Behavioral Finance's Answer to the Financial Crisis of 2008

In the 2008 financial crisis, assets previously worth billions became worth dollars. The risk of mortgages collapsed an entire nation's economy resulting in the bankruptcy of many companies and resulting layoffs. While the financial crisis left companies and Americans in worse financial condition, a handful of arbitrageurs turned a profit. A few investors recognized the opportunity to take advantage of the vast differences in value present in the housing market through collateralized debt obligations (CDOs) and credit default swaps (CDS) and effectively short the mortgage industry. However, these people were in the minority. The majority bought into the idea that house values would continue to increase until the financial system collapsed. How does this happen? How does an asset seen as the safest possible cause a downturn of this magnitude? This paper will discuss how behavioral finance answers these questions. While behavioral finance does not provide a complete picture of each factor contributing to bubbles and crashes, it does offer an explanation for why stock market bubbles form, how they spread, and how they inevitably crash. First, we will discuss the behavioral finance's argument regarding the efficiency of the stock market. Then, the paper will analyze how individual behaviors spread to many people and ultimately result in bubbles and crashes.

Historically, stock market bubbles have casted doubt onto the broadly accepted efficient markets hypothesis (EMH). My premise is that the behavioral finance-based arguments contradicting the efficient markets hypothesis are correct and that the same behaviors causing stock market bubbles also make markets inefficient. Jay Ritter discusses the two tenets of EMH as (1) markets are rational and (2) investors' forecasts regarding the future are unbiased (2003). Behavioral finance claims that markets are not rational through several examples of irrational

behavior which in turn causes the market to act inefficiently in response to information (Ritter 2003). An example of irrational behavior employed when making financial decisions is unconscious utilization of biases. One bias investors fall victim to is representativeness bias. Representativeness bias is similar to "stereotyping which assumes that if something shares some features with something else, it will share all features" (McGrath, 2016A, slide 14). Also known as the 'law of small numbers', this bias is linked to the availability bias because it relates to how recent information is given more weight when making a decision (Ritter, 2003). The availability bias shows itself in these skewed and unpredictable swings of crashes and bubbles because information in combination with this bias causes increased volatility through overreactions (DeBondt and Thaler, 1985). In their study, DeBondt and Thaler constructed two portfolios: a loser and a winner (1985). These portfolios confirmed the presence of overreaction with an average spread in returns of 24.6% between them (Debondt and Thaler, 1985). Other biases supporting the thesis that the stock market does not act rationally are the overconfidence bias and the illusion of knowledge. Overconfidence bias is a heightened perspective of your abilities which inspires an investor to have too much confidence in their forecasts (McGrath, 2016B). The illusion of knowledge is a form of the overconfidence bias and happens when people acquire more information about an outcome and falsely believe this information will help them solve the problem or make a decision (McGrath 2016B). This illusion is particularly dangerous because it falsely builds the confidence of the decision maker while leaving the accuracy of the decision untouched (Hall, Ariss, Todorov, 2005). Hall, Ariss, and Todorov came across this finding by conducting two separate experiments measuring the impact of knowing the names of basketball teams in forecasting the winner of a game. In the

first experiment, they found that knowledge of the names increased confidence while the second experiment showed how knowledge of the names simultaneously decreased accuracy. In financial markets, overconfidence and illusion of knowledge can lead to biased forecasts by increasing confidence and decreasing an investor's accuracy in analyzing each company. While this supports a view against the efficient markets hypothesis, it would be interesting to see how minimizing these biases could create a more informationally efficient and potentially less volatile market.

Another way investors act irrationally and ultimately cause markets to react similarly is exhibited in the effects of mood on investors. This is displayed in behavioral concepts such as the Sunshine and Day of the Week effects (McGrath, 2016C). These effects describe how the stock market is positively affected when the weather is sunny or closer to a weekend since these events typically result in a brighter mood for investors. Hirshleifer & Shumway conducted a study on the impacts of sunny weather, the Sunshine effect, and found a correlation between positive market returns and sunny weather (Hirschleifer and Shumway, 2003 cited in McGrath, 2016C slide 6). These findings have been applied in a recent experiment using Twitter feeds to gauge mood. Bollen, Mao, and Zeng researched the influence a person's mood plays in their investment choices and found that mood impacts stock prices as significantly as news. (2010) In fact, they utilized their tests to predict daily fluctuations with an 86.7% accuracy (Bollen, Mao, and Zeng, 2010). Similarly to the moods of the individual investors, returns and overall market performance go up or down in relation to events previously mentioned; however, this displays irrationality in the markets because none of the events change the overall value of the

investments. Although these impacts are fairly short-lived, they drive the market price of the stock up without fundamental changes in the company's financials.

An additional point of evidence for the argument claiming the market's inefficiency is people's dissimilar reactions to gains and losses. This effect can be seen in the house money and snake bite effects. These concepts cause people to gauge risk and pursue investments differently (McGrath, 2016D). The snake bite effect causes a person to be less likely to continue taking risks if an action or investment results in a loss (McGrath, 2016D). Similar to how a person might avoid seeking employment after termination, people generally shy away from events that could cause a negative self-image of themselves. So, in finance, the snake bite effect entails selling out of a position after a loss has occurred, whereas the house money effect could lead to a buy behavior and an increase in overall risk of their portfolio following a gain (McGrath, 2016D). These behavioral factors illuminate how the stock market is inefficient, and in my opinion, the reason for the occurrence of bubbles and crashes.

However, inefficiencies in the thought processes of investors are not the only driver in the creation of bubbles. The dispersion of investors' ideas, beliefs, and trading decisions cause bubbles to culminate through implications of behavioral factors that worsen when compounded by multiple people. Illusion of knowledge, as previously mentioned, is the belief that investors understand a company because they know information about a wide array of details. The first application of this can be seen in the media's effect on investors. Market participants and their financial decisions are influenced by the news and media and through noteworthy stories investors believe they understand the stock, regardless of whether the information impacts the underlying fundamental value of the company (McGrath 2016E). Also,

many investors are subject to the availability bias. Barber and Odean found that available information ultimately affects buying and selling behavior (2008). More specifically, “attention-based purchases by many investors could temporarily inflate a stock’s price, leading to disappointing subsequent returns” (Barber and Odean, 2008).

The scope of news is also influential because it contributes to social influence by causing many people to believe the same central idea. Many investors act upon this idea leading to blocks of similar thinking, otherwise known as information cascades (McGrath, 2016E). An example of this is a new trading simulation platform I have encountered recently, TrakInvest. This platform allows a virtual trader to see and mimic fellow players. The environment created by TrakInvest exemplifies information cascades and their potentially dangerous effect on bubbles. By collecting information from other fellow investors, investors believe they have superior, and possibly profitable, information when these insights may simply be noise. Two groups that contribute to these information cascades are institutions and noise traders. Irrational investors (also known as noise traders) trade similarly enough to significantly impact stock prices and move markets (Barber, Odean and Zhu 2006). After testing many variables, their study found that with an increase of 10% in small trades of an investment the company then reported a return 18 bps higher (Barber, Odean, and Zhu, 2006). Operating under the biases adding to the market inefficiency mentioned in the first paragraph, noise traders drive the market price of assets upwards without affecting the fundamental value of the investment, leading to the formation of bubbles.

Another group of investors who have been evidenced to move in contiguous blocks and consequently affect the market are institutional investors. Information cascades created by

institutional investors hurry the price-adjustment process: shorten the horizon of natural highs and lows (Wermers 1999). Shortening this horizon produces more volatility and adds to the difficulty of effectively analyzing the stock market. The illusion of knowledge along with its implications in social influence, therefore adds to the behavioral factors that contribute to high asset prices and corresponding low fundamental values. Although overconfidence is a bias which negatively affects stock markets, a possible counterargument would be that they have a stabilizing effect on the markets. It has been found that overconfident investors rely less on the work of other investors (Barber and Odean, 2001). It is my assertion that this overconfidence could stabilize markets counteracting the conforming effects of news, social influence, and herding.

Disparities in market prices and asset values seem to be at the core of stock market bubbles and crashes such as; the Stock Market Crash of 1929, the Dot-com bubble in the late 1990s, and the financial crisis in 2008. The behavioral methods traders use to profit from and analyze information may also contribute to this volatility. Two methods used by institutional traders and noise traders alike are positive feedback and momentum. After considering feedback models, Robert Shiller found that when speculative prices increase investors spread their enthusiasm and heightened expectations leading to even higher price increases (2003). These high expectations reinforce the positive speculative beliefs about the stock price causing the market value of an asset upward. Furthermore, as the stocks gain momentum and returns, the momentum accelerates and creates creditability for the investment drawing even more investors. Shiller equates this process to a Ponzi scheme in that when more and more people buy into the scheme, it becomes more credible and an increasing amount of people invest in

the idea (2003). Also stated by Shiller, word of mouth pessimism shifts market prices of the assets downward in a similar way to how a bubble is created (2003). Some areas of interest for further research into these phenomenon and the overall effect of momentum and positive feedback trading include the impact of size of the company traded as well as the time horizons of the investments. Also, in combining negative and positive feedback with the ability to trade based on mood mentioned earlier, it would be interesting to see if the two are correlated in any way. For example, if positive feedback occurs more often on sunny Fridays.

Another aspect of behavioral finance affecting volatility of the stock market is how the human mind processes gains and losses. First, the concept of house money, as mentioned above, affects how we view our gains and may cause us to take on more risk after experiencing said gains. This is seen with bubbles in that after earning above average returns with the next big investment, more people increase the size of their investment because they have a lowered risk tolerance. Another interesting factor to consider is the impact bubbles have on investors as it relates to the prospect theory. With investors more emotionally affected by gains than losses, the positive reaction to gains further exacerbates the problem and builds off the excitement perpetuated by the momentum of the investment. The effects of prospect theory include holding onto losing stocks and increasing the disparity between a stock's fundamental value and equilibrium price (Grinblatt, Han, 2005). Moreover, their studies found that roughly '59% of capital gains are explainable by differences in past returns, and past turnover' (Grinblatt and Han, 2005, p321). This displays how turnover's effect on momentum and the quest for high returns can turn bubbles into crashes.

In circling back to the inefficient markets argument made by behavioral finance and combining its ideas with the effects of momentum, positive feedback, and prospect theory, we revisit the players in the market. Since the efficiency of financial markets relies on the self-correcting abilities of rational investors to minimize over and under reactions, the inability of these speculators to equalize the discrepancy between market and fundamental values results in overreactions (DeLong, Schliefer, Summers, Waldmann, 2012). Overreactions are caused by momentum trading, a strategy similar to positive feedback trading, and are correlated with volatility risk (Daniel, Moskowitz, 2013). Daniel and Moskowitz found that accompanying this volatility risk, is a momentum crash as momentum investors short the losers (2013). Another possible explanation for overreactions are waves in investor sentiments. Changes in investor sentiments, which often accompany bubbles, can have a worse impact on firms with financially uncertain futures (Baker, Wurgler, 2006). This is best illustrated in the financial crisis of 2008 when the overall sentiment of mortgages as an asset decreased dramatically, bringing the stock market with it.

Following the aftermath of the financial crisis of 2008, explanations of the science behind the crash became exceedingly more sought after and interesting to the general public. Behavioral finance is extremely useful in assessing and explaining bubbles and crashes. Although my conclusion rests on the idea that the efficient markets hypothesis is flawed, my claim is that behavioral finance still explains the other components of bubbles and crashes. Through compiling research from various behaviorists, I have concluded that this discipline explains why bubbles happen, how they spread, and why they crash.

References

Baker, Malcolm and Wurgler, Jeffrey. *Investor Sentiment in the Stock Market.* Journal of Economic Perspectives Working Paper.

Barber, Brad M. and Odean, Terrance. (2001). *Boys Will be Boys: Gender, Overconfidence, and Common Stock Investment. T*he Quarterly Journal of Economics. 116 (1), p261-292.

Barber, Brad M. and Odean, Terrance and Zhu, Ning. (2006). *Do Noise Traders Move Markets?*. *EFA Zurich Meetings Paper.*

Barber, Brad M. and Odean, Terrance. (2008). *All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors.* Oxford Journals. 21 (2), p785-818.

Bollen, Johan Mao, Huina and Zeng, Xiaojun. (2011). *Twitter mood predicts the stock market.* Journal of Computational Science. 2 (1), p1-8.

Daniel, Kent D. and Moskowitz, Tobias J. *Momentum Crashes* (September 30, 2013). Swiss Finance Institute Research Paper No. 13-61; Columbia Business School Research Paper No. 14-6; Fama-Miller Working Paper.

DeBondt, Werner F. M. and Thaler, Richard. (1985). *Does the Stock Market Overreact?*. The Journal of Finance. 40 (3), p793-805.

De Long, J. Bradford, Shleifer, Andrei, Summers Lawrence H., and Waldmann, Robert J. (1990). *Positive Feedback Investment Strategies and Destabilizing Rational Speculation*. The Journal of Finance. 45 (2), p379-395.

Grinblatt, Mark and Han, Bing. (2005). *Prospect theory, mental accounting, and momentum.* Journal of Financial Economics. 78 (2), p311-339.

Hall, Crystal C., Ariss, Lynn, and Todorov, Alexander. (2007). *The illusion of knowledge: When more information reduces accuracy and increases confidence.* Organizational Behavior and Human Decision Processes. 103 ( ), p277-290.

McGrath, K. M. (2016C). *Efficient Market Hypothesis I*. PowerPoint presentation. Texas A&M University, College Station.

McGrath, K. M. (2016D). *Emotional Factors*. PowerPoint presentation. Texas A&M University, College Station.

McGrath, K. M. (2016A). *Heuristic Simplification.* PowerPoint presentation. Texas A&M University, College Station.

McGrath, K. M. (2016B). *Self-Deception*. PowerPoint presentation. Texas A&M University, College Station.

McGrath, K. M. (2016E). *Social Factors.* PowerPoint presentation. Texas A&M University, College Station.

Ritter, Jay. (2003). *Behavioral Finance.* Pacific-Basin Finance Journal. 11 (4), p429-437.

Shiller, Robert J. . (2003). *From Efficient Markets Theory to Behavioral Finance.* Journal of Economic Perspectives. 17 (1), p83-104.

Wermers, Russ. (1999). *Mutual Fund Herding and the Impact on Stock Prices*. The Journal of Finance. 54 (2), p581-619.