variables and regresses each against the daily closing values of each corporation, the declared cash equivalents quarterly and the daily analyst ratings (Bartram, 2000). The reason for selecting daily closing values is to account for public sentiment, whether information is known or unknown. Cash equivalents provide a method to check if any manipulation has taken place quarterly and either confirms or does not confirm audit information. Finally, the daily analyst ratings from those that follow the stock provides insight into potential information that is not disclosed. Information from this regression analysis will allow for constructing a model based on a combination of publicly available data that provides input from the corporation, qualitative input from analysts and public sentiment from the stock trades.

The structure of the model is to provide a fundamental equation that also provides time related information and response to changes. Froot, Scharfstein, and J.C. Stein, 1993 further highlight the need to coordinate financing processes and to not optimize or stabilize, but to coordinate for the highest valuation under the given “unknown” circumstances. While the information is readily available over time from an historical perspective, it is important to stress how a company may react in times of illiquidity or other credit issues. The resulting Nyquist plot from the equation allows the stakeholder to view how changes in one variable or all variables may impact the availability/usage/rating of credit by a
corporation. In order to assess the validity of the stress model, various holdbacks of data will be used to assess reaction to stress and non-stress situations (Moghadam, M.R. and H. Samavati. 1991).

To further reinforce the model H3 will be used to determine corporate valuation using bid-ask spread models and compare variances with the new model from H2. H3s conclusion will either affirm or negate the findings from H1 and H2 or provide information where modification is required.

While much of the current interest in stress testing is in Banks and the associate Bank Holding Companies, it is also important to understand the health of the corporation banks are working with and lending to. By further understanding this link, better stress models may result.

Some key assumptions within this model include the lack of interest rate variability over time, the inability to include indices, such as the CPI, to indicate consumer issues or production issues and the inability to account for catastrophic events, such as natural or man-made disasters. In my research however a paper from Grubstrom and Ashcroft developed a model to account for these assumptions using calculus of variations (1991).

RESULTS

While most of the data for H1 and H2 are final, further analysis is required before full release. Preliminary results do however validate H1 and unexpectedly validate H2 as well. One may ask why this is unexpected? The reason is the Hypotheses are somewhat paradoxical, in that if the credit ratings are accurate (H1) but the data related to the corporate valuations is misleading (H2), then investment decisions should not be based on the credit health of the company. This however is the reason for the existence of the rating agencies. Until this issue is worked further H3 will remain unworked.
CONCLUSIONS AND RECOMMENDATIONS

Some of the early recommendations for this research and possibly future research includes the linking of liquidity ratios to market characteristics such as equity liquidity, bond ratings (split ratings), and analysts forecast dispersion. Part of my analysis into the paradox of H1 and H2 may include further use of market characteristics such as bond ratings as better indicators.
REFERENCES


