

ARE INVESTORS MORE HOMO SAPIENS RATHER THAN HOMO ECONOMICUS: A BEHAVIORIST APPROACH TO FINANCIAL CRISIS

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—Abstract —

With the recent financial crisis, the debate of the validity of the efficient market hypothesis has been raised once again, since the stock market crash of 1987. This investment theory in a simple way states that financial markets are efficient and make a rational allocation of resources because all of the available information is reflected into prices. However, as many economists recently claimed, this financial crisis has considerably disproved the theory of market efficiency; indeed the new science of behavioral finance has proved to be true.

The aim of this paper is to analyze from a behavioral approach the recent financial crisis. Are financial markets' participants rational? What is the role of their animal spirit in bubbles and bursts? Do the greed, optimism, confidence and other related sentiments dominate the homo economicus? Reviewing literature and discussing arguments of prominent economists and behaviorists such as Fama, Thaler and Shiller, we provide a simplified human story of financial crisis beyond ARMs, SIVs, CDOs, CDSs and the like.

Key Words: *Financial crisis, Information Market Efficiency, Behavioral Finance*

JEL Classification: G01, G02, G14

1. INTRODUCTION

The concept of efficiency is crucial in economics. Widely, rational allocation of resources is attributed to efficiency of that market. Eugene Fama, a Nobel - prize winner, introduced for the very first time this concept in financial markets, which would bring the most debated and discussed theory in finance: the efficient market hypothesis. The theory states that financial markets are efficient. This implies two things; first, no one can beat the market: the market as a whole is wiser than single investors; second, prices in the market reflect all the available information. Yet, volatility, assets mispricing and speculation have proved to be very common in financial markets throughout history. The recent financial crisis reopened the hot debate between efficient market opponents and proponents. Many economists have argued that this crisis drove a stake through the heart of the academic notion of efficient market hypothesis and the new theory of behavioral finance proved to be true: Markets are not rational, there are always “noisy traders” which anchor bias in their decisions-making, prices do not incorporate the whole information and therefore there are mispriced assets.

The aim of this research paper is to review the financial crisis by a behavioral perspective. We provide a breakdown of the crisis, discussing the role of greed, optimism, herding, overconfidence and panics. It is worth highlighting two limitations within this paper: First, we draw on a wide array of useful analysis. There is no new argument or hypothesis that we provide. Second, we do not conduct an extra examination of us or any tests in regard to the role of psychology in crisis. We do not aim to make a comprehensive psychological analysis. Rather in reexamining selective pieces of analysis, we aim at sketching a simplified framework with some key ideas to understand better this crisis from a behaviorist approach. Paper is constructed as follows: In the first section, a literature review on assets’ bubble theories is provided to build the theoretical background for analyzing the events of the recent global financial crisis. In the second part, a narrative story of the big events and shocks is provided, to be followed by a short analysis of the roots of this crisis. In the third part, a behavioral discussion of this crisis is provided. Lastly, we draw some conclusions on what it can be learned from human’ psychology.

2. LITERATURE REVIEW

2.1 Efficient Market Hypothesis and the rationality of market assumption

The efficient market hypothesis derives from the concept of “efficient market” firstly introduced by Eugene Fama in 1965 as “a market where there are large numbers of rational, profit-maximizing and actively competing investors, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants” (Fama, Jan 1965, “The behavior of stock market prices”). Richard Thaler defines it simply as having the “no free lunch” part and “prices are right” part. This implies that in an efficient market any profit opportunity is eliminated through arbitrage and price reflects all the available information, therefore price is always right. Yet, when it comes to discussions and

empirical tests, investors and researchers do not find consistent the efficient market hypothesis. Anomaly, which is defined as a regular pattern in an asset's return (which is reliable, widely known and inexplicable) is the most common violation of the efficient market hypothesis. The fact that the trend is regular and reliable means that many investors can make predictions and take advantage of it. Small firm effect (Banz:1981), January effect (Keim:1983, Roll:1983, Rozeff and Kiney:1976), the value-line enigma (Copeland and Mayers), the relation between price-earnings ratio and expected returns (Basu: 1977), the volatility of orange-juice future prices (Roll: 1984), the calendar effects such as holiday, weekend, and turn-of-the month seasonalities (Lakonishok and Smidt:1988) are some of the common violence of the theory. Most of these anomalies can be exploited by trading strategies, and while the resulting profits may not be riskless, they seem unusually profitable relative to their risks (Lehman: 1990, Lo: 2007).

2.2 Behavioral Finance – an enduring critique of EMH

Behavioral finance, an approach which takes into accounts the preferences and behaviors of market participants, is still one of the most enduring critiques of the efficient market hypothesis. Psychologists and experimental economists part of the behaviorism have attributed investors' decisions and choices to a combination of cognitive biases such as : overconfidence (Fischhoff and Slovic: 1980, Barber and Odean :2001; Gervais and Odean:2001), overreaction (DeBondt and Thaler:1985), loss aversion (Kahneman and Tversky:1979; Shefrin and Statman:1985; Odean:1998), herding (Huberman and Regev:2001), psychological accounting (Tversky and Kahneman:1981), miscalibration of probabilities (Lichtenstein, Fischhoff and Phillips:1982), hyperbolic discounting (Laibson:1997) and regret (Bell:1982). According to these critics, investors made often irrational decisions, exhibiting predictable and financially ruinous behaviors and thus leading to imperfections in financial markets. Therefore, assets bubble exists.

2.3 Minsky and Kindleberger's approach on bubbles and financial crisis

The theories of financial crisis explanation derives all from Minsky's model (1977, 1982, 1986), a framework which has at its root a "shock", an exogenous event to the financial system which creates profit opportunities. Minsky describes the bubble formation as consisting of four stages:

- Displacement
- Booming
- Euphoria;
- Profit-taking
- Panic

As of Kindleberger's interpretation (1978) on Minsky theory, agents with savings and credits invest their money to the new profitable sector, booming the credit finances and increasing the money supply. In this prosperous time, euphoria sets in. This in turns increases the fragility of the financial system and the probability of biased judgment. Banks loose their prudence and conservatism and lax by extending credits and making insufficient provisions for risk. This allows investors to engage in even more speculative activities. Money supply increases, prices increase,

new profit opportunities and investments are created, income rises and virtuous cycle goes on. However, herding behavior is observed at some points. Inexperienced investors with asymmetric information follow the herd and just because everybody is investing in this sector, they think they will make money as well, so at some points of time the mindless herd might be at a risk. Irrational behavior sets in and speculative finance boom continues until it snaps. As Kindleberger explains when prices increase over an extended range and they differ far from reality due to mania, a bubble is created. At this point, confidence is crucial in bubble bursts. The smartest investors realize the gravity of the situation; they sell their financial assets when they are still at their peak prices leaving the bubble to the rest of the herd. At some points, when investors realize that prices are exuberant, they all want to sell their assets, causing a distress selling. Because of large supply of assets, the assets price fall, firms and households are forced to liquidate their assets, and the supply outnumbering the demand causes further declines in the assets prices. This negative view of market causes confidence to erode, panics to erupt and the bubble to burst. Therefore a crash occurs. When the sector in which the bubble occurs is too complex, too interconnected and too interrelated with the rest of financial system, the whole caliber is affected and a financial crisis occurs, as it was the case.

3. AN OUTLOOK OF THE FINANCIAL CRISIS OF 2007-2008

3.1 Main events which led to the current meltdown

The financial crisis of 2008-2009 was the most severe downturn since the Great Depression of 1930s. What started as a collapse of the main financial institutions in USA was widely spread throughout the world in Europe and Asia due to financial markets interconnectivity. The financial meltdown was caused by the downward movements in real estate prices and other securities related to housing prices. Leading rating agencies mistakenly underestimated the risk, rating with an AAA relatively high risk-securities, which at last drove many firms to bankruptcy. As Nicole Bobbin put in an article in *Forex Trading Currency* "The housing market began to collapse in 2005 and 2006 when defaults started to increase on subprime and adjustable rate mortgages. When hedge funds went belly-up and banks started to report large write-downs, it turned into a Wall Street crisis in 2007. In March 2008, Bear Stearns became the first investment bank to fail, requiring a bailout and acquisition by the Fed and JPMorgan". The downturn spillover had just begun with these failures to be followed by the takeover of Fannie Mae and Freddie Mac in September, Lehman Brothers' bankruptcy a week later and the gulp of Merrill Lynch by Bank of America. Shortly after that, the last two remaining publicly traded U.S. investment banks (Goldman Sachs and Morgan Stanley) filed for change of status to bank holding companies while JPMorgan absorbed Washington Mutual. Soon from 2008 and on, the crisis became a crisis of confidence. Banks became skeptical of lending to each other as they did not know who might be the next to fail" (Bobbin: 2009). So, lastly with the recent financial crisis, "it turned out that once again since the stock market crash of 1987, the whole profession of financial engineering went out of game giving the second-real world reminder of market capriciousness. What it seemed to make the financial system healthier and safer due to the confidence in well-designed models of asset

pricing in Wall Street, came out to be a devastating blow of the entire academic discipline of financial economics” (Financial Economist: 2009).

3.2 The roots of the financial crisis

There exists much literature that seeks to explain the events leading up to the crisis (Ashcraft and Schuermann, 2008; Calomiris, 2008; Gerardi, Lenhart, Sherlund, and Willen, 2008; Gorton, 2008, Demyank and Hemert, 2008).

Mortgage market, financial engineering products and psychological aspirations of different agents in financial markets are at the heart of this crisis. American dream of home’s ownership evoked emotions, cognitive bias, extensive risk, ignorance and blindness. In most of the cases, the buyers even didn’t understand the complex structure of the mortgage. Most of them were mostly focused on getting into their homes that they even didn’t have any idea what they signed (Sanders, 2007). Banks underestimated the risk, increasing dangerously their leverage ratio and accumulating in their portfolio toxic assets, credit rating agencies rated with AAA securities that just a month later were downgraded and regulators put an eye blind resting under efficiency of financial market hypothesis.

The origins of this crisis are pointed to a housing price bubble which interacted both with new kinds of financial innovations that masked the risk, with companies that failed to follow their own risk management procedure, and with regulators and supervisors that failed to restrain excessive taking (Baily, Litan, Johnson, 2008). From the mid-1990s till 2006, the housing prices in USA experiences significant increase far from the increase in households’ income forming a bubble in housing sector. One significant factor in inflating the prices was extrapolation of future prices; individuals witnessed raising prices. In addition, new customers-the unqualified borrowers or subprime borrowers took off exponentially due to innovations in mortgage design such as ARMs, securitization-pooling of mortgages into packages and selling securities backed to investors, CDOs- innovative ways of securitizing where investment banks package the subprime mortgages with other assets backed securities, divide the cash flows into different tranches to appeal to different classes of investors with different tolerance for risk and the like innovations of financial engineering. Insurance companies such as AIG started to sell CDSs, protection insurance to CDO investors that would pay off in the event the loans went into default. An environment of easy monetary policy with low interest rates by Fed and with poor oversight by Regulators facilitated the boom in subprime lending leading to fuel in housing prices. Banks in addition turned to short-term borrowing from money market and the overuse of repos like clock-work, made them especially vulnerable to a case of liquidity drain.

Institutions along each link of securitization chain from the mortgage originator, to loan servicer, to the mortgage backed security issuer, to the CDO issuer, to the CDSs protection seller, to the credit ratings agencies and to the holder of these securities, failed to adequately assess the risk and exercise due diligence, care and prudence (Baily, Litan, Johnson, 2008). While institutions had

little incentives to worry about the risk as long as it was shifted from one party to the other due to the securitization, the buyers of these instruments such as CDO, MBS and CDS holders should have worried about the boomerang risk. Yet, they failed to do so. One reason it may be the enthusiasm they were caught in this bubble house. Other might be the greed and love for money pushed them far and made turned an eye blind assuming a rosy picture for future. In addition lack of transparency and opaque structure of these products that no one used to understand properly, was a contributing factor under the mortgage bubble story. Why did everybody behaved recklessly and blindly towards the massive risks they were taking on? The puzzle that remains open is why did everybody got so wrong when signs of the bubble were already obvious?

4. A BEHAVIORIST APPROACH ON CRISIS' INTERPRETATION

Role of psychology in economics and finance is undeniable. From Keynes (1963) to Minsky and other behaviorists, the role of psychology in economics and finance has been highlighted. Investors, lenders, borrowers and policy-makers before all are humans. Bubbles and bursts are created as a result of their sentiments, reflecting fear and greed, unrealistic optimism and pessimism, mania, euphoria and panics. Biases in human cognition like the tendency to extrapolate too readily from past, herding, overconfidence, wishful thinking, intuition and the like it is a kind of error that reflect human shortcomings. This kind of limitation and shortcoming is the same present in judgment thinking of professionals' investors, professors and trustees.

Two kinds of sentiments affect people while they make financial decisions. As of behavioral portfolio theory, fear arising leads to a drop in consumption below the existing standards of living, and people are motivated to keep aside a portion of their savings. In turn, because of the greed, consumption and investment rises rapidly and investors fail to properly measure the risk (Shefrin & Statman, 2000). Hoping to be rewarded with high returns, investors often neglect the risk putting much more skin in the game. Moreover, they fail to diversify properly the portfolio, increasing the risk of losses if that investment doesn't perform well. The concept of narrow framing (Kahneman & Lovallo, 1993; Kahneman & Tversky, 1984; Read, Lowenstein, & Rabin, 1999) is present when investors make decisions about their portfolio selection and assets correlation. Mental accounting, a type of narrow framing behavior, is observed by Thaler (1985, 1990, 1990) in financial decisions making. As of Shefrin & Statman (2000) because of mental accounting effect, investors fail to properly diversify their investment portfolio, creating registered safe investments for contingency needs and high risky- high reward investment.

Psychology of risk in addition to fear and greed includes many concepts such as: excessive optimism, overconfidence, representativeness heuristic and herding. Excessive optimism and overconfidence leads to a rosy picture of reality, often underestimating the risks. When investors are subject to waves of optimism, they overreact to past events, causing prices to deviate substantially from their fundamental values (De Bondt and Thaler, 1985; Kahneman and Tversky, 1979). Anomaly of attention is another part of the mechanism by which price increase boosts the demands (Shiller, 2001). According to psychologists people pay attention to what others do, speculative assets gather a great deal of attention and investors, even the professional ones, have

their attention attracted by past prices increases. Another part of the mechanism by which prices increases has to do with wishful thinking bias. "After a bubble has continued for a while, there are many people who have committed themselves to the investments, emotionally as well as financially" (Shiller, 2001).

Regarding the role of herding behaviour, the events of the crisis were much in line with some theories of herding behaviour which leads to a bubble formation e.g. Bikhchandani, Hirshleifer and Welch (1992). As of Bikhchandani's game theory model, individuals are not independent-decision makers; indeed they base their decisions both on their judgement and the actions of the others. Because of "information cascades" phenomenon, it may happen that an investors observing others' actions, discards her own judgement and follows the herd. Such kind of social contagion might be in line with the story of mortgage crisis, describing how homeowners, mortgage originators, holders of MBSs, regulators, rating agencies, indeed everyone, were caught in a bubble (Baily, Litan, Johnson, 2008).

For explaining the over-extrapolation of home prices too far in the future, we find useful Barberis' arguments called "bad incentives labels" and "bad models views" (Barberis, 2011). As of him, one explanation might be the banks were aware of the massive risks they were exposing the institutions, but compensation scheme was such a one that no risk consequences were bared by them, they were compensated on short term basis and on the size of the deals structured rather than on long-term basis (Acharya et al., 2009). The second explanation of him, says that due to faulty reasoning, they too failed to reveal properly the risks, extrapolating the past growth in mortgage market too far in the future.

Barberis builds a third alternative hypothesis called "manipulation belief" as a foundation for the plausibility of "bad models" view. This hypothesis has on its center the cognitive dissonance concept, which says that people feel discomfort when they take decisions or actions that conflict with their self-image and beliefs. To reduce the dissonance what they do is belief manipulation. Though being aware that their business models contain huge risks, by manipulating their beliefs, they delude themselves thinking that it is not so risky, rather worth pursuing. So a mortgage desk of a bank, to reduce the discomfort of thinking that subprime securities he is building may pose risks to the institutions and to the broader system, manipulates its beliefs, believing that this business models is not so risky, and stop making prudent loans. "Because of extrapolation bias, the sentiment of many people had been that housing prices would continue to increase by about 10% a year. This belief supported a dramatic increase in the volume of subprime mortgages, especially mortgages with no documentation, and little or no down-payment required" (Shefrin, 2009). Credit rating agencies to allow themselves to earn more in a quarter due to financial incentive of rating the product with a triple AAA, at the same time to remove the discomfort from rating with a triple AAA a product that doesn't deserve, manipulates their beliefs telling himself that since housing prices is likely to rise as it has done for years, subprime defaults would remain low. As of representativeness heuristic, people tend to believe that past trends will continue into the future. So, subprime securitization may have lent itself particularly to belief manipulation (Barberis,

2011). In addition the products were often too complex, that people delude themselves about the risks.

A special attention should be put to confidence argument in this crisis. Confidence structure generates optimism, enthusiasm, and prosperity, the same as loss of confidence generates panic and collapse. Confidence is especially crucial in banking system, which is built in “an unprecedented trust between man and man” (Bagehot, [1873] 1922, p.151). The trust in banking industry is demanded at a higher level than any other industry for two reasons: liquidity and solvency. Maturity transformation, that is borrowing short and lending long is one of the key activities of banks, whose sustainability is sensitive to depositors’ confidence on banking system, otherwise banks will suffer a liquidity shortage. Second, the confidence is of high important because of the losses that a bank may occur through it loans, which in turns offsets its capital.

With the new financial system, the traditional notion of banks has not just only changed, indeed non-banks uncovered by regulation have emerged been known as “Shadow banking system”. Shadow banking system is a modern system of banking, functionally doing what a bank does (Akerlof & Shiller, 2009, p.82). The equivalents of bank deposits in shadow banking is the repo market, therefore when it comes to vulnerability related to confidence they are similar to traditional banks (Gorton & Metrick, 2009). Investments banks, monoline insurers, SIVs, hedge funds, mortgage brokers are all examples of shadow banking (Geithner, 2008; Krugman, 2008; Zandi, 2009, pp.119-121). Because of lack of regulation and transparency the confidence is extra volatile and vulnerable in the shadow banking system (Swedberg, 2010). Keynes also described the financial system as “a delicate machine, the workings of which we do not understand” and this has to do with the role that confidence plays in it (Keynes, [1930] 1963, p.136).

As of the argument introduced by Swedberg “confidence has to do with people’s tendency to base their actions on indicators or proxy signs for what some situation is like, in those cases where they lack direct knowledge of the situation”. When the proxy sign is properly aligned with the economic situation, investors will feel confidence. However, problems arises when proxy sign and economic situation are not in line; for example when proxy is negative and the situation is positive (Merton’s case), yet the real problem arises in Bagehot’s case: the proxy is positive but the economic situation is negative, which shows that there are hidden losses in the banking or financial system that investors are not aware. Yet, this argument is different from the argument of transparency, which says that a lack of transparency may cause the financial crisis. Swedberg indeed emphasizes the case that “it was the disjunction between the proxy signs and the underlying economic situation that was a major cause of the panic”. Swedberg applies this idea to both investors and to institutions and draws a distinction between two types of confidence: collapse of confidence, the situation where confidence suddenly disappears, and withdrawal of confidence, where actors do not engage in economic actions because of lacking the confidence to do so. Loss of confidence can be spread either directly and indirectly. In the case of an indirect spread, reaction is categorical, which means that investors now treat all actors belonging to the same category in the same way, fearing that they may have all the same problem, or guilt by association (Swedberg, 2010). In addition, confidence relationship is mentioned, the one in which one actor

has confidence that the other actor or a third party (e.g. rating agencies) who guarantees the quality of the proxy sign, will do something, by virtue of her special knowledge, objectivity or the like. Regarding the role of the confidence in this financial crisis, there exists a debate whether the loss of confidence due to liquidity position was a primary cause of financial crisis or the loss of confidence having to do with economic losses (insolvency position) was the cause. Yet, it is conventional that after the downward spillover with Bear Stearns, Fannie Mae and Freddie Mac and after the colossal failure of Lehman Brothers, the banks became sceptical to lend to each other as they did not know who might be the next to fail. At this moment, the crisis turned from a mortgage crisis to a confidence crisis. The failure of Lehman Brothers investment bank was the moment in which the confidence among investors evaporated. While Swedberg put a note on the role of confidence in financial system, having psychological side, and a distinct social and sociological side, which has to be well understood and addressed, behavioural economists links it to irrationality of human nature. Confidence belongs to what Akerlof and Shiller called as “animal spirit” (Akerlof & Shiller, 2009; Krugman, 2009; Gladwell, 2009). It is to “animal spirits” that Shiller attributes reasons of Lehman collapse, the bubbles and this financial crisis. Based upon “irrational exuberance” in markets, Shiller wrote about the risk of a real estate bubble well before the crisis hit. His voice was dismissed just because human rationality has its own limitation and shortcoming. Therefore role of psychology in finance is an issue that should be addressed seriously.

4. CONCLUSIONS

What this financial crisis tells us is that markets cannot be beaten. Regarding prices, they were too exuberant. The financial crisis proved that even the more sophisticated models of financial engineering went out of game simply because no one can predict the market volatility. Here the role of investors as human being should be taken in account. Before all investors are human, suffering from limitations in their rational thinking and anchoring bias in their judgment. Aspirations, emotions, wishful thinking, greed, optimism, herding and confidence are part of what Shiller called as “animal spirit” which led to errors and shortcomings in rational decisions. Therefore, investors are not totally homo-economicus, non-emotional fully rational agents. Indeed, as homo sapiens they have ambiguous emotions such as: anger, hatred, guilt, shame, pride, regret, joy, grief, envy, greed, indignation, jealousy, contempt, fear, and yes, love. What economics should do is to incorporate the discipline of cognitive psychology into the economic models and to build much more realistic models of quasi-rational emotional humans (Thaler, 2000)

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