Fair Value Accounting: Assessing the Impact of it upon the Credit Crunch[*]

by

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An essay submitted to the Department of Economics

In partial fulfillment of the requirements for

the degree of Master of Arts

Queen's University

Kingston, Ontario, Canada

September 2008

[*] I am grateful to my supervisor of this essay, Professor Frank Milne. Conversations with him have shaped my views about this topic.

Content

1. Introduction

"The worry about the new international reporting standards is that the hair-trigger behavior of such institutions [hedge funds] may spread to more traditional banking and insurance sectors by importing the potential for amplified responses to market turbulence" (Plantin, Sapra and Shin, 2004).

The worry they had then foreshowed the financial turmoil happening today. If investors and regulators would have understood the implications of this statement and took actions; the impact and magnitude of the Credit Crunch might be less.

Since the breakout of the Credit Crunch in summer 2007, almost all financial institutions around the world have been affected either directly or through spillover effects. The biggest investment banks, commercial banks and insurance companies have been forced to mark their asset portfolios to market prices. The practice has generated large amount of write-downs on their books. The estimated losses in subprime mortgages has been revised from US$ 500 billion to 1 trillion according to Bill Gross at Pimco, who manages the world's largest fixed income fund. Even though this figure is not catastrophic when compared to the accelerated decline in market capital in stock exchange, where losses are several times high, the amplification effect in highly leveraged financial market can not be overlooked.

As credit markets freeze and companies capital market values plummet, investors wonder what the underlying driving force is. As usually expected, investors are eagerly

looking for something to blame. Although analysts tend to offer various versions of explanation for the cause of the credit crisis, perhaps the most cited scapegoat by financial institutions is Fair Value Accounting (FVA). The CEO from AIG (American International Group) opened fire at the accounting standard in March 2008, calling for "more managerial discretion" to save falling investor confidence and to cease the vicious circle which demands endless raising of new capital for financial institutions' balance sheets. [1] After reading the above description, it is important to ask whether investment banks have done anything wrong, or simply obeying the regulations and following the practices of marking to market have caused the financial turmoil. The main task of this essay is to discuss the impact of the FVA on the valuation of different financial assets with special emphasis put on analyzing the situation under the current illiquid market. The essay is organized as follows: Part 1 provides a brief introduction about this topic. Part 2 offers a survey of the background information with respect to the recent credit turmoil. Part 3 provides a literature review and comparison between Fair Value Accounting and Historical Cost Accounting standards. Part 4 provides a theoretical discussion about the weakness of the existing model and suggests possible modifications. Last but not least, Part 5 concludes and offers a brief outlook.

Apart from the most current relevance of the FVA standard and credit turmoil, the debate between FVA and Historical Cost Accounting has been long-lived (Hansen 2004,

[1] Please refer to the article "AIG urges 'fair value' rethink" at Financial Times, March 13, 2008 to see how CEO of the US insurer accuse FVA for the cause of current market distress.

Herz 2003, Volcker 2001). The traditional practice in accounting is to keep log of relevant value of transactions and objects. This is done because our world is neither frictionless nor perfectly competitive and in order to convey “reasonable” value of a commodity, we have to rely on these accounting rules. These practices are designed to approximate the true underlying economic value of an object. Therefore, given our imperfection world, we can not expect accounting practice to fully reveal the fundamental economic value that only exists theoretically. Acknowledging that accounting practice is only an approximation, the main task is to choose one practice that provides the best possible approximation. In other words, we need to select the practice which provides the most relevant information about the current state of the commodity.

In general, historical cost accounting has served people well in general for years, except for several serious scandals, such as the Enron case in 2001. It is a measurement system that only requires companies to record their assets and liabilities at the original costs, with no further timely updates of changes in market values. In a liquid market, price changes are frequent. As a matter of fact, this continuity is one of the most frequently made assumptions by various asset pricing models; the historical cost recording system lacks relevance and obviously can not be viewed as an ideal tool for conveying the most up-to-date important information for decision making purpose.

The authorities which set accounting standards— the International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB) – are given the role of setting generally-accepted accounting practice standards. They are

currently working toward a global convergence of different accounting practices. This convergence basically requires as much involvement of market prices as possible in the process of valuation for level 3 asset[2].

The most commonly made criticism by opponents to the application of FVA is that FVA bring too many inefficiencies by introducing "unreal" or artificial risks that distort the delivery and reception process of the true value of an asset. It diverges from the basic requirement for accounting, which aims to produce the best approximation for the fundamental value of the asset. It is obvious that people are concerned with the consequences of such inefficiencies. Market players may lose their trust of the system, transaction costs may rise substantially, thus creating impediments for decision making. In these cases, the market can never reach its Pareto optimal conditions.

The parallel movement of the changing accounting standards and the financial crisis can not be simply ignored. Suspicion and accusation are based on plenty of evidence. However, one has to keep in mind that although people may think that positive correlations exist, and that the relationship may be proven, we still can not conclude with absolute confidence that one necessarily causes the other. Nonetheless, it is important to investigate the influential effect that setting FVA has on the asset pricing process, at least from a theoretical perspective. The framework used for our discussion is developed from the model used by Plantin, Sapra and Shin (2007). By identifying the major shortcomings

[2] A hierarchy system has been introduced for classifying assets according to their relative liquidity. The level 1 class is most liquid while level 3 assets are least frequently traded in the market. In other words, it is most difficult to determine a fair price of level 3 asset.

of the model and introducing transaction cost into the model, we may weigh the pros and cons between the applications of FVA against the traditional historical accounting practice.

2. Background

This paper does not intend to provide a comprehensive coverage and discuss every detail of the recent financial turmoil and its causes. However, a brief background summary offers an excellent starting point. One must realize the importance of the issue and have a broad understanding of the linkage between the credit turmoil and the accounting principle being discussed. By doing so, one may truly understand the deep influence of FVA practice, which will be discussed in detail later.

When describing the recent credit crunch in the United States, Alan Greenspan comments that it is "likely to be judged in retrospect as the most wrenching since the end of the Second World War." [3] One fundamental change which has occurred in the past two decades, is that mortgages and loans are no longer being kept on the banks' book. The credit risk has been repackaged and redistributed through financial innovations. In the so called "originate and distribute" banking model, in which mortgages and loans are packaged into structured financial instruments and transferred to other market participants (Brunnermeier 2008). Mason (2008) mentions that he has been calling for

[3] For the full content of the former chairman's article, please refer to "We will never have a perfect model of risk" at Financial Times, March 16, 2008

regulators to closely scrutinize the securitization process, but unfortunately he has not managed to raise their attention on this issue.[4] If securitization is tightly regulated, then the amplification mechanism's impact is limited, and we are unlikely to observe today's financial turmoil in this magnitude.

The credit crunch gained most people's attention when several of the largest financial institutions announced significant subprime related write-downs, and was highlighted by the failure of Bear Stearns. However, the write-downs are still continuously expanding in numbers, and recently reached a total of more than US $500 billion. IMF (2008) states that the end of the credit crisis is still yet within sight, which has caused another round of panic in the market.[5] The seemingly endless write downs have had an impact on the very fundamental of financial stability: investor confidence.

The fundamental problem occurs when mortgage lenders take too much risk when pursuing higher profit. Subprime lending is a practice where mortgages are granted at significantly higher than prime rate[6] to customers who do not have as strong a credit history. In this risky subprime lending practice, both borrowers and lenders are exposed to higher risk. The borrowers think that since housing prices have not decreased in the past century, they will not go down in the future. Unfortunately, they are wrong. The prices have increases too much and are inflated by substantial debt, low interest rates, easy credit and loose government regulations. When the housing prices eventually

[4] Mason also questions the regulator's capability to exercise required
[5] IMF financial stability report "Year After Subprime Crash, Risks Remain Elevated" can be retrieved from http://www.imf.org/external/pubs/ft/survey/so/2008/NEW072808A.htm
[6] Prime rate is by convention defined as the lowest interest rate that bank charges its most credit worthy customers.

plummet, people will begin to realize that their home is worth less than their mortgage amount and they will simply stop making the mortgage payments and choose foreclosure. However, that is what the lenders should expect well in advance when granting the permit for those subprime loans. They are exposed to higher probability of loan defaults.

The boom of the housing market, resulting from the false signal that the public perceives from the market, has to do with government strategy. In the early 1990s, the U.S. department of housing launched the National Homeownership Strategy, aiming to achieve an all-time high level of homeownership in America within a couple of years. Plans included innovative schemes to streamline transaction costs, the introduction of creative financing rules, easier land assembly and making mortgages available for people who didn't have sufficient economic resources. While the strategy had good intentions, it also promoted risk substantially, and when coupled with securitization, the latest innovation of the financial sector, the risks skyrocketed and generated great spillover effects on other markets.

Brunnermeier (2008) identifies three amplification mechanisms that have led the mortgage crisis to turn into a worldwide financial turmoil. The first mechanism has to do with liquidity spirals that arise from deterioration in borrowers' balance sheets. Borrowers are forced to raise more funds in the short term and are concerned about the mismatch caused by leveraged financing. The second mechanism involves the lending channel. An interest rate spike is expected when there is excessive uncertainty about future funding needs and expected limited access to the lending market. The third

mechanism is the typical runs on banks. Because market today is so interwoven, and because borrowers are also lenders at the same time, a so called “gridlock risk” emerges.

In the past several years, investment banks like Bear Stearns and many other financial engineers, have actively traded structured financial instruments. These assets include Mortgage Backed Securities (MBS), and Collateralized Debt Obligations (CDOs) which are actively traded at the secondary markets. CDOs are constructed from a pool of fixed-income assets, such as corporate bonds. These assets are divided into different tranches with different levels of default risk and compensation. The market for these Asset Backed Securities has grown substantially in just a few years.[7]

Through securitization, many mortgage lenders have passed rights to loan payments and related credit/default risk to third-party investors. Corporate, institutional investors and other market players holding MBSs or CDOs face a significant amount of loss when being marked to market. Consequently, firms have to raise fresh capital at higher cost in order to maintain their balance sheet. But given the volatility present in the market, funding is no longer easily accessible in the markets such as commercial paper, interbanks, fed funds and repo.

[7] According to the Securities Industry and Financial Market Association, aggregate global CDO issuance totaled US$ 157 billion in 2004, US$ 272 billion in 2005, US$ 552 billion in 2006 and US$ 503 billion in 2007. CDO global market is close to $2 trillion by the end of 2006.

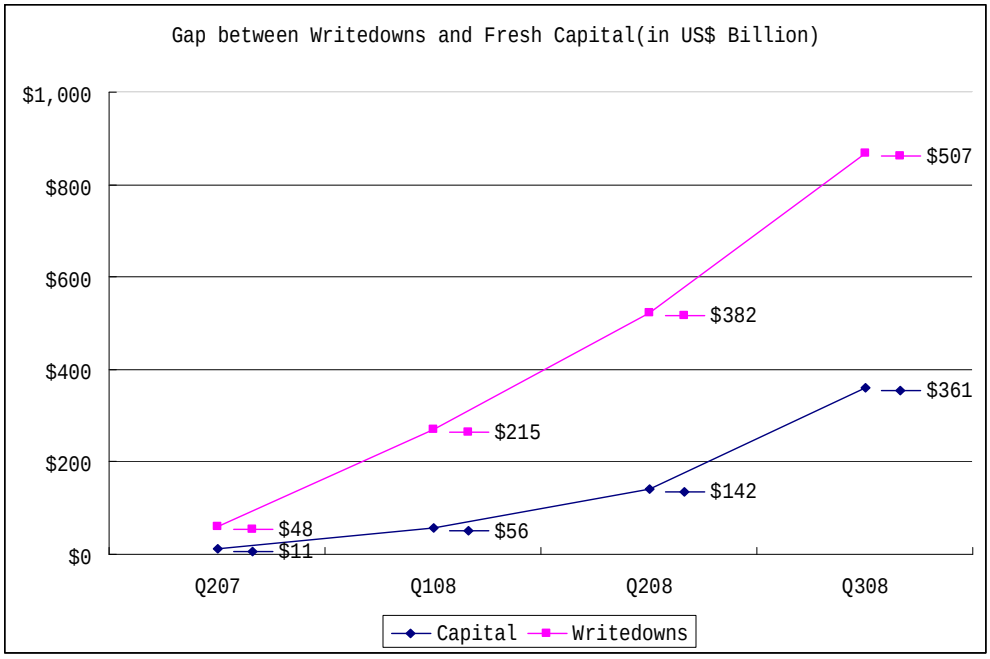

Figure 1: The graph shows the gap between writedowns and newly raised capital has widened recently. Lenders are more cautious and borrowers find harder to roll over short term debt due to credit squeezing. Source: Bloomberg.

Funding liquidity, different from market liquidity, refers to the general market condition for firms to obtain funding. In order to survive, firms must roll over their repo contract, finance their margin requirement and bear the redemption risk. The rising maturity mismatch between purchased assets and their funding has become a concern for banks that are heavily leveraged through commercial papers or repo contracts in order to meet their short term funding requirements. Brunnermeier (2008) illustrates a combined effect resulting from loss spiral and margin spiral. The loss spiral arises from the erosion of the investor's own capital, while the margin spiral is caused by the margin and haircuts spike at times of major price decline. Accompanied by these spirals is higher future volatility, as well as increased asymmetries in information and nonrational behavior on

the part of lenders. In addition to this effect, the mark-to-market intensifies the loss spiral by making the losses more observerable and up-to-date.

Credit rating agencies are also blamed for their failure to use proper risk models to value these products. Under the state regulation, companies wish to issue bonds have to get ratings from rating agencies such as Moody's and Standard and Poor's in the first place. Over time, the scoring systems grow to a dominant role in many financial institutions' decision making process. Rating agencies and issuers of CDOs worked closely to determine the cutoff points among different branches in order to reach a "win-win" situation. In such case, issuers achieved the best distribution of their risky assets to different risk-appetite investors, and reduce their funding costs since AAA rated products pay a lower interest rate. On the other hand, rating agencies charge the highest fees for evaluating structured products. Some critics argue that the credit crunch is a government-sponsored conspiracy against investors, because of the government's support for irresponsible rating agencies.

As a result of the spillover effect, institutions holding CDOs lack the technical capacity to constantly monitor credit performance, and as a result they expose themselves excessively to this potential risk and run their business based on the unreliable expected cash flows. These structured products are often being accused of presenting overcomplicated features that the buyer does not fully understand the undermining risk associated with the product. Therefore, no proper risk hedging is being constructed. As a result, the excessive exposure to risk has accumulated a significant huge Subprime

meltdown. As the credit market tightens, liquidity evaporates and investors lose confidence. Banks face pressure when raising new capital to offset the write-downs. The direct impact can be observed by looking at the ABX (home equity) index, which shows the cost of insuring a pool of mortgages of a particular rating against default. In addition, the spillover effects from the subprime turmoil can be seen from the CDX N.A. IG (North America Investment Grade) index, which reflects the cost of insuring corporate bonds against default for companies from a broad spectrum of industries. [8]

Figure 2: The CDS index reached a peak on the run of Bear Stearns. Source: Bloomberg.

One thing that is often being overlooked is the risk sharing scheme offered by the prime brokerage process. Theoretically, firms could reach a complete netting position by engaging in an interest rate swap. However, in reality, due to imperfect information, one

[8] The CDX North America Investment Grade Index is composed of 125 investment grade entities, distributed among 6 sub-indices: High Volatility, Consumer, Energy, Financial, Industrial, and Technology, Media & Tele-communications.

party hold doubts about its indirect counterparties' creditworthiness, thus making netting impossible. As Mason (2008) mentions in an interview with the Institutional Risk Analyst (IRA), there is no "true sale" of assets between the investment bank and the hedge fund because the hedge fund has very little capital and the prime broker bears all the risk in the financing relationship. The credit risk has never left the bank, even though it might seem as though the risk has been transferred to another agent. In a market filled with structured products, it is extremely difficult for institutions to determine their own exposure to credit risk.

Another significant issue to notice is that unlike other financial crises which have happened in the past, we are observing a slow-moving crisis for almost the whole year, from summer 2007 to summer 2008, as opposed to a one-time huge shock to the market. One plausible explanation would be that, in the past, when the bubble has burst, all market makers have unanimously agreed upon the "single price" of the asset. This was the case in the 1998 Asian financial crisis, where currency depreciated, and as the medium for every commercial transaction, its collapse had a chain effect on the economy. Obviously, accounting standards do not play an eye-catching role in this process.

Unlike the situation before, now with the "marking to market" enforcement, asset holders have to constantly adjust their portfolio holdings to the current market price. Since the credit crunch broke out in summer 2007, the housing market has experienced difficulty. Krugman and other economists have been noticing problems for some time and

have mentioned them on various occasions.[9] Unfortunately, administrator's have not paid enough attention to the problem, and former chairman of the Federal Reserve Greenspan is being accused of being irresponsible, although he repeatedly argues that the Fed has no obligation toward the market, and that it has no intent to interfere with the free market structure. Quite ironically, unlike his predecessor, the current Fed Chairman, Mr. Bernanke, has had to implement a series of market interventions in order to help the big financial institutions.

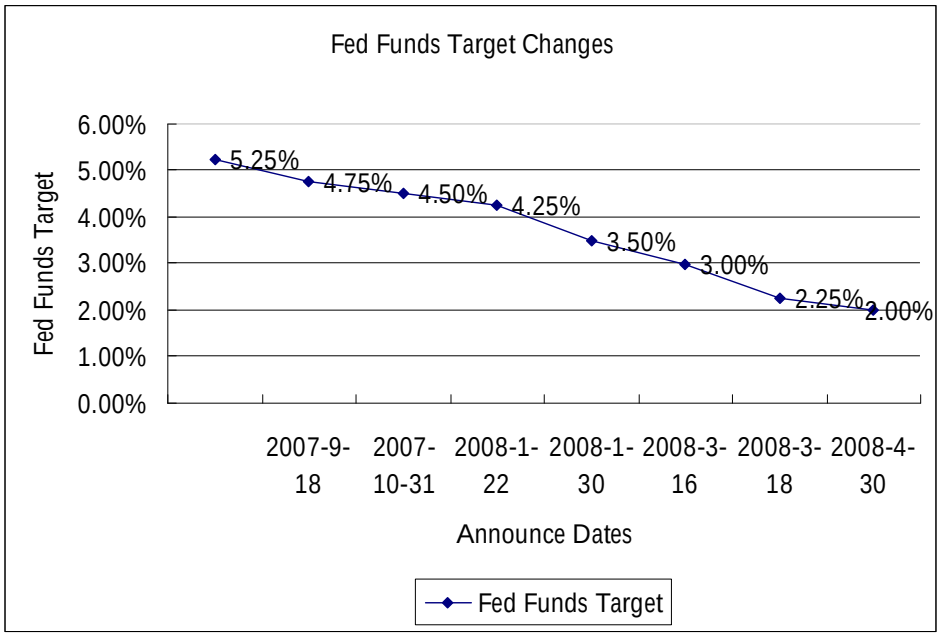

Figure 3: Fed announced a series of fund target cuts. In March 16, 08, Fed cuts the discount rate to 3.25% in an unscheduled meeting and extends discount window loan terms to 90 days from 30 days. Source: Bloomberg.

Those policies include: 1) providing discount windows for banks to borrow at lower cost; 2) introducing a Term Auction Facility (TAF) for banks to anonymously bid for

[9] See Paul Krugman "Greenspan and the Bubble" at New York Times, Aug 29, 2005

28-day loans against collateral; 3) announcing US$ 200 billion Term Securities Lending Facility (TSFL) that allows investment banks to swap agency bonds for Treasury bonds for up to 28 days; 4) introducing Primary Dealers Credit Facility (PDCF) so that investment banks may use the discount window. In recognizing the necessity for these special purpose facilities, and under the current market condition worsening, the Fed announces extension of TSFL and PDCF to 2009.

Would Mr. Greenspan maintain his standpoint given the status quo, if he were still the chairman of the Fed? The market certainly does not include a mechanism to save itself from financial catastrophe like this. The question left unanswered is what is the extent of the problem we are facing? With more foreclosure for inadequately-handled subprime mortgages, the asset such as CDOs and MBSs that build their value based on the securitization of the pool of subprime loans, have lost substantial value. The holders know the prices of their poor quality assets will decrease based on the “marking to market” principal. As a result, no one wants to trade these assets, and they must record immediate loss on their balance sheet. Thus, the liquidity of the market evaporates, and no relevant price will be regarded as the fair value for those illiquid assets.

The vicious circle keeps growing, and market players lose confidence. More hesitate to take any trade, since all of the models they used to rely on do not work any more, simply because they are built with fundamental assumptions no longer valid in current circumstances. A few of these widely made common assumptions include frictionless markets, a lack of transaction costs, and continuous trading activities within continuous

time. Nevertheless, when comes to a company's portfolio that is so securitized and so heavily leveraged, it is very hard to pick up a single model that works.

Current financial turmoil also reaches out to other countries and regions beyond the U.S. Banks that rely heavily on the mortgage business in the U.K. have also suffered significantly. For example, the mortgage lender Northernrock has been nationalized by the British government. [10] Meanwhile in the southern hemisphere, the Australia & New Zealand Banking Group Ltd. (ANZ) reported declining profit as great as 25 percent due to the escalation of bad loans. The National Australia bank is also at the greatest risk of being hurt by the deteriorating global economy.[11] Moody's senior credit analyst Beatrice Woo (2008) says in her report that Korean banks face tight liquidity conditions in both domestic and foreign currency funding. In the current highly risk-averse climate, any additional worsening in the banks already stretched liquidity ratios may induce downgrading to their bank financial strength ratings (BFSRs). As the financial fiasco continues and expands in regions of influence, it is important that one look closely at the impact of FVA on the asset valuation procedure, in order to see whether it induces any distortion.

[10] For full coverage please refer to BBC News, "Northern Rock to be nationalized" retrieved from http://news.bbc.co.uk/1/hi/business/7249575.stm
[11] Source: Bloomberg.

3. Literature Review: Fair Value Accounting V.S. Historical Cost Accounting

3.1 Voices from Two Sides

Though FVA is a very popular topic in both accounting and economic, not much has been done in the theoretical investigation of the relationship between FVA and asset pricing. Plantin, Sapra and Shin (2004, 2008), Allen and Carletti (2006) are among the few who have investigated this problem from a theoretical perspective, aiming to provide a comparison between FVA and the historical accounting standard. Most academic works in recent years have attacked the problem from an empirical angle. Before we begin the literature review about both theoretical and empirical works done in the area, let us first look at some of intensified debates that could shed some lights on this issue.

Proponents of the FVA movement argue that it conveys more relevant and useful financial statements by accurately capturing the real world volatility in a dynamically changing environment. They also argue that overnight devastation of CDOs prices should not be counted as a fault by FVA rules. Since the liquidity in the market disappears very rapidly, many institutions holding CDOs are forced to switch from Level 1 valuation to Level 3 valuation techniques within a short period of time. For companies that do not posses adequate resources to make this transition smoothly, it does produce some level of

inefficiency. However, it is not the system to blame. On the contrary, this inevitable process is desirable, as the investor may be informed of the latest development of the market and perceive the best available approximate for the asset prices (Young, 2008).

The most frequently-cited problems with FVA include several of the followings. First, the requirements are defined inconsistently and as a result, measurement approaches differ among users and disclosure is both inadequate and inconsistent. The original goal for the adoption of value fair accounting is to replace the static, historical-based measure with a more up-to-date, dynamic, market-based system. However, constrained by the flaws mentioned above, it often brings unnecessarily complicated and hard-to-perceive results. With the introduction of SFAS 157 (September 2006) and SFAS 159 (February 2007), the FASB and IASB have been moving toward a more comprehensive approach to adoption of FVA adoption procedure (Benston, 2008). The SFAS 157 has introduced a hierarchy of valuation methodologies that deal with different markets in which an asset is traded with most emphasis placed on liquidity. Ferguson (2008) sees SFAS 157 a very comprehensive and complex standard that imposes significant challenges for financial managers and audit committees of boards of directors who administrate the production of financial statements.

Secondly, criticism arises the most in dealing with illiquid asset pricing when there is a lack of active trading market. The fundamental challenge urges regulators to establish credible and actionable practice standards. Unfortunately, this standard requires an increased level of disclosures in the firm's methodology for generating their reported fair

values. Those methods are often very sophisticated and only those who develop the model can comprehend them. According to Flegm (2008), when dealing with level 3 assets, the reporting party is not required to undertake all possible efforts to obtain relevant information about the market player's assumptions if the input information is not readily available. Therefore it raises great concern about the accountability of the standard, due to potential managerial discretion when it comes to the level 3 asset pricing (Benston, 2008; Ferguson, 2008; Krumwiede and etc 2008). For example, a substantial number of CDOs being sold in the past 2 years have now been frozen, according to a Wachovia report. Apparently, the SFAS 157 rulings are not particularly helpful with respect to the most illiquid assets that lie in the eye of the storm. Keeping this point in mind, most investors and market participants suspect that their counterparties are not putting forth their best effort to achieve the best approximate for the value of the product. Consequently, they are likely to quit the game with huge loss. In other words, investors are left with no choice because the market is no longer functioning. As Mason (2008) points out, the problem arises because we allow mark- to market applications for loans and OTC structured assets for which there is no market.

Last but not least, in the event of extreme market stress like today's, in obeying the FVA standard, the investor's confidence may be destroyed. As this confidence is, the most fundamental mechanism in keeping the financial market in stable condition, it creates a vicious circle that disappoints all participants.

Nonetheless, opponents' worries about possible opportunity for earnings

manipulation are not resolved to be FVA practice. As we have observed in the recent financial market turmoil, CEOs of the largest financial institutions in the world have actually attacked FVA, claiming it generates unreliable asset prices, forces the company to encounter meaningless huge write-downs, destroys investor's confidence, and thus creates a vicious circle. Most interestingly, their proposal for an alternative solution dose not involve moving back to historical cost accounting measurement. Instead, they naively demand even more flexibility and more room for managerial discretions. Clearly, it is not a prudent choice under any circumstance for explicit reasons, as Goldman Sachs calls the proposal "Alice in Wonderland Accounting". This paper does not aim to solve the fundamental challenges faced by FVA, but to provide a thorough evaluation, based on the effectiveness of the practice.

3.2 Empirical Research

Most existing empirical research focused on financial instruments and supports the incremental value relevance of the marking to market approach for securities (Eccher et al., 1996; Nelson, 1996). Empirical research conducted by Barth (1994) investigates how share prices reflect the fair value estimates of banks' investment securities versus the historical costs. Investment securities here are primarily referred to as government-issued and government agencies' debt securities. Most of them are categorized as hold-to-maturity securities. Her findings suggest that fair value estimates of investment

stocks provide significant explanatory power, compared with the explanatory power produced by historical costs. Apparently, historical costs do not provide any significant explanatory power beyond that provided by fair value estimates. Furthermore, fair values of investment stocks are found to have less measurement error than historical costs, based on the information revealed by stock prices. She finds that previous works fail to account for the influential role of fair value mainly because of errors in estimating the fair values. Beyond this primary reason, cross sectional difference among sample companies also contribute to an unsatisfactory result. In contrast, she focuses on the banking sector's stock performance and thus, not only avoid the cross sectional problem, but also makes the work more relevant to the problem being discussed.

In order to obtain explanatory power of the model, share prices for a selected group of banks are regressed on investment securities historical costs and fair value estimates together with the book value of stock before investment securities. In addition to testing the relative measurement errors of the method, the bank equity returns are being regressed on securities gains and losses based on fair values and historical costs together with realized earnings.

One important thing to keep in mind is that accounting standard reform has been continued to evolve since the paper was published in 1994. At the time, fair value reporting was still an option for banks to choose on a voluntary basis, but now under GAAP and SFAS, FVA is involuntary for banks in the recording of their assets. Therefore in Barth's 1994 paper, we have a large chance of encountering an adverse selection

problem. It would be reasonable to assume that banks that voluntarily choose to disclose these fair value results are confident with the numbers and expect to have positive effects on their financial statement. If this is true, then the study suffers from a serious flaw. The relevance of this change would be an easily-accessible, larger dataset for almost all banks around the world under the present accounting regulation standard. It would be interesting to see if this larger dataset generated similar kinds of results that this paper has rendered.

3.3 Theoretical Approach

Even without the application of FVA by the joint effort from both FASB and IASB, banks and insurance companies from major industrialized countries have formed an "unprecedented joint lobbying campaign" against the ruling. The group is in strong opposition to a "full" fair value system that avoids items that represent a large portion of their balance sheets being marked to market. These items include long term loans for banks and outstanding insurance claims for insurance companies (Plantin, Sapra and Shin, 2004).

There are three main types of concerns for the lobby group. First, they claim the regulation setting authority supporting FVA is based on invalid assumptions about secondary market liquidity for their assets and liabilities. Secondly, the policy distorts the banks' and insurance companies' long-term financial planning horizon. Under the new

regulation, they are forced to adjust their asset holdings according to short term fluctuations that are usually not a major concern for them. Finally, they are worried about policy-induced excessive artificial volatility in the markets, since the market price has become so important for the purpose of measurement. Boyer (2007) organizes a useful chart to list potential drawbacks and advantages of FVA, as applied to banks. From the list, we can see how the principle translates into a specific operational procedure.

Plantin, Sapra and Shin also emphasize the importance of identifying artificial fluctuations in the market when using them as fair value. It requires people to distinguish between the volatility of the underlying fundamentals and the volatility that cannot be justified by the fundamentals. However, it is unrealistic to assume that market price is free from the artificial influence of large amounts of transactions, especially in an illiquid market. In the opposite situation, in times these trades often serve as an indication of the investor's assumption and thus can not be ignored. Therefore, embracing the FVA principle risks mispricing assets based on factors that are not purely a reflection of market fundamentals. The case may become even worse when the market distress feeds on itself. In order to limit loss, traders are forced to sell assets when prices fall, but this action itself adds further downward pressure on the market prices, which induces more traders to sell. The vicious circle characterized by the "feedback effect" continues.

Barch and Landsman (1995), Bromwich (2004), Allen and Carletti (2006) all contribute to the literature on FVA from a theoretical perspective. Among them, we will choose to focus on Plantin, Sapra and Shin (2008) simply because their study presents a

very simple model which tries to capture a broader picture. The model focuses on the manager's strategic decision making aiming to maximize expected earnings in a financial institution. Studies have proven that managers' compensation is positively correlated with reported companies' financial earnings, rather than stock returns (Sloan 1992). This gives management the incentive to pursue the greatest profit, and thus directly affect the company's reported financial earnings. The OTC market has presented several obvious and intrinsic impediments for efficiency. One such obstacle is the lack of resilience that leaves room for excessive market volatility.

The authors choose to use a simple 3-dates model to illustrate the strategic decision making process over a continuous number of identical financial institutions. There are three dates indexed by $t \in \{0,1,2\}$. There are many identical financial institutions (FIs) that participate in the market. Each FI holds a loan asset at date 0 that has an exogenously assigned value v_0. The asset is assumed to have only one stream of future cash flow v and it is known to all FIs at date 0. FIs face uncertainties about the exact date the asset pays off. This prepayment risk is captured by assigning probability 1-d and d to date 1 and date 2, respectively.

Managers are assumed to be short-sighted and their employment periods are assumed to be less than the asset duration. Each manager is assumed to yield maximum date 1 accounting value of the asset, which is determined by the accounting standard. In the context of a historical cost regime, initial asset value v_0 can be used as an approximation for v. Under fair value however, there exists no reliable estimate because the OTC market

is constructed based on costly search and negotiation practices. In order to account for this illiquidity, they admit the price sensitivity to liquidity may affect the loan asset market.

The authors use a simple formula to capture the price setting rule under this rather complex structure.

$$P = \delta v - \gamma s$$

Where δ is a between 0 and 1, s stands for the proportion of financial institutions who have optioned to sell their asset and γ is a positive constant. The linear demand function presents a very simple structure where price is affected by the discounted present value and a spill-over effect of other firms' selling. The negative sign represent the negative externality. A single FI in the queue is placed under uniform distribution over [0, *s*], where *s* is the consensus expectation of the proportion of firms that choose to sell the asset. The expected payoffs from the sale are

$$\delta v - \gamma \frac{s}{2}$$

It is obvious that selling the asset is never an efficient strategy given a positive value of *v*. They further discuss different scenarios for specific value ranges of the parameters involved in the formula, such as different durations. When duration is relatively low, when $d \le \frac{1}{2}$, then FIs choose to hold their assets through maturity, which achieves the best outcome, whereas for longer duration assets, the results are different for the two regimes. They also use global game techniques to characterize the equilibrium outcomes in the two accounting regimes. A close description of the methods they used step by step

has not been included in this paper, but the general results derived from those equilibrium conditions and their implications are summarized.

Under historical cost standard, managers choose to sell short-horizon assets when they appreciate in order to record immediate gain on the book by subtracting a lower historical acquired cost. This raises a concern on over-conservatism for firms who are losing their incentive to engage in longer term financial holding period, and who sell when the asset becomes most valuable. Switching to fair value does not solve the problem completely, as inefficiency may be caused by illiquid market conditions. The negative externalities generated by other firms selling puts additional pressure on the existing price, thus diverting more from the approximation of fundamental value. As a consequence, all firms hold similar expectations, the group effect causes the price to plunge further under the fair value regulation. This so-called “beauty contest” phenomenon leads to self-induced price volatility that undermines the market mechanism for efficient allocation of resources.

Therefore, they conclude that when the general market is good, a historical cost regime prevents firms from holding assets longer in order to sell at optimal price. In bad times, fair value creates inefficiencies. Knowing these unavoidable outcomes, it seems the forecast for future market conditions is most desirable for choosing the optimal regimes. But it is unrealistic for us to switch between the two systems all the time because market conditions constantly change too. Furthermore, different durations of assets also play a role in determining the selling strategy made by managers. We have

different discounted value at different payoff dates.

Facing the dilemma, it is important to develop a better understanding of the strategic interactions between firms in the secondary market. Under a historical cost regime, other firms' sales put downward pressure on asset prices and holding assets to the report date is more desirable. Therefore firms' strategies could be viewed as substitutes and have a smoothing effect on price volatility. Conversely, the negative externality is contagious and may enlarge the volatility for prices. Thus, they can be classified as strategic complements.

This simple model characterizes the feedback effect between market price and a firm's strategic movement in the illiquid market. It also depicts the dilemma for policy makers to choose between ignoring price signals and relying on outdated information. Their theoretical model has three major implications. First, assets with longer maturity dates have the greatest level of exposure to artificial volatility. In general, long- lived assets are combined with historical cost methods, and short lived assets are combined with fair value methods in order to make both more desirable than the alternative combinations. Second, liquidity is crucial for valuing assets, in order to avoid excessive vulnerability to artificial volatility. Mark-to-market is preferable when the market is deep and liquid. Older claims are more vulnerable to artificial volatility in the fair value regime, newer junior claims are more susceptible to volatility under historical cost regime. These findings are ultimately bad news for banks and insurance companies, since most of the assets/liabilities on their balance sheet are illiquid, older, and have a longer duration.

3.4 Critique about the Theoretical Model

The major advantage of this model is that it tries to capture the rather complex issue by introducing the pecuniary negative externality from others' sales. It also conveys this idea through a very simple way. Among a handful of theoretical approaches to this topic, this paper stands out for the abovementioned reasons and also because it provides a very relevant approach to dig into the fundamentals of the current credit crunch. However, it also overlooks some very important aspects of the problem and thus need careful evaluation from a different perspective. The result rendered by the author's model is biased because of the following reasons.

There are three major shortcomings of this approach. Firstly, the historical cost regime is what they call a "pure" standard, in that it does not incorporate the impairment practice. This pure environment is not a perfect reflection of the reality. Therefore, some of the conclusions made need further specifications. Secondly, they assume that the market is in a well-functioning status, where an individual firm's actions directly affect other firms through the transmitting feature of the marketplace, and market participants hold consensus estimation of the sales proportion, which is unrealistic under the illiquid market. If we follow their steps, then the conclusion should be interpreted with extreme cautions because it certainly does not approximate the situation we are facing in this financial crisis. Last but not least, due to the false assumption made for the

strongly-functioning marketplace, the model also fails to represent the significant bid/ask spread for asset pricing before any transactions may happen between two counterparties. The authors completely ignore the presence of huge transaction costs in the stressed market. Therefore, their model renders biased result. As a matter of fact, transaction costs and market illiquidity also form a vicious circle/ negative feedback effect that prevent the market from functioning normally. These points will be discussed in detail in the following section. The basic idea is very simple: with the presence of large bid-ask spreads on asset, it does not make sense to adopt the FVA practice because the “fair” price will always lie far away from the fundamental value of the asset. Consequently, the agents are worse off if they are forced to trade at the "fair value" or depressed price.

The “pure” historical cost regime does not incorporate the impairment practice, and thus imperfectly reflects reality, and leads us to conduct careful evaluation of various conclusions generated from the model. The daily practice of historical accounting with impairment measurement is different from what the author presents in the model setup. In reality, if the value of a relatively long-lived asset falls below its original purchased cost, then a write-down is required to record the asset at its fair value. It is thus very similar to the fair value practice. The only difference lies in the actual requirement and the application of the incurred impairment. The authors admit that the key for this write down practice depends on the nature of the impairment of the asset, simply because it determines how to compute the actual figure of the impairment. In one specific scenario, if the impairment is caused by excessive market risk and the fair value is computed using

discount rates from some of the same class assets, then the result differs from the previous one according to the model specification. For certain conditions, the historical cost regime would be worse than the fair value regime. As we can see, it is very important to notice this intended setup specification of the model, and keep in mind that the implications would be different from the scenario where we face impairment measurement.

This model treats the market as well-functioning, where an individual firm's action transmits into aggregate market force through the easily observable centralized trading body. In the OTC market, participants no longer hold consensus estimation of the sales proportion due to illiquidity. The authors' model setup has left some room to capture this heterogeneity among financial institutions in the valuation process. First, the discount factor δ represents the fact that the ability for a buyer from the secondary market to receive the potential cash flow is impaired. This is probably due to the counterpart's risk being involved and a lack of a long-time relationship with the original borrowers (Diamond and Rajan, 2005). Secondly, the price also depends on *s*, the proportion of institutions that opted to sell the loan portfolio. However, these two heterogeneities only reveal some of the preliminary differences generated from bilateral trading transactions. It does dig into the fundamental characteristics that are more relevant for analyzing the current credit turmoil.

By assuming all financial institutions are identical, this model ignore the different levels of risk appetites that each one possesses, and consequently overlooks an interesting

area of bargaining strategy. This is indeed a crucial aspect of this process. Some analysts have argued that the reason we waited for so long to see continued tides of the subprime related breakouts, is due to completely different opinion/ risk appetites among a significant number of institutional investors. To put it differently, the “fair value” price is so distorted and lies far away from the fundamental price, to the extent that some investors are more willing to hold the asset and endure additional writedowns in the hope that market will turn around. FVA discourages trade in the distressed market and induce additional writedowns, leads investors to a worse outcome.

The OTC market is very opaque. All data gathered and presented in the analysts’ reports are crude estimations at best. Therefore, when market participants have different views about the future trends of the market, even if they are all risk averse, their carried-out buy/sell actions will likely add to the complexity of the market. Simply speaking, the FIs are not idiosyncratic and they need to decide individually about the timing and quantity of their transactions – both buy and sell. All these randomly distributed actions are very unlikely to form the proposed “group effect” on price. In other words, the selling practice does generate negative externality on a firm’s perception about the current market condition and their expected payoffs at future dates, but this may only take effects on an individual basis. Given the opaqueness of the OTC market, firms would almost never discover the appropriate s value that stands for the proportion of firms selling the portfolio.

Some firms value the asset cheaply enough, based on their perception about the

market, and decide to buy and hold for future turnaround. In the meantime, some firms insist on a negative outlook and sell in a process that consists of random, sporadic unpredictable actions. As a result, different expectations form their from unique observation of the market. The market is not deep, and is nowhere near any distribution lognormal distribution for stock price certainly does not apply to this case. All we observe are jumps in the market. And there are very few reasons being given. The fundamental shortcoming of their model is that there exists no accurate number of sale proportions. Further, it is unreliable for assuming the market participant will hold identical estimates for this number.

The authors make unreliable assumptions for the properly-functioning marketplace, at least for the purpose of evaluating the policy impact to the OTC market. The model is silent about the significant bid/ask spread for asset pricing. Without considering the significant spread, no transactions could even be carried out between two parties. This would create very high transaction costs in the stressed market, as we have observed in the recent credit market. In addition, transaction cost and market illiquidity also form a negative feedback circle that prevents the market from adjusting and converging back to its normal condition. Therefore, the results generated from their model are biased.

The authors mistakenly assume the market is still a well functioning place for transmitting an individual firm's action to others and those being affected can react in a way that is predetermined with similar assumptions for a well functioning marketplace. The truth is that the marketplace does not work anymore. Firms can no longer rely on the

market to deliver fairly cheap information. They need to undertake tremendous effort to discovery the true status of the market and this brings us to another issue that the authors ignore in their discussion—the transaction cost.

In searching for transactions which have taken place in the OTC market and the relevant prices, firms have to rely on out sources which sometimes may not be quite reliable. Milne (2008) presents an intense discussion about different theoretical approaches for bid/ask spread brought about by the presence of transaction costs. It will certainly play some important role in the strategic bargaining process.

The model could be improved by taking into account the information quality of the strategic bargaining game where firms hold different expected payoffs and put effort into executing any transaction. In this friction-based market where asymmetric information predominates, firms hold different views about the trends of the market. This is because they form expectations based on information derived from different sources. For example, large investment banks and think tanks all construct and maintain their own database, and from their reports, one can see that all trade volumes are estimated.[12] Therefore, based on individually different estimations of the sales proportions [s_1, s_2, … s_n], firms form various price expectations. As a consequence, the expected proceeds deviate among various parties. Each individual FI should hold distinct payoff expectation E (p_n) equals to:

[12] Although I have not gather and present all those relevant data from various report released by investment banks, it is quite plausible that due to the nature of the OTC market, no volume figures are absolutely accurate and even bid/ask spreads quoted on some of the trading system, such as Bloomberg, are given for indication purpose only.

$$\mathrm{E}(p_1) = \delta v - \gamma \frac{s_1}{2},$$

$$\mathrm{E}(p_2) = \delta v - \gamma \frac{s_2}{2},$$

…

and $\mathrm{E}(p_n) = \delta v - \gamma \frac{s_n}{2}$

These arrays of prices ultimately create an array of bid/ask spreads. In addition, these bid/ask spreads amplify the friction of the OTC market. However, far from describing reality, the authors completely ignore the existence of bid/ask spreads by assuming all parties' expectation fall into the same range, namely the [0, s] sales proportion estimate. In this search market (Krainer and LeRoy, 2002), the specific transactions between two firms can not be interpreted as an indication of the value that represents aggregated ominous expectations from a continuum of market players.

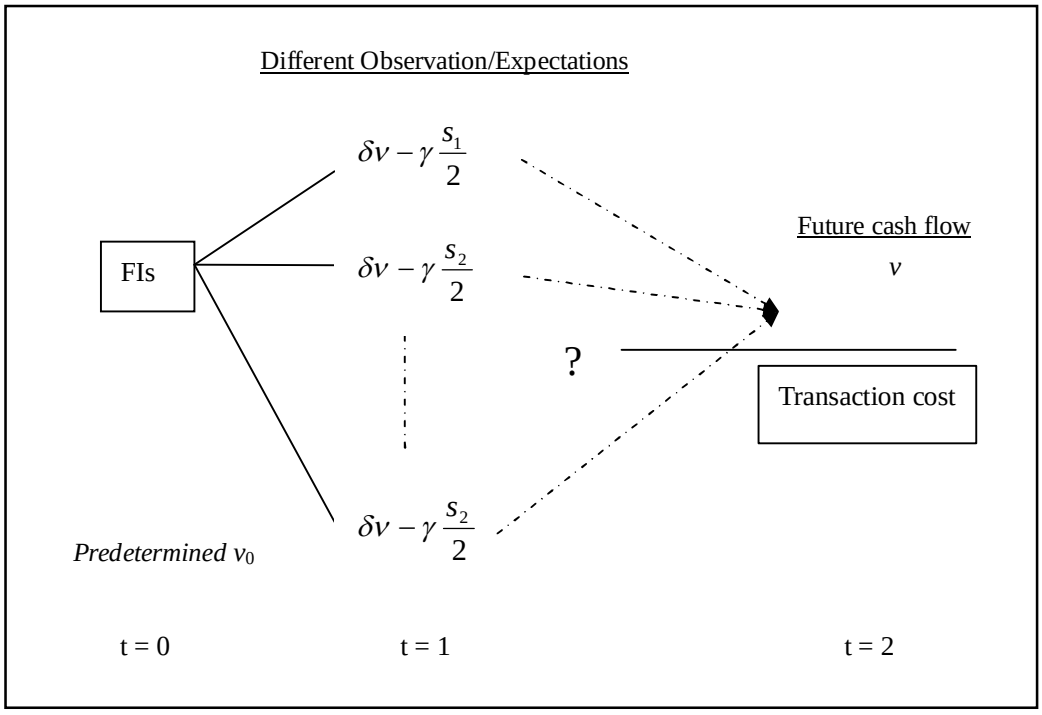

Figure 4

The ultimate price induced from a transaction in this stressed market not only represents where supply meets demand, but also conveys relevant information about their private knowledge of the market. From this leak, it is possible for each individual FI to extract otherwise private information, although it requires some additional efforts. The Grossman Paradox shows that in an equilibrium where acquisition of information is costly, full informative prices cannot coexist with the transaction cost (Grossman 1981). If we believe that the Grossman Paradox holds in this case, then the information retrieved from any existing transaction only partially reveals the other's information set, and no true equilibrium can be achieved. Models using the Bayes-Nash equilibrium attempt to tackle this difficult situation by employing a strategic trader game. The model is built on the interaction between market makers and a bunch of insiders who hold a certain amount of private information. It suggests that the market liquidity actually endogenously evolves as the degree of interaction increases.

This adverse selection model further investigates how the price quality improves when competition among insiders intensified (Glosten and Milgrom, 1985; Kyle, 1985; Vives, 1995). When we relate this imperfection with our evaluation of the FVA regime under the illiquid market, we can conclude that, market prices in general can not be regarded as the consensus indication of all participants' view about the market. Also, the fair value cannot be viewed as a true reflection of the value of fundamentals, and thus should be treated with caution when marking and asset to the market.

In addition, Hitz (2007) also calls for attention to fair value from the "in" side, which

poses the question: Before any trading happens, do we value our asset fairly in the first place? This is a very important point worth considering.

4. Conclusion

Under FVA, market risk or volatility is the prominent concern when it comes to asset valuation. The combination of a liquidity drought in OTC markets and FVA has not only created hundreds of billions of dollars in non-cash losses for many banks, but has also destroyed investors' confidence. With the avoidable transaction cost, even if two parties can reach an agreement, the cost is significant, and it is far from an ideal approximation/reflection for the fundamental value of the asset.

The changing of accounting standard and the financial crisis certainly deserve close examination with respect to the impact of accounting regimes on the asset price, but we also need to keep in mind that even if we find proof for a positive correlation, we still can not conclude with absolute confidence that it also grants causation. Nonetheless, by investigating the influential effect that the setting of FVA has on the asset pricing process from a theoretical perspective, we may identify major shortcomings of the model and introduce rational expectation and transaction costs into it. We may also weigh the pros and cons between the applications of FVA against traditional historical accounting practice. The result is not in favor of FVA in a drought market with extreme illiquidity. The legitimacy of employing FVA practice amid large bid/ask spread (presence of

transaction cost) is not well established. It contributes to biased result from ordinary model and could make investors worse off. However, marking to market is already the standard in place. We can only hope that in the years to come, regulators can find a method somewhere between “panacea and Pandora’s box” that leads to a fair approximation of the fundamental value of assets.

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