Exploring Investors' Decision Making Processes During the 2008 Financial Crisis Using Epstein's Cognitive Experiential Self-Theory: A Multiple-case Study

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RICHARD ENG

Prescott Valley, Arizona

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

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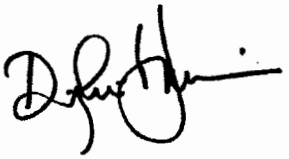
By

Richard Eng

Approved by:



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Member: Thomas Schaefer, Ph.D.

Certified by:

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Dr. Peter Bemski, Ph.D.

Dean, School of Business and Technology Management Date

Northcentral University

Abstract

A longstanding controversy in financial economics is whether investors' rational forces or their emotional responses govern the asset pricing of the financial markets. Some psychology researchers use dual- process models to understand peoples' information processing. The problem is that some investors allow cognitive biases which operate quickly and automatically in the *System 1* domain, to affect their decisions rather than respond deliberatively and rationally which are ascribed to the *System 2* domain. The purpose of this study was to explore how and why investors, when faced with extreme stress impelled during the 2008 Financial Crisis, yielded to either *System 1 or System 2* axis decision-making. Without evaluating the role that cognitive biases play in information processing, investors will not understand why they make inauspicious automatic decisions or grasp the steps that could help avoid realized losses in their stock portfolio. This qualitative research consisted of a multiple-case study that included in-depth semi-structured interviews of 12 investors who had at least $1 million invested in stocks and bonds and triangulation data analysis. The research findings indicated that *stock market literacy* and risk profiling are foundations for sound investing. When faced with a financial crisis, some investors displayed cognitive biases such as nervousness, worry, and fear that led to myopic loss aversion that caused them to sell their entire stock portfolio or reallocated into more conservative, less risky bonds. Some investors with no emotions and higher *stock market literacy* considered the financial crisis as a blip in the long-term upward trend performance of stocks and viewed the financial crisis as an opportunity to buy more stocks. For those investors that displayed emotions because of the financial crisis, emotion regulation strategies helped them make more controlled and

deliberative investment decisions. Nevertheless, the decisions made by investors may be satisficing because of peoples' bounded rationality, the inherent information processing limitation of the human mind. The specific role of emotion in the duality of information processing was undetermined because the crisis evolved over time rather than a singular event. It is possible that quantitative determination of *stock market literacy* and the application of Epstein's Rational-Experiential Questionnaire and personality tests including satisfaction questions could shed further information on the dual-process mechanisms.

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Chapter 1: Introduction

The 2008 Financial Crisis caused a fundamental shock in the economy worldwide, disheartening investors, economists, and policymakers alike (Arup, 2010). Many investors saw the value of their investment portfolios decrease significantly, and some feared losing their savings (Chambers, Benibo, & Spencer, 2011). Although the crisis caused many investors to lower their risk tolerance and even exit from the stock market, some investors did not de-risk their portfolio but continued to hold on to their stocks and even viewed the depressed asset prices as an opportunity to add stocks to their portfolio. Surprisingly, academic research on these issues remains scarce (Hoffmann, Post, & Pennings, 2013; Prorokowski, 2011).

Contrary to traditional finance theory, investors' cognitive principles, their judgments that originate in biased impressions and deliberative reasoning provide the theoretical framework for behavioral finance theory (Kahneman & Klein, 2009). The devastation of the 2008 Financial Crisis to investor wealth combined with the extreme volatility and high uncertainty in the economic outlook may have induced individual investors to alter their investment behavior (Hoffmann et al., 2013). Behavioral finance considers the individuals' cognitive psychological, social, and financial factors simultaneously to understand and explain investors' decisions (Hayes, 2010). Some psychologists have adopted a dual-system approach, arguing that individuals use a dual step process of cognition described as *System1*—unconscious, rapid, and automatic reactions and *System 2*—conscious, slow, deliberative, and analytical reasoning (Evans, 2008). In particular, the Cognitive Experiential Self-Theory (CEST) theoretical framework incorporates the cognitive and psychodynamic unconscious aspects of

information processing described as two parallel, interacting modes: an emotionally driven experiential system and a rational system (Epstein, 1994). Characteristic of *System 1,* ~~i~~nvestors are not always rational and often, their financial decision-making is intuitively driven by cognitive (heuristic) biases that often lead to severe and systematic errors (Nguyen & Schubler, 2012). Characteristic of *System 2,* some investors exercise their self-perceived ability and use self-evaluation metrics such as savviness (Marshall, 2009; Othman, 2012) and self-efficacy (Bandura, 1993; Forbes & Kara, 2010) to overcome their heuristic biases. A key factor that creates self-assessed behavior is sensing self-efficacy, which is the confidence of one's ability to deal with overwhelming circumstances (Hira, 2010). Self-efficacy includes knowledge of experiences and overcoming of obstacles through persistent effort (Bandura, 2012). Contrarily, Keren and Schul (2009) argued that the conceptual underpinnings of the various two-system frameworks are ill-defined and suggested that an alternative uni-system model may be more useful such as the uniform model of human judgment (Erb et al., 2003). Authors of extant literature cited that emotions, intuitions, and other heuristic biases influence the decision-making of investors (Ackert, Church, & Deaves, 2003; Lo, 2011). However, some scholars have suggested the development of qualitative research studies to derive nonstatistical results on how individual investors face a financial crisis and the cognitive system used for making investment decisions (Fenton-O'Creevy, Soane, Nicholson, & Willman, 2011; Vasile, Sebastian, & Radu, 2011).

Background

The scope of the Financial Crisis of 2008 has been compared to the Great Depression of 1929 with respect to loss of asset liquidity in the financial markets, failures

of numerous financial institutions including banks and others that required restructuring and government intervention, drastic devastation of stock and bond valuations, and extreme stock market volatility (Almunia, Benetrix, Eichengreen, O'Rouke, & Rua, 2009; Barro & Urua, 2009; Bordo & James, 2010). The financial crisis of 2008 caused precipitous declines in the stock prices as the stock market as measured by the S&P 500 index declined 56.7% from its high in October 2007 to its low in March 2009 (Davis & Madura, 2012). People faced a devastated stock market valuation and a projection of a deep economic recession. Additionally, homeowners suffered from slumping real estate values and difficulty in meeting their mortgage obligations as shown by the increase of 81% foreclosures in 2008 compared to that in 2007 (RealtyTrac, 2009). In the dismal financial and economic climate, people were also experiencing shrinking incomes, declining consumption, deteriorating employment opportunities as their sentiment plummeted, and their risk tolerance declined (Calvo, 2010).

Extreme market volatility and prosody of negative financial headline news occurred daily and throughout the crisis from mid 2008 until mid 2009. To garner attention, the press commonly reports that psychology drives the financial decision-making and moves asset prices. For example, the phrase: there are only two emotions in Wall Street–fear and greed–is commonly quoted when the stock market plunges in value (Goodman, 1968). Furthermore, Lo (2011) asserted that the common origin for all financial bubbles and busts is fear and greed. Subject to such daily prosodic headlines of doom and gloom not only of the devastation of the stock market but also of the plunging real estate values and economic woes, many investors became fearful and under extreme pressure to act as they watched the value of their portfolio drop precipitously; some even

feared losing their life savings (Bollerslev & Todorov, 2011; Caballero, 2009; Chambers et al., 2011; Deaton, 2012; McInerney, Mellor, & Nicholas, 2013).

Fearing continuation of devastating loss in value of portfolios, many investors de-risked their portfolios by reallocating to safer asset while some even sold some or all their assets at depressed fire-sale prices (Dzielinski, 2011; Hoffmann et al., 2013; McCarthy et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to inauspicious losses in their stock portfolio. Many individual investors characteristically buy, sell, and even over trade at inopportune times, realizing poor returns, and even losses (Bucher-Koenen & Ziegelmeyer, 2011; Dalbar, 2011). When faced with such an extreme crisis, people often have often become fearful. While blood pressure, dilated blood vessels in muscles, and a rush of adrenaline may protect an individual from physical threats, they do little to shield one from financial threats. In fact, past researchers indicated that severe emotional stress impairs rational decision-making abilities, leading to a number of behavioral biases (Lo, 2011). Thus, many investors in the midst of the 2008 Financial Crisis were uncertain of their financial security and uncertain what action to take.

Unfortunately, many investors, allowed cognitive biases, particularly emotion, fear, and intuition to affect their decisions and reallocated their portfolio to investments perceived to be safer and some even sold their entire portfolio at fire-sale valuations. When faced with crises, investors' quick selling without rational thought, of all their risk assets at fire-sale prices in favor of government bonds and cash may not serve their longer-term goals if they maintain these holdings too long (Lo, 2011). A longstanding controversy in financial economics is whether investors' rational forces or their

emotional responses govern the asset pricing of the financial markets (Lo and Repin, 2002). The crash of the stock market though devastating and rare is not unexpected. For the past few decades, the financial market has experienced unforeseen and sudden economic turmoil that has led to unpredictable stock market volatility and returns (Kadariya, 2012). Identifying the factors influencing these unforeseen events based on rational decision-making process has become difficult for traditional financial economists to explain (Frankfurter, McGouin, & Allen, 2004).

Because traditional neoclassical theory has difficulty in explaining these anomalies, researchers sought other theories. The evolution of financial theory for the past half century could be categorized into two paradigms: the traditional neoclassical expected utility model based on rational expectations (von Neumann & Morgenstern, 1947) which subsequently led to Efficient Market Hypothesis model and behavioral finance which help explain numerous anomalies which could not be explained by traditional theories (Shiller, 2003). Behavioral finance theory integrates cognitive psychology, sociology, and finance theory to explain the irrational behavior that leads to anomalous events. Importantly, behavioral finance includes individuals' insights of cognitive psychology and social and financial factors in order to understand and explain investor decisions (Hayes, 2010).

Much of the researchers on investors' decisions focused on studies in traditional finance theory including variants of the expected utility axioms on how the *homo economicus* makes rational investment choices under conditions of risk (Frankfurter et al., 2004) and actual investor behavior that influenced cognitive (heuristic) biases (Baker & Nofsinger, 2002). Psychology and other social science theories may explain some

stock market anomalies–bubbles and crashes (Kahneman & Tversky, 1979; Statman, 1999). Thus, behavioral finance theory has emerged to help understand how people actually behave in a financial setting (Baker & Nofsinger, 2002; Lo, 2012; Shiller, 2003). The behavioral finance literature may be grouped into two broad categories: the analysis of anomalies in the traditional financial paradigm that assumes agents' rational decisions and utility maximization (De Bondt & Thaler, 1985) and the identification of the individual investor behavior (cognitive biases) that is inconsistent with the rational agent paradigm (Odean, 1999).

Notably, Efficient Market Hypothesis theory is unable to explain extreme negative anomalous episodes such as the 2008 Financial Crisis (Baker, Wurgler, & Yuan, 2012; Shleifer & Vishny, 1997). Empirical research on such extreme anomalous episodes demonstrated that financial markets are evolutionary and dynamic systems, which encompass both rational and irrational behavior (Hommes & Wagener, 2009). Furthermore, most financial crises link to behavioral factors (Avgouleas, 2009). Behavioral finance challenges the assumptions of EMH theory by assessing the individuals' insights of cognitive psychological, social, and financial factors to understand and explain investors' decisions (Hayes, 2010).

Because rational and deliberative models could not explain anomalous events, psychology researchers began to investigate intuitive and emotional aspects of decision-making (Bohm & Brum, 2008). Studies of intuitive decisions began with the heuristics-and-biases approach that identified deviations of human judgment from normative models (Kahneman, Slovic, & Tversky, 1982). Because heuristic is a fast, simple, and an effortless mechanism that describes information processing, researchers initially

incorporated intuition within their judgment and decision models (Bohm & Brum, 2008). Emotions can significantly affect decision-making (Ackert et al., 2003; Blanchette & Richards, 2010; Hoffman et al., 2013). Dual-process models represent another decision making approach that incorporates intuition in their model (Chaiken & Trope, 1999). However, within the category of dual process approaches, few researchers focus on emotional processing altogether such as Epstein's (1994) cognitive experiential self-theory, Haidt (2001), Hanoch and Vitouch, (2004), and Wang (2006). Each of these researchers explicitly links emotion to the fast and quick processing of information. To help understand peoples' behavior and how they reason, learn, make decisions, and make social judgments, researchers in cognitive and social psychology have developed dual-process theories. Although these theories come in different forms, they all agree in those two distinct information processing mechanisms (Evans, 2008). All of these theories have in common the distinction between cognitive processes that are fast, automatic, and unconscious–*System 1* (often referred to as heuristic and intuitive) and those that are slow, deliberative, and conscious –*System 2* (often referred as analytic).

Although theories abound in describing how people process information, two different ways of knowing emerge–one involved with emotions and experience and the other involving rationality and intellect, leading to a dichotomy between the head and the heart (Epstein, 1994). Epstein's Cognitive Experiential Self Theory (CEST) provides a unified framework for understanding the ways that people comes to know. Importantly, CEST is a broad integrative theory that is compatible with other theories, including psychodynamic theories, learning theories, and phenomenological self-theories (Epstein, 2003). All of these theories may become operative for stock market investors (Bragues,

2011; Forbes & Kara, 2010; Hoffmann et al., 2013; Kahneman & Tversky, 1979; Othman, 2012).

Some professional and individual investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions (Epstein, 2010; Hon-Snir, et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to losses in their portfolio (Lo, 2011). The purpose of this multi-case study is to explore how and why investors when faced with extreme stress impelled during the 2008 Financial Crisis, yielded to either *System 1 or System 2* axis decision-making.. The primary significance of this study is to help investors understand why they make inauspicious automatic decisions and grasp the steps that could help them avoid losses in their stock portfolio when they face a financial crisis by evaluating the role that cognitive biases play in information processing. The implication of this research is for policy makers and financial professionals to understand how and why investors make decisions so that they can help improve investors' financial literacy and recommend the necessary steps to minimize the effects of unexpected and devastating macroeconomic and income shocks. Importantly, policy makers and financial professional should focus on investors categorized as low financial literacy.

Statement of the Problem

The specific problem is that some professional and individual investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions rather than respond deliberatively and rationally which are ascribed to the *System 2* domain (Epstein, 2010;

Hon-Snir, Kudryavtsev, & Cohen, 2012). A longstanding controversy in financial economics is whether investors' rational forces or their emotional responses govern the asset pricing of the financial markets (Lo and Repin, 2002). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to inauspicious losses in their stock portfolio (Lo, 2011). Many individual investors characteristically buy, sell, and even over trade at inopportune times, realizing poor returns, and even losses (Dalbar, 2011). Nearly half of the investors during the 2008 Financial Crisis either reduced or stopped investing (Harris & Hahn, 2010). Many psychology researchers such as Epstein (1994), Evans (2008), Fenton-O'Creevy et al. (2010), and Stanovich and West (2000), use a dual process model to help understand investors' reasoning. The dual process theory of information processing assumes two processing modes: unconscious, rapid, and automatic (*System* 1) and conscious, slow, and deliberatively analytic (*System 2*). When faced with crises, investors' quick selling without rational thought, of all their risk assets at fire-sale prices in favor of government bonds and cash may not serve their longer-term goals if they maintain these holdings too long (Lo, 2011).

Without evaluating the role that cognitive biases plays in information processing, investors will not understand why they make inauspicious automatic decisions or grasp the steps that could help avoid losses in their stock portfolio (Shariff, Al-Khasawneh, & Al-Mutawa, 2012). Quick automatic decisions (*System 1*) tend to occur without conscious effort and usually, people do not understand why they make such decisions as their brain operates in this default manner (Camerer, Lowenstein, & Prelic, 2005; John, Bullock, Zikopoulos, & Barbas, 2013; Kahneman & Frederick, 2005; Perring, 2011).

Purpose of the Study

The purpose of this case qualitative study is to explore how and why investors, located in the Northeast region of the United States, yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. This research extended the seminal work of Epstein (1994), who proposed a dual-process model referred to as cognitive-experiential self-theory (CEST) for processing information. A multiple-case study research design satisfied the goal of this exploratory research and data were collected through multiple sources, including in-depth individual interviews, field notes, and subject matter expert (SME) review and reflection of the data collected. The units of analysis was 12 wealthy investors with a financial portfolio of at least $1 million dollars in stock and bonds (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013). The participant selection strategy employed a purposeful small sample using homogeneous participants that was informational rich Patton (2002). With a purposeful sample, participants fulfilled the minimum requirements to participate, possessed well-developed attitudes and opinions regarding their experiences, and provided in depth information on the phenomena under study (Patton, 2002). The research literature is rich with studies on investor behavior, particularly when many events occur that are difficult, if not impossible, to explain by normative theories (Lo, 2011; Smith & Harvey, 2011). To gain insight on how investors behave contrary to normative behavior, some researchers examined investor behavior under stress (Fenton-O'Creevy et al., 2011; Lo & Repin). Before selecting the unit of analysis, this researcher knew what to analyze and determined the sampling methods (Cavanagh, 1997). As recommended by Yin (2009), this researcher determined the units

of analysis after the research questions were finalized. With the financial crisis causing a fundamental shock in the economy worldwide, disheartening investors, economists, and policymakers alike (Arup, 2010), many investors saw the value of their investment portfolios decrease significantly with some feared losing their savings (Chambers, Benibo, & Spencer, 2011). Data triangulation analysis permitted cross-data validity checks of the various data sources in order to achieve accurate and valid findings (Merriam, 2009; Stake, 2010). Epstein's dual process theory (1994) formed the foundation for the comparison of the results of each case study, with the purpose of formulating an original contribution to extend said theory.

Theoretical Framework

Two types of cognition describe the functioning of the brain for processing information in decision-making models (Stanovich, West, & Toplak, 2011). Although theories and models abound for describing how people process information, two ways of knowing emerge, one involved with emotions and experience and the other involving rationality and intellect, leading to a dichotomy between the head and the heart (Epstein, 1994). Some psychologists have adopted a dual-system approach, arguing that individuals use a dual step process of cognition described as *System1*—unconscious, rapid, and automatic reactions and *System 2*—conscious, slow, deliberative, and analytical reasoning (Evans, 2008; Stanovich & West, 2000). In particular, Epstein's Cognitive Experiential Self Theory (CEST) provides researchers a unified framework for understanding the way people process information in decision-making. Importantly, CEST is compatible with a variety of other theories, including psychodynamic theories, learning theories, and phenomenological self-theories (Epstein, 2003). All of these

theories may become relevant for people involved with investing in the stock market (Bragues, 2011; Forbes & Kara, 2010; Hoffmann et al., 2013; Kahneman & Tversky, 1979; Othman, 2012; Tuckett, 2009). Psychodynamic psychology involves cognitive biases (heuristics) and both learning and phenomenological self-theories involve self-efficacy (savviness) (Epstein, 2003). For this reason, Epstein's cognitive experiential self-theory that integrates the cognitive and the psychodynamic unconscious will provide the central theoretical framework for this study. Importantly, the CEST model includes key factors in decision making such as emotion, heuristics (cognitive biases), and experiential learning (self-efficacy), which potentially may lead to peoples' savviness. Investors have frequently displayed these factors (Fenton-O'Creevy et al. 2011; Kahneman & Tversky, 1979).

According to cognitive experiential self-theory, people operate by two basic information processing systems referred to as experiential (*System 1*) and rational (*System 2*) (Epstein, 1985, 1994). Although the experiential and rational systems operate in parallel, they are able to interact. The experiential system (*System 1)* encompasses people's personal theories of reality and operates according to principles that are automatic, holistic, and affective. However, the experiential system (*System 1*) often influences the rational domain (*System 2*). The rational system (*System 2*) operates at the conscious level and is analytic, intentional, affect-free, and reason-oriented in which a conscious appraisal of events mediates behavior (Epstein, Pacini, Denes-Raj, & Heier, 1996).

The cognitive experiential self-theory approach is an associative system in which influences from past events and experiences rather than evidence often mediates behavior

(Epstein, 1994). In contrast to the rational system, the experiential system is emotionally driven and therefore, a greater emotional threat such as the 2008 Financial Crisis, may lead to a shift in the balance from the rational system toward the experiential system. Epstein (2004) suggested that the use of the word *vibes* that refer to vague feelings often operate outside of awareness; however, people can become aware of them. Epstein (2004) further described *vibes* as a subset of feelings, which include other feelings such as agitation, edginess, and apprehension–all associated with emotions and more easily articulated. According to Epstein's model, when people respond to an emotionally significant event, they begin to process the encountered information through the experiential system (*System 1)* automatically and then instantaneously search their memory bank for related events. The recalled memories and feelings influence the ensuing path of information processing and subsequent decisions. As the sequence of information processing occurs instantaneously and automatically, people are usually unaware of their operation. To understand their decisions, people usually find the most emotionally acceptable explanation. The finding an explanation in the rational domain (*System 2*) for that which the experiential system determined (*System 1*) is referred to as rationalization (Epstein, 2004). However, ~~i~~nvestors do not always act rationally and often, their financial decision-making is intuitively driven by cognitive (heuristic) biases that frequently lead to severe and systematic errors (Nguyen & Schubler, 2012). Importantly, this heuristic processing is the normal information processing mode of the experiential system and thus, an important element of *System 1* (Epstein, Lipson, Holstein, & Huh, 1992). Epstein's CEST dual process model represents heuristics as cognitive shortcuts that describe the manner, which some people could think in many

real-life situations, such as the 2008 Financial Crisis. Additionally, other researchers have suggested that stressful conditions that interfere with the rational system and exacerbate heuristic biases caused decision-makers to shift towards the experiential (*System 1*) system (Evans, 2003; Kahneman & Frederick, 2002; Reyna, 2004). Stock investors, under stress, demonstrated such behavior (Porcelli & Delgado, 2009). Those investors who sold because of their 2008 Financial Crisis traumatic experience may have experienced such an exacerbated scenario.

For experience, peoples' learning is adopted from the experiential system (*System 1*) rather than from logical inference, which is exclusively the domain of the rational system (*System 2*) (Epstein, 2003). The biases that influence conscious rational thinking (*System 2*) are adaptive as the experiential (*System 1*) system operates according to schemes learned from experiences (Epstein, 2003). Because the experiential system is a learning system, the experiential system can integrate useful information from the rational system. The experiential (*System 1*) system operates as an associative learning system that includes classical conditioning, operant conditioning, and observational learning (Epstein, 2010). Although these learning processes are different, they are all part of the experiential (*System 1*) system because they operate by the same rule, and have the same processing attributes. Epstein (2010) asserted that the information acquired from all three learning processes is the primary source of the intuition: knowing without knowing how one knows.

Epstein (2003) argued that the rational (*System 2*) system might influence the experiential system. The slower rational (*System 2*) system can correct the faster, automatic experiential (*System 1*) system. People often reflect on their initial

spontaneous thoughts, realize they are unsuitable, and then replace with an improved decision. The experiential (*System 1*) system learns directly from experience as well as real-life corrective experiences to alter and improve the initial decision. Furthermore, Epstein argued that the rational (*System 2*) system could influence the experiential (*System 1*) system in both automatic and purposeful ways. While the experiential system operates in an associative manner, thoughts and learned experience in the rational system can trigger associations in the experiential system. Furthermore, repetition of thoughts, behavior, and experience in the rational system (*System 2)* can influence the experiential (*System 1*) in an unintended way (Epstein, 2003). Smith and DeCoster (2000) argued that through such repetition of thoughts, behavior, and experiences that originated in the rational domain could become habit-forming or personalized with the control shifting from the rational system to the experiential system. Epstein (2003) argued that this shift in control of the behavior could occur without conscious awareness. However, Epstein warned that some thoughts and behavior could become counter-productive. This ability for thinking and learning experiences in the rational (*System 2*) system to influence the experiential (*System 1*) system provides an opportunity for investors to overcome cognitive (heuristic) biases processed in the experiential (*System 1*) system.

Neither system is superior to the other. Epstein (2003) argued that the two systems are simply different ways of understanding the situation and making decisions. Associated with emotions, the experiential (*System 1*) system adapts by learning from outcomes. On the other hand, the rational (*System 2*) system is affect-free and adapts by logical inference. Each system has its advantages and disadvantages.

Faced with a financial crisis as they watched their portfolio values drop precipitously, investors were uncertain and conflicted on what to do (Lo, 2011). Therefore, information on how investors reach their decisions is critical to help them understand how they process information and arrive at their decisions. For this reason, monitoring the output of each of the two systems of processing information as proposed in the dual process theory for conflict is crucial to avoid decision-making errors.

Epstein (1994, 2003) postulated the CEST model as a theory of individual differences (i.e. individual styles) and suggested that people process information by two parallel interactive systems. Although the experiential (*System 1*) and rational (*System 2*) processes are different, they generally interact harmoniously and synchronously without people being aware of their simultaneous operation in everyday decisions. The experiential system (*System* 1) operates at a nonconscious level characterized as emotion and intuition while the rational domain (*System 2*) is conscious control described as rational and analytic. The experiential process (*System* 1) act as default unless the rational function (*System* 2) is activated. However, conflict between experiential (*System 1*) and rational (*System 2*) often occurs depending on the context of the environment. Importantly, the experiential (*System 1*) process can override the rational (*System 2*) choice even when people are aware of their inferior choice (Denes-Raj & Epstein, 1994). If people are able to understand their own experiential (*System 1*) and rational (*System 2*) processing of information and how the two systems interact with each other for them to respond adaptively to conflict situations (Berger, 2007), then effective solutions for conflict resolution can be realized. Evans (2006a, 2006b) argued that how dual process theories account for conflict between *System 1* and *system 2* needs to be addressed and

explicated and further warned that mapping of dual processes on to underlying dual systems is extremely difficult.

Agreeing with Evans (2006a, 2006b), Darlow and Soman (2010) argued that the most central question in the dual-system framework is how each of the systems interacts. In evaluating each system, Epstein (1994) postulated that the experiential-rational systems (*System 1-System* 2) process information in parallel and resolve any conflict only after both processes have reached some potential responses. Rather than a parallel model of processing, Evans (2006a, 2008) postulated a default-interventionists serial model whereby the rapid preconscious processes (*System 1*) always works first by cueing default behaviors that the analytic reasoning (*System 2*) may approve or intervene upon the final decision with more deliberate reasoning with either overriding or elaborating the intuitive response (*System 1*). In studying dual-process theories, researchers have suggested that two types of reasoning can often conflict in some situations (Bonner & Newell, 2010; Denes-Raj & Epstein, 1994; De Neys & Olsen, 2008; Evans, 2006b; Sloman, 1996, 2002; Stanovich & West, 1998; Wang, 2006). Each of the processes of the dual process theory can compete and conflict with one another and advocate different responses. Although diverse dual process models abound, researchers have concluded that either the fast automatic process (*System 1*) or the slow deliberate analytical (*System 2*) processes control peoples' decisions. However, it is unclear how the systems actually operate (Stanovich & West, 2000) or how people actually use either system when making decisions. Thus, understanding how and when people use experiential (*System1*) or rational (*System 2*) processing of information for their decision-making, particularly

when faced with a financial crisis, is critical in order to avoid unnecessary losses in portfolio values (Lo, 2011).

Emotion is another key factor that is critical to how people process information for decision-making. The dynamic interaction between the emotional and rational modes of decision-making is not clearly defined because there is no consensus on an operational definition of emotion that would allow separating the influence of emotion from a rational assessment (Wang, 2006). Although emotion is an integral part of Epstein's CEST model (1994), it is not the focus. Epstein (1994) uses emotion as a role in the acquisition of information in the experiential process (*System 1*) rather than as the focus of decision-making. Different from Epstein's view of the influence of emotion on peoples' way of processing information for decision-making, Evans (2012) argued that the influence of emotion might not be confined to the *System 1* domain. Evans (2012) suggested that *System 1* processing could lead to emotions and feelings of intuition that are conscious, even though the underlying processing is not accessible. *System 2* processing is consciously accessible in part, but invariably depends upon a number of rapid, unconscious support systems, such as those which provide pragmatic cues to the relevant context, or retrieve relevant information from long-term memory. Thus, the influence of emotion on either *System 1* or *System 2* processing of information on decision-making is unclear.

When faced with conflictive decisions, the dominance of emotion and experiential considerations often prevent people from deciding optimal choices even when they know that their choice is less optimal (Denes-Raj & Epstein, 1994). Epstein (1994) asserted that people primarily allow the experiential processing (*System 1*) to dominate the

rational domain (*System 2*) because it is effortless and in most cases, automatic and thus, people's actual behavior emerges from experiential processing (*System 1*). However, when asked how rational people would behave, some people responded that they could rely on the rational system and make different judgments and decisions (Epstein, et al., 1996).

The various dual process theories have been postulated such as Epstein's (1994) experiential-rational and Evans (2008) default-intervention models are representative of the numerous dual process theories. Importantly, there is no clear agreement that describes how people use unconscious, rapid, and automatic processes (*System 1*) and conscious, slow, and deliberatively analytic functions (*System 2*) to reach their decisions, particularly decisions related to a financial crisis. Because diverse models of processing information for decision-making postulate a wide-range of factors and processing tracks, understanding and determining how the systems operate and how people process information for investors' decisions in the face of the financial crisis is crucial. The results of this qualitative study through analysis of semi-structured interviews of investors contributed to dual-process theory by determining how investors use their intuitive, experiential automatic processes (*System 1*) or deliberative rational thought functions (*System 2*) to reach their decision when conflicted with their choice of selling all of their stocks, reallocating their portfolio, or even investing in more stocks when faced with a financial crisis by examining the sequence of the thought process of investors and how emotion may influence those processes.

Research Questions

When faced with the financial crisis, investors' cognitive principles and their judgments that originate in impressions as well as in deliberate reasoning guide behavior (Tversky & Kahneman, 2000). Researchers have used dual-process approaches to describe reasoning and decision-making (Evans, 2008). Cognitive scientists posit that the two separate cognitive systems provide the framework for thinking and reasoning. While some two-system theories describe parallel processes that involve explicit and implicit knowledge systems, others describe preconscious processes that influence deliberative analytic reasoning in decision-making (Evans, 2008). Different researchers have various terminologies to characterize the two-system approach, which can be described *System 1*—unconscious, rapid, and automatic reactions and *System 2*—conscious, slow, deliberative, and analytical reasoning (Evans, 1984). For example, intuition and thinking are the distinction between two types of thinking (Frankish & Evans, 2009). With a two-system approach, the key issue is to define the difference between the two kinds of processing (Evans, 2012).

The research questions define the approach for this study. To understand how investors use their cognitive processes to arrive at their decisions, a qualitative multiple-case research will explore how and why did investors yielded to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis. This method enables researchers to study complex phenomena within their contexts (Baxter & Jack, 2008; Fiegen, 2010). The units of analysis for this study was 12 investors located in the Northeast region of the United States. Researchers can

predict similar or contrasting results across cases based on the theory by carefully choosing cases (Yin, 2009).

To obtain the suitable answers, it is essential to ask the right questions (Browne & Keeley, 2007). Thus, it is essential to identify relevant questions for the research. Consistent with the purpose of this study, the research questions are as follows:

Q1: How did investors yield to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Q2: Why did investors yield to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Nature of the Study

A common tool utilized in exploratory research is a qualitative study that uses a multiple-case study design (Eisenhardt, 1989; Yin, 2009). A qualitative case study is an appropriate method to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. In crises, whereby people face extraordinary circumstances, qualitative research approaches provide a sound methodological framework for developing an understanding of the implicit subjectivity that occurs in people (Morgan & Drury, 2003). The qualitative research approach defines subjectivity as the manner in which people make sense of their experiences (Morgan & Drury, 2003). Thus, this study was a qualitative research approach that attempts to understand the nature of reality through peoples' narrated accounts.

Building theory from using case studies is a research approach that evaluates one or more cases to develop inductively theoretical constructs, propositions, and midrange

theory from empirical data (Eisenhardt, 1989). The theory emerges from the observed phenomena and develops by perceiving relational patterns among constructs within and across cases and their underlying characteristics (Eisenhardt & Graebner, 2007). The focus of case studies is replication logic, whereby each case may be considered as a distinct stand-alone experiment (Eisenhardt, 1989). Moreover, multiple case approaches are discrete experiments that replicate, contrasts, and extends to develop the emerging theory (Yin, 2009). The theory-building process cycles case data, emerging a theory, and extant literature. The present research relied on the framework of existing dual process theories as the starting point to understand better, how investors describe their cognitive (heuristic) biases and self-efficacy (savviness) in their investment decisions when faced with the 2008 Financial Crisis

Researchers use a multiple case study that involves data collection that includes interviews, field notes and SME review, as well as a reflection of the data collected to explore the range of historical, attitudinal, and behavioral issues (Yin, 2009). This combination of the approaches provides for greater strength and validity of the research findings. Each case study involves an in-person interview with 12 investor with at least $1 million dollar invested in the stock and bond markets. A purposeful small sample strategy utilized homogenous participants who are informational rich for each interview (Patton, 2002). With a purposeful sample, participants fulfilled the minimum requirements to participate, possessed well-developed attitudes and opinions regarding their experiences and provided in-depth information on the phenomena under study (Patton, 2002). Case study research was used to gain inference from multiple sources, such as (a) the review of available literature and historical documents; (b) formal,

informal, and in-depth interviews with the study participants and (c) data produced through existing case studies, and field tests (Mack et al., 2005; Yin, 2009).

To gain an in-depth understanding of participants' perceptions, perspectives, and experiences with the phenomena under study, data collection in the form of semi-structured, open-ended interview questions was used (Patton, 2002). An initial field test was conducted to confirm the applicability and dependability of the interview questions and data collection techniques. A semi-structured interview format provided adaptability, a feature important for case studies, in that each participant's experiences were unique (Stake, 1995). Open-ended questions, as commonly used in a semi-structured interview, identified themes and nuances in the participants' answers (Yin, 2009).

Content analysis, with the aid of the NVivo computer software program, helped organize and analyze the content of the data to gauge the extent of emphasis, or omission of emphasis, of any analytical category (Yin, 2009). Careful data analysis focused and ruled out significant rival interpretations (Gibbert & Ruigrok, 2010) on how cognitive biases and self-efficacy influence the investor decision-making process. As part of this focus, cross-case synthesis to determine comparability of each case and data triangulation to corroborate facts found aggregated results across the multi-case study (Yin, 2009); such analytical techniques may enhance the robustness of the findings.

The data triangulation process evaluated data from interviews, field notes and SME review and reflections on the data collected. Data triangulation permitted cross-data validity checks of data collected by various methods in order to achieve accurate and valid findings (Merriam, 2009; Stake, 2010). Each identified theme analyzed provided a narrative of the phenomena. Importantly, careful examination of the data identified any

trends and inconsistencies in results. This multiple-case study was unique because it focused on contemporary events and issues, which center on compelling theoretical frameworks (Yin, 2012) by comparing the results of each case.

The use of replication logic in this study allowed for an analytic generalization in order to compare previously developed theories with empirical results (Yin, 2009). The Epstein's Cognitive Experiential Self Theory (1994) theoretical framework formed the foundation for the comparison of the results of each case study, with the purpose of formulating an original contributing to said theory.

Significance of the Study

The significance of this multi-case study was to provide an understanding of how and why investors process information to make their investment decisions in order to minimize the devastating effects of a financial crisis on asset valuations. Many investors watched helplessly as they viewed the value of their portfolio dramatically plummet, while some even feared losing all of their savings, as well as some investors made emotional decisions by yielding to their cognitive biases, which led to inauspicious losses in their stock portfolio during the 2008 Financial Crisis s (Chambers, et al., 2011; Chai et al., 2011). Importantly, investors who are investing in retirement plans could benefit from this research because the shock from the Financial Crisis of 2008 negatively influenced the investor such that they incurred a substantial loss in retirement saving valuation as a result of poor financial literacy ((Bucher-Koenen & Ziegelmeyer, 2011; Calvet, Campbell, & Sodini, 2009; Chai, et al., 2011). Additionally, the benefit of understanding how and why decisions are reached could help the development of emotional regulation methods for investors' not only to resist yielding to *System 1*

cognitive heuristic biases that could cause selling of stocks at depressed valuations, but importantly to exercise deliberative, rational thinking processes (*System* 2) to increase their financial literacy. Financial literacy has been shown as key to retirement planning (Lusardi & Mitchell, 2011; Seo & Ilies, 2009). People with low financial literacy tend to sell their stock portfolio when faced with a financial crisis whereas investors with greater financial literacy could overcome the effects of unexpected and devastating macroeconomic shocks (Klapper, Lusardi, & Panos, 2012).

The results of this study could reveal the manner that investors' use dual-process mechanism and the relationships amongst investors' perception, risk tolerance, and other emotional, irrational, and rational factors that influenced their decisions and thus contribute to the body of knowledge on information processing and decision-making. Although some cognitive scientists posit various dual-process theories that provide the framework for information processing (Evans, 2008), other scientists argued that the dual-process framework is at best incomplete (Frank, Cohen, & Sanfey, 2009) and looked to other explanations that emphasize the prominent role of emotion (Bossaerts, 2009; Phelps, 2009; Sokol-Hessner, Camerer, & Phelps, 2012). Thus, it is unclear how and why investors process information to arrive at their decisions when faced with a financial crisis.

The primary significance of this study was to help investors understand why they make inauspicious automatic decisions and grasp the steps that could help them avoid losses in their stock portfolio when they face a financial crisis by evaluating the role that cognitive biases play in information processing. The implication of this research was for policy makers and financial professionals to understand how and why investors make

decisions so that they could help improve investors' financial literacy and recommend the necessary steps to minimize the effects of unexpected and devastating macroeconomic and income shocks. Importantly, policy makers and financial professional should focus on investors categorized as low financial literacy.

Definition of Key Terms

Cognitive bias. A cognitive bias decision deviates from normative and rational behavior, which leads to inaccurate judgments, illogical interpretation, perceptual distortions, and errors (Baron, 2008; Tversky & Kahneman, 1974).

Consciousness thought. Consciousness is the cognitive and affective task that an individual is consciously aware of while performing a task (Dijksterhuis, 2004). It is also a thinking process that is intentional, controllable, serial in nature, and accessible to awareness (Bargh & Morsella, 2008).

Dual-process theory. This term refers to a system of ideas that describe two distinct systems for processing information. Each system, using a different mechanism, may lead to different and conflicting outcomes. Typically, the first system operates as non-conscious, fast, automatic, heavily contextualized, and without using working memory whereas the second system engages as conscious, slow, controlled, flexible, decontextualized, and using of working memory (Frankish & Evans, 2009).

Experiential. This term refers to the first of two cognitive systems and describes an intuitive, unconscious, fast, and automatic mechanism of processing information in the cognitive-experiential self-theory for global personality of individual differences (Epstein, 1994).

Heuristic. This term refers to provisional and reasonable reasoning that is not regarded as final; the purpose of heuristic processing is to discover the solution of the present problem (Polya, 1945). The use of a belief system concerning uncertain events whereby the complex tasks of assessing probabilities and predicting values simplified in order to make judgments quickly and economically; however, use of heuristics often leads to severe and systematic errors (Tversky & Kahneman, 1974).

Nonconsciousness (unconscious) thought. This term refers to the cognitive and affective processes that occur beyond an individuals' conscious awareness (Dijksterhuis, 2004). An unconscious mind is a pervasive influence on deliberative mental processes (Bargh & Morsella, 2008).

Rational. For purposes of this study, this term refers to the second of two cognitive systems described as conscious, slow, and deliberate in the cognitive-experiential self-theory for global personality of individual differences (Epstein, 1994). The rational mode considers known objectives to select an optimal solution from among a set of known solutions (Eisenhardt & Zbaracki, 1992).

Savviness. Savviness is described as a personal characteristic that demonstrates fluency and literacy (Peppard, 2010) and depends on a combination of experience and cognitive ability (Agarwal, Driscoll, Gabaix, & Laibson, 2006). .

Self-efficacy. Self-efficacy is the process of individuals who self-assess their own ability and competence to complete tasks and attain goals in a given environment with emphasis on observational learning (Bandura, 1977). Other researchers have argued that positive illusions such as optimism may lead people to attain better outcomes (Benabou & Tirole, 2003; Taylor & Brown, 1998).

System 1. A term coined by Stanovich and West (2000), *System 1* is the first of two modes of processing for dual-process theory of thinking, reasoning, decision-making, and social judgment. *System 1* is unconscious, fast, automatic, experiential, and relatively undemanding of computational capacity.

System 2. This term refers to the second of two modes of processing for dual-process theory of thinking, reasoning, and decision-making, coined by Stanovich and West (2000). *System 2* is conscious, slow, rational, and analytical; conjoins the various characteristics of the processing of analytic intelligence to uncover the computational components underlying intelligence.

Summary

The 2008 Financial Crisis caused a fundamental shock in the economy worldwide, disheartening investors, economists, and policymakers alike (Arup, 2010). The specific problem is that some professional and individual investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions (Epstein, 2010; Hon-Snir, et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to losses in their portfolio (Lo, 2011).

The purpose of this multi-case study is to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. When people face extraordinary circumstances, qualitative research approaches provide a methodological framework for developing an understanding of the implicit subjectivity that occurs in people (Morgan & Drury, 2003).

Building theory from using case studies is a research approach that develop inductively theoretical constructs and propositions from empirical data (Eisenhardt, 1989) by relying on the framework of existing dual process theories as Epstein's CEST model for processing information as a starting point to understand how investors describe their cognitive (heuristic) biases and self-efficacy (savviness). A multiple-case study research design satisfies the goal of this exploratory research and data was collected through individual interviews and field notes. The units of analysis will be 12 wealthy investors with a financial portfolio of at least $1 million dollars in stock and bonds. The use of thematic analysis on the subjects' interview data and archived data involves the identification of themes, patterns, ideas, or meanings contained within the collected data (Yin, 2009). To assure validity, reliability, and generalizations of the findings, the researcher will prolong the process of data gathering, employ triangulation methodology, conduct member checks, collect referential materials, and engage in peer consultation (Merriam, 2009). Importantly, triangulation analysis of the interview data and archived data to determine consistency and variance achieves trustworthiness and permits cross-data validity checks (Gibbert & Ruigrok, 2010; Merriam, 2009; Shenton, 2004), thereby enhancing the trustworthiness of the study. The research results could help investors understand decision-making and influence policy-makers and financial professionals to help improve financial literacy. Furthermore, the findings of this research could assist the development of emotional regulation methods to help investors to resist yielding to *System 1* cognitive heuristic biases that could cause selling of stocks at depressed valuations. Klapper, et al. (2012) asserted that greater financial literacy helps investors overcome the effects of unexpected and devastating macroeconomic shocks. The

significance of this study is to help investors understand why they make inauspicious automatic decisions and grasp the steps that could help them avoid losses in their stock portfolio when they face a financial crisis.

Chapter 2: Literature Review

Decision is a choice of action—of what to do or not to do (Baron, 2008). The basis for decisions is goals based on beliefs that such actions will achieve the goals. Faced with the 2008 Financial Crisis, investors saw the value of their investment portfolio decrease significantly and needed to decide what course of action to take, if any. Information processing and learning are crucial for decision-makers involved with investing in the financial markets whereby effective learning requires comparing new information to prior expectation, particularly in a financial crisis (Biais & Weber, 2009). Researchers of information processing have applied the dual-process theoretical framework in various research programs since the late 1970s (Evans, 2008).

This section contains a review of the literature that will guide and inform the case study research that explores how investors describe their decision-making during the 2008 Financial Crisis. The review includes the assessment of prior and current research studies that addressed the issues, which identify with cognitive and social psychology specifically among wealthy investors who have significant investment portfolios (greater than $1 million) of stocks and bonds. Theoretical background of the study emerged from the search and review of peer-reviewed articles.

Documentation

A search and review of articles determined clarity and understanding of the central phenomena of the judgments and decisions of investors during a financial crisis. Peer-reviewed articles mainly from ProQuest, EBSCOhost, Science Direct, SAGE, and Gale Academic OneFile databases were accessed using the Northcentral University Library. The searches have been ongoing for a few years, updating and synthesizing the

literature review with the most recent research studies. Some specific key words including dual process, cognition, heuristic, cognitive bias, conscious thought, unconscious thought, rational, self-efficacy, emotion, emotional regulation, financial literacy, financial crisis, investor behavior, decision-making, behavioral finance, and risk tolerance, were searched individually as well as in combination to capture the prevailing themes of how and why investors processed information to reach their decisions during the 2008 Financial Crisis.

Historical Overview of the 2008 Financial Crisis

According to the Financial Crisis Inquiry Commission, referred as the FCIC (2011), the cause of the financial crisis is due to a lack of government regulation and oversight in the mortgage and mortgage-backed securities market. The environment of low interest rates, easily obtainable credit, lax regulation, and poorly understood risky subprime mortgages contributed to the bursting of the housing bubble. The bursting of the housing bubble caused values of derivative securities tied to the real estate pricing to plummet and a liquidity crisis ensued that damaged many financial institutions (Bailey, Litan, & Johnson, 2008).

Brunnermeier (2009) reported a comprehensive description and chronology of the liquidity crisis and subsequent credit crunch. Through 2007 and 2008 as underlying subprime mortgage holders defaulted, rating agencies downgraded derivative mortgage-backed securities; this caused investors to panic and the market prices for these securities plunged. The direct losses on these mortgage related securities, as well as market-wide contagion and panic that ensued, led to the failure or near failure of many large financial institutions across the system. The default of subprime mortgages that passed through to

the derivatives of the securitized subprime mortgages led to a series of events that resulted in the 2008 Financial Crisis. Many institutions owned these securitized mortgages and the negative shock to their balance sheets caused them to liquidate assets. This forced-asset liquidation at lowered prices and further deteriorated their balance sheet, amplifying the crisis (Krishnamurthy, 2009). Furthermore, Krishnamurthy (2009) asserted that the shocks to the untested mortgage-backed securities and other related derivatives increased investors' uncertainty about their investments, causing them to disengage from the markets, a process that exacerbated the crisis even further. Billions of dollars in losses from the liquidation of mortgages and derivative mortgage securities along with other related financial assets devastated both the real estate and financial markets (Brunnermeier, 2009).

These devastating events, including the bankruptcy of Lehman Brothers, a leading investment bank on Wall Street and the near-bankruptcy of American International Group, a substantial insurance institution, brought the crisis to a peak in autumn of 2008 (Yulek & Randazzo, 2012). Panic, perpetuated by a lack of transparent balance sheets of leading financial institutions viewed as *too-big-to-fail*, entangled themselves with complex esoteric dealings such as credit default swaps, caused the credit markets to seize-up with virtually no liquidity and depressed asset valuations (Lang & Jagtiani, 2010). Because investors value liquidity to assure that they could sell securities quickly to raise cash if necessary, many of these institutions, needing cash to meet margin requirements, sold securities causing the stock market to plummet and the economy to plunge into a deep recession (Brunnermeier, 2009; Krishnamurthy, 2009).

The financial crisis of 2008 caused precipitous declines in the stocks as the stock market as measured by the S&P 500 index declined 56.7% from its high in October 2007 to its low in March 2009 (Davis & Madura, 2012). People faced a devastated stock market valuation and a projection of a deep economic recession. Additionally, homeowners suffered from slumping real estate values and difficulty in meeting their mortgage obligations as shown by the increase of 81% foreclosures in 2008 compared to that in 2007 (RealtyTrac, 2009). In the dismal financial and economic climate, people were also experiencing shrinking incomes, declining consumption, deteriorating employment opportunities as their sentiment plummeted and their risk tolerance declined (Calvo, 2010).

Contrary to the opinion of the Federal Commission Inquiry Commission, some researchers argue that 2008 financial crisis is more closely linked to behavioral factors (Avgouleas, 2009; Barberis, 2011; McCarthy, Solomon, & Mihalek, 2012; Shefrin, 2009). Modern social science, with its positivist/quantitative orientation and mathematical techniques are inherently incapable of accounting for investor behavior, particularly in a financial crisis (Bragues, 2011), because the quantitative models, from the most basic to complex, based upon human misunderstandings and errors in judgment (Solow, 2009). Thus, key factors that influence the market microstructure and market pricing include the manner in which investors, both individual and professional, make their investment decisions (Fenton-O'Creevy et al., 2011; Hoffmann et al., 2013; Hon-Snir et al., 2012; Kuzmina, 2010). Importantly, investors' irrational behavior compromised the efficient capital market theory, which played a crucial role in the 2008 Financial Crisis (McCarthy et al, 2012). Because the markets were extremely volatile

since the beginning of the crisis and the prosody of headline financial news were emotive and ongoing, investors made poor decisions including overreactions and valuation errors that led to irrational behavior (Dzielinski, 2011; McCarthy et al., 2012). Irrational behavior is not unique to the domain of non-professional individuals. Professionals including securities analysts, investment managers, and others who have success in their field often develop a sense of over-optimism and over-confidence, which may lead to irrational behavior and subsequent decisional errors (Hon-Snir et al., 2012; Prentice, 2007; Tuckett, 2009). The irrational behavior occurred because the originators of the securitized mortgages, investment banks, and mortgage institutions minimized and disregarded the risks of the investment products (Poole, 2010). While originators of these products promoted them as virtually *risk free* with the highest investment grade ratings, investors minimized the actual risks attached to the investments. Importantly, the crisis is a result of greed and the willingness to ignore risks and neuroeconomic analysis of the human brain may provide insight into the decision-making process (Wargo, Baglini, & Nelson, n.d.).

Contrary to the behavioral view, Ohanian (2010) adopted the neo-classical view of the 2008 Financial Crisis. In an extensive analysis, Ohanian (2010) found that the 2008 recession differs markedly from other postwar United States' recessions in that lower labor input accounts for nearly the entire decline in income and output. Furthermore, Ohanian (2010) observed that lower productivity accounts for much of the other United States recessions. Importantly, Ohanian (2010) contended that existing financial behavioral models do not explain the 2008 recession; he found that labor market distortions drove the recession; a factor ignored by behaviorists. Finally, Ohanian (2010)

asserted that economic policies that intended to manage the crisis instead deepened the recession by distorting incentives because of poorly designed policies and increasing uncertainty due to poor articulation of the underlying economy.

Investor Decision-making

People often make judgments and decisions of varying complexity and importance. How people make these decisions have been the object of researchers for decades. In early work, researchers proposed broad general theories that focused on prediction of outcomes of input-output model rather than processing models (Glockner & Witteman, 2010). The recent Financial Crisis of 2008 has provoked a debate on the rationality of financial markets and investor behavior (Avgouleas, 2009; Lo, 2012; Tuckett, 2009; Wallison, 2011). The Dow Jones Industrial Average, a measure of the United States stock market value plunged from 14,164 on October 9, 2007 to 6,594 by March 5, 2009, a decline of 53% (Smith & Harvey, 2011). Reinhart and Rogoff (2009) reported that such turbulences in the financial markets can have severe and long-lasting effects on the real economy with estimates of a 35 percent drop in housing prices over a six year period, a seven percentage point rise in unemployment over four years, and a nine percent decline in a firm's output over two years. For such possible repercussions on the economy, understanding the determinants of the turbulences in the financial markets is important to individual investors, particularly since many investors desperately sold to get out of stocks that caused the drastic free-fall in the market (Smith & Harvey, 2011).

Individual investor's behavior affects asset prices (Hirshleifer, 2001; Kumar & Lee, 2006), return volatility (Foucault, Sraer, & Thesmar, 2011), and even the economy

(Korniotis & Kumar, 2011). In the face of such economic and stock market disturbances, the question is can the traditional paradigm of economics adequately describe the reality of the events occurring in the financial markets (Szyszka, 2011). Importantly, is there any theory that can explain or predict the processes that actually takes place during a financial crisis?

From a neuroscience view of the brain, neuroeconomic theory describes the existence of multiple interacting brain systems that allow an individual to be best understood as an organization of systems (Brocas & Carrilo, 2013). The brain system is complex, whereby each system performs different functions and each function needs the intervention of several systems, according to Brocas and Carrilo (2013). The outcome of a decision emerges from a complex process and may not be consistent with predictions made by neoclassical models that presuppose the individual has well-defined underlying preferences, a complete and unbiased understanding of the environment, and an unlimited, unbounded capacity to learn (Schoemaker, 1982). Such a normative view is critical and provides a benchmark for comparison with actual behavior. However, at times, actual observed behavior is quite different. Cognitive psychology researchers have developed many models for observed behavior that depart from normative behavior predicted by neoclassical models (Brocas & Carillo, 2013).

For the past several decades, a search of the finance literature has revealed numerous conclusions from empirical studies that differ with that of traditional views of the capital market. In response to the observed anomalies viewed in the financial markets, behavioral finance theory to describe the individual's decision-making has emerged. Thus, a discussion will begin with neoclassical economic utility followed by

behavioral finance with emphasis on how the individual processes information to make judgments and how emotion influences people's decisions.

Neoclassical economic utility and efficient market hypothesis theory.

Individual decision-making is vital yet unpredictable influence on every aspect of human life. In general, social and cognitive factors, such as narrow perception capacity, sequential central processing, short-term memory capacity, and affection limit people's' decision-making (Cacioppo & Nusbaum, 2003; Miller, 1956; Schoemaker, 1982; Simon & Newell, 1971). Since the latter half of the 20th century, traditional economic and financial decision-making theorists have argued and assumed that people were rational agents and guided by expected utility theory (Friedman & Savage, 1948; Rabin & Thaler, 2001; Schoemaker, 1982). Economic and financial decision models assume preferences among choices that are stable and well defined, invariant of any constraint with regard to the context and framing of the problem at hand (Schoemaker, 1982). Expected Utility Theory (EUT) model is the first normative model that provides rational criteria for decision-making when people face risk (von Neumann & Morgenstern, 1947). The EUT model assumes that the investor's primary focus is the price of an asset, the expected stream of returns from the investment, and the risk (volatility) associated with those returns (Friedman & Savage, 1948). As the wealth of the investor increases, the value to them (utility) decreases; thus, investors are risk averse, always preferring to avoid risk unless a premium could be gained by accepting it (Schoemaker, 1982). Assumptions according to the expected utility model include people are rational and choose option paths by assessing the probability of each possible outcome, discerning the utility from

each outcome, and then analyzing the assessments to arrive at the decisions that offer the optimal combination of probability and utility.

The expected utility theory led to the development of the Efficient Market Hypothesis (EMH) model, considered as the backbone of investment theory from the mid-60s to mid-90s (Konstantinidis, Katarachia, Borovas, & Voutsa, 2012). The Efficient Market Hypothesis model illustrates the efficiency of the financial market, which includes many well-informed and intelligent investors. Additionally, both individual stocks and aggregate stock market reflect all available information and are priced correctly (Fama, 1970). Importantly, Efficient Market Hypothesis model assumes that investors always value securities rationally and will always seek to maximize their utility (Fama, 1970). Trading activities of rational investors cancel the trading of irrational investors (Shleifer, 2000). The EMH theory implies that prices of securities will incorporate any new information immediately (Malkiel, 2003a). For this reason, neither technical analysis, which is the observation of price movements, nor fundamental analysis, which is the analysis of financial accounting data would help investors achieve returns greater than those that could be obtained by investing in a passive portfolio of individual stocks representing an index such as the S&P 500 index (Malkiel, 2003b). Thus, no investor can beat the market by generating abnormal returns.

However, in discussions of market efficiency, violations of the predictions and rules set forth by EMH theory labeled as anomalous and incidences of financial market inefficiencies, referred as irrational behavior are common (Latif, Arshad, Fatima, & Farooq, 2011). Anomalies may occur once, frequently, and even continuously. Market anomalies described as a deviation from the traditional financial paradigms are too

widespread to be ignored and too systematic to be dismissed as random error (Tversky & Kahneman, 1986). Although precise causes of the anomalous behavior remain debatable, numerous studies have argued that anomalies explains investor behavior guided by cognitive principles and investor judgments that originate in biased impressions as well as in deliberative reasoning (Boudoukh, Richardson, & Whitelaw 1994; Kahneman & Klein, 2009; Latif et al., 2011; Tversky & Kahneman, 2000).

Notably, Efficient Market Hypothesis theory is unable to explain extreme negative anomalous episodes such as the 2008 Financial Crisis (Baker, Wurgler, & Yuan, 2012; Shleifer & Vishny, 1997). Empirical research on such extreme anomalous episodes demonstrated that financial markets are evolutionary and dynamic systems, which encompass both rational and irrational behavior (Hommes & Wagener, 2009). Furthermore, most financial crises link to behavioral factors (Avgouleas, 2009). Behavioral finance challenges the assumptions of EMH theory by assessing the individuals' insights of cognitive psychological, social, and financial factors to understand and explain investor decisions (Hayes, 2010).

Behavioral finance, emotions, dual-process theories, and deterring biases. Cognitive psychologists define behavioral finance as normal behavior even when people make decisions that are prone to judgments stemming from limited information-processing abilities that often results in errors (Taffler & Tuckett, 2010). The press commonly reports that psychology drives the financial decision-making and moves asset prices. For example, the phrase: there are only two emotions in Wall Street–fear and greed–is commonly quoted when the stock market plunges in value (Goodman, 1968). Furthermore, Lo (2011) asserted that the common origin for all financial bubbles and

busts is fear and greed. Behavioral finance relies on cognitive psychology, which incorporates cognitive biases and sentiments such as attentional bias, loss aversion and herding behavior, into models of decision-making. These models have successfully provided some understanding of the market behavior when market behavior deviates from the predictions of the efficient market hypothesis theory (De Bondt, Palm, & Wolff, 2004; Thaler, 1993). Some behaviorists hypothesize that affect (emotions, moods, feelings, and attitudes) plays a prominent role in financial decision-making (Elster, 1998; Weber & Johnson, 2009). Investors are frequently urged to control their feelings, meaning that they need to suppress strong feelings (Babin & Donavon, 2000).

Emotion processing and decision-making. Emotion processing and decision-making are essential aspects of life. However understanding this construct is limited and incomplete (Mitchell, 2011). A narrow definition of emotion is difficult because emotion has cognitive, physiological, social, and behavioral characteristics (Solomon, 2008). Although many people believe emotion is a feeling, Frijda (2008) considers emotions as evaluative rather than purely bodily sensations or cognitive judgments. Importantly, when traditional economists consider emotions in their description of financial market behavior, emotion often causes unexplained and undesirable price movements (Ackert, Church, & Deaves, 2003). Neoclassical theorists portray emotion as interfering with rational cognition and exclude emotion from the study of cognition (Elster, 1998). Furthermore, the choice and action process do not acknowledge emotion as integral or primary (Peterson, 2007; Shefrin, 2000). Importantly, psychologists asserted that individuals develop rules of thumb (heuristics) to minimize processing-time when making decisions, although this manner of processing may lead to wrong decisions

(Kahneman & Tversky, 1979). For these reasons, behavioral finance research initially focused on these biases rather than on emotion. In fact, Evans (2008) ignores the subject of emotion when he assembled his taxonomy of dual process theories.

Researchers have debated whether emotions are functional or maladaptive (Gohm & Clore, 2002). Whereas some argue that feelings are a source of unwanted bias (Shiv, Loewenstein, Bechara, Damasio, & Damasio, 2005; Slovic, Finucane, Peters, & MacGregor, 2007) and therefore, need to be regulated (Fenton-O'Creevy et al., 2010; Gross & John, 2003), others argue that feelings play an adaptive role in decision-making (Damasio, 1994; Seo & Barrett, 2007) and benefit personal well-being (Fredrickson, 2001). Notably, to understand the influence of emotions on decision-making, Fenton-O'Creevy et al. (2010) conducted a qualitative study using semi-structured interviews of nearly 120 professional traders that related to their feelings and role in decision-making. The traders were asked to describe the range of emotions that they experienced during trading. Additionally, traders described the long-term and short-term effects of emotions on their decision- making and trading strategy, the role of intuition in their trading, and the influence of emotions on performance. Because measures such as value at risk, trading outcomes, and profit and loss are confidential and not available to Fenton-O'Creevy's research team, total remuneration for each trader was used as a metric of trader performance and an indicator of expertise. Fenton-O'Creevy et al (2010) concluded that emotions and their regulation played a central role in traders' decision-making. Furthermore, how traders engaged in their intuitions influenced the performance of the traders with traders using antecedent-focused emotional regulation strategies performing better than those that employed response-focused strategies.

Fenton-O'Creevy's analysis showed that emotion plays a central role in decision-making because trader's emotions and cognition are inextricably linked. Although other studies have demonstrated that emotional arousal can be detrimental to performance (Lo et al., 2005; Schunk & Betsch, 2006), Fenton-O'Creevy et al. (2010) argued that the role of emotions in decision-making, the various emotion regulation strategies, and the environment that *gut feel* can improve decision-making must be understood. Fenton-O'Creevy's observation that the traders' relies on affective cues in decision-making for improved decisions is similar to Damasio's conclusions that the use of affective cues improves both learning processes and decision-making (Bechara, Damasio, Tranel, & Damasio, 1997; Damiso, 1994). Moreover, Ericsson (2006) reported that people are naturally proficient in acquiring expertise and learning, a concept described in Epstein's (1994) dual process experiential-rational model of information processing. Importantly, Fenton-O'Creevy's suggested that the emotion regulation may be critical to expert performance and thus greater focus could be placed on the interactions amongst emotion, emotion regulation, and intuition. For these reasons, a greater understanding of the mechanisms involved in processing information is required to explain and ultimately improve decision-making under emotion and risk. Certainly, a dual process theory such as Epstein's cognitive experiential self-theory can provide a framework to understand the mechanism involved with the influence of emotion on decision-making during a financial crisis.

In three different published studies, Seo and his colleagues examined the relationship between investors' experience and their decision-making in a stock investment simulation study of over 100 investors. Using one experimental sample and a

one-time experiment but examining three different aspects of the investors' experience, Seo reported the findings in three coauthored research papers (Seo & Barrett, 2007; Seo & Illes, 2009; Seo, Godfarb, & Barrett, 2010). While the analytical methodology of the data was different for each of the three published studies, there was only one sampling, which comprised of an experience-sampling procedure in which the investors rated their feelings and thoughts directly on the website while performing investing activities. This methodology of sampling minimizes the cognitive biases that can affect memory-based self-reports (Reis & Gable, 2000; Wheeler & Reis, 1991). The stock investment simulation study occurred over 20 business days. Given $10,000 of hypothetical cash each, investors were not given any investment guidelines but allowed to invest any amount of the hypothetical monies at their discretion. Each investor who participated in the simulated investment experiment logged onto the computer once each day during stock market trading hours. Within the simulated investment program that offered participants to invest in12 anonymous stocks, additional information provided fundamental financial data of each anonymous stock along with corresponding market risk indicators and past one-year returns. Past five-day trends of major broad market indices were available also. With this information, the participants made their investment decisions based solely based on their opinion on the performances and information of the 12 anonymous stocks and the market indices; no contemporaneous information such as economic data or geopolitical news that can influence the change in direction of stock market valuations were available to help their analysis. After reviewing past market data and stock information that was updated once daily and included any changes in data from the previous day, the participants assessed their current feelings using a Likert type scale

questionnaire just prior to finalizing their investment decision for the day. Participants of the simulated investment study were volunteers from six investment clubs located in northeastern United States. Participants received between $100 to $1,000 for participating; the amount dependent upon their investment performance.

While the feelings of the participants of this simulation study may be influenced by the past five-day trends of the anonymous stock and market indices, no specific information of the causes of those changes and trends was available to the participants. Thus, the participants were limited to a narrow view of data that do not give any insight of future performance of the anonymous stocks or market indices. In addition, it is unknown whether the feelings that are self-reported by the individual are due to the past performance of the anonymous stocks or the overall market or some other environmental (personal) concern that the participant encountered. The study included a computerized program, which simulated market activity of 14 ups and 6 down days as measured by market indices. The simulated stock market program did not include any data on the breadth of the daily movements of the anonymous stocks or market indices; thus, it is assumed that there were no significant moves in stock or market valuations.

The study was based on a correlation research design; therefore, the determination of precise causal directions among the key variables was impossible (Seo & Barrett, 2007). The methodology did not rely on the participants' perceptions of their affective characteristics because the affective information processing as measured by affective reactivity, emotion differentiation, and affective influence regulation were measured by directly computing scores from the participant's daily decisions. However, these metrics are too domain-specific to measure accurately the participant's overall affective state and

may not be reliably replicated. Importantly, affective processes are characterized by dual process theories (Evans, 2008) and identified as conscious (*System 2*) and nonconscious (*System 1*) processes by Bargh and Morsella (2008) and Epstein (1994). Affective responses in the nonconscious (*System 1*) domain may have suppressed or amplified the results of their study (Seo & Barret, 2007); thus, both conscious (*System 2*) and nonconscious (*System 1*) processes of affective information processing and their effects on decision-making need further research.

For their one-time experiment, Seo and his research team used a remuneration structure whereby the worst performing participant received a minimum to maximum of $100 to $1000 may have led some participants to be more focused on the remuneration and thereby influencing their feelings and their decision-making of stock selection. Furthermore, the use of hypothetical cash of $10,000 for simulated investing can induce an agency dilemma because agents who do not have their own money at stake, may make decisions that mostly serve to protect themselves (Barber, Heath, & Odean, 2003). Thus, participants may irrationally invest the hypothetical cash because of this agency dilemma with the goal of achieving the highest remuneration. Moreover, to enhance the importance of agency dilemma, Vlaev, Stewart, and Chater (2008) concluded that investors are more risk averse when investing in financial products in the real world than when making decisions amongst gambles in laboratory experiments. Investors showed more risk aversion in allocating real-world assets than in selecting laboratory investment schemes; their inability to make any absolute judgments of the riskiness of each laboratory investment. Consequently, the investors' judgment of riskiness is not of the

overall level of riskiness but rather the riskiness of the prospect relative to that of other prospects within the laboratory offer (Vlaev et al., 2008).

Importantly, emotion and cognition are interdependent (Simon, 1967) and understanding the role and significance of emotion is critical to understanding cognition (Phelps, 2006). The integration of emotion and decision-making is a dynamic, iterative process to help people adapt to their situation by considering the internal state of the individual, determinants of the valuation process, and the characteristics of the environment (Paulus, & Yu, 2012). In naturalistic settings, researchers have examined the influence of emotions and feelings on financial decision-making. Hirshleifer and Shumway (2003) concluded that sunshine affected stock returns and Kamstra, Kramer, and Levi (2003) found that stock returns were lower during the fall and winter when daylight decreased. Notably, Edmans, Garcia, and Norli (2007) observed that the stock market declined after a country lost important sport matches such as the Soccer World Cup.

Focusing on individuals, researchers have demonstrated that emotional reactions fluctuate with significant market events, such as price volatility or intraday breaks (Lo, 2011; Lo & Repin, 2002; Lo, Repin, & Steenbarger, 2005). Specifically, Lo and Repin (2002) studied the importance of emotion in the decision-making process using a sample of 10 professional traders and measured their physiological characteristics associated with emotional reactions such as sweating, and heart palpitations. They found that traders have increased emotional arousal during critical notable events such as increased price volatility. Lo and Repin findings suggested that the observation of the relationship between the cognitive inputs and the emotional reactions that are often assumed

subconscious may be viewed as the genesis of intuition. Harteis and Gruber (2008) asserted that the intuition is a crucial component of professional competence based upon a study of two groups of 16 expert and novice investment bankers who were asked to forecast the stock market values of the stock market index and several stocks that traded on the German DAX stock exchange.

Market forecasters cannot base their opinions on complete information that is necessary to determine factors objectively because crucial information is always missing. Thus, intuition is an important component of competence for stock market professionals because intuition allows individuals to make decisions in situations when complete information is unavailable. Propitiously, intuition is also the focus of numerous dual process theories of cognition including those posited by Epstein (1994), Gilovich, Griffin, & Kahneman, (2002) and Stanovich and West (2000). Importantly, Hodgkinson, Langan-Fox, and Sadler-Smith (2008) argued that understanding of intuition in terms of its underlying somatic, affective and cognitive components and how they are integrated, could contribute to a unified account of psychological functioning across a wide range of applications. Furthermore, understanding intuition and the role it plays in investor behavior has been studied using dual process theories. In particular, Epstein's (1994) cognitive experiential self-theory incorporates the intuition in the subsystem of the experiential (*System 1*) domain (2010). The role of intuition in the investors' information and decision-making processes during a financial crisis would be of interest.

Focusing on other heuristic biases of both professional and individual investors, Hon-Snir et al. (2012) asked 41 professional portfolio managers and surveyed another 300 investors to detect if they were affected by different psychological investor biases.

The participants responded by answering 10 questions that related to common biases such as disposition effect, gambler's fallacy, hot hand fallacy, herd behavior, and availability heuristics. Each of the five biases was paired as questions using 5-point Likert-scale. Whereas the 41 professional managers the researcher contacted individually, an invitation for online survey participation was posted on one of the leading financial websites in Israel. The web site is widely recognized for being regular visitors from by stock market investors. Neither the time frame of the survey nor any information concerning the contemporaneous market conditions were discussed by the researcher. Using descriptive analysis and correlation analysis along with hypothesis testing, Hon-Snir found that herd behavior, a heuristic bias that possess strong emotional content, along with other biases, influenced the decisions of both professional and individual investors. However, the most experienced investors displayed less influence from the heuristic biases. Furthermore, behavioral biases affected female investors more than male investors (Hon-Snir et al, 2012); a similar effect noted in studies by Feingold (1994) and Helgeson (2003).

Although the results of Hon-Snir's study seem plausible, there was no confirmation of the accuracy of the self-reported evaluations of each of the survey participants. Importantly, researchers conduct surveys or value elicitation experiments in the laboratory, in an attempt to predict what people would do in the real world. Thus, Chang, Lusk, and Norwood (2009) questioned whether the behavior in surveys and experiments conducted in the laboratory accurately reflect behavior in the real world, while fully acknowledging that every difference between the two settings cannot be controlled precisely. Rude, Durham-Fowler, Baum, Rooney, and Maestas (2010) warned

that the self-report measures are viewed suspiciously because self-reporting is susceptible to demand and self-presentational biases. Some researchers have indicated that individuals do not have full access to their own cognitive processes (Nisbett & Wilson, 1977; Squire, 1994). Freund and Kasten (2011) explained that many researchers found that self-assessments are biased, mostly in the direction of a positively distorted self-evaluation (Maxwell & Lopus, 1994). Such distortions help individuals establish and maintain a positive self-concept because they enhance peoples' self-esteem and feelings of self-worth. A well-documented distortion in self-assessment is the better-than-average effect, which describes a person's tendency to believe that one's ability is above average (Guenther & Alick, 2010). According to Freund and Kasten (2011), people are not very successful in estimating their own ability level. Hon-Snir's study reported the biases investors displayed but did not provide any understanding of how or why the process led to the biases.

Decision-makers experiencing emotions focus on elements of the environment that influence emotional action tendencies (Weber & Johnson, 2009). When faced with a crisis, people often become fearful. People who experience feelings of fear focus on the source of the threat and are ready for flight responses described as the risk-as-feelings hypothesis theory (Loewenstein, Weber, Hsee, & Welch, 2001). Lowenstein et al. (2001) argued that when people face risky situations, emotional reactions often cause people to diverge from their cognitive assessments of those risks. For this reason, emotional reactions often drive behavior and Lowenstein et al. (2001) suggested that people would experience anticipatory emotions described as visceral reactions comprised of fear, anxiety, and dread to risks and uncertainties.

Fear associates with low pleasantness, low self-responsibility, extremely low certainty, medium attention, high effort, and high situational control ratings on an appraisal theory scale developed by Smith and Ellsworth (1985). Furthermore, people who experience fear express pessimistic risk outcomes and risk-averse choices (Lerner & Keltner, 2001). Despite the lack of a uniform definition for emotion, some states are clearly emotional including regret, pride, elation, and fear, which commonly influence people, investors in particular (Elster, 1998). Fear signifies impending doom and an impulse to defend oneself, primarily by immediately exiting the situation (Ohman, 2007). Similarly, Epstein (1972) argued that fear relates to coping behavior, particularly escape and avoidance. Fear is an emotional state, occurs in certain situations, but of limited duration (Rapee, 1991). Clinical fear is current with an intensity that is unreasonable, given the objective danger or threat; it also tends to paralyze individuals, making them helpless and unable to cope and results in impeded psychosocial or physiological functioning (Lader & Marks, 1973). Importantly, Ohman (2007) theoretical perspective on fear stresses the role of rapid early information-processing mechanisms in fear activation and has an origin in an unconscious mobilization to a yet poorly defined threat. With more time to appraise the situation, the emotion fear can be resolved when coping options are available.

Lo (2011) contended that physical confrontations are not the same as financial threats. While blood pressure, dilated blood vessels in muscles, and a rush of adrenaline may protect an individual from physical threats, they do little to shield one from financial threats. In fact, past studies indicated that severe emotional stress impairs rational decision-making abilities, leading to a number of behavioral biases (Lo, 2011). As

mentioned earlier, fear and greed are common denominators of disruptive events that begin with unchecked greed that yields unsustainable asset prices and inevitable collapse of the bubble resulting in unbridled fear, which must subside before recovery is possible (Lo, 2011). Lo (2011) warned that although investors' quick reaction to a fear-threat may play a productive role to manage risk actively and in proportion to their risks reward, extreme fear, however, can cause investors to sell quickly all their risky assets at fire-sale prices in favor of bonds and cash. The depressed value realized from the fire sale may not serve the investors' longer-term objective if they maintain these holdings for too long. Finally, Lo (2011) argued that fear causes peoples' brain to sidestep the higher function part of the brain including the part associated with rationality. Importantly, Lo (2011) contended that people fear for reasons outside the conscious, rational mind, and people think and make decisions with the effects of the emotional brain always operating in the background. Notably, Lee and Andrade (2011) conducted a laboratory experiment of 80 students to determine the influence of fear on the decision to sell in a stock market simulation program. The participants were exposed to videos and their emotions manipulated with the content of the video as being fearful (horror movies) or control condition (documentaries of Benjamin Franklin and Van Gogh). The results showed that fearful participants sell their stock early and when they believe their risk attitude is similar to others in the market but not when they believe their risk attitude is unlike others. Lee and Andrade (2011) explained that people rely on their state of mind to estimate other people's actions.

Different from other behavioral researchers that focused on cognitive biases discussed earlier, Sadi, Asi, Rostami, Gholipour, and Gholipour (2011) examined the

perceptual biases effects on financial decisions while concentrating on the elements of the Five Factor Model hierarchical personality proposed by Digman (1997). Using the questionnaire containing 44 questions that assessed five personality traits, Sadi et al. (2011) surveyed 200 investors participating in the Tehran stock market to examine the role of personality as defined by the *Big Five Model of Personality* on investing decisions. Using correlation analysis of the five factors and perception biases, they found positive relationships between extroversion and hindsight bias, neuroticism and randomness bias and escalation commitment and availability bias, and openness with hindsight and overconfidence bias, whereas they observed a negative relationship between consciousness and randomness bias. Sadi et al. (2011) concluded that personality factors such as extroversion, neuroticism, escalation commitment and openness contributed to investors' perceptual errors in investing. Although using a different metric for assessing personality, Sadi et al. (2011) confirmed the previous observation that personality influence investor behavior (Pompian & Longo, 2004) and argued that educating investors is needed to reduce and overcome their biases

In a similar study, Lin (2011) examined different investor biases but used a different analytical approach, conducting a cross-section analysis using Structural Equation Modeling (SEM) that links the Big Five personality traits with three investor biases. The use of SEM allows the simultaneous evaluation of the factor loadings and error variance of the measurements to test the relationships of the variables. Surveying over 500 investors in Taipei, Taiwan in the fall of 2010, Lin (2011) found a positive relationship between neuroticism with disposition effect and herding bias but no relationship with overconfidence bias. Other personality such as extroversion, openness,

and conscientiousness are positively related with disposition effect and overconfidence bias but no relationship with herding bias. Finally, similar to Sadi et al. (2011) findings, agreeableness is not correlated with any behavior biases. Based on his findings, Lin (2011) argued that investors with a stronger neuroticism personality should place stop-loss orders on their stocks to lock-in gains in order to avoid potential losses, which could result from their disposition and herding biases. Furthermore, investors with strong extraversion and openness personality traits should act more assertive in their decisions in order to avoid herding and overconfidence biases. Finally, those with strong conscientiousness personality traits should also use stop-loss orders to lock-in a gain point to avoid disposition and overconfidence biases.

In a recent study, Zaidi and Tauni (2012) conducted a similar study and surveyed 170 investors who invest in the Lahore Stock Market, the second largest stock exchange in Pakistan. The findings of Zaidi and Tauni study are somewhat different from that of Lin (2011) and Sadi et al. (2011). Unlike previous studies, Zaid and Tauni found no significant relationship between openness personality trait and overconfidence bias. Furthermore, a positive relationship between consciousness, extraversion, agreeableness and overconfidence and a negative relationship between neuroticism and overconfidence biases. Zaidi and Tauni (2012) attributed the difference in results may be due to cultural differences in the investors surveyed or economic factors or size of stock markets; factors that have been shown to influence investors psyche (Masomi & Ghayekhloo, 2011). To overcome these investor biases, Zaid and Taumi (2012) argued that investors should improve their financial literacy.

Dual process theories. Judgmental processes involving risk perception and decision-making are cognitive in nature and considered rational and deliberative evaluation of alternative decisions (Bohm & Brum, 2008). Because rational and deliberative models could not explain anomalous events, psychology researchers began to investigate intuitive and emotional aspects of decision-making (Bohm & Brum, 2008). Studies of intuitive decisions began with the heuristics-and-biases approach that identified deviations of human judgment from normative models (Kahneman, Slovic, & Tversky, 1982). Because heuristic is a fast, simple, and an effortless mechanism that describes information processing, researchers initially incorporated intuition within their judgment and decision models (Bohm & Brum, 2008).

Dual-process models represent another decision making approach that incorporates intuition in their model (Chaiken & Trope, 1999). However, within the category of dual process approaches, few researchers focus on emotional processing altogether such as Epstein's (1994) cognitive experiential self-theory, Haidt (2001), Hanoch and Vitouch, (2004), and Wang (2006). Each of these researchers explicitly links emotion to the fast and quick processing of information. However, while dual-process approaches to describe cognitive processing of information by many researchers, most researchers ignore emotion entirely (Evans, 2008). To help understand peoples' behavior and how they reason, learn, make decisions, and make social judgments, researchers in cognitive and social psychology have developed dual-process theories. Although these theories come in different forms, they all agree in those two distinct information processing mechanisms (Evans, 2008). All of these theories have in common the distinction between cognitive processes that are fast, automatic, and

unconscious–*System 1* (often referred to as heuristic and intuitive) and those that are slow, deliberative, and conscious –*System 2* (often referred as analytic). Cognitive theorists describe multiple kinds of implicit processes, but not all of their proposed attributes can be sensibly mapped on to the two kinds of processing (Evans, 2008). While some of these dual-process theories describe parallel processes that involve explicit and implicit knowledge systems, others involve the influence of nonconscious processes that can influence deliberative reasoning and subsequent decision-making.

Although theories abound in describing how people process information, two different ways of knowing emerge–one involved with emotions and experience and the other involving rationality and intellect, leading to a dichotomy between the head and the heart (Epstein, 1994). Epstein's Cognitive Experiential Self Theory (CEST) provides a unified framework for understanding the ways that people comes to know. Importantly, CEST is a broad integrative theory that is compatible with other theories, including psychodynamic theories, learning theories, and phenomenological self-theories (Epstein, 2003). All of these theories may become operative for stock market investors (Bragues, 2011; Forbes & Kara, 2010; Hoffmann et al., 2013; Kahneman & Tversky, 1979; Othman, 2012).

According to cognitive experiential self-theory, people process information using two systems referred to as experiential and rational (Epstein, 1985, 1994). The experiential and rational systems operate in parallel, but are able to interact with each other. Whereas the experiential system is preconscious, holistic, primarily nonverbal, and intimately associated with affect, the rational system operates at the conscious level and is deliberative, intentional, analytic, and relatively affect free (Epstein, 1994; Epstein

et al., 1996). Epstein's CEST theory (1994) is a dual system model that can operate in both serial and parallel manner. However, a number of other cognitive psychology researchers argued that although characteristics of what each system does are clearly described, it is not clear how the systems operate (Evans, 2008; Gigerenzer & Gaissmaier, 2011; Osman, 2004; Reyna, Lloyd, & Brainerd, 2003; Stanovich & West, 2000). Furthermore, critical but unanswered questions concerning the mechanism of monitoring and controlling of critical factors that could help avoid decision-making errors exist: How efficient is the process? When do people rely on the first intuitive output and when do they engage more effortful thinking? How is *System 1*and *System 2* and the notion of intuitive processing allocated onto the distinction between conscious and non-conscious processes? How are *System 1*/*System 2* and the notion of intuitive processing allocated onto the distinction between conscious and non-conscious processes?

Most dual process theories state that heuristic and analytic system will often interact together. However, both systems can conflict and provide different responses and the analytic system monitors the heuristic system output (Stanovich & West, 2000). When analytic knowledge detects a conflict, the analytic system will attempt to intervene and suppress the heuristic response (Epstein et al, 1996; Evans, 2008; Stanovich & West, 2000). Some cognitive psychologists assert that monitoring of the heuristic systems is serial and relatively lax (Evans, 1984; Kahneman & Federick, 2002). With this serial approach, the heuristic system activates, and then the analytic system monitors the heuristic system output and may intervene should a conflict be detected. Relying on the heuristic path without activating the analytic system, people often make errors in

judgment. Kahneman and Frederick (2005) argued that people often make such intuitive judgments normally know little of logical deliberative analysis, and they simply fail to detect a conflict, often leading to error. Contrarily, Epstein (2010) asserted that people simultaneously believe two conflicting responses, but when they act against their better judgment, they often make errors. In processing information, people often are in conflict because they recognize that a conflict exists between a heuristically cued belief and analytical decision. However, people often yield to the heuristic decision that often leads to error. Thus, while Epstein (1994) contended that dual processing interacts and operate in parallel, most other cognitive psychologists proposed serial processing of information (Evans, 2008; Kahneman & Frederick, 2002).

Recently, Evans (2010) extended his initial theory of reasoning and decision-making. Evans recently suggested using controlled attention and working memory as a criterion. Whereas the first mind (*System 1*) relies on associative learning that can disregard working memory, the second mind (*System 2*) activates working memory. Within this framework, Evans (2011) has argued that people with experience could develop useful heuristics that are quick and simple to process, but still explicitly applied. Therefore, he argued that *System 2* thinking could be exercised in either slow and careful, or even quick and casual manner because of experience. Furthermore, in discussing two minds (dual process reasoning) Evans argued that the old mind (*System 1*) is based on a combination of evolved systems and experiential learning that are driven by what worked in past environments, over peoples' lifetimes. While experiential learning is a key feature of the old mind (*System 1*); however, the new mind (*System 2*) also can learn from experience. Whereas the old mind *(System 1*) forms associations, the new mind (*System*

2) acquires short-cut rules and heuristics that are applied explicitly, but with little effort. People who display such low effort (*System 2*) thinking also could be a source of cognitive biases (Evans 2007; Stanovich, 2010). Thus, experience could be a key factor for investors when faced with a financial crisis.

Other researchers have suggested that implicit reasoning (*System 1*) may be normal and effective for people who have relevant experience and expertise. This experience is essential to Epstein's Cognitive Experiential Self-Theory Model, which is the theoretical framework for this researcher. Finally, experience can be linked to working memory (Evans 2008, 2010; Baars & Franklin, 2003). Evans' (2011) dual-process default-intervention model includes experience as one of the factors for processing information and reasoning.

Using this two-mind framework, Evans (2011) introduced a new concept referred to as hypothetical thinking theory for tasks involving explicit reasoning, judgment, and decision-making processes in the second mind. In these tasks, associative processes might prompt default responses, which than can be suppressed by hypothetical thinking. Importantly, Evans (2011) renamed dual processing to Type 1/Type 2 terminology because the new terminology better describes the process since previous notation implies a singular system. In fact, Type 1 is a subset of systems in the brain that operate independently and automatically in response to their own stimuli within this domain, and are not under any deliberative, cognitive influence from any other domain (Evans, 2011; Stanovich, West, & Toplak, 2011). The change in terminology describes Type 1 processing as comprising of heterogeneous set of systems that are responsible for the biases and heuristics displayed by people, and Type 2 processing is a result of a

deliberative, algorithmic mind that analyzes all possible outcomes that can override the autonomous mind of the Type 1 domain (Stanovich, West, & Toplak, 2011). Even with this new designation, the importance of heuristics and intuition is still critical factors of Type 1 processing. The judgments and decisions that people call intuitive come to mind on their own, without explicit awareness of the evoking cues and evaluation of the validity of these cues and are produced in Type 1 (*System 1*) operations (Kahneman & Klein, 2009).

However, other cognitive psychology researchers have argued for a single process theory. Keren and Schul (2009) argued that the conceptual underpinnings of the various two-system theoretical frameworks are ill defined. They contended that dual-system models provide little scientific advance and rigorous conceptual definitions and stringent criteria for testing the empirical evidence in support of two-system theories is needed. An alternative uni-system model may be more useful, such as the uniform model of human judgment (Erb, et al., 2003).

Deterring heuristic biases. Emerging from the unconscious System 1, individuals may enter the deliberative analytical stage System 2 where self-evaluations of intelligence and cognitive abilities can enhance decision-making. In System 2, some decision-makers use self-evaluation metrics such as self-assessed intelligence (Peterson &Whiteman, 2007), self-declared savviness (Othman, 2012), and self-efficacy (Seo & Ilies, 2009). Savvy investors are decision-makers who have a practical understanding and shrewdness in stock marketing investing (Fiedler, 2011).

Sociocognitive theory suggests that self-efficacy beliefs enhance motivation and performance by increasing effort and perseverance (Bandura, 1997, 2000; Bandura &

Locke, 2003). Performance and master experience are sources for self-efficacy beliefs (Bandura, 1986). Moreover, positively assessed performance tends to increase self-efficacy (Bouffard-Bouchard, 1990). As an example of the influence of self-efficacy, Seo and Ilies (2009) conducted an internet-based simulated stock investment study of over 100 private stock investors from six different investment clubs located in the northeast United States. Participants engaged in a series of stock trading activities with the purpose of achieving goals in response to dynamic task environments (performance feedback and stock market movements). Data analysis indicated that self-efficacy influenced the self-efficacy-performance relationship (Seo & Ilies, 2009). In another study that examined the self-declared savviness of 75 professional stock traders (market makers) that were participating in a new, automated but extremely complex computerized market maker trading system of stocks, participants did not declare themselves as over-confident in their own abilities (Othman, 2012). When faced with difficult tasks, people at times overestimate their actual performance but also mistakenly believe that they are worse than others are (Moore & Healy, 2008). In this study, the under confidence displayed by these traders can be attributed to their lack of familiarity with the new, potentially difficult, and complex computerized system. Thus, both studies on self-efficacy and self-declared savviness provide investors with the opportunity to improve their investing performance.

A major factor that influences self-evaluation behavior is the feeling of self-efficacy, which is the confidence of one's ability to deal with a situation without being overwhelmed (Hira, 2010). People with high levels of self-efficacy believe they can

perform well at a specified task. The development of self-efficacy includes overcoming obstacles and mastering of experiences through perseverant effort (Bandura, 2012).

Although the extant literature cites that emotions, intuitions, and other heuristic biases influence the decision-making process of professional traders, qualitative research studies on how individual investors face a financial crisis and the cognitive system used are scant (Fenton-O'Creevy et al., 2011; Vasile et al., 2011). Thus, the purpose of this qualitative multiple case study is to explore how and why investors yielded to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis.

Investor Decision-making during Financial Crisis

Major but significant and unique economic or financial disruptions can have dramatic and long-lasting effects on the long-term development of an economy (Darne & Charles, 2011). The 1929 Great Depression, the Black Monday Crash of 1987, the Dot.com Bubble of 1999, the 9/11 Terrorist Attack, and the Financial Crisis of 2008 are significant events that could have led to a prolonged economic downturn (Baker et al., 2012: Darne & Charles, 2011; Worthington & Valadkhani, 2004). Additionally, investor behavior during other stock market phenomena such as the illogical behavior of the late 1990s in the valuation run-up of the technology stocks in the NASDAQ market, the soaring pricing of Google from 2005–2008, the unprecedented escalation of oil price in 2008, and accompanying volatility is due to investor emotion (Smith & Harvey, 2011).

The 2008 Financial Crisis has mitigated the investors' desire to invest. In a post-crisis survey, Harris and Hahn (2010) found that nearly half of those investors who were investing during the crisis either reduced or stopped investing. Investors were making

judgments and decisions under enormous uncertainty. Thus, the problem is that the relationship between yielding to heuristic biases in *System 1* cognition and resisting heuristic biases in *System 2* cognition regarding investment decisions during a time of the financial crisis is not clear (Dane et al., 2012; Kahneman & Klein, 2009). Because of their salience, extreme events such as the Great Depression of the 1930s and the 2008 Financial Crisis may strongly influence investors' perception and risk-taking behavior (Kahneman & Tversky, 1979; Malmendier & Nagle, 2011). Furthermore, investors who experience a number of consecutive losses tend to reduce their willingness to take risks (Barberis, 2011; Thaler & Johnson, 1990). In fact, investor perceptions fluctuate significantly during a crisis with investors' return expectations and risk tolerance decrease while their risk perceptions dramatically increasing during the worst times of the crisis (Hoffmann et al., 2013).

Hoffman et al. (2013) surveyed approximately 1400 individual investors and combined their monthly survey data with corresponding trading records to analyze how individual investors' perceptions influence risk behavior during the 2008 Financial Crisis. The 1400 investors had accounts with the largest discount brokerage account in the Netherlands and the data from the questionnaire was collected from April 2008 to March 2009. The survey time frame included several months of double-digit negative stock market returns that almost halved the investors' portfolio value. Investors did not receive any investment advice from the discount brokerage house and managed their own account. Email survey solicitations included only those investors with a monthly average valuation of greater than €250. The survey participants' average account value during the time of the survey ranged from €54,000 from April 2008 and steadily decreased to

€27,000 at the end of the survey in March 2009. The monthly survey questionnaire inquired information on investors' expectations of stock market returns, risk tolerance, and risk perceptions for the upcoming month using a 7-point Likert type scale. Using descriptive statistics and regression analysis, Hoffman et al. (2013) found that investor perceptions changed dramatically during the crisis period, with the metrics of risk tolerance and risk perceptions being less volatile than the metric for investors' expected return. During the worst months of the crisis as measured by the severe drop in stock market valuations, investors' return expectations and risk tolerance decreased, while risk perceptions increased. However, towards the end of the crisis, investors' perception returned to the levels observed prior to the crisis period. Importantly, investors continued to invest actively and did not de-risk their investment portfolio during the worst parts of the crisis. Furthermore, individual investors did not reduce their risk by shifting from risky investments to cash. Some investors used the depressed asset prices as an opportunity to invest in more stocks rather than remaining in cash.

Hoffman et al. (2013) compared their Netherland's sample demographics and account size to other studies conducted for United States investors (Barber & Odean, 2000) and argued that the participants of their study were representative of the broader population of self-directed individual investors. In considering the broader population, normative decision theories assume preferences among choices that are stable and well defined, invariant of any constraint with regard to the context and framing of the problem at hand (Schoemaker, 1982). For risky choices, people analyze thoroughly the perceived severity of each possible outcome with the perceived probability of its outcome (Gerrans, Faff, & Hartnett, 2012).

Although deviations from expected normative outcomes have been explained by cognitive biases (Kahneman & Tversky, 1974), more recent approaches have focused on the influence of affect as the driving force of risky choice considerations and explanations of the anomalous events (Gerrnas, Faff, & Hartnett, 2012). Finucane, Alhakami, Slovic, and Johnson (2000) suggested the decision-making involves *affect heuristic*, which refers to the tendency to use an overall affective impression as an efficient way to respond quickly and effectively rather than analyzing all aspects of the situation. Furthermore, Zajonic (1980) proposed the process that affective reactions precede judgments and decisions people often rely on their feelings when faced with a decision. Importantly, the interaction between affect reacting and cognition processing is salient in dual process theories of information processing for decision-making (Chaiken & Trope, 1999; Epstein, 1994), which suggest that two different modes of processing are operative. The fact that the role of affect is involved in the determination of risky choices implies that the dual process models such as Epstein's Cognitive Experiential Self Theory may be used to describe the decision-making process of risky choices. Furthermore, Slovic, Peters, Finucane, and MacGregor (2005) focused on the concept of dual process theories and posited that risks are evaluated in two different modes: one based on deliberative, slow and detailed analysis while the second based on intuitive, quick and affect-based reasoning. Slovic et al. (2005) termed this process as *risk-as-analysis* and *risk-as-feeling*, respectively.

Agreeing with Slovic's dual process model of risky choice decision-making, Loewenstein, Weber, Hsee, and Welch (2001) also posit a *risk-as-feeling* model which assumes that feelings can emerge without cognitive intervention (probabilities, outcomes,

and other factors can bring forth feelings), and that the influence of cognitive evaluations on behavior is influenced partly by affective responses (cognitive evaluation caused feelings ultimately affect behavior). These studies on risky choice and risk perception show that they are both influenced by cognitive considerations and affective reactions. Evaluating university students in Amsterdam, van Gelder, de Vries, and van der Pligt (2009) examined the influence of perceived risk and negative effect on risky choices and determined that a dual-process model explained their observations. Specifically, affective processing reinforced the relation between negative affect and risky choice, whereas a cognitive processing strengthened the relation between perceived risk and risky choice and thus, a dual process model of risk choice is verified. Hoffman's et al. (2013) comprehensive study examined the change of risk tolerance and risk perception using a survey questionnaire conducted during the 2008 Financial Crisis. An analysis of the information processing mechanisms could provide a better understanding of the investors' decision-making process.

During periods of crisis, some investors display heuristic biases according to self-attribution biases, endowment effect, anchoring, representativeness, and herd behavior (Al-Horani & Haddad, 2011; Nguyen & Schubler, 2012). Nguyen and Schubler (2012) conducted an online survey that invited individual investors, who held their assets at a Germany online bank, to assess the influence of psychological factors considered as mistakes on stock selection on investor behavior. Such psychological factors deemed as mistakes evaluated included self-attribution bias, the endowment effect, anchoring, representativeness, and herd behavior. The on-line survey occurred over a three-day period in July 2011 and nearly 1,000 investors who had owned at least one security

valued more than 10,000 Euros participated. Most of the survey questions did not relate to investing directly, but rather related to the general type of questions that involved choices unrelated to investing and commonly asked in laboratory research studies. The non-investment type questions may not be an accurate assessment of the investors' behavior because Vlaev et al. (2008) showed evidence that peoples' reactions in the real world could be very different from their choices made in laboratory experiments.

Statistical analysis and regression analysis of the survey data indicated that participants displayed cognitive (heuristic) biases including self-attribution, endowment effect, representativeness, and herd behavior. Analysis of the socio demographic characteristics of the survey respondents suggested that education and income affect behavior and importantly, education effectively reduces self-attribution, anchoring, and representativeness biases. In arriving on these conclusions, Nguyen and Schubler (2012) recognized that their study on self-attribution bias did not prompt the participants to choose between destiny and their own abilities. Therefore, those participants who can completely attribute to either destiny or own abilities are low; possibly leading to inaccurate results. Importantly, the responses of the participants were not verified by examining their actual portfolio transactions held at the bank. Thus, the reliability of their answers can be questioned. Additionally, although Nguyen and Schubler confirmed the existence of anchoring effect, they did not use examples of stock valuations nor inquire about the participants assets and thus, their conclusion of anchoring effect may be flawed as applied to investments. For the psychological bias representativeness, Nguyen and Schulbler used a laboratory-type of experiment relating to distances between cities and thus, their conclusions concerning investor representativeness investment bias may

be flawed. Lastly, Ngyuen and Schubler examined herding by asking whether the participant's investment decision to buy or sell a stock influenced by a friend who sold the same stock. This methodology of examining herding on a one-one basis does not reveal any information with respect to the dynamics associated with herd behavior, specifically the influence of mass behavior on market valuations. Essentially, Nguyen and Schubler conducted a laboratory type experiment without examining the data from the investors' portfolio transactions; using the portfolio transaction data could have confirmed the investors' biases recorded. Furthermore, they did not address any causation of the bias or any theoretical framework for judgments and reasoning.

Bucher-Koenen and Ziegelmeyer (2011) examined the effect of the 2008 Financial Crisis on the families of German households and their financial decisions. The survey data collected is referred to as the SAVE survey data base, which contains the data of over 2000 German household The survey data collected in the early summers of 2007,2008, and 2009 assessed the household financial and socio-economic condition including metrics of financial literacy and cognitive abilities. Because of the 2008 Financial Crisis, the 2009 survey included additional questions that focused on the financial crisis. Cognitive reflection tests quiz-like questions to measure investors' cognitive abilities were included in the survey. For the data that was recorded only in 2009, data analysis showed that financial literacy increased with cognitive capacity. Bucher-Koenen and Ziegelmeyer (2011) concluded that those who displayed poor financial literacy and poor cognitive ability tend to sell their assets at losses during the 2008 Financial Crisis; an observation also observed by Calvet et al. (2009) for investors in Sweden.

In another study, Al-Horani and Haddad (2011) conducted a survey to determine the influence of investor biases such as self-attribution, overconfidence, conservatism, opportunistic behavior, sensitivity to rumors, and mimicking attitude on investment decisions of investors who use the Amman Stock Exchange. The survey questionnaire consisted of indirect questions that avoided any leading questions. Although the questions were hypothetical, each question pertained to a possible real-life occurrence that could occur during a normal trading day of the Amman Stock Exchange. A sample of approximately 100 stockbrokers participated in the survey. Al-Horani and Haddad argued that individual investors might change their real behavior and show some perfect and faultless behavior when answering the questionnaire. Thus, they surveyed stockbrokers and asserted that they are in daily contact with the investors through receiving and executing orders that enables them to have insight and objectivity of investors' behavior and attitude. Using a Likert constant sum scale of 100%, the brokers provided their assessment of each category by reporting the most correct percentage that they believed described the behavior of the client. The percentage represented the degree of the psychological bias. Using descriptive statistics and the sum of averages of each psychological bias, the analysis concluded that the self-attribution, opportunistic behavior, sensitivity to rumors, mimicking attitude, and to a lesser extent overconfidence influenced investment behavior that could lead to poor investment performance.

The assessment of investors' psychological biases by the stockbrokers is a key factor to the reliability and validity of the analysis. Empirical research suggested that vocal cues influence the interpretation of how physical and psychological aspects of the person behind the voice and their message. For example, subtle cues disclose both the

speakers' temporary aspects such as their current emotional state (Gobl & Chasaide, 2003) and dispositional characteristics (Krauss, Freyber, & Morsella, 2002) even if reliability and validity of the listener's inferences are problematic (Scherer, 2003). Importantly, perceptual evaluation of the voice is subjective and based on comparisons with other voices or with the previous impressions of the same voice (Bele, 2005). Because the human voice offers access to peoples' minds-their attitudes, intentions, and feelings (Bruck, Kreifelts, & Wildgruber, 2011), a reliable perceptual analysis requires a standardized protocol; this standardization for listeners would enhance reliability and validity (Fex, 1992). Bruck et al. (2011) argued further that acoustic cues transmitted by voices provide emotional information while modulations of the tone of voice (i.e. speech prosody) or nonverbal vocalizations such as laughter also provide data that help analyze emotions. In fact, some studies that used rigorous analysis of acoustic cues measured from samples of emotional speech aid distinctive acoustic profiles for common emotions as fear, anger, sadness, and joy (Bruck et al., 2005). However, researching vocal cues and their implications for describing peoples' behavior and how people are perceived is complicated (Scherer, 2003). Thus, the stockbrokers that assessed the psychological biases of investors calling into the brokerage house likely needed some training in perceptual voice evaluation so that their assessment of investors could be more accurate and even enhanced the reliability and validity of the research. Although their analysis determined that psychological biases influence investment behavior, Al-Horani and Haddad (2011) did not examine the underlying causes of the biases that are important factors for investors to understand so that such biases can be suppressed.

Such irrational investor behavior may have contributed to individual and macroeconomic damage during the 2008 Financial Crisis. To avoid such damage, investors should consider safeguards against heuristic biases and seek rational options such as purposeful emotional regulation.

Summary

The research problem is highlighted in the investor decision-making and investor behavior literature and identified directly to the source: the investor. The investor is critical not only as a source for the market pricing of assets, but importantly as a source of information that may lead to a better understanding of investor actions such that future investment strategies can be formulated to minimize the influence and consequences of the financial crisis. Much of the literature on investors focused on studies in traditional finance theory including variants of the expected utility axioms on how the *homo economicus* makes rational investment choices under conditions of risk (Frankfurter, McGouin, & Allen, 2004) and actual investor behavior that influenced cognitive (heuristic) biases (Baker & Nofsinger, 2002). Psychology and other social science theories may explain some stock market anomalies–bubbles and crashes (Kahneman & Tversky, 1979; Statman, 1999). Thus, behavioral finance theory has emerged to help understand how people actually behave in a financial setting (Baker & Nofsinger, 2002; Lo, 2012; Shiller, 2003). The behavioral finance literature may be grouped into two broad categories: the analysis of anomalies in the traditional financial paradigm that assumes agents' rational decisions and utility maximization (De Bondt & Thaler, 1985) and the identification of the individual investor behavior (cognitive biases) that is inconsistent with the rational agent paradigm (Odean, 1999).

For the past few decades, the financial market has experienced unforeseen and sudden economic turmoil that has led to unpredictable stock market returns (Kadariya, 2012). Identifying the factors influencing these unforeseen events based on rational decision-making process has become difficult for traditional financial economists to explain (Frankfurter et al., 2004). These empirical anomalies are unexplainable by traditional financial theory; however, some can be explained by behavioral finance (Shiller, 2003). Behavioral finance includes individuals' insights of cognitive psychology and social and financial factors in order to understand and explain investor decisions (Hayes, 2010). As part of the investor decision-making process, some psychologists have adopted a dual-system approach, arguing that individuals use a dual step process of cognition described as *System 1*–unconscious, fast, and automatic reactions and *System 2*–conscious, slow, deliberative, and analytical reasoning (Evans, 2008).

The recent financial crisis has mitigated the investors' desire to invest. In a post-crisis survey, Harris and Hahn (2010) found that nearly half of those investors who were investing during the crisis either reduced or stopped investing. Investors were making judgments and decisions under enormous uncertainty. Thus, the relationship between yielding to heuristic biases in *System 1* cognition and resisting heuristic biases in *System 2* cognition regarding investment decisions during a time of the financial crisis is not clear (Dane et al., 2012; Kahneman & Klein, 2009) and has yet to be explored from the individual investor's perspective.

Chapter 3: Research Method

The specific problem of this study was that some professional and individual investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions (Epstein, 2010; Hon-Snir, Kudryavtsev, & Cohen, 2012). A longstanding controversy in financial economics is whether investors' rational forces or their emotional responses govern the asset pricing of the financial markets (Lo and Repin, 2002). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to inauspicious losses in their stock portfolio (Lo, 2011). Many individual investors characteristically buy, sell, and even over trade at inopportune times, realizing poor returns, and even losses (Dalbar, 2011). Nearly half of the investors during the 2008 Financial Crisis either reduced or stopped investing (Harris & Hahn, 2010). Many psychology researchers such as Epstein (1994), Evans (2008), Fenton-O'Creevy et al. (2010), and Stanovich and West (2000), use a dual process model to help understand peoples' reasoning. The dual process theory of information processing assumes two processing modes: unconscious, rapid, and automatic (*System* 1) and conscious, slow, and deliberatively analytic (*System 2*). When faced with crises, investors' quick selling without rational thought, of all their risk assets at fire-sale prices in favor of government bonds and cash may not serve their longer-term goals if they maintain these holdings too long (Lo, 2011).

Without evaluating the role that cognitive biases plays in information processing, investors will not understand why they make inauspicious automatic decisions or grasp the steps that could help avoid realized losses in their stock portfolio (Shariff, Al-

Khasawneh, & Al-Mutawa, 2012). Quick automatic decisions (*System 1*) tend to occur without conscious effort and usually, people do not understand why they make such decisions as their brain operates in this default manner (Camerer, Lowenstein, & Prelic, 2005; John, Bullock, Zikopoulos, & Barbas, 2013; Kahneman & Frederick, 2005; Perring, 2011).).

The purpose of this qualitative case study was to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. This research extended the seminal work of Epstein (1994), who proposed a dual-process model referred to as cognitive-experiential self-theory (CEST) for processing information. A multiple-case study research design satisfied the goal of this exploratory research and data collected through multiple sources, including in-depth individual interviews, field notes, and subject matter expert (SME) review and reflection of the data collected. The units of analysis was 12 wealthy investors with a financial portfolio of at least $1 million dollars in stock and bonds (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013). The participant selection strategy employed a purposeful small sample using homogeneous participants that is informational rich Patton (2002). With a purposeful sample, participants fulfilled the minimum requirements to participate, possessed well-developed attitudes and opinions regarding their experiences and provided in depth information on the phenomena under study (Patton, 2002). The research literature was rich with studies on investor behavior, particularly when many events occurred that are difficult, if not impossible, to explain by normative theories (Lo, 2011; Smith & Harvey, 2011). To gain insight on how investors behave contrary to normative behavior, some studies examined

investor behavior under stress (Fenton-O'Creevy et al., 2011; Lo & Repin). Before selecting the unit of analysis, this researcher determined what to analyze and sampling methods (Cavanagh, 1997). As recommended by Yin (2009), the unit of analysis was selected after the research questions were finalized. With the financial crisis causing a fundamental shock in the economy worldwide, disheartening investors, economists, and policymakers alike (Arup, 2010), many investors saw the value of their investment portfolios decrease significantly with some feared losing their savings (Chambers, Benibo, & Spencer, 2011). The units of analysis was 12 wealthy investors with a financial portfolio of at least $1 million dollars in stock and bonds (Bajtelsmit & Bernasek, 2001; Boscaljon, 2013; Chhbara, 2005; Martin, 2012). Data triangulation analysis permitted cross-data validity checks of the various data sources in order to achieve accurate and valid findings (Merriam, 2009; Stake, 2010). Epstein's dual process theory (1994) formed the foundation for the comparison of the results of each case study, with the purpose of formulating an original contribution to extend said theory.

Selection of the subjects and cases was critical because the researcher could predict similar or contrasting results across cases based on theory (Yin, 2009). As such, identifying appropriate questions for the research was critical. Consistent with the purpose of this study, the research questions addressed by this study are as follows:

Q1: How did investors yield to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Q2: Why did investors yield to either *System 1 or System 2* axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Research Method and Design

A search of research databases indicated that the examination of how and why investors yield to dual process decision-making when faced with extreme stress induced during a national financial crisis has limited research availability for use in a qualitative research studies. Qualitative studies that explore investors' perceptions when faced with a national financial crisis have yet to be conducted from an individual investor's point of view. A common tool utilized in exploratory research is a qualitative study that uses a multiple-case study design (Eisenhardt, 1989; Yin, 2009). This approach provides information on how and why investors yielded to either *System 1 or System 2* axis decision-making and how-investors describe their cognitive (heuristic) biases and self-efficacy (savviness) in investment decisions during the national 2008 Financial Crisis.

In crises, whereby people face extraordinary circumstances, qualitative research approaches provide a sound methodological framework for developing an understanding of the implicit subjectivity that occurs in people (Morgan & Drury, 2003). The qualitative research approach defines subjectivity as the manner in which people make sense of their experiences (Morgan & Drury, 2003). Thus, the researcher utilized a qualitative research approach that attempted to understand the nature of reality through peoples' narrated accounts. Researchers use a multiple case study that involves data collection that includes interviews, field notes and SME review, as well as a reflection of the data collected to explore the range of historical, attitudinal, and behavioral issues (Yin, 2009). This combination of the approaches provides for greater strength and validity of the research findings.

In choosing the case study research design, this researcher did consider other qualitative methods such as narrative inquiry, phenomenology, or ethnography. The choice to develop a case study was made due to the variety of strategies that could be used to answer a research question that was phenomena-driven and is broad to provide the researcher with ample flexibility while conducting the field research. Eisenhardt and Graebner (2007), and Gummesson (2006) point out that the case study approach could be helpful in comprehending a specific aspect in its natural environment. For the case study of exploring how and why investors yielded to either *System 1* or *System 2* axis in decision-making when faced with extreme stress impelled during the 2008 Financial Crisis, this researcher believed that both flexibility and structure, would be difficult to understand simply through *uncritical* personal storytelling–narrative inquiry (Clandinin & Connelly, 2000) or through a design– phenomenology where conflicting philosophies about data analysis can raise inconsistencies to methodological clarity (Norlyk & Harder, 2010). To meet this design need, the researcher applied Yin's (2009) recommendation that the case study method is relevant when the research study includes either a descriptive question (what happened?) or an explanatory question (how or why did something happen?).

Importantly, whereas a deductive research approach would use the theory that is already available to analyze a specific aspect of the phenomena, an inductive research approach would use case study research methodology to broaden, develop, create, and even extend the theory to understand the phenomena (Barratt, Choi, & Li, 2011). Building theory from using case studies is a research approach that evaluates one or more cases to develop inductively theoretical constructs, propositions, and midrange theory

from empirical data (Eisenhardt, 1989). The theory emerges from the observed phenomena and develops by perceiving relational patterns among constructs within and across cases and their underlying characteristics (Eisenhardt & Graebner, 2007). The focus of case studies is replication logic, whereby each case may be considered as a distinct stand-alone experiment (Eisenhardt, 1989). Moreover, multiple case approaches are discrete experiments that replicate, contrasts, and extends to developing the emerging theory (Yin, 2009). The theory-building process cycles case data, emerging theory, and extant literature. The present research relied on the framework of existing dual process theories as the starting point to understand better, how investors describe their cognitive (heuristic) biases and self-efficacy (savviness) in their investment decisions when faced with the 2008 Financial Crisis.

For qualitative multiple case research, the number of cases to evaluate was not dependent upon statistical sampling logic, but dependent upon theoretical or sampling biases that are necessary or sufficient for replication (Yin, 2009). Cases may be chosen to replicate previous cases, to extend emergent theory, or to fill any category of interest to understand fully the emergent theory (Eisenhardt, 1989). In case studies, the smaller the case numbers, the greater the opportunity for depth of observation (Voss, Tsikriktsis, & Frohlich, 2002). However, the use of multiple cases may increase external validity and guard against researcher bias (Gibbert, Ruigrok, & Wicki, 2008). Importantly, for theory building purposes, the use of multiple cases is likely to create more robust and testable theory compared to the use of a single case research and specifically, the use of four to 10 cases generally works well (Eisenhardt & Graebner, 2007). The use of less than four cases would cause difficulty in capturing the complexity of the real world while more

than 10 would cause difficulty for the researcher to process the information. Additionally, researchers using a qualitative approach also use the saturation criteria as a guide to determine the number of cases (Taylor, 2010). However, a fierce debate exists on the definition of saturation as identified with sample size. Some argue that although saturation is useful, it provides little practical guidance for determining the number of cases to be used prior to actual data collection (Guest, Bunce, & Johnson, 2006; Mason, 2010). Importantly, scholars agree that incremental learning becomes minimal after reaching saturation because researchers would be observing phenomena already observed (Eisenhardt, 1989).

For this study, a case study approach provided the most flexibility for a researcher to explore, examine, and understand investors' perceptions in the midst of the 2008 Financial Crisis. A case study is an empirical inquiry that evaluates phenomenon in depth, and within the context of the environment, especially when the boundaries between phenomenon and context are unclear (Yin, 2009). Because phenomenon and context are not easily distinguishable, the use of case study inquiry manages the situation in which more variables of interest are available than data points exist, relies on multiple sources of evidence with data converging in a triangulating fashion, and benefits from the prior development of theoretical proposition to guide the data collection and analysis (Yin, 2009). For theory development, a qualitative research approach relies on units of analysis, case boundaries, and type of case study. According to Nonthaleerak and Hendry (2008), one of the major issues facing qualitative researchers is that of how many cases should be a part of the multiple-case study approach. The present study will also use multiple cases to enhance the relevance of the study (Yin, 2009). For this multiple

case study, the units of analysis was 12 investors who reside in the Northeast region of the United States, with the investors' decision-making process during the 2008 Financial Crisis as the boundary of the study. A limited number of cases allow the focus on fewer subjects, but more variables within each subject compared to examining a large number of cases.

This researcher's approach was to use a multi-case study to explore the differences within and between cases and replicating findings across the multiple cases. The selection of multiple cases in this study involved replication logic, as select criterion identified prospective participants for each case (Yin, 2009). The replication enhanced the validity, generalizability, and reliability of the findings (Eisenhardt, 1989; Ravenswood, 2011; Rowley, 2002). Based on results of numerous studies, multi-case research approach was robust and reliable (Baxter & Jack, 2008). Additionally, this study utilized replication logic by posing the same interview questions to each participant. In this case study, questions of *how* and *why* generate an expanded source of information for complex patterns of results (Yin, 2012). Multiple-case studies may be more difficult to implement than the single-case structure, but resultant data provided greater confidence in the researcher's findings (Barratt, Choi, & Mei, 2011; Yin, 2009). Descriptive case studies are most commonly used in both structures; they supported rich and revealing insights into the experiential world of a case (Yin, 2012). During study design, cases were chosen based on expected results and theoretical framework (Yin, 2009).

To gain an in-depth understanding of participants' perceptions, perspectives, and experiences with the phenomena under study, data collection in the form of semi-

structured, open-ended interview questions were used (Patton, 2002). A semi-structured interview format provided adaptability, a feature important for case studies Therefore, questions may need to be refined (Stake, 1995). Structured interviews, such as those used for quantitative studies, were not suitable for case studies due to the lack of depth of information collected (Yin, 2009). Open-ended questions, as commonly used in a semi-structured interview, identified themes and nuances in the participants' answers (Yin, 2009).

The interview guide was field tested with a formative interview development process. The process involved the dissertation committee members, who have experience in education, finance, or behavioral finance, providing feedback on the preliminary version of the proposed question guide. The purpose of the committee review was to assess the study's validity and reliability. The review also determined whether the questions were understandable, relevant, and valid (Stake, 1995; 2010). Face-to-face interviews with three SMEs: one with practical experience in investment advising, another academic researcher in the area of finance and a third one in the field of behavioral economics provided summative input (Patton, 2002). The goal of the formative and summative interview evaluations was to develop questions that answer the research questions of the study.

Prospective participants were contacted by telephone for the study with an invitation of participation and assessment of their eligibility of meeting the object of the study, in the same manner as the participants in the full study. This initial set of respondents provided other potential subjects who may have shared similar characteristics. The second group of subjects when interviewed provided additional

subjects. The process continued until the researcher determined that the sample was sufficient such that further rounds of nominations would have unlikely provided significant new information. Importantly, not screening for such factors as age, gender, race, religion, or cultural background avoided discrimination (Patton, 2002). Volunteers who accepted the invitation to participate signed a Letter of Consent that emphasized participants' confidentiality, researcher's ethical standards, and the structure of the interview.

Importantly, the researcher emphasized data and conversation confidentiality and anonymity of each participant. The interview process consisted of a recorded face-to-face or telephonic conversation. The researcher kept all recordings were encrypted and saved in the cloud as well as in a locked cabinet in the office. Under no circumstances were the participants' identity was revealed. Participant's name did not appear on any documents or recordings. For each participant, assigning personal code and pseudonym to identify corresponding personal data maintained anonymity and confidentiality. Asking each participant the same interview questions, the researcher demonstrated replication logic for the study (Yin, 2009). In this study, theoretical replication will reinforce expectations that the disposition of each case provided varied or contrasting results (Yin, 2012).

After approval of the full study from the Institutional Review Board (IRB), the researcher sought participants who consented to the interview and authorized publication of their data (Patton, 2002). The participants offered a variety of views and opinions on the topics to be investigated. The snowball or chain-referral sampling method involved identifying a set of possible respondents (Tansey, 2007). The strategy for selecting

participants employed a small group of homogeneous participants that provided an information-rich sample (Patton, 2002). This sampling strategy allowed the researcher to be immersed in the research and established trusting relationships with participants so that an in-depth research study was achieved. For these reasons, a small number of cases helped the researcher to develop a closer relationship with the participants, and therefore enhance the validity of a detailed, in-depth inquiry in a naturalistic setting (Crouch & McKenzie, 2006).

Throughout the interview process, field notes were utilized as a secondary method of gathering data. The researcher's technique for collecting field notes utilized Groenewald's (2004) guidelines as follow:

1. Observational notes recorded events as they actually happened during the interview.
2. Notes reflected the initial interpretation concerning meanings.
3. Methodological notes reminded the researcher to perform certain tasks at the right time.
4. Written memos at the end of each interview session developed brief abstract summaries.

Multiple cases included within this comprehensive study tested for similar results (replication) across different cases. The selection of the number of cases or sample size was not dependent upon statistical sampling logic, but dependent upon theoretical or sampling biases that were necessary or sufficient for replication (Yin, 2009). Cases were chosen to replicate previous cases, extended emergent theory, or to fill any category of interest to understand the fully the emergent theory (Eisenhardt, 1989). In case studies,

the smaller the case numbers, the greater the opportunity for depth of observation (Voss, Tsikriktsis, & Frohlich, 2002). Importantly, for theory building purposes, the use of multiple cases likely created more robust and testable theory compared to the use of a single case research (Eisenhardt & Graebner, 2007) and specifically, the use of four to 10 cases generally worked well. The use of less than four cases would cause difficulty in capturing the complexity of the real world while more than 10 could cause difficulty for the researcher to process the information. Additionally, researchers using a qualitative approach also use the saturation criteria as a guide to determine the number of cases (Taylor, 2010). Importantly, scholars agree that incremental learning becomes minimal after reaching saturation because researchers would be observing phenomena already observed (Eisenhardt, 1989). The sample size for this study was guided by the concept of saturation, the point at which no new information or themes are observed with additional interview (Bowen, 2008). As an example, Guest, Bunce, and Johnson (2006) conducted a systematic analysis of a qualitative study of over sixty highly homogeneous subjects using semi-structured interviews by focusing on the codes they developed from each interview. Guest et al (2006) found that a sample of six interviews was sufficient to enable development of meaningful themes and useful interpretations, thus achieving saturation on a homogenous group of subjects. Guest et al. (2006) identified the subjects in their study as a homogeneous population displaying narrow objectives. This homogeneity could have enabled their research methodology to reach saturation with as few as six samples. Since this research will evaluated a homogenous sample of investors who could be considered a homogenous group with narrow objectives, this researcher

expected a small sample of approximately eight to 12 interviews could achieve saturation.

The researcher documented and categorized the transcribed notes from the digitally recorded interviews and the handwritten field notes using the Microsoft Excel spreadsheet software. The NVivo (Tansey, 2007) computer software analyzed participants' content and themes. Based on common statements, coding identified themes and keywords that were consistent, referenced, and traceable to the data collected. Coding categories emerged from the interviews and then matched with constructs identified in the literature that were relevant to emerging themes. Thematic coding was both theoretical and inductive.

Content analysis, with the aid of the NVivo computer software program, organized and analyzed the content of the data to gauge the extent of emphasis, or omission of emphasis, of any analytical category (Yin, 2009). Careful data analysis focused and ruled out significant rival interpretations (Gibbert & Ruigrok, 2010) on how cognitive biases and self-efficacy influenced the investor decision-making process. As part of this focus, cross-case synthesis determined comparability of each case and data triangulation to corroborated facts found aggregated results across the multi-case study (Yin, 2009); such analytical techniques may enhanced the robustness of the findings The use of replication logic in this study allowed for an analytic generalization in order to compare previously developed theories with empirical results (Yin, 2009). The Epstein's Cognitive Experiential Self Theory (1994) theoretical framework formed the foundation for the comparison of the results of each case study, with the purpose of formulating an

original contributing to said theory. Chapter 4 and Chapter 5 of the final dissertation manuscript include the findings and analysis of each case study.

Construct validity, internal validity, external validity, and reliability were measures of quality of research (Yin, 2009). The use of multi-case studies strengthened construct validity (Gibbert et al., 2008). Whereas the specification of the unit of analysis (investors) provided internal validity, theoretical relationships achieve external validity (Yin, 2009). Developing a formal case study protocol provided the reliability (Merriam, 2009; Yin, 2009). However, reliability and validity have been a source of concern in qualitative studies as far back as the 1980s (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Morse et al. (2002) argued that researchers should address issues of reliability and validity during the inquiry itself, rather than ex post facto. Guba and Lincoln (1982) replaced the terms reliability and validity with the parallel concept of trustworthiness, which defined factors such as credibility, transferability, dependability, and confirmability. Within these factors, trustworthiness was demonstrated by strategies including audit trail, member checks when coding, categorizing or confirming results with participants, peer debriefing, structural corroboration, and referential material adequacy. To assure validity, reliability, and generalizations of the findings, the researcher incorporated some of the factors of trustworthiness (Guba & Lincoln, 1982) within a protocol (Merriam, 2009) that provided trustworthiness (reliability and validity) for the research study as follows:

Prolonging the processes of data gathering on site. This step referred to ensuring the accuracy of the findings by providing the researcher with information that helps formulate interpretations.

Employing the process of triangulation. Triangulation from multiple data sources rather than relying solely on one source allowed crosschecking of information and strengthens conclusions (Johnson, 1997). Triangulation involved corroborating data from multiple perspectives and enhances the depth of understanding how investors described their cognitive biases and self-efficacy in their decision-making during a financial crisis (Stavros & Westberg, 2009). Importantly, triangulation of multi-sources allowed the uncovering of diversity of information in a context that would allow transferability both within and across cases. The purpose of triangulation was to reduce biases and increase the reliability and validity of the study (Jehn, 2009). Triangulation was achieved by comparing data from interviews (Patton, 2002; Yin, 2009), observations recorded in field notes (Patton, 2002; Yin, 2012) and subject matter expert (SME) review and reflection of the data collected (Yin, 2012).

Conducting member checks. Allowing a subject to corroborate actively on the interpretation of data and to assisted the researcher in data collection led to more valid, reliable, and diverse construction of realities (Golafshani, 2003). Once interviews were accomplished and initial themes were identified, member checking was conducted. The goal of member checking in this study was to confirm and validate the information observed and recorded by the researcher (Merriam, 2009; Stake, 2010). Member checking was also used for proving and reviewing the data for further investigation and credibility (Merriam, 1998). The process of member checking began with the researcher reviewing the observations and interpretations. Next, the members reviewed the findings and confirmed and validated the researcher's interpretations. Lastly, after interviews were completed, reflective/interpretive summaries were written for participants and peers

review.

Collecting referential materials. Complementing the file with investors' monthly/quarterly investment statements showing portfolio changes during the period of the financial crisis provided a valuable source of data for triangulation analysis. Any changes in portfolio composition shown on the investment statements were compared to the participants' commentary and data collected from the interview transcripts. Quantitative data derived from the brokerage statement corroborated the findings from qualitative data. For example, the data from the transcribed interview including investor reactions such as sell, reallocate, hold or sell and dates of transaction were compared to the brokerage statements that verified accuracy of participants' statements. However, brokerage statements are private and proprietary; thus, the archived documents were processed for safekeeping, focusing on security of identity and storage. Examination and subsequent discussion of the quantitative data in the brokerage statements, which display any changes in portfolio composition and valuations, became a focal point of the discussion for the participants to recall any feelings, as well as the thinking, and reasoning processes experienced in arriving at their decision-making.

Engaging in peer consultation. Prior to composing the final report, the researcher used a pooled judgment process by consulting with colleagues in order to establish the validity. Triangulation by the researcher to involve other peer researchers' interpretation of the data improved the analysis and understanding of the findings Golafshani, 2003).

Reliability was the extent to which results are consistent over time, an accurate representation of the sources studied, and a reproduction of the study yielded similar

results (Spencer, Ritchie, Lewis, & Dillon, 2003). Processes such as documentation of the stages of production, interpretation, and analysis achieved external reliability in qualitative research methodology (Morgan & Drury, 2003). Thus, the researcher utilized electronic recording, scanning, and writing devices to document each step of the research process, particularly interview conversations, field notes, and paper documents. Moreover, reliability means producing trustworthy results and establishing meaningful findings that appealed to the reader (Trauth, 1997). Another method of ensuring reliability, or dependability, was making certain that all interviews were carefully transcribed from their recordings and coded carefully. Inter-rater reliability was used with a reliable subject matter expert to listen to the transcriptions with the researcher (Kottner et al., 2011). The use of inter-rater reliability was used to limit experimenter bias on the results of the research (Kottner et al., 2011). The procedures used in the research were carefully documented in a way that clearly explained how the study was conducted (Gibbert & Ruigrok, 2010). In addition, the data was organized and added to a database in order to facilitate replication for future studies.

To insure reliability in qualitative research, evaluation of trustworthiness aspect of the research process was critical (Seale, 1999). The trustworthiness of the research analysis depended on several factors, including credibility, transferability, dependability, and confirmability (Golafshani, 2003; Morse, Koven, Mundt, & Gohmann, 2008; Shenton, 2004). Multiple sources for data triangulation provided research credibility, transferability, and confirmability. Triangulation of interview data and data from investors' monthly statements showing portfolio changes determined consistency and variance among the sources of data. Furthermore, the use of triangulation provided

cross-data validity checks of data collected through all the interviews and archived investment statements in order to achieve a more accurate and valid estimate of the findings (Merriam, 2009; Stake, 2010).

Credibility of the research assessed whether a true picture of the accuracy of the phenomenon under study. Transferability that determined reasonable detail of the context of the fieldwork is sufficient to be applied to another situation or setting. However, further research may be required to determine whether the research findings and conclusions are transferable from this setting to other contexts. Although difficult for qualitative studies to achieve, dependability of the study allowed future researchers to replicate the study. A consistent research design and method, reliability of data sources, and the ability to explain inconsistencies contributed to research dependability. Last, confirmability of the study assured that the findings emerged from the data and not the researchers own predispositions. Triangulation analysis of the interview data and archived data to determine consistency and variance reflected the trustworthiness of the research. Triangulation of the data was a key focus of the study and permitted cross-data validity checks to achieve more accurate and valid results (Gibbert & Ruigrok, 2010; Merriam, 2009; Shenton, 2004), thereby enhancing the trustworthiness of the study.

Population

The population of individuals was all investors of stocks and bonds in the United States. In 2013, an estimated 57.7 million households (47.1% of households) and approximately 97.9 million investors owned shares of mutual funds or other U.S. registered investment companies compared to 53.3 million households and 93.2 million investors in 2008 according to an annual survey taken by the Investment Company

Institute (ICI) (Burham, Bogdan, & Schrass, 2013; Investment Company Institute, 2008). Since 2000, U.S. the percentage of adults who invested in stocks have hovered around the 62% level and peaked in 2007 just prior to the 2008 financial crisis based on Gallup's annual Economy and Finance Survey (Saad, 2013). Since 2008, the percentage of adults invested in stocks has steadily declined to 52% in April of 2013. Examining the demographics of investors, Burham et al. (2013) showed that mutual fund ownership increases with household income and those with household income greater than $50,000 held nearly 70% of all mutual funds; additionally, 42% of households with age of head of household over 55 owned mutual funds.

Thus, nearly half of the households in the United States own investments in stocks and bonds and are affected by stock market volatility. Importantly, wealth in the United States is highly concentrated with approximately two-thirds of the wealth is held by the wealthiest 10 % of the households and about one-third held by the wealthiest 1 % (Kennickell, 2009; Levine, 2012). The next 9% of households held two-fifths of all the wealth and therefore, the top 10% of the wealth hold 75% of the total wealth. Levine (2012) found that this top 10% of wealthy households benefited the most from rising stock prices for the period of 1989-2007.

Many investors allow cognitive biases, particularly emotion, fear and intuitions, to affect their decisions, which led to inauspicious loses when faced with a financial crisis. Since nearly half of the households in the United States invest in stocks and bonds and wealth is highly concentrated in the wealthiest 10% of the households, analysis of the cohort of wealthiest investors is appropriate to explore how and why investors reached their decisions. Therefore, the criteria to participate in this study is investors who have at

least a $1 million portfolio in stocks and bonds and experienced the 2008 Financial Crisis; these investors are likely to have been influenced by extreme stock market volatility.

Sample

Because of evidence that wealthy investors invest differently than those who are less wealthy (Bateman, 2009; Makarov & Schornick, 2010; Paravisini, Rappoport, & Ravina, 2012; van Rooij, Lusardi, & Alessie, 2012), the selection criteria include investors who have at least $1 million dollars in stocks and bonds (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013) and experienced the 2008 Financial Crisis (Martin, 2012). For example, Makarov and Schornick (2010) developed a mathematical general equilibrium model that can explain why wealthy households invest a large share of their wealth in risky assets, but Paravisini et al. (2012) found wealthy investors are more risk averse after a negative housing wealth shock. Furthermore, although wealthier people invest in the stock market compared to the less wealthy (van Rooij et al., 2012), older, wealthy individuals also reacted positively to increasing risk compared to younger investors with less wealth (Bateman, Islam, Louviere, & Satchell, & Thorp, 2011).

This research study utilized a purposeful, snowball or chain-referral purposeful sampling method (Tansey, 2007). The purposeful sample was taken from respondents from a mailing of the Introductory Letter (see Appendix A) sent to a list of individuals provided by Larkspur Data Resources; at least 250 letters were mailed. Larkspur Data Resources provided an online database of over 4 million high-net-worth individuals throughout the United States by utilizing over 70 different information sources to identify

indicators of wealth. Their searchable database enabled targeting those individuals in the Northeast with respect to the value of their investable assets. In the event that an insufficient number of individuals who qualify to the requirements of this study respond, the snowballing approach to gain additional participants was implemented. The strategy for selecting participants for a purposeful sample employed a small group of homogeneous participants that provided an information-rich sample (Patton, 2002). This sampling strategy allowed the researcher to immerse himself in the research and establish trusting relationships with participants so that an in-depth research study could be achieved. For these reasons, a small number of cases helped the researcher to develop a closer relationship with the participants, and therefore enhanced the validity of a detailed, in-depth inquiry in a naturalistic setting (Crouch & McKenzie, 2006).

Participants who respond to the call for the study were contacted by telephone to determine their eligibility of participation in the research by meeting the objectives of the study. To be eligible for participation, the investor have had at least $1 million dollars in stock and bond portfolio prior to June of 2008 and experienced the 2008 Financial Crisis (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013). This initial set of respondents provided other potential subjects who may share similar investing characteristics. The second group of subjects when interviewed will provide additional subjects. The process continued until the researcher determined that the sample is sufficient such that further rounds of nominations unlikely provided significant new information. Importantly, not screening for such factors as age, gender, race, religion, or cultural background avoided discrimination (Patton, 2002). Potential participants provided an overview of the research study along with the methods and procedures of the

research process with emphasis that participation was voluntary and anonymous. Importantly, the opportunity to opt out of the process at any time during the interview session and research study process was underscored (Patton, 2002; Yin, 2009).

The interview process consisted of a recorded face-to-face or telephonic conversation. Asking each participant the same interview questions, the researcher demonstrated replication logic for the study (Yin, 2009). Importantly, the interview utilized an interview guide that had been field-tested to ensure validity and reliability of the questions. In this study, theoretical replication reinforced expectations that the disposition of each case provided varied or contrasting results (Yin, 2012).

Multiple -cases included within this comprehensive study tested for similar results (replication) across different cases. Replication across cases in the data collection among the investors in this case study provided for the confidence in the overall results. Once the results from the data collection become repetitive, data collection reached data saturation. A two-stage process guided achievement of data saturation: an initial sample of around five cases followed by an additional seven cases in order to determine if any new themes emerge (Bowen, 2008). This research initially utilized a sample of five subjects to attempt to achieve data saturation; however, a total of 12 subjects were interviewed. Importantly, the sample size was increased until saturation was achieved with 12 participants. Finally, investors who agree to participate were interviewed at a location of their choice using a semi-structured interview approach that allowed flexibility to use multiple-subjects differently while covering the same constructs (Noor, 2008).

Materials/Instruments

Interview questions were aligned with topics covered in the literature review section of this multiple-case study (Yin, 2012). Each potential participant was provided a letter that briefly described the research study and an invitation of participation (see Appendix A). Importantly, an informed consent form (see Appendix B) specified the purpose, participation requirements, research personnel, disclosure of possible risk/discomfort levels of participant, potential benefit of the study, anonymity and confidentiality of the data to be collected, the right to withdraw at any time, and participants' signature that acknowledged full understanding of the conditions of participations. Interviews were focused in nature (Yin, 2009); not exceeding an hour. Using a formatted semi-structured interview established a standard procedure across all interviews (Ali & Yusof, 2011). The interview protocol will consisted of: (a) the opening (welcome and indication of objectives); (b) the body (interview questions); and (c) the closing (summary and thanks). To gain insight into participants' opinions of the phenomena as well as create a non-threatening atmosphere, the researcher asked conversational questions during the formal line of inquiry (Yin, 2009). An interview guide (see Appendix C) was essential for successful interviews and was designed with exploratory, opinion, and value type questions that enhanced the understanding of the opinions, judgments, perspectives, and values of the participants (Patton, 2002). Part A of the interview Guide (see Appendix C) recorded participant's pseudonym assigned identity code, age, gender, number of years of experience in investing in stocks and bonds, and the value of their investments as of June 30, 2008. The questions (Part B) of the interview guide (Appendix C) utilized questions based on the framework of the

research questions to elicit the participants' responses on how and why they yielded to either *System 1* or *System 2* decision-making when faced with the 2008 Financial Crisis. The interview guide emphasized a series of broad themes to direct the conversation toward the topics and issues under study (Qu & Dumay, 2011).

The interview guide initially was field tested (Appendix D) and reviewed by the Subject Matter Expert to ensure that the questions were relevant, reliable, and valid (Patton, 2002). Prior to participants' interview, an interview guide was field tested. After the IRB had granted approval, the Interview Guide (Appendix D) was e-mailed to two seasoned investors who each had over 25 years of investment experience. Each responded yes to each of the three questions that addressed the clarity, relevance, and validity of the interview questions. The Dissertation Committee approved the interview guide and ensured that the questions were valid and reliable. Additionally, the feedback from participants of the field tested along with the examination by the SMEs of the field study results provided an unbiased and objective view of the effectiveness of the interview guide and the field study process (Patton, 2002). The responses from the field test interviews (Appendix D) underwent a quality audit (Patton, 2002) by the Dissertation Committee Chair and one SME to determine the credibility, dependability and applicability of the interview guide's questions and the interview procedures (Golfashani, 2003). Such field-testing established trustworthiness and credibility in the study findings (Lincoln & Guba, 1985). The goals of the field test study identified ambiguities, to clarify the wording of questions, and to allowed early detection of necessary additions or omissions (Noor, 2008). For the field study, participants known to the researcher who had a portfolio value of more than $1Million and experienced the 2008 Financial Crisis,

were recruited to test the Interview Guide. An overview of the questions in the Interview Guide (see Appendix C) is next.

Question 1. "Please describe your investment experience, specifically how and why you bought, reallocated, or sold your stocks, prior to the 2008 Financial Crisis and discuss any experience in investment decisions with respect to any volatile moves in the market? This question explored the investors' investment experience and how they may have dealt with past financial crises. The purpose of the study was to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. Although theories abound in describing how people process information, two different ways of knowing emerge–one involved with emotions and experience and the other involving rationality and intellect, leading to a dichotomy between the head and the heart (Epstein, 1994). Epstein's Cognitive Experiential Self Theory (CEST) provided a unified framework for understanding the ways that people comes to know and reach decisions. The specific problem was that some investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions (Epstein, 2010; Hon-Snir, et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to losses in their portfolio (Lo, 2011).

Evans (2011) has argued that people with experience could develop useful heuristics that are quick and simple to process, but still explicitly applied. Therefore, he argued that *System 2* thinking could be exercised in either slow and careful, or even quick and casual manner because of experience. Furthermore, in discussing two minds (dual

process reasoning) Evans argued that the old mind (*System 1*) is based on a combination of evolved systems and experiential learning that are driven by what worked in past environments, over peoples' lifetimes. While experiential learning is a key feature of the old mind (*System 1*); however, the new mind (*System 2*) also can learn from experience. Whereas the old mind *(System 1*) forms associations, the new mind (*System* 2) acquires short-cut rules and heuristics that are applied explicitly, but with little effort. People who display such low effort (*System 2*) thinking also could be a source of cognitive biases (Evans 2008; Stanovich & West, 2000). Thus, experience could be a key factor for investors when faced with a financial crisis.

Other researchers have suggested that implicit reasoning (*System 1*) may be normal and effective for people who have relevant experience and expertise (Epstein, 1994; Reyna, 2004). This experience is essential to Epstein's Cognitive Experiential Self-Theory Model, which is the theoretical framework for this researcher. Finally, experience could be linked to working memory (Evans 2008, 2010; Baars & Franklin, 2003). Evans' (2011) dual-process default-intervention model includes experience as one of the factors for processing information and reasoning. This research question proposed to reveal the investors' experience and how and why they made their investment decisions and provided data to address Research Question 1 and 2.

Question 2. "Please describe when and how you learned about the 2008 Financial Crisis?" This question explored investors' perception in the midst of the crisis. The purpose of this question was to focus on the perceptions of the investor. Because of their salience, extreme events such as the Great Depression of the 1930s and the 2008 Financial Crisis could strongly influence investors' perception and risk-taking behavior

(Kahneman & Tversky, 1979; Malmendier & Nagle, 2011). Furthermore, investors who experience a number of consecutive losses tend to reduce their willingness to take risks (Barberis, 2011; Thaler & Johnson, 1990). In fact, investor perceptions fluctuate significantly during a crisis with investors' return expectations and risk tolerance decrease while their risk perceptions dramatically increasing during the worst times of the crisis (Hoffmann et al., 2013). Investor perceptions fluctuate significantly during a crisis with investors' return expectations and risk tolerance decrease while their risk perceptions dramatically increasing during the worst times of the crisis (Hoffmann et al., 2013). This research proposed to reveal how investors perceived the financial crisis and why they made their investment decisions and provides data to address Research Question 1.

Question 3. "Please describe the factors that led to your noticing that there was a Financial Crisis in 2008?" This question explored the origin of the investors' concern for the financial crisis and the events that led to their decision-making in response the financial crisis. Major but significant and unique economic or financial disruptions could have dramatic and long-lasting effects on the long-term development of an economy (Darne & Charles, 2011). The 1929 Great Depression, the Black Monday Crash of 1987, the Dot.com Bubble of 1999, the 9/11 Terrorist Attack, and the Financial Crisis of 2008 are significant events that could have led to a prolonged economic downturn (Baker et al., 2012: Darne & Charles, 2011; Worthington & Valadkhani, 2004). This research question revealed how investors' perceived the financial crisis and why they made their decisions according to Research Question 1.

Question 4. "How did you feel when you learned that there was a financial crisis?"... These questions focused on immediate feelings, emotions, or fears that an investor may have experienced upon realization that there was a financial crisis. Extreme market volatility and prosody of negative financial headline news occurred daily and throughout the crisis from mid 2008 until mid 2009. To garner attention, the press commonly reports that psychology drives the financial decision-making and moves asset prices. For example, the phrase: there are only two emotions in Wall Street–fear and greed–is commonly quoted when the stock market plunges in value (Goodman, 1968).

Emotion is a key factor that is critical to how people process information for decision-making. The dynamic interaction between the emotional and rational modes of decision-making is not clearly defined because there is no consensus on an operational definition of emotion that would allow separating the influence of emotion from a rational assessment (Wang, 2006). Although emotion is an integral part of Epstein's CEST model (1994), it is not the focus. Epstein (1994) uses emotion as a role in the acquisition of information in the experiential process (*System 1*) rather than as the focus of decision-making. Different from Epstein's view of the influence of emotion on peoples' way of processing information for decision-making, Evans (2012) argued that the influence of emotion might not be confined to the *System 1* domain. Evans (2012) suggested that *System 1* processing could lead to emotions and feelings of intuition that are conscious, even though the underlying processing is not accessible. *System 2* processing is consciously accessible in part, but invariably depends upon a number of rapid, unconscious support systems, such as those which provide pragmatic cues to the relevant context, or retrieve relevant information from long-term memory. Thus, the

influence of emotion on either *System 1* or *System 2* processing of information on decision-making is unclear. These questions revealed how investors' perceived the financial crisis and how they made their investment decisions and addresses Research Question 1.

Question 5. "How would you describe your behaviors when you realized that your investment portfolio dropped precipitously?"

These questions focused on immediate feelings, emotions, or fears when they actually observed their investment portfolio value drop precipitously. Importantly, this question relates to why an investor would make the decision to sell, reallocate, hold, or buy stocks in their portfolio when faced with a financial crisis. Lo (2011) asserted that the common origin for all financial bubbles and busts is fear and greed. Subject to such daily prosodic headlines of doom and gloom not only of the devastation of the stock market but also of the plunging real estate values and economic woes, many investors became fearful and were under extreme pressure to act as they watched the value of their portfolio drop precipitously, while some even feared losing their life savings (Bollerslev & Todorov, 2011; Caballero, 2009; Chambers et al., 2011; Deaton, 2012; McInerney, Mellor, & Nicholas, 2013). This research question revealed how investors' perceived the financial crisis and how and why they made their decisions and addresses Research Questions 1.

Question 6. "Looking back at that time of the Financial Crisis of 2008, please identify what you believe was the strongest factor - your feelings or thoughts - guiding your decision to sell, reallocate, hold, or buy because of the financial crisis?"

These questions (6, 7) addressed why investors feel in terms of emotions such as fear, disgust, anger regret, or envy made their investment decisions. Emotions is operative in both intuitive (*System* 1) and deliberative (*System* 2) (Pfister & Bohm, 2008). Whereas fear, disgust, and anger were associated with *System 1* processing, regret and envy were identified with the *System 2* function. See narrative to Question 4 on influence of headline news. Fearing continuation of devastating loss in value of portfolios, many investors de-risked their portfolios by reallocating to safer asset while some even sold some or all their assets at depressed fire-sale prices (Dzielinski, 2011; Hoffmann et al., 2013; McCarthy et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to inauspicious losses in their stock portfolio. Many individual investors characteristically buy, sell, and even over trade at inopportune times, realizing poor returns, and even losses (Bucher-Koenen & Ziegelmeyer, 2011; Dalbar, 2011). When faced with such an extreme crisis, people often have often become fearful. While blood pressure, dilated blood vessels in muscles, and a rush of adrenaline may protect an individual from physical threats, they do little to shield one from financial threats. In fact, past studies indicated that severe emotional stress impairs rational decision-making abilities, leading to a number of behavioral biases (Lo, 2011). Thus, many investors in the midst of the 2008 Financial Crisis were uncertain of their financial security and uncertain what action to take. This research question revealed whether emotions influenced their decision-making process and how emotions are operative within the two systems and why investors' made their investment decisions and answers Research Questions 2.

Question 7. "Can you please explain why one of these processes (state to participants his answer to Question 6 on feelings or thoughts) was the dominant factor in your decision to sell, reallocate, hold, or buy during the Financial Crisis of 2008?" This question focused on feelings, emotions, or fears. Unfortunately, many investors, allowed cognitive biases, particularly emotion, fear, and intuition to affect their decisions and reallocate their portfolio to investments perceived to be safer and some even sold their entire portfolio at fire-sale valuations. When faced with crises, investors' quick selling without rational thought, of all their risk assets at fire-sale prices in favor of government bonds and cash may not serve their longer-term goals if they maintain these holdings too long (Lo, 2011). A longstanding controversy in financial economics is whether investors' rational forces or their emotional responses govern the asset pricing of the financial markets (Lo and Repin, 2002). Emotions can significantly affect decision-making (Ackert, Church, & Deaves, 2003; Blanchette & Richards, 2010; Hoffman et al., 2013). Dual-process models represent a decision making approach that incorporates intuition in their model (Chaiken & Trope, 1999). To help understand people's' behavior and how and why they reason, learn, make decisions, and make social judgments, researchers in cognitive and social psychology have developed dual-process theories. Although these theories come in different forms, they all agree in those two distinct information processing mechanisms (Evans, 2008). All of these theories have in common the distinction between cognitive processes that are fast, automatic, and unconscious–*System 1* (often referred to as heuristic and intuitive) and those that are slow, deliberative, and conscious –*System 2* (often referred as analytic).

Although theories abound in describing how people process information, two different ways of knowing emerge–one involved with emotions and experience and the other involving rationality and intellect, leading to a dichotomy between the head and the heart (Epstein, 1994). Epstein's Cognitive Experiential Self Theory (CEST) provides a unified framework for understanding the ways that people comes to know and reach decisions. The specific problem is that some investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions (Epstein, 2010; Hon-Snir, et al., 2012). When faced with the 2008 Financial Crisis, some investors made emotional decisions by yielding to their cognitive biases, which led to losses in their portfolio (Lo, 2011). This question explored why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis and answers Research Questions 2.

A digital recorder captured the participants' responses to the interview questions and transcribed for analysis. Additionally, the researcher took handwritten field notes during each interview with focus on the participants' reactions, perceived emotions, and behaviors to offer insight into the interview settings and a sense of the shared experience (Patton, 2003). The interview transcripts shared with participants to solicit feedback to determine any discrepancies (Creswell, Hanson, & PlanoClark, 2007). A classification system using pseudonyms identified participants' interview recordings, transcription, feedback, and archived documents for the maintenance of confidentiality. Anonymity of the participants was of utmost importance. All documents were encrypted and saved in the cloud as well as kept in a locked file cabinet for safekeeping.

Data Collection, Processing, and Analysis

After gaining IRB approval to begin the full study, the researcher then sought participants who were willing to consent to the interview process (Patton, 2002). The participants offered a variety of views and opinions on the topics to be investigated. Using a snowball or chain-referral purposeful sampling method, the researcher identified additional possible respondents (Tansey, 2007). The strategy for selecting participants for a purposeful employed a small group of homogeneous participants that provides an information-rich sample (Patton, 2002). This sampling strategy allowed the researcher to immerse himself in the research and establish trusting relationships with participants so that an in-depth research study can be achieved. For these reasons, a small number of cases (12) helped the researcher to develop a closer relationship with the participants, and therefore enhanced the validity of a detailed, in-depth inquiry in a naturalistic setting (Crouch & McKenzie, 2006).

Prospective participants were contacted by telephone for the full study with an invitation of participation and assessment of their eligibility of meeting the objectives of the study, in the same manner as the participants in the field study. This initial set of respondents provided other potential subjects who may share similar characteristics. The second group of subjects when interviewed provided additional subjects. The process continued until the researcher determined that the sample was sufficient such that further rounds of nominations would unlikely provided significant new information. Importantly, not screening for such factors as age, gender, race, religion, or cultural background avoided discrimination (Patton, 2002). Volunteers who accepted the invitation to participate signed a Letter of Consent (see Appendix B) that emphasized

participants' confidentiality, researcher's ethical standards, and the structure of the interview.

Importantly, the researcher emphasized data and conversation confidentiality and anonymity of each participant. The interview process consisted of a recorded face-to-face or telephonic conversation at a location of the participant's choice. The researcher kept all recordings in a locked cabinet in the office. Under no circumstances were participants' identities revealed. Participant's name did not appear on any documents or recordings. For each participant, assigning personal code and pseudonym to identify corresponding personal data maintained anonymity and confidentiality. Asking each participant the same interview questions, the researcher demonstrated replication logic for the study (Yin, 2009). In this study, theoretical replication reinforced expectations that the disposition of each case provided varied or contrasting results (Yin, 2012).

Multiple cases included within this comprehensive study tested for similar results (replication) across different cases. Replication across cases in the data collection among the investors in this case study provided for the confidence in the overall results. Once the results from the data collection became repetitive, data collection reached data saturation. A two-stage process guided achievement of data saturation: an initial sample of five cases followed by an additional seven cases in order to determine if any new themes emerged (Bowen, 2008). This research initially used a sample of five subjects. Ultimately, another seven participants achieved data saturation.

The goal of the data collection process was to focus on the perception of the investor and enable the researcher to evaluate how investors describe cognitive (heuristic) biases and self-assessed efficacy (savviness) in investment decision-making during the

2008 Financial Crisis. The richness of the interview data derived primarily using different sources of evidence including archived investment portfolio documents (Rowley, 2002). Each participant required different approaches to the process of interview and likely yielded different insights. The participants were interviewed at a location of their choice using semi-structured interview approach that allowed flexibility to use multiple-subjects differently while covering the same constructs (Noor, 2008). To understand participants' perceptions and experiences, various methods were used to collect the data for each case study (Yin, 2009). In addition to collecting archived monthly/quarterly portfolio statements from January 2008 through December 2009 for each participant, handwritten field notes were taken during the interview session to capture participants' key responses, expressions, emotions, and actions (Stake, 1995). The collection of interview data and note taking conducted through semi-structured interviews was in response to open-ended questions (Yin, 2009) and the entire interview was digitally recorded.

The researcher documented and categorized the transcribed notes from the digitally recorded interviews and the handwritten field notes using the Microsoft Excel spreadsheet software. Transcripts for each interview were given to each participant provided feedback for accuracy of the participant's comments. The transcripts and handwritten notes of each interview were transcribed in the Microsoft Word format and uploaded into NVivo (Tansey, 2007) computer software program that allowed specific words and phrases to be extracted for content and thematic analysis. The NVivo software program tracked unique nodes, words, and textural descriptors or phrases (Kikooma, 2010). Content analysis, with the aid of the NVivo computer software program help

organized and analyzed the content of the data to gauge the extent of emphasis, or omission of emphasis, of any analytical category (Yin, 2009).

Careful data analysis focused and ruled out significant rival interpretations (Gibbert & Ruigrok, 2010) on how cognitive biases and self-efficacy influenced the investor decision-making process. Based on common statements, coding will identify themes and keywords that were consistent, referenced, and traceable to the data collected by using tables or matrices. Specifically, transcribed participants' responses were coded by headings and interview questions. Analyzing the various words, phrases, and headings will allowed coding categories to emerge from the interview data and then the researcher matched these categories with constructs identified in the literature that were relevant to the emerging themes. Coding was both theoretical and inductive in order to identify emerging themes and compared to other coded categories to assess linkages and meanings between cases (Paton, 2002). Thematic analysis developed the patterns, ideas, meanings within the data to identify themes that were consistent with referenced and traceable data. Importantly, potential variations in data accuracy and errors were noted. Not only were content analysis identifies, codes, and differentiates primary patterns for each case (Duriau, Reger, & Pfarrer, 2007), but it also provided a basis for future research (Stake, 2010). Data analysis and emerging themes provided a narrative to describe the observed phenomena

Triangulation of multiple data sources was critical to multi-case qualitative studies for overcoming skepticism of singular methods, lone analysts, and single-perspective interpretations (Patton, 2002). Therefore, triangulation approach using transcribed interview data, field notes, and archived documents of portfolio activity to

corroborate the facts (Merriam, 2009; Stake, 2010; Yin, 2009). Triangulation of the data of emerging patterns and themes, field notes along with feedback of each interview, and archived portfolio documents of each participant provided the accuracy and validity of the phenomena (Creswell et al., 2007; Jonsen & Jehn, 2009)

Critical to the triangulation process and accurate assessment of the phenomena observed, cross-case synthesis approach aggregated results across the multi-cases and allowed the comparison of each of the cases (Yin, 2009). For this study, 12 cases were expected to achieve saturation in order to provide how and why investors yielded to either *System 1* or *System 2* type of processing information in their investment decisions in the face of a devastating 2008 Financial Crisis. Although each case in the cross-case synthesis was treated individually, synthesis of all the data from all cases strengthened the robustness of the results of the study (Yin, 2009).

Khan and VanWynsberghe (2008) demonstrated that a cross-case synthesis is an acceptable approach for multiple-case studies. They asserted that comparing across cases enables the researcher to assess similarities and differences to help learn and understand the phenomena under study. Importantly, Gibbert & Ruigrok (2010) argued that rigor is not the focus and often not addressed in many case studies. However, Eisenhardt and Graebner (2007) argued that researchers' use of the *Natural Science Model* that focuses on construct validity, internal validity, external validity and reliability could help insure rigor in case studies. Although the concepts of validity and reliability are generally used in quantitative research Golafshani (2003), many researchers have challenged the rigor of qualitative studies. For this reason, Shenton (2004) redefined the framework for ensuring rigor by focusing on Guba's (1981) criteria for trustworthiness of naturalistic inquiries.

With respect to the construct reliability, Seale (1999) argued that trustworthiness of the study is the basis for evaluation. Importantly, Shenton (2004) asserted that trustworthiness could be established through credibility rather than internal validity; transferability rather than external validity; dependability, rather than reliability; and confirmability to reduce investigation bias with the use of triangulation. With respect to the construct validity, a number of approaches for assuring the validity include triangulation (Jonson & Jen, 2006; Gibbert & Ruigrok, 2010), establish a chain of evidence (Yin, 2009), and careful documentation of research procedures (Gibbert & Ruigrok, 2010).

According to Gibbert and Ruigrok (2010), construct validity termed as reliability by Lincoln and Guba (2000), refers to how researchers investigate that which they claim to investigate. For this research, reliability was addressed by using triangulation of interviews and documents (Gibbert & Ruigrok, 2010). However, this researcher was aware that documentation could affect the validity by having inaccurate data (Jonson, & Jehn, 2009; Yin, 2009). Data triangulation increases reliability by creating different venues for information while providing valuable assessments of each with respect to the strengths and weaknesses of the data gathered (Yin, 2009). Multi-case studies that use triangulation of data from multiple sources are more dependable compared with studies that do not include triangulation of data (Jonson & Jen, 2009; Yin, 2009). For this study, reliability was strengthened further by establishing a chain of evidence with a clear explication of the data collection and analysis process (Gibbert & Ruigrok, 2010).

Internal validity is termed as credibility (Lincoln & Guba, 2000) and referred to the relationship between variables and results that emerge from the collection of the data as well as the analysis of the data (Gibbert & Ruigrok, 2010). Credibility of the research begins with a thorough review of the literature on the phenomena that was studied. The chain of evidence that extended from the results of the literature study to the research data and analysis was clearly explained (Yin, 2009). Using this method, the research ensured a logical relationship between the research questions and results of the analysis to insure credibility. Dependability referred to whether the research study could be duplicated to yield the same results. Accurate transcription and coding of the interview session enhanced dependability. When possible, Kottner et al., 2011) suggested the use of inter-rater metrics between the researcher and SME to minimize researcher bias of the data and results of the research study. Careful and precise documentation of all the elements of the research methodology and process favored replication of this study (Gibber& Ruigrok, 2010). Lastly, schematics further provided rigor for this research study. Rosenberg and Yates (2007) suggested that the use of schematics, key concepts and procedural steps in visual graphical form that outlines the structure of the study enhanced the rigor of the study. Schematic graphics that present a clear interpretation of the iterative process of the study added to the rigor integrity and rigor of the study.

The use of replication logic in this study allowed for an analytic generalization in order to compare previously developed theories with empirical results (Yin, 2009). This multiple-case study was unique because it focused on contemporary events and issues, which centered on compelling theoretical frameworks (Yin, 2012) by comparing the results of each case. The use of replication logic in this study allowed for an analytic

generalization in order to compare previously developed theories with empirical results (Yin, 2009). The Epstein's Cognitive Experiential Self Theory (1994) theoretical framework formed the foundation for the comparison of the results of each case study, with the purpose of formulating an original contributing to said theory. Chapter 4 and Chapter 5 of the final dissertation manuscript will include the findings and analysis of each case study.

Assumptions

This multi-case study approach assumed that the participants, each with a unique experience, provided reliable, in-depth perspectives and honest opinions regarding how and why they arrived at their investment decisions during the 2008 Financial Crisis. The open-ended questions elicited detailed responses from the participants, relying on the participants' communication style and ability to articulate accurately the facts of how they processed information and their decision-making process during the crisis (Wilson, Myers, & Gilbert, 2003). The participants were assumed to have provided accurate and elaborative statements. However, this researcher recognized that when faced with difficult tasks, people at times overestimate their actual performance but also mistakenly believe that they are worse than others are (Moore & Healy, 2008). The accuracy of the participants' decisions was verified by examining their brokerage records. However, verifying the accuracy of their feelings and emotions was difficult, other than examining the consistency of the factual content of the interview.

Because participants discussed personal and sensitive information, the interview process provided participants a level of comfort and rapport with the interviewer such that the participants did not feel vulnerable. Thus, the researcher was sensitive to

possible sources of tensions and emphasized good manners, respect, and genuine interest, all which could help bridge any barriers between the participants and interviewer (Qu & Dumay, 2011).

Importantly, respondents' accurate recall of their feelings during a crisis was critical. Participants' recalling of information is influenced by a range of factors that are critical to achieving valid conclusions from the interview data. According to Dockerell (2004), these factors include what is to be recalled, the manner of questioning, how the questions influence the accuracy of the response, and the time gap between the event and the interview. Some research studies suggested that inaccurate recall of emotional events might be due to peoples' focusing on the incident in question rather than other concurrent events (Wilson, Meyers, & Gilbert, 2001, 2003). However, Levine and Edelstein (2009) argued that memories of emotional events could be preserved for many years because significant emotional events enhance information processing in multiple memory systems and concluded that presence of retrieval cues among other factors such has rehearsal contribute to enhanced memory for emotional information. Notably, Breslin and Safer (2011) acknowledged that people could remember negative public events more accurately than positive events in environments with frequent references to the negative events. The frequent prosody of headline news of the stock market volatility is a constant reminder to investors of the fragility of their investments. Thus, the researcher used cues such as various prominent events that occurred during the 2008 Financial Crisis to enhance the accuracy of the recall of the participants' feelings and how they processed information to reach their investment decisions.

Limitations

A qualitative study using a semi-structured interview approach relies on the accuracy of self-reporting of participants. Rude, Durham-Fowler, Baum, Rooney, and Maestas (2010) warned that the self-report measures are viewed suspiciously because self-reporting is susceptible to demand and self-presentational biases. Research studies have indicated that individuals do not have full access to their own cognitive processes (Nisbett & Wilson, 1977; Squire, 1994). Freund and Kasten (2011) explained that many studies have found that self-assessments are biased, mostly in the direction of a positively distorted self-evaluation (Maxwell & Lopus, 1994). Such distortions help individuals establish and maintain a positive self-concept because they enhance peoples' self-esteem and feelings of self-worth. A well-documented distortion in self-assessment is the better-than-average effect, which describes a person's tendency to believe that one's ability is above average (Guenther & Alick, 2010). According to Freund and Kasten (2011), people are not very successful in estimating their own ability level. Thus, some participants may not accurately report their feelings and manner in which they processed information and limit the validity of the study. The researcher utilized carefully designed probing questions, which were designed and refined in the field test to minimize the participants' self-reporting bias.

The recruiting of non-diverse participants with respect to the value of investable assets using a purposive and snowball sampling is inherently biased (Patton, 2002). Although the participant selection approach that identifies investors with investable assets of over $1 million dollar in stocks and bonds provided an information-rich sample, the small sample size may have unique investor needs and characteristics and may not be

representative of the overall population of investors. Qualitative studies are not intended to have samples be generalized to the population, but to capture in-depth information in a naturalistic setting to develop theory (Crouch & McKenzie, 2006).

As with any qualitative study, researcher bias must be avoided. The researcher himself has characteristics of the purposive sample and thus a member of the group. Therefore, the researcher was careful to avoid research bias because the degree of affinity that the researcher has with the sample could have introduced bias by limiting the researcher curiosity such that the researcher could discover what he thinks he knows rather than pursuing inquiries into areas that he does not know (Mehra, 2002). The use of a field study, conducting member checks, and engaging in peer consultation could help avoid researcher bias (Chenail, 2011).

Delimitations

The delimitation of the study defines the boundaries of the study (Yin, 2009). The purposive sample is limited to investors with more than $1 million of investable assets in stocks and bonds. The multi-case qualitative study focused on how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. The selected sample was small and consisted of investors who reside in the Northeast region of the United States. Since the 2008 Financial Crisis that began as a national crisis but subsequently expanded to a global contagion, investors from other regions in the world may have different experiences and views than those participating in the study's sample. Notably investors with less than $1million in investable assets in stocks and bonds are excluded from the study; however, their collective investment decision could have influenced asset

valuations during the crisis and decisions of those investors who have more monies invested than they do. Importantly, although financial literacy influences investors during a financial crisis (Lusardi & Mitchell, 2011; Seo & Illes, 2009), it was not addressed in this study.

Ethical Assurances

The overarching standard for this research study was to ensure professional and ethical behavior throughout the research study including participants understanding of informed consent procedures, protection from harm, and right to privacy as well as professional colleagues' honest treatment. Research and collection of data began only after this study has been granted approval by the IRB. Strict adherence to the IRB guidelines ensured compliance with ethical standards of conduct for research and the standards of the IRB of Northcentral University. The researcher refrained from exerting any undue pressure on any investor to participate in the study. Importantly, the researcher did not screen for such factors as age, gender, race, religion, or cultural background to avoid discrimination (Patton, 2002). Volunteers who accepted the invitation to participate were sent an Introductory Letter (Appendix A) and an Informed Consent Form (Appendix B) that included information that their participation is voluntary, anonymous, and involves little risk and no benefit was to be gained by their participation (Yin, 2009).

According to Crompvoets (2010), participants needed to feel confident that their comments and personal data remained anonymous and confidential. Under no circumstances was the participant's identity revealed. Participant's name did not appear on any documents or recordings. For each participant, assigning personal code and

pseudonym to identify corresponding personal data maintained anonymity and confidentiality. All data, recordings, and documents were encrypted in the cloud and stored in a secured cabinet that has a padlock. Data will be preserved until December 2019. Thereafter, the files will be deleted and documents will be shredded.

Prior to the interview process, informed consent approvals were received from each participant (Shank, 2006). Participants were provided an overview of the research study and the methods and procedures of the research process. Opportunity to opt out of the process at any time during the interview session was emphasized throughout the research process by addressing all participants' questions and concerns (Patton, 2002) and by reminding participants that their participation was voluntary and anonymous (Yin, 2009). Importantly, the participants provided their feedback regarding the interview's content accuracy by reviewing a transcription of their interview (Patton, 2002). Either the participant or researcher handwrote the participants' feedbacks.

The researcher presented truthful positions and statements with respect to all facets of the research process and analysis to ensure academic integrity and honesty (Yin, 2012). Thus, the highest ethical standards were achieved when all the guidelines and procedures were strictly followed with emphasis on the confidentiality and anonymity of each participant and honesty of the researcher.

Summary

A multi-case study approach for this research provided the most flexibility for a researcher to explore, examine, and understand investors' perceptions of their needs in the midst of the 2008 Financial Crisis. A case study was an empirical inquiry that evaluates phenomenon in depth, and within the context of the environment, particularly

when the boundaries between phenomenon and context are unclear (Yin, 2009). For this study, 12 investors who reside in the Northeast region of the United States were the units of analysis with the investors' decision-making process during the 2008 Financial Crisis as the boundary of the study. A limited number of cases allowed the focus on fewer subjects, but more variables within each subject. Specifically, a multi-case study allowed the exploration of differences within and between cases and replicated findings across the multiple cases. The replication enhanced the validity, generalizability, and reliability of the findings (Eisenhardt, 1989; Ravenswood, 2011; Rowley, 2002). Importantly, the cases chosen enabled the researcher to predict similar or contrasting results across cases, based on the theory because of comparison of each case (Yin, 2009). Based on results of numerous past studies, multi-case study approach was robust and reliable (Baxter & Jack, 2008).

The use of thematic analysis on the subjects' interview data and archived data involved the identification of themes, patterns, ideas, or meanings contained within the collected data (Yin, 2009). The goal of the analysis was to focus on investors' thinking and how they processed information to arrive at their investment decisions. The data analysis relied on theoretical propositions, considered rival explanations, and developed a case narrative (Yin, 2009).

The use of multi-case studies strengthened construct validity (Gibbert et al., 2008). Importantly, although analysis treated individual case as a separate case, synthesis of the cases collectively enhanced the case findings. To assure validity, reliability, and generalizations of the findings, the researcher prolonged the process of data gathering, employ triangulation methodology, conduct member checks, collect referential materials,

and engage in peer consultation (Merriam, 2009). Importantly, triangulation analysis of the interview data and archived data to determine consistency and variance achieved trustworthiness. Triangulation of the data was a key focus of the study and permitted cross-data validity checks to achieve more accurate and valid results (Gibbert & Ruigrok, 2010; Merriam, 2009; Shenton, 2004), thereby enhancing the trustworthiness of the study.

Chapter 4: Findings

The purpose of this case qualitative study was to explore how and why investors, located in the Northeast region of the United States, yielded to either *System 1 or System 2*-axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. This research extended the seminal work of Epstein (1994), who had proposed a dual-process model referred to as cognitive-experiential self-theory (CEST) for processing information. A multiple-case study research design was used to satisfy the goal of this exploratory research and data was collected through multiple sources, including in-depth individual interviews, archived notes, and subject matter expert (SME) review and reflection of the data collected. The units of analysis consisted of 12 wealthy investors with a financial portfolio of at least $1 million dollars in stocks and bonds (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013). The researcher's selection strategy employed a purposeful small sample using homogeneous participants that are informational rich (Patton, 2002). Data collection included transcription of recorded semi-structured interviews with the 12 participants along with investment brokerage statements. Data triangulation analysis permitted cross-data validity checks of the various data sources in order to achieve accurate and valid findings (Merriam, 2009; Stake, 2010). Epstein's dual process theory (1994) provided the foundation for the comparison of the results of each case study, with the purpose of formulating an original contribution to extend said theory.

Chapter 4 contains the results, findings, and summary of the 12 participants' interviews that describe how investors responded the Financial Crisis of 2008. Comparative analysis between the theoretical framework and findings identified

knowledge gained from this study (Yin, 2009). Consistent with the purpose of this study, the Research Questions are as follows:

Research Question 1 (RQ1): How did investors yield to either *System 1 or System 2*-axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Research Question 2 (RQ2): Why did investors yield to either *System 1 or System 2*-axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

The analysis focused on the archived statements and investor profile made available by each of the participants along with their recorded responses to the Interview Guide questions:

1. Please describe your investment experience prior to the 2008 Financial Crisis?
2. Please describe when and how you learned about the 2008 Financial Crisis?
3. Please describe the factors that led to your noticing that there was a Financial Crisis?
4. How did you feel when you learned that there was a financial crisis?
5. How would you describe your behaviors when you realized that your investment portfolio dropped precipitously?
6. Looking back at that time of the Financial Crisis of 2008, please identify what you believe was the strongest factor - your feelings or thoughts- guiding your decision to sell, reallocate, hold, or buy because of the financial crisis ?
7. Can you please explain why one of these processes (state to participants his answer to 6- feelings or thoughts) was the dominant factor in your decision to sell, reallocate, hold, or buy during the Financial Crisis of 2008?

Summarized Results of the Field Study

The field test confirmed that applicability and dependability of the interview questions and data collection techniques. In accordance to the Institutional Review Board (IRB) guidelines, the interview guide enabled the acquisition of feedback on the initial version of the questions from the members of the Dissertation Committee. The

Dissertation Committee members reviewed the instrument and focused on ensuring the validity and reliability that the questions were understandable, relevant to the study, and valid (Patton, 2002). After the IRB had granted approval, the Interview Guide (Appendix D) was e-mailed to two seasoned investors who each had over 25 years of investment experience. Each responded yes to each of the three questions that addressed the clarity, relevance, and validity of the interview questions.

Results of the Main Study

Informed Consent and IRB approval was granted on April 5, 2014. Direct mailing and snowball sampling methods to potential participants of this research provided the 12 investors who met the qualifications ($1million in stocks and bonds in January 2008) for this study. Interviewing of the participants occurred between April 18 and June 3. The researcher conducted and digitally recorded each interview either face-to-face or by telephone. To maintain anonymity and confidentiality, the researcher assigned pseudonyms to each interviewee (Yin, 2009). Each recorded interview was electronically delivered and transcribed by a third-party vendor.

NVivo software program (v. 10.0) was used to help analyze the transcribed interviews for common themes and frequently occurring words to reveal emergent themes. The NVivo program facilitated the categorization of words into themes and combined with archived data from brokerage statements from each of the participant, allowed the triangulation of all data to provide the results. Themes were organized by the Research Question (RQ) number and theme number combination, with the first number referring to the research question number and the second number referring to a distinct theme. For each theme, the corresponding system was identified. As an example, the

first theme in Research Question 1 is identified as Theme RQ1.1. (System 1), whereas the first theme in Research Question 2 is identified as Theme RQ.2.1. (System 1) The system associated with the theme is in parenthesis as (System 1). The results of the analysis and identified themes are organized by Research Question followed by a thematic analysis of the textual data to identify emerging themes. The researcher identified 11 themes for Research Question 1 and four themes for Research Question 2.

Demographic findings. Prior to the recorded interview, each participant self-completed a survey that profiled their age, gender, education, occupation, value of their investments in 2008, source of investments, investors' experience, risk tolerance, investment objectives, years of experience prior to 2008, advisor dependence, action taken during the financial crisis, and action taken after crisis (crisis period defined as between June 2008 to June 2009, Table 1, 2). Two females and 10 males were interviewed with ages in the year 2008 ranging from 42 to 84. Seven participants were over 71, three were between 50 and 55, while the youngest was 42. Six of the participants were retired while six were still gainfully employed. Five of interviewees graduated from high school, three graduated from college, and four earned advanced college degrees. Because the focus of this study is on the decision-making process of investors during the 2008 Financial Crisis, the researcher identified the investors' decision in parentheses (i.e. sold, reallocated, hold, bought) next to their pseudonyms. As presented in Table 2, during the crisis, three participants sold (Kellem, Kurt, and Zorro), three investors reallocated (Ann, Bria, Luigi), two investors held (Luke and Norm), and four investors bought (Chase, Rocky, Vincent, and Willie).

Table 1

Participant Profile

Name	Gender	Age-2008	Education	Investment Value 2008	Source of Investments	Advisor Dependent			
Ann	F	84	College	1.5-2m	Self	Yes			
Bria	F	76	High School	1-1.5m	Inheritance	Yes			
Chase	M	71	Grad. School	>2m	Self	No			
Kellem	M	55	High School	1-1.5m	Inheritance	Yes			
Kurt	M	50	Grad. School	1-1.5m	Self	Yes			
Luigi	M	73	High School	1.5-2m	Self	Yes			
Luke	M	74	College	1-1.5m	Self	Yes			
Norm	M	42	College	1-1.5m	Inheritance	Yes			
Rocky	M	55	Grad. School	>2m	Self	No			
Willie	M	78	High School	>2m	Self	No			
Vincent	M	71	High School	>2m	Self	No			
Zorro	M	53	Grad. School	1-1.5m	Self	Yes			

Table 2

Investor Self-Profile and Investment Decisions

Name	Investment Years Prior to 2008	Experience	Risk Tolerancce	Objective	June 2008-June 2009 Action	Date Invested in More Stocks			
Ann	50	B	G	K	Reallocated	2010 Feb			
Bria	35	B	G	K	Reallocated	2010 Mar			
Chase	50	C,D	H	L	Bought	2008 Mar			
Kellem	10	A	G	L	Sold	2010 Oct			
Kurt	15	B	G	L	Sold	2010 Oct			
Luigi	40	B	G	K	Reallocated	2010 Dec			
Luke	50	B	G	L	Held	2010 Dec			
Norm	15	B	G	L	Held	2010 Jan			
Rocky	30	C,D	H	L	Bought	2008 Oct			
Willie	50	D	G	K	Bought	2008 Oct			
Vincent	40	D	H	K	Bought	2008 Oct			
Zorro	10	D	G	L	Sold	2010 Oct			

Investor Experience Self-Profile:

A. I know very little of financial markets and market investments.
B. I have some understanding of financial markets and market investments, but generally rely on others to provide investment recommendations.
C. I have a good understanding of financial markets and market investments.
D. I am an experienced investor in financial markets and market investments.

Investor Risk Profile, Self-Profile:

E. Low Risk/Conservative
F. Moderately Low Risk/Moderately Conservative
G. Moderate Risk/Moderately Conservative
H. Moderately High Risk/Moderately Aggressive
I. High Risk/Aggressive

Investment Objectives, Self-Profile:

J. Current Income
K. Current Income/Capital Appreciation
L. Capital Appreciation

Examining the self-assessment profiling data, the researcher notes that one participant (Kellem) knew very little about investment, five interviewees (Ann, Bria, Kurt, Luigi, Luke, Norm and Zorro) stated they have some understanding of investments, two participants (Vincent, Willie) considered themselves as experienced investors, but not necessarily a good understanding of the fundamentals of investments, while two investors (Chase, Rocky) categorized themselves as having both good understanding of the fundamentals of investments and experience in the financial markets. Investor experience, as measured by the number of years holding a brokerage investment account, ranged from as little as 10 years to as long as 50 years. Additionally, examining the self-profiling data in Table 1, the researcher observed that four investors (Chase, Rocky, Vincent, Willy) did not rely on a financial advisor for advice whereas eight participants (Ann, Bria, Kellem, Kurt, Luigi, Luke, Norm, Zorro) were advisor- dependent.

Results of semi-structured interviews. To determine how and why investors yielded to either the *S1* or *S2*-axis of decision-making, the participants' answers to the Interview Guide questions help identify emerging themes. The Interview Guide contained seven questions in support of the two Research Questions. The seven-interview questions were designed with exploratory, opinion, and value type questions that could enhance the understanding of the opinions, judgments, perspectives, and values of the participants (Patton, 2002). Analyzing the transcription of the interviews identified emerging themes. Triangulation of the self-profile data, transcription of the interviews, and archived brokerage statements provided the answers to the two Research Questions discussed next.

Research Question 1(RQ1). How did investors yield to either System 1 or System 2-axis decision-making with extreme stress induced during the 2008 Financial Crisis? The first five Interview Guide questions focused on determining how investors arrived at their investment decision-making. Interview question # 1 was designed to interrogate the investor's past investment experience and along with their self-profile and assess each investor's investment experience prior to the 2008 Financial Crisis. The focus of interview question #1 was on how investors made decisions during normal and volatile market conditions prior to the 2008 Financial Crisis and the participants' responses follow.

Theme RQ1.1(System 2): ***Some Investors were advisor-dependent.*** As mentioned earlier, eight participants (Ann, Bria, Kellem, Kurt, Luigi, Luke, Norm, and Zorro) considered themselves as advisor-dependent. For example, as they faced market volatility such as the 2000 dotcom meltdown and the 911 terrorist attack, events that occurred prior to the 2008 Financial Crisis,

Ann (Reallocated) reacting to the 911 Terrorist Attack stated:

…I discussed things with my broker, and he gave me several ideas…

Kellem (Sold) added:

…I really didn't have any experience in moving stocks around… I found it best to use my brokers' advice since I'm inexperienced at investing or knowing where to put my money…

Kurt (Sold) commenting on the dotcom meltdown lamented:

… my experience was predominantly through one-firm and one adviser who I had trusted and basically relied on his advice…

The eight participants who were advisor-dependent ranged in investor experience from 11-50 years and level of education from high school to advanced college degrees. Only one participant (Kellem) self-profiled himself as knowing very little about financial markets and market investments. Seven investors (Ann, Bria, Kurt, Luigi, Luke, Norm, Zorro) seek advice from other people to provide recommendations for investments and self-assessed themselves as having some understanding of the financial markets and market investments. Finally, four investors did their own investment analysis and reached their own investment decisions without the use of a financial advisor. Age, years of investment experience, or education level did not seem to influence whether the investor relied on the advice of an advisor.

Theme RQ1.2 (System 2): ***Some investors made their own investment decisions, advisor-independent.*** Four of the 12 participants (Chase, Rocky, Vincent, Willie) considered themselves as advisor-independent; primarily making their own decisions after conducting their own research on stocks and the stock market. While Chase (Bought) stated dismissively, "I thereafter just invested in stocks and basically made my own decisions" and Willie declared "Ford stock was around $2 it went down to $1 and I have and I said to myself you know that will be a pretty good buy and I called-up (my broker) and bought myself 500 shares of Ford stock," Vincent (Bought) elaborated, "I started investing in 1959 and my first stocks that I purchased, I think it was in 1960's, was Pfizer and then Bristol-Myers because I thought they were two big companies that could only go up in value because the population keeps growing and growing and people are living longer." To demonstrate that some investors are very capable of transacting stocks expertly, Rocky acknowledged as follows,

Rocky (Bought):

> My decision-making, I try to be rational. I look at things like the number of analysts recommending the stock over time, the history of the stock price and its strengths, weaknesses, opportunities and threats to the company. If I think that it is a good investment, I'll keep it or buy it if I don't own it. If it's a bad investment, I sell it and cut my losses. Whenever I make a good investment, you know, I'm happy about it, I'm not ecstatic, but I'm pleased. Yet when I make a bad investment, I don't take it personal. I just cut my losses and move on to the next investment. When I am considering selling a stock, a losing stock, sometimes I have regrets from having made a bad decision by buying it in the first place. You know, I think, hey, if I screwed up, I shouldn't have bought it in the first place and maybe I did not do enough homework. Sometimes, after I sell a bad stock, I do feel some cognitive dissidence. I wonder if I'm making if I made another bad decision by selling it because maybe I sold it too soon, and it will bounce back in the near future.

Theme RQ1.3 (System 1or 2): ***In general, investors who knew little or have some understanding of investments expressed emotions during times of market volatility.*** Unfortunately, many investors allowed cognitive biases, particularly emotion, fear, and intuition to affect their decisions and reallocate their portfolio to investments perceived to be safer and some even sold their entire portfolio at fire-sale valuations. Kellem (Sold) reacting to the 911 Terrorist Attack recalled "I was shocked, and when I saw the stock market dropping rapidly after that occurred, I just felt I was afraid that I wasn't going to be able to control my funds anymore, and I was very nervous." Kurt (Sold) added, "after a couple of months went along I kept seeing the numbers drop and drop and drop. I got a little more nervous; a little more agitated, and just had an overall uneasy feeling."

Regarding the Dotcom crisis and the 911 Terrorist Attack, Zorro (Sold) elaborated,

Zorro (Bought):

> I was upset with him (broker) because I really, maybe, wanted to back-off a little bit but we didn't sell. I thought maybe it was unpatriotic to sell at that time, but I was scared, we stayed in…it was a real fearful time; we didn't know if we were

> under assault and I really thought–I really seriously considered just selling everything. I seriously considered selling everything at 911 and back in 2001 and I didn't. I didn't sell that night I kind of held on, but it was– when you worked so hard and try to put some money together, and you watch it just roller coaster up and down it really– sometimes it really gets in your gut, gets in your head.

Market volatility also affected those investors who reallocated or held. Bria recalled, "I was scared being alone and listening to the news was kind of depressing but and talking to my broker, things I was lucky I guess everything was all right. The 911 was a very scary thing for me and for everybody listening and seeing the news." Remembering the 911 Terrorist Attack, Luigi (Reallocated) added "…I know 911 when that happened I was upset, frustrated and almost to the point of being scared as to what was going to happen with my stocks… I was worried about what would happen with my portfolio and worrying (sic) about what I would do for my family at that time." Noteworthy comments were made by Norm, who appears to be excessively nervous with market volatility yet held his stock position no matter the market conditions. Norm admitted,

> ***Norm (Held):***
>
> … By nature, I'm a very emotional person…it's a touch tough when you're an emotional guy cause I'd want to pull out of the market every five minute and then I kick myself for not leaving the money in, so it's kind of a roller coaster that way… The emotional end of it just makes me want to pull the money out because that's the money–the way I look at it as the money I'm using (the money) is my family's money and not mine, so I'm spending my kid's inheritance, so I lose money in the market is like I'm taking food from my family's mouth and that just drives me crazy so I–that's the stressful part… I'm an emotional guy, so I tried to fight the emotions…

Theme RQ1.4 (System 2): ***Investors who are experienced and have a good understanding of investing viewed market volatility as possible buying opportunity for stocks.*** In the face of the volatile stock market period after the 911 Terrorist Attack,

while Chase was not influenced and expressed no concern about the market volatility, Rocky, Vincent, and Willie viewed the situation as possible buying opportunity. Commenting on the 911 Terrorist Attack, while Willie remarked, "In 911 when the market took a dip I decided to stay put (hold)," Rocky and Vincent viewed this market volatility as a more aggressive buying opportunity. For example,

> ***Chase (Bought) declared:***
>
> … so it really didn't impact me that much, so I never cared. It has just always been numbers to me–the money. I'm not a spender, so I don't care really how much money I have. So when it goes down, I don't get excited about it because it's just numbers. It doesn't have any impact on my life. It doesn't impact how I live.
>
> ***Rocky (Bought) opined:***
>
> I do not consider myself an emotional trader so while I was concerned with the market drop, I did not go into panic mode. If anything, I looked at the crisis as a buying opportunity.
>
> ***Vincent (Bought) added:***
>
> I heard the news on the market, and everything was starting to drop and I figured that was a buying opportunity then because I knew that things would start working themselves out. And I jumped in and bought quite a few more stocks and added to my stocks that I already owned. And you know when the market drops like that – to me it's a buying opportunity and that's why I like to buy (when the market is way down).

The next series of interview questions relate to the turmoil of the 2008 Financial Crisis. The focus of Interview Guide question #2, #3, and #4 explore, examine, and understand investors' perception in the beginning and in the midst of the crisis, particularly when the realized that their own portfolio suffered a devastating loss in value. The purpose of these questions was to focus on investors' perceptions of the financial crisis, how they felt, and how they processed the information to reach their decision to sell, reallocate, hold, or buy stocks. These questions provide the information that is

needed to answer Research Question 1. All participants became aware of the 2008 Financial Crisis through television news media, and some became very concerned when they confirmed what they heard after they viewed their brokerage statement (Kellem, Kurt). For example, Kellem stated: "…you'd hear it every night on the news, and more important than that, I saw my portfolio dropping every month that I received the (brokerage) statement…I saw it went down more and more and more…" and Kurt added: "…Now I had online access, so I could see my portfolio on a daily basis versus a monthly basis, and you know, it was quite apparent that something bad was happening in the market, and I was getting nervous again…"

All of the participants displayed reactions to this crisis similar to that experienced in prior market volatility. Eight of the 12 participants (Ann, Bria, Kellem, Kurt, Luigi, Luke, Norm, Zorro) expressed some form of nervousness, anxiety, worry, or fear throughout the crisis whereas four investors (Chase, Rocky, Vincent, Willie) accepted the circumstances and perceived an opportunity to invest in more stocks at depressed prices. When they learned that the financial crisis existed, Ann (Reallocated) and Luke (Held) expressed anger, Zorro (Sold) experienced both anger and fear, Kurt (Sold) was both angry and nervous while Keller (Sold) expressed nervousness. Comments by the participants are next. As the financial crisis extended in time, Bria (Reallocated) and Luigi (Reallocated) became more nervous and fearful while Norm (Held) remained extremely nervous and scared throughout the crisis.

Theme RQ1.5 (System 1): ***Some investors were worried and experienced nervousness because of the 2008 Financial Crisis.*** Six participants (Ann, Kellem, Kurt, Luigi, Luke, Norm) were worried or expressed nervousness when they learned about the

financial crisis. For example, Kellem (Sold) stated, "I was nervous, I was upset and I was uncertain about the future," while Kurt (Sold) lamented, "I didn't realize it was a crisis until Lehman Brothers went bankrupt. Early on in 2008 there was a lot of turmoil, the financial news stations that I watch on a nightly basis–they were kind of painting a gloom and doom scenario, and I was getting nervous again." Finally, Luigi summarized how many participants in this cohort felt,

Luigi (Reallocated) added:

> I was watching television at that time, and I saw the predicament that the state of the union was in and again worrying and being frustrated with the crisis…I was very nervous and upset that the banks were failing…

In addition to being nervous, some investors expressed fear such as Bria (Reallocated), Kellem (Sold), Kurt (Sold), Luigi (Reallocated), Norm (Held), and Zorro (Sold). Thus, the next theme relates to fear.

Theme RQ1.6 (System 1): ***Some investors were scared and experienced fear when they faced the 2008 Financial Crisis.*** For those that sold, Kellem (Sold) recalled, "I was fearful and insecure…I was afraid I could lose it all," Kurt (Sold) added, "I was just shocked when I found myself in this situation again," and Luigi (Reallocated) reminisced, "It was just alarming." Three of the participants, Bria (Reallocated), Norm (Held), and Zorro (Sold), made notable comments that follow:

Bria (Reallocated) expressed her concerns of healthcare and commented:

> It was very scary, and friends would talk about it and you just hope that you will be all right, and things would get better financially… I think a lot of it as you get older you start worrying about your (health)–the money that it takes (for healing) to be (when you are) sick. You don't want to be sick, but if you are, you will crack, man that's for sure

Norm (Held) continued his nervousness throughout the crisis and elaborated:

> I felt scared. That's pathetic but true. I did feel scared that I had significant monies in the market, and I was not longer in the driver's seat. That was very intimidating. You're stuck between wanting to pull it out or wanting to keep it in, so that's how I felt, scared…I was scared of the fact that I had money up there, and I didn't know what the future held.

Zorro (Sold) expressed his total negative feelings throughout the crisis and declared:

> … it was horrible… the brokerage firm (Lehman), it went out of business and then it's all hell broke loose. It was not a good time, it was a very scary time and I don't know if anyone called it a financial crisis when it was happening but it sure as hell felt like a crisis. You just saw it on the news, and my account kept going down, it wasn't fun.

In addition to the nervousness experienced by the eight of 12 participants, some expressed anger towards the loss in valuations and some cases, their brokers.

Theme RQ1.7 (System 1): ***Some investors experienced anger in addition to their nervousness and fear.*** Much to his chagrin, Kellem (Sold) concisely declared, "I was angry and my portfolio kept going down and I ~~I~~ just wanted to get out before I lost too much" and Luigi (Reallocated) resigned himself to market forces by expressing, "I was angry, but there was not much that I could do about it, or no one could do anything about it at that time." Kurt (Sold) and Zorro (Sold) experienced intense anger and lamented as follow,

Kurt (Sold):

> …I was nervous, obviously nervous. But I also felt angry as well. You know, angry that I said earlier I think (sic) here we go again. That kept resonating in my head, here we go again. How did we let this happen? How did we not see it coming, and how did we not plan better? So that is kind of how I was feeling… I was angry, and I was nervous…. So it was anger, more than nervousness because I was just shocked that I found myself in this situation again….But at the time of the sale I was more angry than anything…

In very strong feelings and words, Zorro bemoaned,

Zorro (Sold):

> …So that's why I felt scared, mad, depressed and angry and all these things… unfortunately, there is the emotion on the other side when you see what you've accumulated getting cut in half, then emotion plays a part on the dark side. Making (me) sell, and maybe I shouldn't have– but I was mad…Well, it was fear and mainly scared, anger was in there, but I didn't just sell because I was angry, I sold it because I was scared and fearful that whatever was left was going to go away…

Theme RQ1.8 (System 1): ***Some investors adopted a narrow view of the market and would have sold their portfolio immediately after realizing their portfolio values dropped drastically.*** Kellem sold at the beginning of the 2008 Financial Crisis in October 2008 whereas Kurt and Zorro sold in March 2009, when the stock market indicators went down a second time after the initial drop in October. Their comments follow,

Kellem (Sold):

> I was very nervous about it. I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have.

Kurt (Sold):

> The strongest factor was I just got burnt twice in my mind in the last several months. The market started rallying again from I guess those March lows, and I think I probably sold within a week of the low…I called my adviser, I said I need x amount of dollars back. I want out…

Zorro (Sold):

> ... if I could like when I opened up my statement on the weekend and saw how much I lost, if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker. It was a bad time; very, very scary, very bad time and it did feel–I kind of had a little glimpse in there–I wonder how he (it felt)–maybe I don't know if it was as bad in '30s (Great Depression), maybe it was worse, but it sure felt like we were getting there fast. So that's how I felt

Theme RQ1.9 (System 2): ***Some investors adopted a broad view of the stock market and expressed acceptance of the situation and viewed the 2008 Financial Crisis as a buying opportunity.*** Four investors (Chase, Rocky, Vincent, Willie) relished the crisis as an opportunity to buy more stocks at drastically reduced values. For example, Rocky (Bought) explained, "stock plummeted; I actually went out and bought some of its stock. It wasn't, you know, I didn't panic, but I saw it as a buying opportunity." Chase and Vincent agreed and commented,

Chase (Bought):

> I didn't need any money, you know, I had surplus funds and for that which the market value was diminished I had no reason to do anything. I could just watch it and did try to evaluate is my money better someplace else and, you know; the whole idea is that if the whole market is going down then my general reaction was if I was going to sell the stock, I wouldn't particularly buy another one because I thought it would go down less than the one I held. It would probably just go to cash. So I, you know, didn't have the feeling that I was going to run out of money, and I'll say, by the way, I don't know anybody who had that feeling, you know, at the time and I don't know what more I can say…in summary, my attitude has been to try to invest to get appreciation over time, but when I become uncertain about what to do or I think things may be turning down and I was contrary to my aims, I do nothing and to observe it (the market) rather than to react to it by acting, by selling because I learned that in my early investing about getting whipsawed and so what's the point of that and especially if you have to pay–depending on the commissions.

Vincent (Bought):

> … you heard like the world was coming to an end, and everybody was selling everything out. And I see the opportunity as long as they keep selling then I just waited to look out– that's far enough (drop) then I figured– well you are not going to see companies like General Electric go out of business and close their doors or Pfizer close the doors or International Paper all of a sudden stop making newspapers, I said (to myself) – so I got in and bought…

Other than the three participants that sold (Kellem, Kurt, Zorro), the remaining nine investors either reallocated, held or bought stocks as they had a long-term outlook on stocks and framed the crisis in broad terms, and expected the market to go back up.

Obviously, those investors who bought thought the market would go up. Therefore, only those five participants that reallocated (Ann, Bria, Luigi) or held (Luke, Norm) their stock positions are discussed in the next theme, RQ1.10.

Theme RQ1.10 (System 2): ***Some investors embraced a broad view of the stock market performance and viewed the 2008 Financial Crisis as blip in the upward trend of the stock market.*** While Ann opined, "I had a hunch, I'm going to stick with it. And with this, I hope to get out of whatever I lost and even make a little more ahead," Bria commented, "...you just hope you will be all right and things would get better financially… I was lucky enough to have some dividends and really appreciated them, they helped me financially and so I was one of the lucky ones I made out okay." Luigi thankfully recalled, "I was fortunate by now that I did not sell at the time because I felt it should be coming back… I had a little faith that it would come back, and that's why I did hold on to my stocks at that time as urged by my broker… I did expect that they (stock prices) would come back at some point." For the two investors that held, they articulated,

Luke (Held) declared:

> I decided to weather the storm; I did not want to sell stocks, and I just again hope things will turn around and will bounce back… optimistic about the market is going to turn around and eventually it will come back… I always felt in the old cliché– what rises falls and what falls rises, so I just again, weather the storm…So, I just held on and waited, waited and then the market finally bounced back, came back around…

Norm (Held) added:

> So I hung my hat in that philosophy and honestly for the most part it turned out okay, a few companies did fail on me, but over time they did bounce back to where they were the previous stature…I knew if I pulled out I would have some money, but I've lost money across the board, and I truly believed that if I stayed in the market it would bounce back…

In the midst of the 2008 Financial Crisis, even though investors experienced devastating losses in their stock portfolio, some investors' directed their anger at the officials of the U.S. Government as well as officials and management of Wall St. firms who may be influencing stock prices.

Theme RQ1.11 (System 1): ***Some investors expressed anger at those involved with the financial system.*** Those who were angry with those involved with the financial system included investors with diverse attributes. Kellem (Sold) expressed "No one seemed to have any faith in what was happening in the system" and Luigi added "… a big concern of mine that the government was providing money for the banks and some of the stock companies went under… I had a little faith in the government." Similarly, Kurt expressed lack of faith in the U.S. Government by stating, "**…**the government intervention, which at that point with the government stepping into– it seemed like save these big banks… There was a real big problem… I also felt maybe a little bit of lack of distrust in the whole system." Luke (Held) and Rocky (Bought) commented more directly at Officials of the U.S. Government and Wall St. by stating,

Luke (Held):

> …I had recognized there was a lot of insider trading, and I was–I became very pessimistic and angry about the near future, but optimistic about the market is going to turn around, and eventually it will come back, but in the meantime when there was too much of corruption going on in the market… I was angry in the sense that what I was seeing, what was happening nowadays and I will give you an example–Dodd-Frank Bill Legislation of Financial Institution— they were in collusion and nothing was being done to them, but it started making my anger. I was a little disappointed with what's the fellow's name, Obama. He had one of these other guys inside, and they weren't really financial men and I guess they were making money based on the insiders trading and I am sure there were a lot of them out there.

Rocky (Bought):

> I was somewhat upset with the government. It seemed that all these guys did was spend time blaming the other political party. Personally, I feel that Alan Greenspan, he bears tremendous responsibility for the financial crisis. It was during his tenure that no money down, no income verification, mortgages were done. He saw the crisis coming and sure enough, he stepped down just before it happened…

Ann (Reallocated) anger was towards officials of Wall St. Firms and corporations as she lamented,

> ***Ann (Reallocated)*:**
>
> …if that is going on for me, the same thing is going on for people on the outside, especially with the big men in business (Wall St.), manufacturing (Corporations)… I was annoyed not because I had lost that kind of money, but the fact that the big shots were out there, they've seen this coming… they allowed it to happen, and the poor people are the ones that are suffering. The big shots can get along; they've got a cushion. That's what makes them in that position…

Rather than assail officials of the U.S. Government and Wall St., two participants (Chase, Norm) made positive comments concerning them. Chase suggested, "The US government did a reasonable job of dealing with this crisis…I had 100% confidence" and Norm added, "…but losing any money is an embarrassment and blaming somebody else for that is kind of a cop-out, so that's how I feel about the whole thing."

Research Question 2 (RQ2): Why did investors yield to either System 1 or System 2-axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis? The last two Interview Guide questions focus on why investors yielded made their decisions in the face of the 2008 Financial Crisis. These questions address why investors feel in terms of emotions such as fear, disgust, anger regret, or envy in their decision-making process. Unfortunately, many investors allowed cognitive biases, particularly emotion, fear, and intuition to affect their decisions and reallocate

their portfolio to investments perceived to be safer and some even sold their entire portfolio at fire-sale valuations.

Theme RQ2.1 (System 1): ***Some investors framed the stock market in a narrow view referred to as myopic loss aversion and sold their stocks during the 2008 Financial Crisis to protect what value that remained.*** The main factor that drove the participants (Kellem, Kurt, Zorro) to sell was to preserve the value of what they had. They had neither assurance that the valuations would not go lower nor when they would go higher. Despite the pleadings from their broker to not sell, Kellem, Kurt, and Zorro, under uncertainty of the future direction of the market and unprecedented stock market volatility, they chose to sell their stock positions and either purchased bonds or money market cash. The comments of Kellem, Kurt, and Zorro follow,

> ***Kellem (Sold):***
>
> I just wanted to protect what I had left because I was afraid that I could lose it all… I wanted to protect what was left because I was afraid that I could lose everything I had. I was nervous I was angry, and my portfolio kept going down and I just wanted to get out before I lost too much because it was the majority of my retirement plan and investment… I was very nervous about it…I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have.
>
> ***Kurt (Sold):***
>
> … in ’08, I had the conversations a lot with my adviser, and he taught me how to sell, and at first I was thankful because the government got involved, the markets went up, the beginning of ’09 came on, and my portfolio looked as though it was getting better. It started growing again and then I– at first I was, you know, relieved, happy, you know, he talked me out of selling at the bottom. I felt a little more comfortable, then March I think it was of ’09, here we go again.… I just got burnt twice in my mind in the last several months. The market started rallying again from I guess those March lows, and I think I probably sold within a week of the low…I called my adviser, I said I need x amount of dollars back. I want out, and that is–that is kind of the overriding factor that made me sell… I didn’t sell in September when the market was higher and, you know; here we are again a few months later in the same position. I am going to need to preserve what I have.

Zorro (Sold):

> …So I asked him (to), I made him do it so – because he wasn't going to do anything. Okay, by the way, if I could, if I could like when I opened up my statement on the weekend and saw how much I lost if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker. It was bad time; very, very scary, very bad time and it did feel. I kind of had a little glimpse in there– I wonder how he (it felt) – may I don't know if it was as bad in '30s (Great Depression), maybe it was worse but it sure felt like we were getting there fast… when you see what you've accumulated getting cut in half, then emotion plays a part on the dark side. Making (me) sell, and maybe I shouldn't have– but I was mad… I sold it because I was scared and fearful that whatever was left was going to go away. So that was the dominant factor to sell, and I moved some money to bonds at that time, so trying to make things more conservative…

Theme RQ2.2 (System 2): ***Some investors adopted a broad view of the stock market performance and reallocated their portfolio because they expected the market to rebound but did not know where or when the bottom would be reached.*** Although some investors had a long-term outlook on the market, the volatility caused them to be nervous. Because of the uncertainty of the future market direction and not knowing whether the stock market would go lower and how much, Ann, Bria, and Luigi adhered to their broker's advice, sold some of their stock positions, and reallocated into bonds and cash. The comments of Ann, Bria, and Luigi are as follow,

Ann (Reallocated):

> I didn't worry about my money even though I didn't like the idea of losing it because I worked hard to get it…I had a hunch. I'm going to stick with it. And with this, I hope to get out (break even) of whatever I lost and even make a little more ahead… I buy; I sell, I balance out…I decided to sell because things appeared to be going upward. And I'm sure we'll make out all right

Bria (Reallocated):

> ...well, depression again like 1929 which my parents lived through so I guess I could do it too. They did make them scared… But I was lucky hung in there… just hoped you will be alright, and things would get better financially…I was

> lucky enough to have some dividends and really appreciated them, they helped me financially and so I was one of the lucky ones, I made out okay.
>
> ***Luigi (Reallocated):***
>
> I was fortunate by now that I did not sell at the time because I felt it should be coming back…I held on to them, my stocks because I did expect that they would come back at some point.

Theme RQ2.3 (System 2): ***Some investors embraced a broad view of stock market performance and held or bought stocks because they expect the market to rebound and believed that stock were at good value.*** This cohort of investors had a long-term outlook for stocks and framed the volatile situation with a broad view. For this reason, even though they did not know whether the stock market would go lower, they believed that the market would ultimately revert upwards and for those who thought valuations were good, they bought stocks. Luke was always optimistic about his investments and declared, "I am very optimistic about the market. I always felt in the old cliché– what rises falls and what falls rises, so I just again weathered the storm… So, I just held on and waited, waited and then the market finally bounced back, came back around" and Norm added "I knew if I pulled out I would have some money, but (would have) lost money across the board and I truly believed that if I stayed in the market, it would bounce back… When (If) I cashed it in, it was done...So I believed if I held on to it, it would bounce back and for most case I was right." In hindsight, buying during the 2008 Financial Crisis was the wise strategy. While both Chase and Rocky had advanced college degrees and had a good understanding of stocks and stock market underpinnings as well experience, Vincent and Willie had years of experience ~~and~~ but not an in-depth understanding of stocks or the stock market underpinnings. It is noteworthy that regardless of investor attributes, the key to their decision-making to buy stocks during the

crisis was their stock market experience. For the four participants (Chase, Rocky, Vincent, Willie) who purchased stock during this crisis period, they were extremely happy and made the following comments,

Chase (Bought):

I think didn't think the stock market would make V-bottom; I did, and so that was one thing that held me back from investing as the market went down and then started going back up I didn't believe it and so this whole time I look at it more as a challenge rather than something that's distressing…I didn't need any money, you know, I had surplus funds and for that which the market value was diminished I had no reason to do anything. I could just watch it and did try to evaluate is my money better someplace else and, you know; the whole idea is that if the whole market is going down then my general reaction was if I was going to sell the stock, I wouldn't particularly buy another one because I thought it would go down less than the one I held… so I think I've always had a low standard of living compared to my income and the assets I have, so there is no threat to that by having less money… in summary that my attitude has been to try to invest to get appreciation over time, but when I become uncertain about what to do, or I think things may be turning down and I was contrary to my aims, I do nothing and to observe it rather than to react to it by acting, by selling because I learnt that in my early investing about getting whipsawed and so what's the point of that and especially if you have to pay – depending on the commissions

Rocky (Bought):

I'm not a panicky kind of guy. I like to take advantage of opportunities, you know, a guy like Warren Buffet buys stuff when it's cheap. So to some extent, I buy when everyone is selling and I sell when everybody is buying. I try to be analytical and rational in my decision making that is before making a decision I research the stock…, I'm analytical and based on the findings of my research, I make a decision. Thus, I'm rational… I expected the market to come back…

Vincent (Bought):

I just had this strong feeling that US businesses or businesses I mean they run the world. And they are not going to close the door and fold up. And I just figured what opportunity can you get to buy… it was to me it was an opportunity because you are investing in businesses that have been around for years, you know, and they are solid companies. I mean, and that was a good opportunity and so I just felt that was a time to jump in and buy… Yeah, I was excited about buying because I knew it was going to come back, and I figured this was an opportunity, you know, that may come to me now; my age maybe this once you know.

Willie (Bought):

> When the market took a nose dive, I was interested in buying. My stocks paid a good dividend, the quality stocks I bought year after year or once in a great while and I kept them because I wanted the dividend because I lived off my dividends. Therefore, I did not have to sell my stocks because I was getting a good return on my money (dividends), and I kept them they've done very well over the years… And I'm happy with the market because it came back. When I was buying stocks, I notice the market was down, there was a good chance to buy these stocks cheaper…I stay with the more reasonable stocks, so I did quite well. The strongest factor (for buying stocks) was that my stocks paid a good dividend, and they pay very well, now I'm very happy that I stay with the portfolio that I have... If there is a crisis in the market, and it goes down, I look at my dividends and I'm happy with my dividends and I have a chance to buy stocks at a lower price and I look around and sometimes I buy, sometimes I don't buy, but when I buy I buy quality stocks.

Theme RQ2. 4 (System 2): ***Some investors had sufficient cash flow to meet their immediate needs and had no necessity to sell their stock portfolio.*** All of the participants in this research study had no immediate need for any distributions from their investments. They were either gainfully employed or they were retired and using the cash flow such as dividends and interests from their investments to meet their retirement living and goals. Only Norm needed some monies for his children's college education, 12 years hence from the 2008 Financial Crisis, although he had some monies set aside already. Also, both Kurt and Zorro were at least over ten years from retirement before needing to withdraw any monies from their investments.

For those who sold and were not retired, Kellem (Sold) stated, "…it (portfolio) was the majority of my retirement planning.., " Kurt expressed, "...I was maybe 10 to 12 years away from retirement.., " and Zorro (Sold) exclaimed, "…growing money to buy something down the road to buy my place (retirement home) in Florida…" Contrarily, Norm (Held) who had some monies set aside for his children's college education (12 years hence) and over 20 years from retirement lamented, "…I figured I had enough time

to recoup, so owning stock as long as you didn't cash it in; it was just a number. When I cashed it in it was done. So I believed if I held on to it, it would bounce back and for most case I was right…" For others who were not retired and added stocks to their portfolio and had a well-diversified portfolio,

Chase (Bought):

> … I lost by 70 or 100 grand on that, but that was just a small fraction of my total net worth, I mean, it maybe 20% of that stock account or something like that, but it isn't, you know, you're unhappy because of the absolute numbers, but it's not – my total investment portfolio which I call the money that I have in cash available for investment... and so since I was still earning income and since my cash investments weren't impacted I felt that everything was going to be okay… So I, didn't have the feeling that I was going to run out of money…

Rocky:

> I had a relatively conservative portfolio…You know, after the crisis, I had a job and, you know, I wasn't in danger of losing my house or anything like that and I didn't have any unexpected expenses, you know, like I – because of my job, I had family coverage and health insurance. But if I sold a stock, it was because I felt that it was a loser stock or that it had no growth opportunity. From all the crises that I experienced over time, I learned not to panic. But, you know, overall I'm not a panicky kind of guy. I like to take advantage of opportunities…

For those participants who were retired, Luke (Held) stated, "…I not really need the money..," Ann (Reallocated) stated, "…if I sold, did I need the money? Not really. If I sold, I still had a small nest egg to compensate and to live on.., "and Bria (Reallocated) declared, "…I was lucky enough to have some dividends and really appreciated them, they helped me financially and so I was one of the lucky ones I made out okay… how you are going to live and because you do count on your investments and your dividends, and all you were fortunate enough to have." Remarkably, Luigi was not concerned about caring for himself but more interested in paying for his grandchildren's college education as he stated, "…what I would do for my family at that time…I was worried about mostly

my family–giving money to my grandchildren and for their college education and trying to get a better standard of living for them–but I did survive it, and I think I did help my kids and my family and grandkids to very, to having a fairly easy time of this crisis…"

Notable comments were made by two retired participants, who relied on living on the dividends from stocks that they owned,

Vincent(Bought):

> … I think there was no reason that I needed to sell it. I didn't need the money to sell and put it somewhere, and I knew it was going to come back in just a matter of time and I figured well, hey I'm healthy enough I could outwait this– you know, and it eventually will come back… I mean, and that was a good opportunity and so I just felt that was a time to jump in and buy for my daughter and my son and my grandkids and at that low price. I said, you know, how many times does that come around in your lifetime. Yeah, I was excited about buying dividend stocks because I knew it was going to come back, and I figured this was an opportunity, you know that may come to me now, my age maybe this once you know…

Willie (Bought):

> … sometimes the market goes down then down and then down and you wonder if it's going to come back and slowly climb back and then like taking a drop off then comes back and it slowly comes back to where it should be. And if you sell the stock, then you have to look around another stock to buy, and you might find something that is good, maybe you find something might be better, but I just stayed in there and picked up my dividends because I live off my dividends… I just stay with the stock and see what happen, and I knew it was – it's sad that the market went down that much but it came back, so I'm very happy the market came back… The strongest factor was that my stocks paid a good dividend, and they pay very well now I'm very happy that I stay with the portfolio that I have. I have quite few stocks and over the years they've done quite nicely…When the market took a nose dive, I was interested in buying. My stocks paid a good dividend, the quality stocks I bought year after year or once in a great while and I kept them because I wanted the dividend because I lived off my dividends. Therefore, I did not have to sell my stocks because I was getting a good return on my money (dividends), and I kept them they've done very well over the years.

Thematic Analysis of the Textual Data Set

The researcher identified a number of themes that were common in the answers to the questions established in the Interview Guide. The use of thematic analysis identified themes, patterns, ideas, or meaning contained in the transcription of interviews (Yin, 2009). Moreover, the application of thematic analysis provided a more detailed and nuanced explication of the various themes within the data (Stake, 2013). Based on the analysis of the participants' recurrence, repetition, and forcefulness of their words and phrases expressed during the interview, the researcher identified common themes that aligned with the theoretical framework and relevant literature (Stake, 2013).

When faced with the financial crisis that leads to severe loss in portfolio valuations, analysis of the interview data suggested that the overarching theme is myopic loss aversion (Benartzi & Thaler, 1995; Hardin & Looney, 2012; Kahneman & Tversky, 1979). During this crisis period, some investors experienced cognitive biases such as nervousness, anxiety, and even fear and anger as they unwittingly framed a narrow view of stock market performance. Other investors viewed the 2008 Financial Crisis as blip in the historical upward trend of the stock market and accepted the crisis while some even viewed the crisis as a buying opportunity–to add to their stock portfolio as they embraced a longer view of the stock market performance.

Loss aversion is a decision-making bias and is part of the prospect theory framework developed by Kahneman and Tversky (1979) who posit that people consider losses more heavily than gains of equal magnitude. This attitude towards the weight of losses is what often drives investors to sell during periods of extreme market volatility. As an extension of prospect theory framework, an integral part of loss aversion is mental

accounting and framing. Mental accounting refers to the manner in which people frame decision problems (Thaler, 1985; Thaler & Johnson, 1990). Framing of information is an important factor in investment decision-making. Kahneman and Tversky (1979) posited that the reference point of observation of data and information could shift in such a way that a gain could appear as a loss, or a loss could appear as a gain. For example, two investors (Kurt, Zorro) did not sell at the onset (October 2008) of the 2008 Financial Crisis but towards the end (March 2009) finally sold, as they framed their losses and gains during this market volatility period. Importantly, the three participants (Kellem, Kurt, Zorro) who sold stocks preserved whatever value of monies that remained as they adopted a narrow frame of the stock market performance. Contrarily, the investors who reallocated, held, or bought stocks embraced a broad frame of stock market performance as they considered the volatile performance due to the financial crisis as a blip in the long-term upward trend of the stock market performance.

Another important factor that could influence investment decisions is stock market literacy (Bucher-Koenen & Aiegelmeyer, 2011; Klapper, Lusardi, & Panos, 2012; Lusardi & Mitchell, 2011; Seo & Illes, 2009). The four investors (Chase, Rocky, Vincent, Willie) who bought stocks during the crisis, self-profiled themselves as either having a good understanding of the stock market or as experienced stock market investors or both and made their own investment decisions and considered themselves as advisor-independent. Contrarily, the remaining eight investors who either sold or reallocated indicated they had some understanding of the stock market investments or little experience, and all were advisor-dependent. Furthermore, experienced investors (self-profile) and stock market literacy (good understanding of stocks and stock market)

could mediate investors' decision-making during the 2008 Financial Crisis. Notably, the three investors who sold (Kellem, Kurt, Zorro) ultimately disregarded their financial advisor's advice and sold all of their stocks during the 2008 Financial Crisis.

Emotion regulation (Gross, 2014; Gross & John, 2003) is another recurring theme demonstrated by investors during of the 2008 Financial Crisis potentially to avoid yielding to the biases of anxiety and fear of some investors (those who reallocated, held or bought stocks). Whereas those investors who sold immediately exercised little to no emotional regulation despite efforts from their financial advisor to hold on to their stocks, those investors who reallocated or held their stock portfolio applied emotional regulation, albeit through advice from their financial advisor. For those who bought stock and were either experienced investors or had a good understanding of the stock market, they practiced self-emotion regulation.

This analysis revealed numerous themes that align with the Research Questions: how and why investors yielded to *System 1*or *System 2* –axis when faced with the 2008 Financial Crisis. Analysis of the data showed that those investors who sold immediately, likely yielded to the cognitive biases of nervousness, anxiety and fear, all characteristic of *System 1* –axis quick decisions. Contrarily, investors who reallocated, held, or bought stocks, yielded to more deliberative and analytical information processing, characteristic of *System* 2-axis decisions. The use of emotion regulation, whether by a third party such as a financial advisor or self-regulation could mediate the influence of cognitive biases; thus, permitting investors to move from the quick *System 1* to more the deliberative *System 2*-information processing.

However, investors who sold stocks during the financial crisis do not necessarily indicate that the investors' neither experienced cognitive biases nor yielded to *System* 1-information processing. Such investors could have deliberated (*System* 2, information processing) and reached the decision to sell, which they would consider satisfactory–bounded rationality and the construct satisficing could be the reason. Bounded rationality is a description of decision-makers inability to react rationally because of their cognitive limitations to know all available information (Simon, 1956). Because people lack complete knowledge, they lack the cognitive resources to optimize. Simon (1956) argued that people embrace satisficing when making decisions as they search through the available alternative choices until an acceptable rather than optimal decision is reached.

A key to processing information is to control the constructs that may influence the processing of information such as cognitive biases and stock market literacy. For example, developing stock market literacy and accumulating sound stock market experience could mediate nervousness, anxiety, and fear when faced with stock market volatility. Significantly, complying with advice of professional financial advisors could help mediate an investor's emotion such that any cognitive biases could be overcome by extending their stock market view from a near-term narrow view to a broader outlook. This analysis of investor behavior helps to answer the Research Questions: how and why did investors yield to either *System 1* or *System* 2-axis processing of information for decision-making during the 2008 Financial Crisis.

Evaluation of Findings

Findings including common themes from this research study coupled with insights gleaned from the extant research studies provide the foundation for answering

the two research questions of this study: How and why did investors yield to either *System 1*or *System 2*-axis decision making during the 2008 Financial Crisis. The evaluation of the findings will proceed first with a discussion of this researcher's proposed three phases of the decision-making process: foundations, determinants, and information processing. This discussion includes such topics as *stock market literacy*, risk-profiles, cognitive biases, loss aversion, emotion regulation, the importance of time variance and information processing. Next, Epstein's Cognitive Experiential Self-Theory (CEST) model will be the theoretical framework used to evaluate the findings of this research. Included in this section is a proposed two-dimensional framework for information processing, and closes with a general discussion on dual process theories with respect to Epstein's CEST model. Lastly, the two-research questions are answered.

Decision-making process. A decision is a choice of action—of what to do or not to do (Baron, 2008). The basis for decisions is goals based on beliefs that such actions will achieve the goals. Understanding the decision-making process of investor is enhanced by findings in research studies in the behavioral sciences, which rely on the knowledge of economics, finance, and cognitive psychology. Scholars studying behavioral finance have found evidence that the decision-making process could be activated by cognitive illusions, heuristics, and cognitive biases that could lead to misinformed investment decisions (Zindel, Zindel, & Quirno, 2014). Traditional classical economic and financial models are unable to explain a number of anomalies observed in the financial markets. Hirshleifer (2014) contended that the emergence of behavioral finance over the past three decades have challenged scholars to deliberate on the consequences of both the rational and irrational aspects of human judgment

The factors that influence the decision-process and choices of action that an investor faced during the 2008 Financial Crisis is represented in a flowchart format (Figure 1). Three phases describe the decision-making process for investors: Phase I–Foundations–consisting of investors' stock market literacy and risk profile; Phase II–Determinants–consisting of investors' cognitive biases and emotion regulation; and Phase III–Information Processing-consisting of the investors' action on all of their acquired information and cognitive activity leading to the decision as illustrated in Figure 1. This researcher will discuss factors that influence investment decision-making process next.

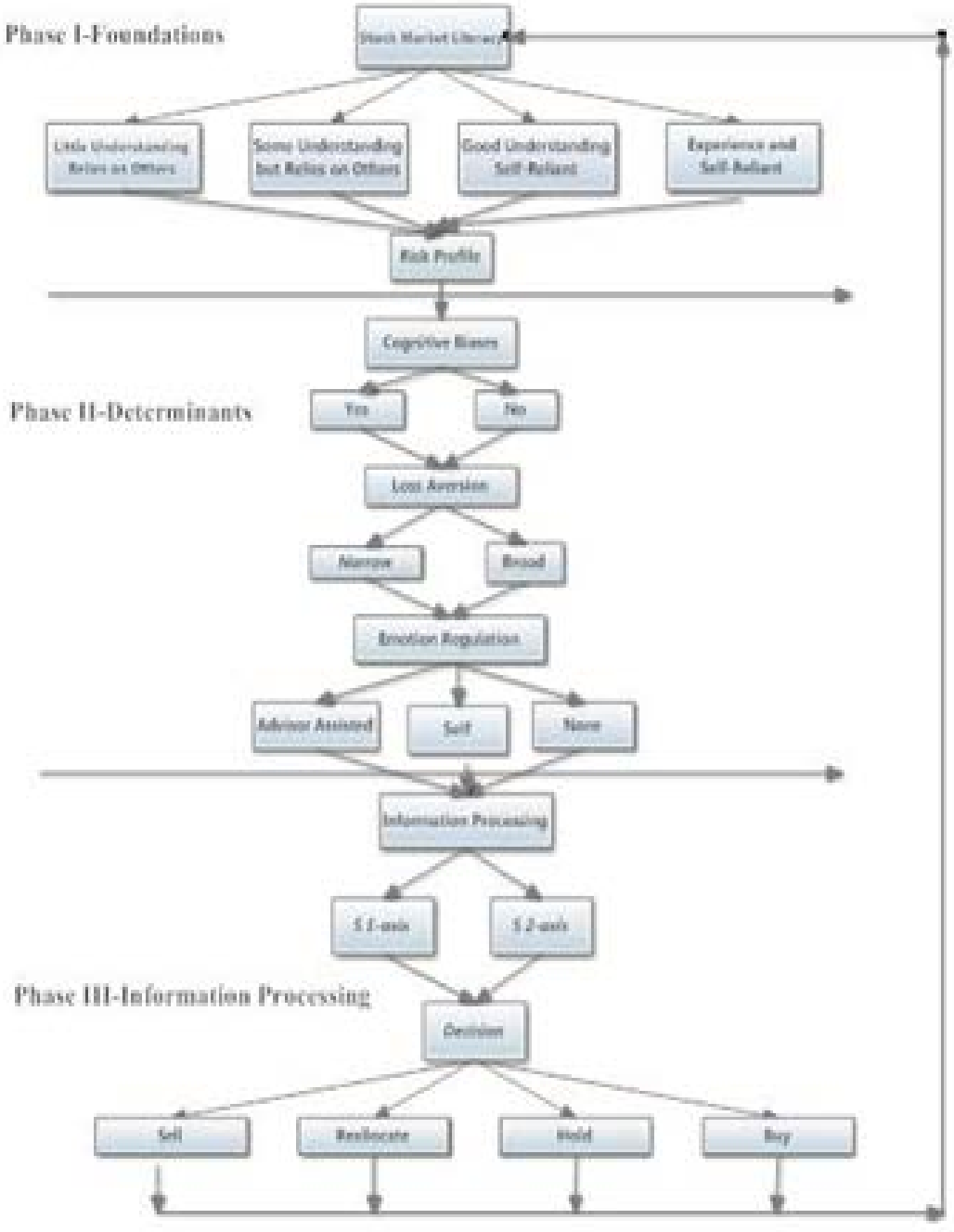
Phase I-Foundations. The investors' decision-making process is based on what the investors need to know to invest their monies. Thus, investors commonly will seek to learn about the fundamentals of investing themselves or trust a third party such as a relative or financial advisor to guide their investment decisions. Because investing in stocks does not guarantee the principal value invested, investors' literacy and risk profile are critical and considered foundations for investment decisions.

Stock market literacy. Greater financial literacy helps investors overcome the effects of unexpected and devastating macroeconomic shocks (Klapper, Lusardi, & Panos, 2012). Researchers have shown that good financial behavior are positively correlated with higher levels of financial knowledge (Edmiston & Gilet-Fisher, 2006) and financial education and experience positively influence financial knowledge and behavior (Lyons, Palmer, Jayaratne, & Scherpf, 2006). In a more recent studies, Bucher-Koenen and Ziegelmeyer (2011) concluded that investors in Germany, who displayed poor financial literacy and poor cognitive ability, tended to sell their assets at losses during the 2008 Financial Crisis; an observation also observed by Calvet et al. (2009) for investors

in Sweden. Importantly, large segments of the U.S. population have low levels of financial literacy (Hung, Parker, & Young, 2009).

Figure 1

Decision-making Process



While many studies on financial literacy focused on peoples' numeracy skills (Banks & Oldfield, 2007, Banks, O'Dea, & Oldfield, 2010)and general knowledge such as IQ (Grinblatt, Keloharju, & Linnainmaa, 2011), Hung et al. (2009) argue that there could be benefits to evaluate the specificity of other factors affecting literacy. Most surveys try to assess the ability to understand basic economic/financial principles and simplistic functions of the most common financial asset by means of tests such as interest rate calculations. Some studies focus on specific aspects of financial behavior such as Lyons et al. (2007) on credit literacy, Lusardi and Tufano (2009) on debt literacy, Guiso and Jappelli (2008) on risk of portfolio diversification, and Noth and Puhan (2009) on mutual funds' fees. Another study covered topics ranging from interest rates and inflation as well as the difference between stocks and bonds and the benefits of risk diversification (van Rooij et al., 2011). Importantly, according to Korniotis and Kumar (2013), although intelligence should be correlated with success in financial decision, directly establishing this link is difficult because of the unavailability of data sets that contain both measures of cognition and financial performance. A comprehensive review of studies on financial literacy has been provided by other researchers (Hung et al., 2009; Remund, 2010). However, to this researcher's best knowledge, no studies have been conducted that specifically focuses on the investor's personalized literacy of stocks and the stock market underpinnings; this researcher will refer to this as *stock market literacy*. A definition of stock market literacy that is based on a comprehensive study is beyond the scope of this research study. For this reason, a subjective definition of stock market literacy will be based on the researcher's triangulation analysis of all the data collected in

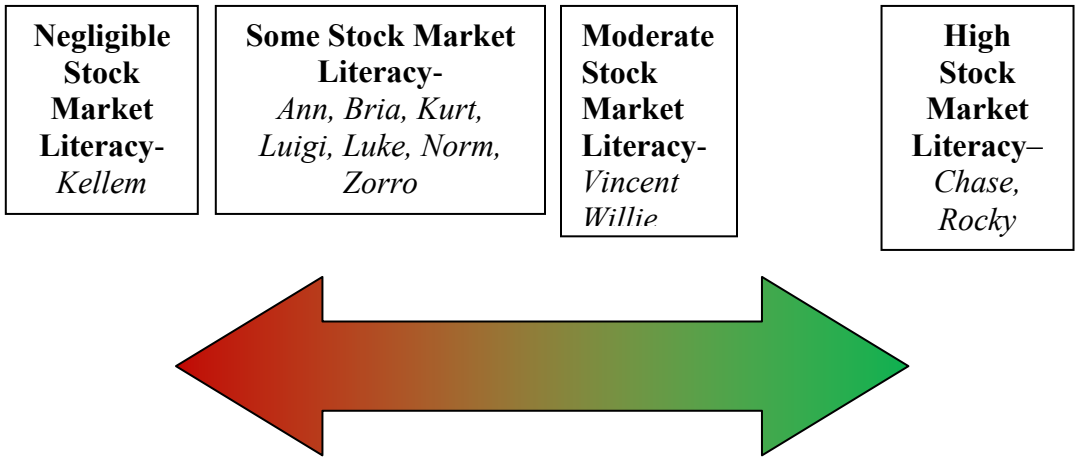
this research study including self-profiling data, interview conversations and investment brokerage statements. This researcher defines *stock market literacy* as the knowledge and understanding that a retail investor has on the fundamental accounting data of individual stocks and the stock market underpinnings' and factors that cause stocks and the stock market valuation to change with emphasis on the investor's goals and investment time horizon.

The action of the participants in this research is allocated into four categories: sellers, reallocaters, holders, and buyers (Table 2). The self-profiling of investor experience provides representation of each of the investor's position on the continuum of *stock market literacy* ranging from low to high (Figure 2). The findings revealed that Kellem (Sold) self-profiled himself as knowing very little about financial markets and market investments (Table 2), which is the likely driving force that caused him to sell at the onset of the 2008 Financial Crisis. Kellem's self-profiling confirmed his inexperience as he expressed "Well, prior to 2008 my investment experience was my 401K at work, and that I pretty much had invested in one way and left it alone. So I really didn't have any experience in moving stocks around. I just purchased mainly my company stock and a little bit of a balance fund then I let that ride. I found it best to use my brokers' advice since I'm inexperienced at investing or knowing where to put my money." Thus, Kellem's words and his actions during the 2008 Financial Crisis would place him in the negligible *stock market literacy* category even though he has ten years of experience of investing and also advisor dependent (Theme RQ1.1) as shown in Figure 2.

Contrarily to Kellem's literacy, investors (Chase, Rocky, Vincent, Willie) who bought stock are on the opposite high-end of *stock market literacy* continuum.

Figure 2

Continuum of Subjective Stock Market Literacy



Stock market literacy is defined as the knowledge and understanding that a retail investor has on the fundamental accounting data of individual stocks and the stock market underpinnings and factors that cause stocks and stock market valuation to change with emphasis on the investor's goals and investment time horizon. Stock market literacy is determined by triangulation of investor's self-profiling data, semi-structured interview data, and brokerage statements.

Both Chase and Rocky have graduate degrees and appear to have a good understanding of stocks and stock market underpinnings. For example, Chase demonstrated his knowledge and understanding of the factors that affect the stock market as he discusses the influence of inflation, "…In June, I had conversations with stock brokers about whether we're going to have a collapse and I concluded we're not likely to have a collapse and it was just a question of what do we have to start protecting against

inflation…I've seen inflation, and I've always been aware that a government uses inflation to pay down and take care of the debtors and so you don't want to be a debtor and so it's just a question; but then there is the question of whether we're going to get deflation…" Furthermore, on stock market underpinning, Chase elaborated, "…that the other thing I watched was VIX (a measure of stock market volatility based on trading of the index options representing the S&P 500 Index)…the stock market would go down 700 points or up 500 points…very jumpy and I know from Elliott Wave Theory…things I've always remembered that, in studying the Elliott Wave Theory that the market when it gets near the top– is very jumpy and so when I see this jumpiness, you know; things are screwed up…" Chase clearly demonstrated that he not only has a good understanding of stocks and stock market underpinnings and factors that affect stock market valuations, but he also is an experienced investor with 50 years of experience and thus, he has high *stock market literacy* (Figure 2).

With knowledge and understanding of stocks similar to that of Chase, Rocky demonstrated his understanding of stocks, "…I spend two or three hours online researching a stock. In some cases, I spoke to my stockbroker to ask for his opinion. For example, I used to own Dell and in Dell stock. When Apple introduced the iPad, Dell stocks came down. I went online and did some research on Dell and computers in general. My research indicated that, you know; fewer Dell stocks were being sold because people were migrating to laptops because they were more practical and fewer laptops were being sold because people were migrating to iPads. At the same time, Lenovo was growing into a formidable competitor to Dell. So I sold my Dell stock…" Furthermore, Rocky demonstrated his understanding of factors that influence the stock

market and its underpinnings as he elaborated "… I had anticipated the crisis. You know; my biggest worry before the crisis was the double digit appreciation of the real estate market, I mean real estate was just up, up, up,…people buying houses with no money down and no verification of income…It reminded me of the savings and loan fiasco of the 70s when everyone and his brother was buying a condominium or a second home to rent. I saw a real estate bubble building, and I knew the real estate prices could not continue at the rates that they were increasing every year…I knew that it was not a matter of 'if', but a matter of 'when' the real estate bubble will burst. And secondly, when the (real estate) bubble burst, I expected the entire (stock) market to be affected. Housing events is a very important sector in our economy, and it reaches into many other sectors like construction, banking, chemicals, insurance, et cetera and thus, stocks…" Clearly, Rocky, with 30 years of experience in investing in stocks and bonds, displays high *stock market literacy* (Figure 2). Notably, both Chase and Rocky self-profiled themselves as not only having good understanding of financial markets and market investments, but also as experienced investors and viewed the 2008 Financial Crisis as a buying opportunity (Table 2). Importantly, Chase and Rocky did not display any cognitive biases such as nervousness, anxiety, or fear during the crisis as they rationally analyzed stocks and the stock market in search for opportunities to add stocks to their investment portfolio and thus, categorized as having high stock market literacy (Figure 2).

Both Vincent's and Willie's knowledge and understanding of the fundamentals of stocks or factors that influence the stock market is not nearly as extensive as compared to that of both Chase and Rocky. At no time during the researcher's conversations and interviews did either of them demonstrate their knowledge of the fundamentals of

investing in stocks by mentioning any accounting or economic parameters that could influence the valuations of stocks or stock market. For this reason, the researcher position both Vincent and Willie as having moderate *stock market literacy.* Vincent and Willie investing success are primarily due to their many years of experience. *Stock market literacy* could be developed from learning experience, which is discussed next.

Some scholars have examined investors' learning experiences. For example, commenting on investors' learning ability, Nicolosi, Peng, and Zhu (2009) argued that the learning process that exists within a real market setting with potentially semi-rational investors is not well understood. From a theoretical perspective, Gervais and Odean (2001) posited a multi-period market model that describes how stock traders learn about their ability; however, during this learning process, the trader can develop the bias of overconfidence from the outcomes of successful and failure trades. The model specifies that the traders initially do not know their ability and only learn about their ability through experience. Importantly, the model describes how investors could learn about their private signals' precision through a mechanism more complex than that from the traditional economic assumption of Bayesian updating. In discussing the applications of Gervais and Odean's (2001) theoretical model, Nicolosi et al. (2009) contended that results of some of these past studies have demonstrated that some investors improved their investing performance with increasing experience in trading and in some cases, eliminated some cognitive biases such as disposition effect and endowment effect (Chaing, Hirshleifer, Qian, & Sherman, 2011; Feng &Seasholes, 2005; List, 2011; Seru, Shumway, & Stoffman, 2010). However, based upon laboratory experiments, other researchers suggested that effective learning from experience are at best mixed, and in

fact investors' could take a long time or may not be able to effectively eliminate behavioral biases (Knetsch & Sninden, 1984; Camerer & Hogarth, 1999). Importantly, Nicolosi et al. (2009) argued that laboratory tests fail to capture accurate investor behavior when significant wealth is at stake because the participants deal with relatively simplistic signals and tasks in a laboratory environment thus, concluded that studies of investors in a real market environment could provide a more accurate assessment of investor performance. Because increased experience allows more accurate ability inference, Nicolosi et al. (2008) posited that investment experience could help investors achieve better investment performance. Thus, in real market situation, the abilities and success of Vincent and Willie investment strategies during a crisis are consistent with the findings of Nicolosi et al. (2009), as demonstrated by their comments.

Another aspect of learning is self-efficacy. Sociocognitive theory suggests that self-efficacy beliefs enhance motivation and performance by increasing effort and perseverance (Bandura, 1997, 2000; Bandura & Locke, 2003). Performance and master experience are sources for self-efficacy beliefs (Bandura, 1986). Moreover, positively assessed performance tends to increase self-efficacy (Bouffard-Bouchard, 1990). As an example of the influence of self-efficacy, Seo and Ilies (2009) conducted an internet-based simulated stock investment study of over 100 private stock investors from six different investment clubs located in the northeast United States. Participants engaged in a series of stock trading activities with the purpose of achieving goals in response to dynamic task environments (performance feedback and stock market movements). Data analysis indicated that the self-efficacy influenced the self-efficacy-performance relationship (Seo & Ilies, 2009). Consistent with the findings of these studies, over their

long investment time horizon, both Vincent and Willie demonstrated their savviness and self-efficacy in investing in stocks.

For example, Vincent began his investing experience over 50 years ago as he stated, "Well I started investing in 1959 of my first stock that I purchased Pfizer. I think it was in the 1960's and later on I bought Bristol Myers, because I thought they were two big companies that could only go up in value because the population keeps growing and growing and people, you know, living longer. So I have been in it for quite a while before the crisis…When I started (with) the two stocks, so I said (to myself), then I wanted to get more into it (and) involved– and I started buying a lot of (stocks)–(after) reading a lot of periodicals and different magazines and what not and started buying a lot more of stocks. Started bought (buying) in my portfolio, and even today now I still read a lot of periodicals and a lot of different magazines and…reports." After years of investing experience and facing the 2008 Financial Crisis, Vincent asserted, "Well I just had this strong feeling that US businesses or businesses I mean they run the world. And they are not going to close the door and fold up. And I just figured what opportunity can you get to buy International Paper for $3.50 a share or General Electric for $6. So I said (to myself) when are you ever going to get that opportunity. So that was one of the reasons for jumping in and buying."

Similarly, Willie who has over 50 years of investing experience expressed, "Well, when I was about 18 years of age I got interested in the stock market through my father and the first stock I bought was some bank stocks and then usually would buy some– mainly every year or something like that. And then I slowly watch the Nightly Business report, and I would talk to my father about different things. And one thing I bought when

I was young was Coca Cola, I bought 25 shares of that…I hung on to it for a long time and then I bought Buckeye Partners after that and then in the, I guess in the early 60s I bought 40 shares of McDonalds …McDonald's stock I stayed with because you go down the highway and you had a sign that they sold so many thousands of stock, next time you go down the highway they would sell 200,000 hamburgers and stuff like that. And years ago you could have a milk shake of burger and French fries for under a dollar that was a nice treat when you are going down for a ride down to the beach. And so I decided to stay with it because it started giving me a small dividend, and the dividend just kept on moving up." In response to the 2008 Financial Crisis, Willie added, "When the market was down I used to watch Nightly Business Reports and I was watching one time and Ford stock was around $2 it went down to a $1 and I have and I said to myself you know that will be a pretty good buy, got them so. I called up and bought myself 500 shares of Ford stock, and I notice over the years the dividends is probably getting higher and higher. And I bought Citi Group I think they took a nose dive, I bought myself 500 shares of that, I think $2 a share then I think Bank of America was a good stock so I decided to hang on that and all my stocks, good name stocks…are good, the banks stocks are good the food stocks are very good, at least I'm very happy with McDonalds. And I'm happy with the market because it came back. When I was buying stocks, I notice the market was down, there was a good chance to buy these stocks cheaper like Ford, Citi Group, even some of the bigger stocks were very tempting to buy…The strongest factor was that my stocks paid a good dividend, and they pay very well now I'm very happy that I stay with the portfolio that I have. I have quite few stocks and over the years they've done quite nicely." For these reasons, even without a good understanding of financial

fundamentals of stocks and factors that influence market price movements, both Vincent and Willie are categorized as having moderate stock market literacy (Figure 2). Importantly, the four investors who bought stocks during the 2008 Financial Crisis not only demonstrated moderate to high stock market literacy, but also made their own investment decisions and did not rely on any financial advisor (Theme RQ1.2, RQ1.4).

Investors who experienced nervousness, anxiety, and even fear as previously discussed in the Results section (Theme RQ1.5, RQ1.6), self-profiled themselves as having some understanding of the financial markets and market investments but primarily relied on others to provide recommendations for investments (Table 1, 2). In examining the conversations of each of the participants (Ann, Bria, Kurt, Luke, Luigi, Norm, Zorro), this researcher positions these investors at the low end of the spectrum of *stock market* literacy as having have some understanding of stocks and the stock market; at no time did they make any comments that would lead the researcher to believe that they had much understanding of the fundamentals of stock valuation or factors that influence stock market movement (Figure 2). This cohort of investors relied primarily on the advice of their financial advisors who recommended to them to either reallocate or hold their stock positions (Table 1, 2).

Another factor that could affect *stock market literacy* is cognitive ability. The education level of the participants in this study ranged from high school to advanced college degrees (Table 1). Examining the data from the sample size of 12 participants, this researcher found no correlation between education and investor action of whether they sold, reallocated, held or bought stocks during the 2008 Financial Crisis. With respect to cognitive ability, the primary value of education is to increase cognitive

abilities (Hanushek & Woessman, 2008). In studying investors' likely to have high cognitive abilities compared to those expected to have lower cognitive abilities, Korniotis and Kumar (2013) found that those with higher cognitive ability were likely to participate in the stock market and investment performance improved with experience but negatively correlated with age due to the adverse effects of cognitive aging. Additionally, portfolio distortions by investors with higher cognitive ability reflect an informational advantage and achieved higher risk-adjusted returns compared to investors with lower abilities, who displayed cognitive biases and thus low risk-adjusted returns. In another study, Agarwal et al. (2009) found that peoples' financial sophistication varies over their life cycle, peaking at age 53 and observed a similar relationship between cognitive ability and age. For this study, assessing the cognitive ability of each participant was beyond the scope of the research. However, for the limited sample size of 12, this researcher found no correlation between education and action of the investor whether they sold, reallocated, held, or bought stocks. Notably, the four investors that bought and weathered the financial crisis, Chase and Rocky attained advanced college degrees, while Vincent and Willie achieved high school diplomas. Importantly, each of the four had more subjective *stock market literacy* than the remaining eight participants. Moreover, age was not a factor in utilizing their *stock market literacy*. At the time of the 2008 Financial Crisis, Chase (71), Rocky (55), Willie (78), and Vincent (71) each exercised their *stock market literacy* and viewed the crisis as an opportunity to add stocks to their portfolio, their cognitive ability does not appear to have been diminished (Table 1, 2, Figure 2). Besides *stock market literacy*, the understanding and ability to tolerate price movements,

especially downward (losses) is a critical aspect in the foundation of investment decision-making. Thus, the risk profile of investors' is important and discussed next.

Risk profile. The assessment of risk tolerance and investment objectives are tools for managing the expectations of portfolio volatility and achieving the goals of the investor. Self-profiling data of the risk tolerance and investment objectives for each of the participants are given in Table 2. The participants profiled themselves as either moderately risk/moderately aggressive or high risk/moderately aggressive. Importantly, the definition and the manner which financial risk is measured are subject of much debate, even their usefulness in times of extreme market volatility, among scholars and practitioners (Hanna, Waller, & Finke, 2008). Numerous debates on risk tolerance measures have included types of questions to be utilized to assess attitudes, current behavior, and feelings (Roszkowski & Grable, 2005). Risk tolerance is often assessed by using questionnaires that elicit feelings about risk assets and peoples' comfort level when asset value changes. For example, Gilliam, Chattterjee, and Grable (2010) compared two commonly used empirical measures of risk tolerance and found that a 13-item scale had the best explanatory power for allocations between risky and non-risky assets. Evaluating measures of risk tolerance is beyond the scope of this study. However, what is important to this study is that investors' risk tolerance could change, particularly when financial market volatility causes losses in investors' portfolios leading to risk averseness; as during the period of the 2008 Financial Crisis. Furthermore, although some researchers have indicated that risk aversion is stable over time (Baucells & Villass, 2010; Sahm, 2008), other scholars asserted that risk aversion is time variant (Malmendier & Nagle, 2011; Thaler & Johnson, 1990; Staw, 1976). Jung and Treibich (2014) argued

that the sensitivity of risk aversion could change, dependent upon a change in the environment such as introduction of a financial shock (i.e. 2008 Financial Crisis), and risk aversion should not be assessed just once, but over time. In a telling study on risk perception and the economic crisis, Burns, Peters, and Slovic (2012) conducted seven online surveys with the same questionnaire over a period from September 29, 2008 to October 6, 2009 (in the midst of the 2008 Financial Crisis) of which over 400 people responded to all seven surveys. Burns et al., (2012) found that peoples' perception of risk decreased rapidly during the onset of the financial crisis and in time leveled off near the end of the crisis period. Interestingly, they found that depending upon the cohort categorized as gender, income, numeracy (financial literacy) and political attitude, people belonging to different cohort reported different experiences. What is important is that peoples' perceptions of risk changes over time and circumstances and different people have different experiences, given the same environment. This finding is similar to finding of other scholars, who reported heterogeneity in risk attitudes across individuals (Engleman & Tamir, 2009; Schunk & Betsch, 2006).

For this researcher's study, the investors that sold and reallocated unwittingly, changed their risk profile during the 2008 Financial Crisis. For example, before the crisis, Kellem self-profiled himself as moderate risk/moderately aggressive and knew very little about financial markets or financial investments (Table 2). Because Kellem observed his investment portfolio dropped precipitously, Kellem expressed his concerns, "…I was shocked and when I saw the stock market dropping rapidly…I just felt I was afraid that I wasn't going to be able to control my funds anymore, and I was very nervous...I was very nervous about it. I had hoped trends would reverse but when I saw

our values dropping so much I just I would have sold the stocks immediately if I could have… I was fearful, and I became very insecure…" As to why he sold, Kellem lamented, "…I just wanted to protect what I had left because I was afraid that I could lose it all." In his words, Kellem describes his fear of losing all his money as he disregarded his self-profile of moderate risk/moderate aggressive risk tolerance and sold his stocks at the onset of the 2008 Financial Crisis in October 2008.

Similarly, Kurt and Zorro self-profiled themselves as moderately high risk/moderately aggressive and but acknowledged having some understanding of stocks and financial markets. Unlike Kellem, Kurt and Zorro stayed with their stock portfolio at the beginning of the crisis and finally sold later when the stock market when down again in March 2009. At the beginning of the 2008 Financial crisis in the fall of 2008, Kurt complained, "…Early on in 2008 there was a lot of turmoil, the financial news stations that I watch on a nightly basis, you know, they were kind of painting a gloom and doom scenario. But it seemed like the government was there to backstop, you know, the big banks and then all of a sudden I think it was maybe September of 2008 or sometime near that, you know, Lehman Bros went bankrupt, and that was the first real-time I really felt like here we go again…You know, portfolio starting to go down again. Now I had online access, so I could see my portfolio on a daily basis versus a monthly basis, and you know, it was quite apparent that something bad was happening in the market and I was getting nervous again…I can remember this day I called my broker, I said, here we go again. And he did everything he could do to keep me from selling. He kept telling me do not sell at the bottom, do not sell at the bottom. But I kept asking him– am I going to know when we are at the bottom? And he couldn't really answer that question. I just knew that

the feeling I had it certainly felt like it was a bottom at that point in time. It was probably sometime maybe late September of 2008, but you know, it just was not an easy feeling…" Despite these awful feelings, Kurt did not sell his stocks until March 2009 as he bemoaned, "…. So '09 comes we go lower than where we were in '08. It was on the phone with my adviser again. Again he was telling me not to sell. So what – you know, your question of what was the strongest factor, the strongest factor was I just got burnt twice in my mind in the last several months. The market started rallying again from I guess those March lows and I think I probably sold within a week of the low. I called my adviser, I said I need x amount of dollars back. I want out, and that is – that is kind of the overriding factor that made me sell…I was angry again that, you know, I didn't sell in September when the market was higher and, you know, here we are again a few months later in the same position. So it was anger, more than nervousness because I was just shocked that I found myself in this situation again…But at the time of the sale I was more angry than anything. You know, here we are again, like I mentioned. I think I told you earlier, getting closer to retirement, you know, than I was in the dot-com era, kids in college. So I was just angry, you know, how did this happen to me? Why was this happening again? And I just – I also felt maybe a little bit of lack of distrust in the whole system. So it was anger, distrust, and you know what, I am going to need to preserve what I have…" Over time, 14 years prior to September 2008 to six months later March of 2009, Kurt disregarded his risk profile from moderate risk/moderate aggressive to unwilling to take any more risk as he sold his stock portfolio.

Zorro reacted in the same manner as Kurt. Zorro painfully recalled, "…why can't we have a great market like people used to tell me how great it was in the '80s and '90s

and I finally get in and it's just been horrible. It's been painful so I really – I felt I was scared because this (is) my money, this was the money that was supposed to take care of me when I'm old and it was going away fast… Well I felt like I'm paying this guy to take care of my investment and then look at how much they dropped in that period of time?" Zorro waited until March of 2009 to sell as he bewailed, "…He (broker) should really give me hope, some ability or some way to at least warn me or advise me or do something (to) mitigate the risk and was I mad, I'm still mad. I had to call him and to modify – I wanted to be more experienced and I had to move and rotate some money into more conservative things. So I asked him (broker), I made him do it so – because he wasn't going to do anything. Okay by the way, if I could, if I could like when I opened up my statement on the weekend and saw how much I lost, if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker. It was bad time; very, very scary, very bad time…Well it was fear and mainly scared, anger was in there but I didn't just sell because I was angry, I sold it because I was scared and fearful that whatever was left was going to go away. So that was the dominant factor to sell and I moved some money to bonds at that time, so trying to make things more conservative…" Although Zorro self-profiled himself as moderate risk/moderate aggressive and having some understanding of stocks and the stock market, overtime he changed his risk profile and sold his stock portfolio.

Risk preferences are factors that have been used extensively in decision-making. For the investors who sold during the crisis, the losses in their portfolio caused them to become more conservative by investing in less risky assets referred to as *flight to quality*. For those that sold, their time-variant risk aversion and time-variant risk perception that

they demonstrated are consistent with the findings of (Malmendier, & Nagel, 2011; Thaler & Johnson, 1990; Staw, 1976) and Burns et al. (2012), respectively. Importantly, those that sold would have benefited from Jung and Treibich (2014) argument– that the sensitivity of risk aversion and risk perception could change with a change in environment such as a financial shock. For this reason, Jung and Trebich asserted that risk aversion should not be assessed just once, but periodically over time.

Phase II- Determinants. Understanding the processes that underlie the decisions and the drivers of risk taking under such extreme market volatility is critical not only to the investor but also to financial advisors, professional money managers, and public policy makers, particularly when investors' life savings are at stake. Consistent with traditional neoclassical expected utility models based on rational expectations (von Neumann & Morgenstern, 1947), Markowitz's (1952) classical portfolio theory posits that investors' individual risk taking is a function of their attitude and their estimates of expected return and variance (volatility) of the investment. In the expected utility model, the risk attitude defined as the trade-off between expected return and volatility is determined by the curvature of the investors' utility function. Investors can have different subjective estimates of the expected return and volatility. Importantly, some investors in real life situations, particular in face of a crisis, do not behave rationally nor make decisions in the classical normative manner (Hayes, 2010). Furthermore, because people lack complete knowledge, they lack the cognitive resources to optimize. Simon (1956) argued that people embrace satisficing when making decisions as they search through the available alternatives until an acceptable rather than optimal decision is reached. The devastation of the 2008 Financial Crisis to investor wealth combined with

the extreme volatility and high uncertainty in the economic outlook may have induced individual investors to alter their investment behavior (Hoffmann et al., 2013). Contrary to traditional finance theory, investor's cognitive principles, their judgments that originate in biased impressions and deliberative reasoning provide the theoretical framework for behavioral finance theory (Kahneman & Klein, 2009) in which heuristics and cognitive biases play a major role. Heuristics and cognitive biases are discussed next.

Heuristics and Cognitive biases. Observing that peoples' real life assessments of likelihood and risk do not conform to laws of probability , Kahneman and Tversky (1979) recognized peoples' role of task complexity and limited processing capacity in erroneous judgment and posited three general-purpose heuristics–availability, representativeness, and anchoring–as the foundation of many intuitive judgments under uncertainty (Gilovich & Griffin, 2002). Each heuristic was associated with a set of biases, which are departures from normative rational theory that represent the underlying heuristics. Based upon this preliminary work on judgment heuristics, Kahneman and Tversky (1979) introduced prospect theory based on the concept of cognitive biases to describe peoples' systematic but flawed responses to judgment and decision problems in their study on how people make decisions given their limited resources (i.e. bounded rationality proposed by Simon, 1955). Tversky and Kahneman (1974) explicated the difference between judgment and decision-making in terms of heuristics. Heuristics is judgment and decision-making mechanism or cognitive shortcuts that rely on little information and little cognitive resources, whereas cognitive biases are systematic error in judgment and decisions-making common to all human beings (Wilke & Mata, 2012). Although heuristic

decisions are quick and easy to compute, the decisions often introduce systematic and severe errors (Tversky & Kahneman, 1974). Seminal studies by Kahneman and Tversky (1979) along with many other scholars have focused on understanding cognitive illusions and heuristics and cognitive biases and their implications on the behavior of decision-makers (Zindel et al., 2014). Analysis of decisions under risk is critical to understanding investor behavior in the financial market. Prospect theory has emerged as the best available description of how people evaluate risk in an experimental setting while violating the predictions of the traditional expected utility model (Barberis, 2012).

Although the formulation of prospect theory consists of four elements: reference dependence, loss aversion, diminishing sensitivity, and probability weighting (Kahneman & Tversky, 1979), two of the elements, reference dependence and loss aversion appear to be demonstratively active in investors faced with the 2008 Financial Crisis. According to prospect theory, investors evaluate outcomes relative to a reference point such as purchasing price, highest value of portfolio, or lowest portfolio value. Importantly, different than normative expected utility that focuses on peoples' utility of the outcome, prospect theory focuses on an S-shape value function which is concave for gains and convex and much steeper (2.25 times as much, Tversky & Kahneman, 1992) for losses. The steepness in the convex function in the loss region demonstrates that investors are more sensitive to losses than gains for the same value. The function reflects risk aversion in the gain region and risk seeking in the loss regime. Loss aversion along with its components of mental accounting and framing are considered cognitive biases and are critical constructs in investors' decision-making; these constructs are discussed next.

Loss aversion, mental accounting, framing. The concept of loss aversion plays a central role in prospect theory of decision-making under risk (Kahneman & Tversky, 1979). In later research, Kahneman and Tversky (1984) discussed the cognitive and psychophysical determinants of choice in risky and riskless contexts and suggested that decision problems could be described or framed in numerous ways that leads to peoples' different preferences. They elaborated on the concept of mental accounting that was first introduced by Thaler (1985). According to Kahneman and Tversky (1984), the organization of mental accounts leads people to evaluate gains and losses in relative rather than absolute terms. Furthermore, because people tend to consider problems one at a time, often neglecting other possible choices or future opportunities to make similar decisions, decision problems could be framed narrowly or broadly (Kahneman & Lovallo, 1993). Thaler (1999) presented a comprehensive view of the concept of mental accounting and elaborated on the framing aspect, suggesting that people could frame outcomes narrowly. Thaler (1999) defined mental accounting as the set of cognitive operations used by people to organize (i.e. coding and categorizing), evaluate, and track financial activities. Based upon laboratory test results, Thaler (1999) noted that peoples' risk attitude of loss aversion depends on the frequency which they reset their reference point. Thaler concluded that frequent short-term (daily or monthly) evaluations by investors prevent them from adopting longer-term (greater than annually) strategies such as taking more risks; the process of frequent evaluations is referred as myopic loss aversion or narrow framing. When investors evaluates risk over a short-term (daily or monthly) horizon rather than concurrent risks over a longer-term (monthly, quarterly, or greater than annually, this is referred to as narrow framing or myopic loss aversion

(Benartzi & Thaler, 1995). Rather than investing in riskier assets (stocks), many investors tend to invest in safer assets (government guaranteed bills or certificate of deposits) to minimize short-term volatility or even loss of principal; concerns demonstrated by many investors during the 2008 Financial Crisis. Benartzi and Thaler (1995) suggested that some investors become more sensitive to loss aversion when considering riskier assets such as stocks in short-term horizons, whereas for longer time horizons, the probability of encounter losses is minimal leading to dramatic reduction in loss aversion. Thus, framing drive risk preferences. When investors adopt myopic narrow time horizon, loss aversion dominates their perceptions of risk and cause them to migrate towards safer guaranteed investments. Contrarily, investors embracing a broad view are likely to be less risk averse and greater risk appetite as they combine probabilities and payoffs over longer periods.

Based on past studies, myopic loss aversion consists of loss aversion and mental accounting, which shape investors' risk behavior (Hardin & Looney, 2012). While loss aversion describes a cognitive bias whereby investors weigh losses more than gains of equal magnitude, mental accounting refers to the manner which investors cognitively frame the situation, both influencing the risk preferences. Hardin and Looney (2012) contended that information horizon, evaluation frequency, and decision frequency are critical factors that influence decision problem framing. Information horizon is the time over which prospective probabilities and payoffs are presented. Evaluation frequency is the rate at which investors review the performance and outcome of their investments. Decision frequency is the rate at which an investor adjust (buy or sell) their investment portfolio. Hardin and Looney (2012) argued that the anticipated gain is much greater

than the agony of potential loss; investors would prefer avoiding a loss. Investors faced this dilemma during the 2008 Financial Crisis. Investors whom this researcher interviewed faced this predicament.

For this researcher's study, the investors (Kellem, Kurt, Zorro) who framed the stock market with a narrow view referred to as myopic loss aversion (Theme RQ2.1) during the 2008 Financial Crisis sold their stock portfolio. For example, Kellem expressed, "…Well again I was very nervous about it. I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have… I was nervous I was angry, and my portfolio kept going down and I just wanted to get out before I lost too much because-it was the majority of my retirement planning and investment…" At the time of the 2008 Financial Crisis, Kellem was 55 years old and approximately 10 years from retirement (Table 1). Kellem clearly stated that his investment was for his retirement. Kellem went from an initial broad view of the market (i.e. investments for retirement 10 years away) to a narrow view (i.e. immediate) because of the 2008 Financial Crisis. Thus, Kellem experienced an extreme case of myopic loss aversion as he altered his framing of investment time horizon and sold to stem his losses in his stock portfolio at the onset of the crisis in October 2008 (Theme RQ1.8).

Both Kurt and Zorro waited until later in the crisis (March 2009) to sell their stock portfolio (Table 2). Kurt exclaimed, "…Nervous because I was maybe 10, 12 years away from retirement and I had built up a pretty, pretty nice nest egg…", while Zorro lamented, "…I felt I was scared because this (is) my money, this was the money that was supposed to take care of me when I'm old and it was going away fast…looking for the

emotion of growing money to buy something down the road to buy my place in Florida (for retirement) that's the emotion…" On the recollection of their thoughts during the crisis, Kurt recalled, "…the beginning of '09 came on and my portfolio looked as though it was getting better. It started growing again and then I – at first I was, you know, relieved, happy, you know, he talked me out of selling at the bottom. I felt a little more comfortable, then March I think it was of '09, here we go again... So '09 comes we go lower than where we were in '08… The market started rallying again from I guess those March lows and I think I probably sold within a week of the low…" and Zorro declared, "…People were just feeling negative, there was mass layoffs and all that really led me to notice part of my statement just getting ripped apart, while everything I had – kind of when we finally got growing again after 9/11 and things were coming up and then bam! It's just – it was almost – we almost got chopped in half again it's like so – it's all a memory…" and when Zorro finally decide to sell his stocks, Zorro lamented, "…It was bad time; very, very scary, very bad time and it did feel. I kind of had a little glimpse in there– I wonder how he (it felt)– may I don't know if it was as bad in '30s (Great Depression), maybe it was worse but it sure felt like we were getting there fast…" Notably, Kurt and Zorro past up their opportunity to sell their stock portfolio earlier in the crisis (October 2009) but chose a later date (March 2009) to exit their stock portfolio as ultimately, their framing changed from broad to narrow view (Theme RQ1. 8).

Reviewing the comments made by those investors that sold (Kellem, Kurt, Zorro) or reallocated (Ann, Bria, Luigi) as well as one investor who held (Norm), this researcher observed that they mentioned emotions such as nervousness, worry, and fear (Themes RQ.1.5, RQ1.6). Although emotions play a role in decision making in general, it is still

largely unknown how emotions influence the processing of information (Frank, et al., 2009; Grecucci & Sanfey, 2014; Phelps, 2009). Emotions and emotion regulations are discussed next.

Emotion and emotion regulation. During the 2008 Financial Crisis, some investors did not yield to emotions or biased decision-making. Those investors who reallocated, held or bought stocks regulated their emotion, had a third party such as a financial advisor influenced them, or did not yield to any bias as they made their investment decisions. Grecucci and Sanfey (2013) suggested that the decision-making behavior often deviates from traditional rational economic expected utility behavior primarily because of emotional factors that weigh heavily on decisions that are accounted for by traditional economic models. Typically, traditional economic models exclude factors such as emotion, moods, and social cues (Sanfey, 2007). Unpleasant emotions such as fear and nervousness could lead to lower confidence and more risk averse perceptions (Han, Lerner, & Keltner, 2007; Guiso, Sapienza, & Zingales, 2013; Kugler, Connolly, & Ordonez, 2010). Emotions are rapid and automatic responses to specific stimuli (Sanfey & Chang, 2008).

Emotion regulation refers to strategies that people develop to influence which emotions they have, when they have them, and how they experience and express them (Gross, 1998, 2014). Notably, self-regulation and emotion regulation are often intertwined, and an elementary response to emotion is posited by Koole, Van Dillen, and Sheppes (2011). Emotion consists of multiple components including specific thoughts, feelings, and physiological responses (Frijda, 2008; Larsen, Bernston, Poehlmann, Ito, & Cacioppo, 2008; Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005). People respond

to emotion in two phases, both demonstratively different (Lazarus, 1991). The primary response involves immediate, unregulated raw response to emotional stimuli, whereas the secondary response is driven by emotion regulation and is a function of peoples' ability to cope with the primary emotional response (Baumann, Kaschel, & Kuhl, 2007). According to Koole et al. (2011), the transition from primary to secondary processing could be quick and unnoticeable to people. They posited that the primary response is referred to as emotional sensitivity, which is determined by any factor that influences peoples' emotional response to the stimuli, including the intensity of the stimuli(e.g. highly arousing stimuli are able to trigger emotions rapidly such as catastrophic losses in investment portfolio), peoples' personality (e.g. higher neurotic people will enter a negative state quicker), and the environment (e.g. during a financial crisis, emotions such as nervousness and fear are more apparent) of the emotion episode. To exit from the increased emotional intensity, Koole et al. (2011) suggested the people could return to a baseline emotional level without any conscious regulatory effort in a process known as habituation (Rankin, 2009). Habituation is a rudimentary form of psychological adaptation that enables behavioral response decrement. This cycle of emotion described by Koole's et al. (2011) occurs nonconsciously and thus, without any higher-order processing.

For a more advanced view on emotion regulation, Gross (1998, 2001) posited a model that in part describes emotion as a sequence of four stages: stage 1 is the person's encounter of a situation that is stimuli-provoking; stage 2 is the person's view of the relevancy of the emotion; stage 3 is the person's cognitive appraisal of the emotion which may or may not result in an emotional response; and stage 4 is the person's expression of

their emotions in behavior. According to Gross, the emotion regulation strategies could be introduced at each of the four stages. Gross' (1998, 2001) model consists of two broad and distinct classes of emotion regulation strategies depending upon whether the regulation is at the input (i.e. antecedent focused such as cognitive appraisal referred to as reappraisal) or at the output (response focused; referred to as suppression). People utilize one of these strategies to cope with emotions that emerge from stressful or difficult tasks or decisions (Wallace, Edwards, Shull, & Finch, 2009). Reappraisal redefines and changes the meaning of the stimulus with the goal of altering the resulting affective state, whereas suppression tend to minimize emotions by ignoring and inhibiting any overt-emotion-expressive behavior while the emotion unfolds (Wallace et al., 2009).

Reappraisal involves a cognitive redirections/refocus of an emotional reaction to the situation at-hand (Richards & Gross, 2000). As an example or reappraisal, at the onset of the 2008 Financial Crisis, Luke was angry at his perception of the corruption in both government and financial institution personnel but not at his significant loss in stock valuation. However, he appraised the situation and was still optimistic of the market as he stated, "…(There) was too much of corruption going on in the market …I became very pessimistic and angry about the near future, but optimistic about the market is going to turn around and eventually it will come back …Well, I am a very optimistic guy; I did, I figure, if it means if I got angry there is nothing I could have done… I was angry in the sense that what I was seeing (the corruption)… Well, again I am very optimistic about the market. I always felt you know, in the old cliché what rises falls and what falls rises, so I just again weather the storm…Well, I held on because I am a very optimistic guy, and I knew, again I not really need the money and I don't want to be angry because the damage

is already done. So, I just held on and waited, waited and then the market finally bounced back, came back around…"

As a possible example of the use of response-focused strategy such as suppression for emotion regulation, Norm vacillated between selling and holding his stock portfolio and agonized throughout the crisis by bemoaning, "…A lot of sleepless nights, lot of panic. I held true to one of my father's sayings, which was if you don't sell it you don't lose it. So, while on paper I was short some valuations, as long as I held tight those valuations would come back. So I hung my hat in that philosophy and honestly for the most part it turned out okay…In my particular case it was clearly emotional. I tried to hold on to logic with both hands, but I couldn't do it. I was very scared, I was very emotional about it, so clearly for me it was emotions, it was an emotional decision…but I held true to the family, which – holding on as long as I didn't sell I didn't lose any money. Short-term that's very nerve-wracking at best, so in my perspective that was a very emotional thing…I knew if I could I would've sold everything in a heartbeat, but I knew that was wrong at the core, so I held on. I guess it's really both because during that time I was a very emotional wreck. Let me elaborate on that too…When I lose money, it's an embarrassment. It is embarrassing because here I am in charge of these things and…I'm supposed to do my due diligence…It's something that I'm not proud of, so it's a very embarrassing situation to be in…"

Both Luke and Norm faced an emotion-eliciting situation that they could not avoid and thus, exercised self-emotional regulation. Luke reappraised the situation and believed there was nothing he could do about the circumstances and diverted his attention to the fact that the crisis was only a blip in the long- term uptrend of the stock market.

Luke's processing of the emotional experience led him to *Stage 3* of Gross' (1998, 20010 model of emotion regulation, concluding threat level of stimuli would not cause and emotional response. By being optimistic that the valuations of the stock market would move back up, he enabled himself to prevent the emotional aspects of the emotional-stimulus process. Notably, Luke did not express any nervousness or fear of the situation that caused his significant loss in stock valuation. Contrarily, Norm experienced nervousness and fear throughout the financial crisis. Norm vacillated between selling and holding-on to his stock portfolio throughout the crisis. Norm's emotion never subsided but could have used suppression to inhibit the decision to sell. Gross (2001) contended that the suppression should not change the emotional experience but should increase physiological activation because of the effort in the ongoing emotional process. Additionally, Gross argued that the suppression is a form of emotion regulation that would require self-corrective action throughout the emotional event. Such monitoring would require the continuous use of cognitive resources and thus, reducing the resources available for processing events so they can be remembered later. Thus, suppression is cognitively costly (Gross, 2001).

However, this researcher believes that Norm unlikely used self-suppression as an emotional regulation strategy but followed the emotion cycle described by Koole et al. (2011) that was described earlier. It appears that Norm constantly was torn emotionally between selling and holding-on to his stock portfolio while recalling his father's wisdom of not selling stocks during the crisis period in trying to reach an investment decision. Therefore, this researcher asserts that this caused the nonconscious processing of the emotion. This nonconscious processing caused Norm to remain in *System 1* processing,

allowing him reach a decision to hold-on and not sell his stocks; a process that proceeded without any deliberative cognitive processing. This researcher contends that Norm found relief of his emotional distress through habituation, which is an adaptive psychological emotion regulation strategy of decrement behavior as suggested by Koole's et al., (2011). What is interesting in Norm's behavior is that he neglected the advice (emotional regulation strategy) of his financial advisors to help him through the emotional advisor and yielded to his nonconscious processing of emotionally driven stimuli. This emotional processing within *System 1* of the dual process theory of information processing is discussed more thoroughly in the Theoretical Framework section.

For the cohort (Ann, Bria, Luigi) who reallocated, their financial advisor influenced them. Although, their financial advisor provided the emotion regulation strategy for them, this cohort expressed nervousness, worry and fear throughout the crisis. For example, Bria stated, "…it was very scary...," while Luigi recalled, "…I was very nervous and upset…". By heeding to their financial advisors advice, this cohort of investors anticipating a possible prolonged unwanted emotional experience because of the possible length of the financial crisis, engaged in situation modification, which was achieved by selling a portion their stocks and investing those proceeds into safer guaranteed investments. Thus, situation modification was an effective emotion regulation strategy and likely introduced as an antecedent strategy in *Stage 3* of Gross' emotion regulation strategy. This strategy allowed this cohort of investors to use their cognitive skills to appraise the intensity of the threat level of the stimuli (i.e. the financial crisis) and what role the emotion (e.g. nervousness, worry fear) would play.

For the cohort (Kellem, Kurt, Zorro) who sold their stock portfolio, only Kellem sold his stocks immediately, at the beginning of crisis after observing the drastic drop in value of his stock portfolio while Kurt and Zorro waited until later, near the end of the crisis to sell. Kellem exercised no emotion regulation as he lamented, "…I was very nervous about it. I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have…" Notably, both Kurt and Zorro considered selling near the beginning of the crisis but waited towards the end to exit. Initially, both Kurt and Zorro adhered to their financial advisor (emotion regulation) in the beginning, but later yielded to their emotions and finally sold their stock portfolio as they disregarded their advisors' emotion regulation strategy. This cycle of initial adherence and subsequent rejection of the emotion regulation strategy demonstrates the time-variant nature of emotions and emotion regulation. Kurt expressed, "…it was just a punch in the stomach… I just got burnt twice in my mind in the last several months… I was angry, and I was nervous… at the time of the sale…) while Zorro lamented, "…it was fear and mainly scared, anger was in there, but I didn't just sell because I was angry, I sold it because I was scared and fearful that whatever was left was going to go away…" These comments by Kurt and Zorro demonstrate the rejection of the emotional regulation strategies of their financial advisors.

While some investors (Luke, Norm) self-regulated their emotions, others (Ann, Bria, Luigi) used an exogenous source such as their financial advisor to influence their emotions. Some investors (Kellem, Kurt, Zorro) rejected their financial advisors' guidance. Importantly, some investors (Chase, Rocky, Vincent, Willie) demonstrated no influence of emotion on their investment decisions in the face of the 2008 Financial

Crisis. For each investor as it is for all human beings, people are subject to bounded rationality and its influence on a persons' decision.

Bounded rationality and satisfice decisions. According to Gilovich and Griffin (2002), the most significant theoretical development in the psychology of judgment and decision-making is Simon's (1955) contention that the assumption that people are fully and completely rational is an unrealistic standard implied by the theory of the rational choice model. Simon (1955) posited a more limited criterion for actual real life performance, referred to as bounded rationality, which acknowledges the inherent processing limitations of the human mind. People attempt to reason and choose rationally but within the constraints imposed by their search, computational, and cognitive capacities. Thus, Simon argued that people are forced to make decisions not as *maximizers*, as classical rational choice theory would contend, but as *satisficing*, whereby peoples' goals, if achieved, are happy enough. The term *satisfice* is derived from the blending of two words–satisfy and suffice that describes how cognitive limitations force people to make good rather than optimal decisions. Satisficing could be observed in the studies on heuristics and biases by Kahneman &Tversky (1979) who developed prospect theory. Within the prospect theory, Kahneman and Tversky included the processing step editing phase, which describes people evaluate a gamble by discarding low probability events in favor of high probability events in an effort to simplify the evaluation of the problem. From a neural perspective, such heuristics could be viewed as a rational tradeoff between the benefits of deliberation and the biological costs associated with the deliberation (Sapra & Zak, 2009).

Thus, satisficing is people searching for an outcome that is good enough whereas maximizing is people searching for an outcome that is optimal. To satisfice, people need only to have a threshold of acceptability, and when this threshold is met or exceeded, the decision is made. Some scholars have shown that decisions reached by satisficing processes could result in happier people and better decisions (Jain, Bearden, & Filipowicz, 2011; Polman, 2010; Schwartz, Ward, Monterosso, Lyubomirsky, White, & Lehman, 2003). For this study, those investors who reallocated (Ann, Bria, Luigi), held (Luke, Norm), and bought (Chase, Rock, Vincent, Willie) were satisfied, although may not be optimum, with their decisions because they viewed the precipitous drop in stock valuations is only a blip in the longer term performance of the stock market. Importantly, the investors that sold (Kellem, Kurt, Zorro) also may be satisfied with their decision because by selling they were preserving what value they had left. For example, Kellem stated, "…I just wanted to protect what I had left because I was afraid that I could lose it all…", Kurt indicated, "…I called my adviser; I said I needed x amount of dollars back. I want out…," and Zorro added, "…I sold it because I was scared and fearful that whatever was left was going to go away…"

Because the 2008 Financial crisis was not an instantaneous event but developed over time, it is not surprising that investors perceptions, attitudes, and their responses could change overtime as the ensuing events of the crisis unfolded; this was observed for Kurt and Zorro when they decided to sell their stock portfolio towards the end rather than the beginning of the crisis. Thus, the influences of time on some of the important factors that influence decision-making are discussed next.

Time-Variance. Prospect theory describes investors are more sensitive to losses than gains for the same value by as much as 2.25 times (Tversky & Kahneman, 1992). Thus, risk aversion is a critical construct for investors making decisions in the midst of a crisis such at the 2008 Financial Crisis. Because risk tolerance and risk profile of investors are important factors of the decision-making process during crisis periods, they will be discussed again in this section. Although some researchers have indicated that risk aversion is stable over time (Baucells & Villass, 2010; Sahm, 2008), a number of studies in macroeconomics and finance have identified that peoples' relative risk aversion is time varying (Brunnermeier & Nagle, 2012). In one such study, Burns, Peters, and Slovic (2012) conducted seven online surveys with the same questionnaire over a period from September 29, 2008 to October 6, 2009 (in the midst of the 2008 Financial Crisis) of which over 400 people responded to all seven surveys. Burns et al., (2012) found that peoples' perception of risk decreased rapidly during the onset of the financial crisis and in time leveled off near the end of the crisis period. Interestingly, they found that depending upon the cohort categorized as gender, income, numeracy (financial literacy) and political attitude, people belonging to a different cohort reported different experiences. What is important is that peoples' perceptions of risk changes over time and circumstances and different people have different experiences, given the same environment.

In another study of the 2008 Financial Crisis, Weber, Weber, and Nosic (2013) found that investors hold risk and return expectations that change significantly over time and seem to guide their investment behavior. Furthermore, they reported that the changing risk and return expectations are influenced by recent events in a manner not

consistent with a rational theory. The 2008 Financial Crisis period was fraught with daily prosodic headlines of doom and gloom not only of the devastation of the stock market but also of the plunging real estate values and economic woes, many investors became fearful and were under extreme pressure to act as they watched the value of their portfolio drop precipitously, while some even feared losing their life savings (Bollerslev & Todorov, 2011; Caballero, 2009; Chambers et al., 2011; Deaton, 2012; McInerney, Mellor, & Nicholas, 2013). Thus, it is not surprising that Kurt and Kellem changed their risk perception during the crisis as they passed on selling at the onset of the crisis (October 2008) and finally sold near the end of the crisis (March 2009). The negative, hostile prosodic headlines contributed to Kellem's, Kurt's and Keller's distorted risk perceptions and biases rather than adhere to their original underlying risk profile (Table 2). Thus, it was difficult for them to stick with their initial risk assessment and investment goal due to short-term, and short-lived, perceptual biases, framing effects, and behaviorally driven emotional discomfort.

Phase III-Information processing. Based on two fundamental processing modes, Schneider and Sheffrin (1977) developed a general framework for human information processing, which emphasized the roles of automatic and controlled processing. They posited that controlled processing is highly demanding of attentional capacity and is easily established, altered and strongly dependent on load, whereas automatic processing is demanding of attention and is difficult to alter, ignore or suppress once learned and unaffected by load. The context of this and other similar studies initially involved the study of lower-order cognition such as perception and attention (Schneider and Shefrin, 1977), but more recently preceded to include neuroscience

studies (Camerer, Lowenstein, & Prelec, 2005; Corr, 2010). Because of the conflict in findings amongst scholars evaluating information processing, Evans (2008) reported that the term automatic processing is used only as a contrastive with control processing, implying no assumption about how such processes were derived. Significantly, Evans (2008) provided a comprehensive review of dual processing accounts of reasoning, judgment, and social cognition and suggested that the many dual-process theories have in common the notion of two different modes of processing information referred to as *System 1*–unconscious, rapid, automatic, and high capacity and *System 2*–conscious, slow, and deliberative by Stanovich and West (2000).

Because classical economic models do not address automatic and affective (emotional) processing of information, Camerer et al. (2005) argued that human behavior requires a fluid interaction between controlled and automatic processes, and between cognitive and affective systems. Importantly, they cautioned that automatic processes keep behavior below the conscious level and, therefore, introspection primarily accesses the controlled domain. Using the two-dimensional framework posited first by Schneider and Shiffrin (1977), Camerer et al. (2005) elaborated on the interactions of automatic and controlled processes with cognitive and affective neural functioning of the brain with respect to decision-making. Using this two-dimensional format, this researcher will discuss Epstein's Cognitive Experiential Self-Theory model with respect to this researcher's findings.

Theoretical framework. Epstein's (1994) Cognitive Experiential Self-Test (CEST) model provides the theoretical framework for a discussion of the findings of this research study. This researcher offers a two-dimensional framework to frame the

discussion of how investors could have processed information as they reached their investment decisions during the 2008 Financial Crisis. The two-dimensional framework is discussed first followed by brief comments on dual process theories.

Two-dimension framework. Dual process theories have been developed on various aspects of human psychology, including information processing, implicit learning, reasoning, social judgment and decision-making. While the various scholars of dual process theories agree that two processing mechanisms exist, the utilization of different procedures could yield different and often conflicting outcomes. Nevertheless, most dual process theorists agree on the distinction between the two processes, *System 1* (*S1*) and *System 2* (*S2*), terms that were attributed to Stanovich and West (2000) in their studies on reasoning. Dual process theorists agree that the commonly ascribed properties of *System 1* are nonconscious, automatic, rapid, and parallel processing while *System 2* consists of conscious, controlled, slow, and sequential processing. Dual system theories consider the attributes and attitudes of the all-encompassing dual process theories into two distinctive cognitive systems with different structures, functions, and evolutionary histories; essentially two minds (Frankish, 2010; Frankish & Evans, 2009).
Using Schneider and Shiffrins' (1977) format of the two-dimension framework, this researcher summarizes the relationship between *System 1* (*S1*) and *System* (*S2*) information processes and between Epstein's (1994, 2003) social cognition conceptualization of experiential and rational processing of information referred to as Cognitive Experiential Self-Theory (CEST) as presented in Table 3.

Table 3

Two-dimensional Dual Process Framework for Judgment and Decision-making

		Experiential		**Rational**	
System 1					
Nonconscious Processing					
Automatic					
Rapid					
Emotionally, Affect-driven		**I**		**II**	
Holistic		Kellem		Norm	
Associative		Kurt			
Experience-based		Zorro			
Independent of Cognitive Ability					
System 2					
Conscious Processing					
Conrtolled					
Slow		**III**		**IV**	
Emotion, Affect-free		Ann		Chase	
Rule-based		Bria		Rocky	
Consequential-based		Luigi		Vincent	
Correlated with Cognitive Ability		Luke		Willie	

A comprehensive review of the numerous dual process theories were elegantly summarized by Evans (2008) as he mapped various dual-process accounts into a generic dual-system theory, by considering the clusters of attributes belonging to *System 1*and *System 2*. Thus, this researcher includes these attributes, associated with dual systems of thinking as presented by Evans (2008, Evans & Stanovich, 2013), as a dimension in the two-dimensional theoretical framework for this research (Table 3). The two-dimensional structure (*System 1 –System 2,* experiential – rational) indicates that there are four possible interactive regions (I, II, III, IV), which people could follow when processing

information. Agreeing with Camerer's et al. (2005) explanation of the use of a four-quadrant model, this researcher asserts that the four-quadrant model provides a broad view of the possible processing paths that people could use during decision-making. The four-cell representation is not an assertion that the interaction in each quadrant is equally important. In fact, it could be that some interaction that is left out could lead to incompleteness in some situations.

As presented in Table 3, the two-dimensional framework (*System 1 –System 2,* experiential – rational) gives the common attributes of the dual systems compared to attributes of Epstein's (1994) CEST theory of social judgment. Epstein's CEST is a dual-system theory that integrates Freudian psychodynamics with modern theories of cognitive unconscious (Epstein, 1994, Epstein, et al., 1996). An overview of the dimension (*System 1 – System* 2) of most common attributes found in other dual process theories by Evans (2008) is discussed first followed by a discussion on the second dimension (experiential – rational) describing attributes ascribed to Epstein's (1994) CEST theory. A discussion of the interactive aspect of the research results with the matrix of both dimensions is given at the end of this section.

For the first distinction of the *System 1* - *System 2* dimension-axis shown in Table 3, *System 1* processing is a form of universal cognition and rather than a single system, it is a set of sub-systems that operate with some autonomy (Evans, 2003). It includes instinctive behavior and often formed by associative learning processes (Sloman, 1996). For *System 1,* the nonconscious construct is routinely found in dual-process theories and have their knowledge base and goal structure, which is a set of inferential mechanisms adapted for the control of behavior leading to direct action and conscious thought

(Frankish, 2010). With regard to the distinction between the functional characteristics of automatic and controlled cognition, automatic processes are viewed as having been *automated* from those that were once controlled and conscious. Notably, Evans (2008) suggested that the term automatic is used as a contrastive with controlled and implies no assumption about how such processes were acquired. However, automatic processes are the default mode of brain operation (Camerer et al., 2005). Another functional characteristic of *System 1* is parallel processing, which facilitates rapid responses, allows for multitasking, and gives the brain remarkable ability to certain tasks (Camerer et al., 2005). For dual process models on reasoning, typically *System 1* domain includes cognitive biases described as heuristic and associative.

System 2 processes are the opposite of *System 1* processes as presented in Table 3. Decision tasks are consciously and slowly processed under control. When a challenging occasion is encountered, people tend to undertake deliberate processing for reasoning and decision-making in serial steps (systematic logic or computations) (Camerer et al., 2005). For dual process theories of reasoning, *System 2* is analytical and rule-based, which seeks the good and satisfactory outcomes for the individual and can override more superficial judgments such as cognitive biases and desires that originate from other parts of the brain (Frankish & Evans, 2009).

For the second distinction of the experiential – rational dimension-axis shown in Table 3, Epstein posits a parallel dual process theory that differentiates between an experiential and rational processing system, which allows each process to interact and compete with each other, which is unlike other dual process theorists who subscribe to parallel processing during *System 1* processing and serial sequencing in *System 2*

processing. However, other characteristics of Epstein's CEST theory are similar to other attributes of other dual process theories. Importantly, Epstein's theory differs from other dual process theories by positing that emotions drive *System 1* processing and relative preference for *System 1* or *System 2* processing modes depends upon individual differences in thinking style such as a desire for intellectual challenge or belief in one's own hunches; thus, Epstein posits that each of the dual process has access to distinct forms of knowledge.

The second distinction is represented by the experiential-rational dimension-axis (Table 3). According to Epstein (1994, 2003), the experiential system is an organized, adaptive system and operates in a manner that is preconscious (nonconscious), automatic, rapid, effortless, holistic, concrete, associative, primarily nonverbal, and minimally demanding of cognitive resources. These attributes cited by Epstein are consistent with those attributes reported by Evans (2008). The primary feature of the experiential process is that it encodes information as memory of individual events, particularly highly emotional events and both influences and is influenced by affect (emotion). The purpose of experiential processing is to direct behavior, seeking to achieve a positive outcome while avoiding unwanted consequences, but the cognitions themselves are influenced by affect. According to Epstein (2003), other benefits of the experiential system include the ability to respond to real-life problems that are too complex to be analyzed within their components and that real-life experiences that elude articulation and logical analysis could be learned.

Contrasting the experiential system-axis, Epstein (2003) argued that the rational system-axis is an inferential system that operates according to peoples' understanding of

the rules of reasoning and evidence. The attributes of Epstein's rational system are conscious, analytical, effortful, relatively slow, affect-free, and highly demanding of cognitive resource; all consistent with those attributes of other dual process theorists as reported by Evans (2008). Epstein (2003) reported additional benefits of the rational system that include the capability of higher levels of abstraction and complexity compared to that of the experiential process and thus, enabling planning, long-term delay of gratification, complex generalization, and comprehension of cause-and-effect relations. Importantly, the thinking in the rational system can understand the experiential system, not vice versa.

In describing the operation of the experiential-axis process, Epstein (2003) posited that when people respond to an emotionally significant event, they undergo a sequence of reactions. First, the event causes the peoples' experiential system automatically, instantaneously, and nonconsciously to promptly search their memory bank for related events. A positive (negative) significant event would automatically lead people to have tendencies to reproduce the positive (negative) feelings. Importantly, this process is automatic and instantaneous and thus, people are unaware of this process. Seeking to understand their behavior, people usually will find an acceptable explanation that is most emotionally satisfying. Finding an acceptable explanation using the rational process for that that was originated in the experiential system is referred to as rationalization. Epstein's CEST theory considers the rationalization process as routine and regards this process as a source of irrationality.

The influence of the activities in peoples' experiential system on the rational system can be either positive or negative. Because people find an acceptable explanation

in the rational system for that which was originated in the experiential system, their thinking is often biased by their experiential processing. Epstein (2003) argued that the biases that influence conscious, rational thinking in everyday life are adaptive because the experiential system has implemented relevant experiences in the memory bank for successful outcomes. However, people sometimes face situations when experientially determined biases and their subsequent rationalizations are maladaptive. Additionally, because the experiential system relies on experience and is a learning system, it is a source for information that could be used in the rational system. For this reason, Epstein (2003) contended that the activities in the experiential system could provide a source of passion that the rational processing would not recognize allowing people to engage in intellectual pursuits with heart rather than just dispassionate activities. The domain of the experiential system includes all phenomena that are based on nonanalytical information processing such as heuristics, intuition, fears superstitions, and esoteric beliefs including extrasensory perception. Epstein (2003) reported that the findings of other research studies on heuristic processing are consistent with the principles of experiential processing.

The activities in peoples' rational system can correct the activities of the experiential system leading to a positive outcome. Epstein (2003) indicated that people often reflect on their spontaneous or impulsive thoughts and then recognized that a better or more constructive alternative could provide a better outcome. Additionally, the activities in the rational system could allow a person to influence the experiential processes such that the initial activity emerging from the experiential process would be more appropriate. Also, deliberate action in the rational system such as people

participating in repetitive thoughts or behavior could become *habitualized* or *proceduralized* with control shifting from the rational system to the experiential system (Smith & DeCoster, 2000). In the event that such a transition takes place, the resultant thoughts and behavior would require less cognitive resources and now can occur without conscious awareness. Such a process could be used in stock investing decisions when investors' recognize certain patterns or cycles encountered in the stock market price movements.

These two dimensions (*System 1 – System 2* and experiential – rational) in combination define the four quadrants labeled as I, II, III, and IV as shown in Table 3. Quadrant I contains people who are subject to emotions and prior experiences whether good or bad and make decisions automatically and rapidly, never considering any alternative choices. Investors Kellem, Kurt, and Zorro displayed these characteristics. Quadrant II portrays people who are subject to emotions but through experience or knowledge, know that there are alternative choices and make their decisions rapidly. Norm who held his stock portfolio displayed these attributes. Quadrant III represents people who are continually subject to emotional episodes, but yet could consider alternative choices after some deliberative thought. The cohort that reallocated (Ann, Bria, Luigi) by decreasing their exposure to stocks to safer investments exhibited these qualities. Quadrant IV describes people who are deliberate and rational and not subject to any emotions. The cohort that did not show any emotions and who bought stocks (Chase, Rocky, Vincent, Willie) displayed belong to this cell. Additionally, Luke's demonstrated the attributes (showed no nervousness or fear) of Quadrant IV, but rather than buying additional stocks, he held the stocks he already owned.

Quadrant I describes people who nonconsciously, automatically, and instantaneously make decisions within the experiential with no consideration of any alternative choices. For the cohort of investors that sold (Kellem, Kurt, Zorro), Kellem sold at the beginning of the 2008 Financial Crisis (October 2008) when he first noticed that his portfolio had dropped precipitously. Kellem complained, "…I was nervous, I was upset and I was uncertain about the future… I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have…I just wanted to protect what I had left because I was afraid that I could lose it all… I wanted to protect what was left because I was afraid that I could lose everything I had. I was nervous I was angry and my portfolio kept going down and I just wanted to get out before I lost too much." Kellem was nervous and fearful because he was afraid of losing everything and allowed his emotions influence his decision to sell immediately (automatically and rapidly), without considering alternatives. Similarly, Kurt and Kellem sold towards the end of the 2008 Financial Crisis (March 2009) after disregarding their financial advisor advice to hold their stock position throughout the crisis which began in 2008. Kurt lamented, "…portfolio starting to go down again. Now I had online access, so I could see my portfolio on a daily basis versus a monthly basis, and you know, it was quite apparent that something bad was happening in the market and I was getting nervous… at this point it was anger…nervous because I was maybe 10, 12 years away from retirement... I called my adviser, I said I need x amount of dollars back. I want out, and that is–that is kind of the overriding factor that made me sell..." Similarly, Zorro bemoaned, "…I felt I was scared because this (is) my money, this was the money that was supposed to take care of me when I'm old and it was going away

fast…if I could like when I opened up my statement on the weekend and saw how much I lost, if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker…" Similar to Kellem's decision-making process, both Kurt and Zorro were influenced by their emotions of nervousness and fear because they were afraid of losing everything and allowed their emotions to influence their decision to sell immediately (automatically and rapidly), without considering alternatives as they had previously during the crisis, particularly in October 2008 when they heeded their financial advisor's recommendations. For these reasons, the cohort of Kellem, Kurt, and Zorro displayed attributes typical of Quadrant I automatic and rapid decision-making processing; they did not consider alternative choices. The sell decision by this cohort aligns with Theme RQ1.8, which describes investors who adopt a narrow view of the market and would have sold their portfolio after realizing their portfolio dropped drastically.

Quadrant II describes people, who are subjected to emotional episodes but nonconsciously, immediately, and rapidly recall experiences and learning from their memory to arrive at a quick alternative decision. As an example, Norm expressed nervousness and fear throughout the crisis but held on to his stock portfolio. Norm expressed, "…A lot of sleepless nights, lot of panic. I held true to one of my father's sayings, which was if you don't sell it you don't lose it… while on paper I was short some valuations, as long as I held tight those valuations would come back …In my particular case it was clearly emotional…I tried to hold on to logic with both hands…I was very scared, I was very emotional about it, so clearly for me it was emotions… So I believed if I held on to it, it would bounce back and for most case I was right…" Using

his personal experience and learning from his father, Norm understood certain cyclical facts about the market, but still experienced severe fear, nervousness and even episodes of panic throughout the 2008 Financial Crisis. However, Norm was conflicted. He did not yield to his nonconscious (*System* 1) desire to act automatically and immediately to sell because of his experience, but rather made an immediate decision to hold on to his stock portfolio. According to Epstein (2003), people have conflicts between the heart and the head as well as having unwanted distressing thought including emotions that cannot be controlled by consciously, as in the case of Norm. Epstein argued that his CEST model allows activity in the rational system to improve the functioning of the experiential system by teaching people to understand the operation to the experiential system. In the case of Norm, it appears that when he was faced with emotional 2008 Financial Crisis, his memory recalled his prior investment experience and his father's advice that enabled him to act in the rational domain while at the same time experiencing *System 1* emotional episodes. With his CEST model, Epstein posited that people operate by two independent systems that can conflict: the experiential and rational system. By learning how the experiential system operates, people using the rational processing can correct and train the experiential system from unwanted thoughts. Thus, Norm enabled himself to not yield to the immediate automatic decision to sell stocks because of his emotional episodes, but rather immediately yielded to the decision to hold, a decision initiated by activities in the rational system. Norm's decision places his decision processing in Quadrant II, which portrays people who are subject to emotions but through experience or knowledge, know that there are alternative choices and make their decisions rapidly. This view aligns with the Theme RQ1.10, which describes investors

who embrace a broad view of the stock market performance and views the 2008 Financial Crisis as a blip in the upward trend of the stock market. Also, this view aligns with Theme RQ2.3, which describes investors who not only embrace a broad view of the market, but also expect the market to rebound and believes that stocks are at good value.

Quadrant III represents people who are continuously experiencing emotional activity, but can deliberately consider alternative choices. For the cohort of investors who reallocated (Ann, Bria, Luigi) they each expressed nervousness and fear, except for Ann, who express annoyance more than fear because she could do little to change the market. Bria stated, "It was very scary, and friends would talk about it and you just hope that you will be alright, and things would get better financially…" and Luigi added, "I was very nervous and upset that the banks were failing… "Similarly, Ann stated, "…I was a little bit annoyed…but I realized at that time that other people are going through the same condition…and I was a little angry… I have no control over it…" This cohort of investors is consistently experiencing emotion of nervousness and some amount of fear. However, through their financial advisor, they were able to process the information rationally and thus, reallocated their portfolio. The emotions of nervousness, fear, or anger did not cause this cohort of investors to sell immediately, but through the advice of their financial advisor, they slowly and deliberately made the decision to reallocate part of their stock portfolio to more conservative investments. For this cohort that reallocated, their decision process places them into the Quadrant III domain, which is identified for those people who are continually subject to emotional episodes but yet can consider alternative choices after some deliberative thought. These investors align with Theme RQ1.10 which describes investors who embrace a broad view of the stock market

performance and the losses incurred from the crisis are a blip in the upward trend of the stock market.

Quadrant IV portrays people who do not experience any emotion, but deliberately consider alternative choices before making a decision. Chase, Rocky, Vincent, and Willie, who all bought stocks and Luke who held on to his stock positions all did not experience any emotions such as nervousness or fear during the 2008 Financial Crisis. Their assessment of the situation was conscious, slow and deliberative. The cohort (Chase, Rock, Vincent, Willie) that bought additional stocks viewed the crisis as an opportunity. For example, Vincent declares, "…And I see the opportunity as long as they keep selling then I just waited to look out– that's far enough (drop) then I figured– well you are not going to see companies like General Electric go out of business and close their doors or Pfizer close the doors or International Paper all of a sudden stop making newspapers, I said (to myself) – so I got in and bought…" Rocky added, "Stocks plummeted; I actually went out and bought some stock…I didn't panic, but I saw it as a buying opportunity..." For these reasons, the people who did not show any emotions and consciously, deliberatively, sought alternative choices in a controlled manner, displayed decision-making characteristics consistent with Quadrant IV attributes. These investors align with Theme RQ1.10 that describe investors who embrace a broad view of the stock market and view the losses incurred during the crisis is only a blip in the upward trend of the market. Importantly, for other than Luke, who did not add to his stock portfolio, the remainder investors (Chase, Rocky, Vincent, Willie) who bought align with Theme RQ2.3 that describes investors who embrace a broad view of the market and view the crisis as a buying opportunity.

Discussion-Dual process theories. The 2008 Financial Crisis was not a singular event, but one that evolved over time. The crisis was due to the recession of 2007 -2009 and according to the National Bureau of Economic Research; the recession officially began in December 2007 and ended in June 2009 (National Bureau of Economic Research, 2010). The models for dual process theories and emotion regulation were developed and studied as applications to singular- time events. Thus, the applications of these models must be carefully scrutinized when applied to an event that occurs over an extended time. For these reasons, one particular investor, Norm, who experienced emotions throughout the crisis, will be discussed in detail.

According to the CEST model, when Norm responds to an emotionally significant event such as the catastrophic decline in stock valuations, his experiential system searches his memory banks for related event in a nonconscious manner. The recalled memories and feelings influence the path of further processing and behavioral tendencies. If the recalled memories are positive (negative), Norm will automatically thinks and have tendencies to act in ways anticipated to reproduce (avoid) the feelings and then make his decision. According to Epstein's (1994) CEST model, these events occur instantaneously and automatically, and Norm is unaware of the operation. As it is, Norm decision was to hold-on to his stock portfolio as he heeded to the memory of his father's advice, "…if you don't sell it you don't lose it …" In the midst of the crisis, Norm was in a dilemma as he stated, "…You're stuck between wanting to pull it out or wanting to keep it in, so that's how I felt, scared…Sure. I was scared of the fact that I had money up there, and I didn't know what the future held. It not did look good in the short term, so my only strategy at this point was play a long-term game, but how long do I want to stay in the

market, because, you know, each and every day we (his stock portfolio value) get smaller and smaller, so that was tough, that was though… A lot of sleepless nights, lot of panic"

For Norm, what exactly was going on in his nonconscious mind as he faced this dilemma? Was his search in his memory banks positive as he stated, "…I truly believed that if I stayed in the market it would bounce back…" or negative as he stated, "…At this point I don't even share my financials with my wife solely for the fact that I don't want her to know when I lose money… (designated) for (children's) college and retirement…" According to Epstein's CEST model, seeking to understand behavior, people find an acceptable explanation in the rational system for what was determined primarily by the experiential system, a process referred to as rationalization. Epstein cautioned that influences of the experiential system on the rational system and its subsequent rationalization are regarded as a major source of human irrationality. Notably, Norm in retrospect stated, "…My decision was pretty cut and dry. I knew if I pulled out I would have some money, but I've lost money across the board and I truly believed that if I stayed in the market it would bounce back, not every sector mind you, but the majority of it would bounce back eventually…I had a few more years before I had to pull anything out of the market for… college and retirement and so forth so I figured I had enough time to recoup, so owning stock as long as you didn't cash it in it was just a number. When I cashed it in it was done. So I believed if I held on to it, it would bounce back and for most case I was right…" According to Epstein's CEST, Norm's justification of his decision to hold-on to his stock portfolio is a rationalization of the events that occurred in the experiential system. In retrospect, the fact that the stock market recovered nicely within five years confirmed that Norm's decision was rational and correct. However,

what if the recovery period took 10 years , as it did in the Great Depression years (Reinhart & Rogoff, 2009), and meanwhile Norm needed the money for his children's college education and retirement, would Norm's decision would have been rational or irrational? This was Norm's conundrum, at the time when he made the decision to hold-on; he did not know whether the stock market would recover within the time when he needed the money for his children's college education and his own retirement.

Because the 2008 Financial Crisis extended for a period, at least six months from October 2008 to March 2009 when the stock market was exceptionally volatile, did Norm have to make this nonconscious decision every time that he thought about his investments? With the negative prosodic headlines of financial news throughout the day during this time, Norm probably faced this decision throughout each day until the market reached some stability in 2009. Epstein's CEST model would lead one to believe that Norm faced this conundrum every day in nonconscious manner–recalling positive memories of the stock market recovery as opposed to negative memories of embarrassment of losing monies designated for children's college education and retirement.

As an alternative view, rather than a parallel model of processing (Epstein, 1994), Evans (2006a, 2008) postulated a default-interventionists serial model whereby the rapid preconscious processes (*System 1*) always works first by cueing default behaviors that the analytic reasoning (*System 2*) may approve or intervene upon the final decision with more deliberate reasoning with either overriding or elaborating the intuitive response (*System 1*). Evans (2010, 2012) extended his initial theory of reasoning and decision-making renaming the dual processing identification to Type 1/Type 2 terminologies because the

new terminology better describes the process since previous notation implies a singular system. The change in terminology describes Type 1 processing as comprising of heterogeneous set of systems that are responsible for the biases and heuristics displayed by people, and Type 2 processing is a result of a deliberative, algorithmic mind that requires working memory and analyzes all possible outcomes that could override the autonomous mind of the Type 1 domain (Stanovich, West, & Toplak, 2011). Evans (2012) argued that people have an old and new mind, which pursues goals by very different mechanisms. The old mind relies on Type1 systems that repeat behaviors that have been successful in the past, whereas the new mind depends on Type 2 systems by engaging in mental projections of the future.

Evans' default-interventionist serial model (2012) suggests that rapid Type 1 processes produce default intuitive responses unless the default response is intervened by the slower more reflective type 2 reasoning requiring working memory. Furthermore, in the event that Type 2 processing is inhibited in intervening Type 1processes, belief bias is increased dramatically which would make the response attributable to Type 1 processing. Whereas Epstein (1994) posited that emotion is integral to his theory and confined to the experiential processing (*System* 1), Evans suggested that emotion and metacognition could be factors which play a role in the interaction and conflict of Type 1 and Type 2 processes; which is referred to as a cognitive control problem. This conflict could be resolved in different ways for different episodes, according to Evans. Furthermore, Evans (2012) argued that the influence of emotion might not be confined to the *System 1* domain as Epstein (1994) suggested. Evans (2012) suggested that Type 1 processing could lead to emotions and feelings of intuition, which are conscious, even though the

underlying processing is not accessible. Type 1 processing is consciously accessible in part, but invariably depends upon a number of rapid, unconscious support systems, such as those which provide pragmatic cues to the relevant context, or retrieve relevant information from long-term memory. Evans (2012) further added that other factors might influence cognitive control such as disposition by personality to think analytically before deciding, the motivation to solve the problem correctly, and the cognitive capacity of the person, which could depend upon intelligence or working memory capacity and environmental factors at the time of the decision including any presence of competing tasks.

Applying Evans'(2012) default-interventionist model to Norm, it is likely that Norm desire to sell was intense because of the way he described his situation, "…A lot of sleepless nights, lot of panic…I was very scared, I was very emotional about it, so clearly for me it was emotions, it was an emotional decision… Doing this took 25 years off my life. It's a scary place to be (going through market drops)…" Norm first reaction was to sell, the default action in Evans' model. However by intervening with his Type 2 process of projecting the future (i.e. recovery of stock valuations) and by using his working memory and invoking the memory of his father's adage of "…if you don't sell it you don't lose it…" he deemed the decision to hold-on as a better strategy. However, even with processing the events using Evans' default-interventionist model of information processing, Norm still encountered this dilemma every day throughout the crisis period.

In comparing Epstein's CEST model and Evan's default-interventionist model, it appears that the decision-processing path conflicts. Epstein's model provides a path through *System 1*experiental system whereas Evans' serial model provided a path through

his declared Type 2 system that overrode the Type 1 default system. No matter which model is utilized, Norm still reached the same decisions: to hold-on to his stock portfolio. In recalling emotion regulation, this researcher believes that Norm could have use the emotion regulation process cycle that Koole et al. (2011) described. Koole et al. explained that people respond to emotion in two phases: primary and secondary. The primary response involves immediate, unregulated raw response to emotional stimuli, whereas the secondary response is driven by emotion regulation and is a function of peoples' ability to cope with the primary emotional response. The transition from primary to secondary processing could be quick and unnoticeable to people. They posited that the primary response is referred to as emotional sensitivity, which is determined by any factor that influences peoples' emotional response to the stimuli, including the intensity of the stimuli(e.g. highly arousing stimuli are able to trigger emotions rapidly such as catastrophic losses in investment portfolio), peoples' personality (e.g. higher neurotic people will enter a negative state quicker), and the environment (e.g. during a financial crisis, emotions such as nervousness and fear are more apparent) of the emotion episode. To exit from the increased emotional intensity, the people could return to a baseline emotional level without any conscious regulatory effort in a process known as habituation.

This researcher believes that it is likely that Evans' factors of cognitive control and Kooles' et al. (2011) emotional sensitivity factors could play a major role on how Norm reached his investment decision. Evans factors of cognitive control include disposition by personality to think analytically before deciding, the motivation to solve the problem correctly, the cognitive capacity of the person, which depend upon

intelligence or working memory capacity and environmental factors at the time of the decision. Kooles' et al. (2011) emotional sensitivity factors include intensity of the stimuli, people's personality, and the environment.

Research Question 1: How did investors yield to either System 1 or System 2-axis decision-making with extreme stress induced during the 2008 Financial Crisis?

The investors (Kellem, Kurt, Zorro) who were worried and experienced nervousness, worry, or fear leading to adopting a narrow view(short-term) of the market, and sold their stock portfolio likely yielded to *System 1*-axis decision-making a common theme revealed in the interviews (Themes RQ1.5, RQ1.6, RQ1.8). For example, Kellem (sold) stated, "I was nervous, I was upset and I was uncertain about the future… I was fearful and insecure…I was afraid I could lose it all… I saw our values dropping so much I just I would have sold the stocks immediately if I could have…," while Kurt (Sold) lamented, "…I was nervous …I was just shocked.. I just got burnt twice in my mind in the last several months. The market started rallying again from I guess those March lows, and I think I probably sold within a week of the low…I called my adviser, I said I need x amount of dollars back. I want out…" and Zorro added, "…it was a very scary time… it was fear and mainly scared… Saw how much I lost if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker…"

Although they experienced nervousness, worry, and fear, the investors who relied on advice from their financial advisors reallocated (Ann, Bria, Luigi) and or held (Luke) yielded to *System 2*-axis of the decision-making process. These investors also embraced a broad view of the market and considered the 2008 Financial Crisis as a blip in the long-

term upward trend of the stock market (Theme RQ1.10). As an example, While Ann opined, "I had a hunch, I'm going to stick with it. And with this, I hope to get out of whatever I lost and even made a little more ahead," Bria commented, "...you just hope you will be all right and things would get better financially… I was lucky enough to have some dividends and really appreciated them, they helped me financially and so I was one of the lucky ones I made out okay." Luigi thankfully recalled, "I was fortunate by now that I did not sell at the time because I felt it should be coming back… I had a little faith that it would come back, and that's why I did hold on to my stocks at that time as urged by my broker… I did expect that they (stock prices) would come back at some point…" Similarly, Luke added, "…I decided to weather the storm; I did not want to sell stocks, and I just again hope things will turn around and will bounce back… optimistic about the market is going to turn around and eventually it will come back…"

One investor Norm (held) who was intensely emotional throughout the crisis may have yielded to *System 1*-axis in his decision-making process. He stated, "…A lot of sleepless nights, lot of panic… it was clearly emotional…I was very scared, I was very emotional about it, so clearly for me it was emotions, it was an emotional decision… I knew if I could I would've sold everything in a heartbeat, but I knew what was wrong at the core, so I held on. I guess it's really both because during that time I was a very emotional wreck…I held true to one of my father's sayings, which was if you don't sell it you don't lose it. As fully discussed in the Discussion of Dual Process Theories section, the intensity of Norm's emotion may have led him to process the information in the *System 1*-axis.

The cohort of investors that bought (Chase, Rocky, Vincent, Willie) viewed the conditions brought about by the 2008 Financial Crisis as an opportunity to add stocks to their portfolio and yielded to *System 2*-axis of the decision-making process (Theme RQ1.9). Typical of this cohort of investors, Vincent exclaimed, "…you heard like the world was coming to an end, and everybody was selling everything out. And I see the opportunity as long as they keep selling then I just waited to look out– that's far enough…" and Rocky (Bought) explained, "stock plummeted; I actually went out and bought some of its stock. It wasn't, you know, I didn't panic, but I saw it as a buying opportunity."

Research Question 2: Why did investors yield to either System 1 or System 2-axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Myopic loss aversion, symptom of narrow framing (short term outlook) of the stock market prompted by nervousness and fear, is the primary reason that those investors (Kellem, Kurt, Zorro) who sold yield to *System 1*-axis of decision-making process because they wanted to protect what value they had remaining (Theme RQ2.1). Kellem stated, "…lost too much because it was the majority of my retirement plan and investment… I was very nervous about it…I had hoped trends would reverse but when I saw our values dropping so much I just I would have sold the stocks immediately if I could have…," Kurt lamented, "…I just got burnt twice in my mind in the last several months… I called my adviser; I said I need x amount of dollars back. I want out…," and Zorro bemoaned, "…It was bad time; very, very scary, very bad time…saw how much I

lost if I could have sold it right then and there I would have, but I had to wait to sell it first thing in the morning with my broker…"

Some investors (Ann, Bria, Luigi) adopted a broad view of the market and reallocated their portfolio because they expected the market to rebound but did not know where or when the stock market bottom would be reached and yielded to *System 2*-axis of decision-making (Theme RQ2.2). Ann stated, "…I didn't worry about my money even though I didn't like the idea of losing it because I worked hard to get it…I had a hunch. I'm going to stick with it… I buy; I sell, I balance out…And I'm sure we'll make out all right…," Bria offered, "…But I was lucky hung in there… just hoped you will be alright, and things would get better financially…I was lucky enough to have some dividends and really appreciated them, they helped me financially and so I was one of the lucky ones, I made out okay…," and Luigi recalled, "…I was fortunate by now that I did not sell at the time because I felt it should be coming back…I held on to them, my stocks because I did expect that they would come back at some point.."

For those investors that bought (Chase, Rocky, Vincent, Willie) and Luke (held), they embraced a broad view of the stock market was at good value and expected the market to rebound and go higher as they yielded to *System 2*-axis of the decision-making process (Theme RQ2.3). Luke was always optimistic about his investments and declared, "I am very optimistic about the market. I always felt in the old cliché– what rises falls and what falls rises, so I just again weathered the storm… So, I just held on and waited, waited and then the market finally bounced back, came back around" and Norm added "I knew if I pulled out I would have some money, but (would have) lost money across the board and I truly believed that if I stayed in the market, it would bounce back… When

(If) I cashed it in, it was done...So I believed if I held on to it, it would bounce back and for most case I was right…," Chase stated, "…I bought some Citicorp in May ...in summary that my attitude has been to try to invest to get appreciation over time…, Rocky exclaimed, "…I'm not a panicky kind of guy. I like to take advantage of opportunities, you know, a guy like Warren Buffet buys stuff when it's cheap. So to some extent, I buy when everyone is selling, and I sell when everybody is buying. I try to be analytical and rational in my decision making that is before making a decision I research the stock…, I'm analytical and based on the findings of my research…," Vincent asserted, "…I just had this strong feeling that US businesses or businesses I mean they run the world. And they are not going to close the door and fold up. And I just figured what opportunity can you get to buy… it was to me it was an opportunity because you are investing in businesses that have been around for years…" and Willie added, "…When the market took a nose dive, I was interested in buying…"

For Norm, who held-on to his stock portfolio, he displayed nervousness and fear throughout the crisis although he embraced a broad view of the market and expected the market will ultimately rebound; he yielded to the *System 2*-axis of the decision-making process (Theme RQ2.3). Norm declared, "…A lot of sleepless nights, lot of panic… it was clearly emotional…I was very scared, I was very emotional about it, so clearly for me it was emotions, it was an emotional decision…" A full discussion on Norm's behavior is given in the Discussion of Dual Process Theories section.

Notably, all of the participants in this research study had no immediate need for any distributions from their investments. They were either gainfully employed or they were retired and using the cash flow such as dividends and interests from their

investments to meet their retirement living and goals. Only Norm needed some monies for his children's college education, although he had some monies set aside already. In addition, both Kurt and Zorro were at least over 10 years from retirement. While Chase, Rocky, Vincent, and Willie viewed the 2008 Financial Crisis as an opportunity to buy additional stocks and Norm and Luke held their stock positions, Ann, Bria, and Luigi reallocated their portfolio as the lowered their stock holdings. None of these investors needed additional monies from their investments; they were either gainfully employed or withdrawing dividends or interest from their investments to help meet their retirement expenses and goals. Thus, each of the participants commonly displayed Theme RQ2.4: Some investors had sufficient cash flow to meet their immediate needs and had no necessity to sell their stock portfolio. Interestingly, the investors that sold did not need the money; rather, they wanted to preserve what they had left. Those who reallocated, held, or bought continued their goal of having sufficient cash flow to fund their retirement plan.

Summary

Three phases describe the decision-making process for investors: Phase I–Foundation–consisting of investors' stock market literacy and risk profile; Phase II–Determinant–consisting of investors' cognitive biases and emotion regulation, and Phase III–Processing-consisting of acting on all of the investors' acquired information and cognitive activity.

Phase I foundations discuss the investors' decision-making process which is based on what the investors need to know to invest their monies. Thus, investors commonly will seek to learn about the fundamentals of investing themselves or trust a third party

such as a relative or financial advisor to guide their investment decisions. Because investing in stocks does not guarantee the principal value, invested investors' literacy and risk profile are critical and considered foundations for investment decisions. The researcher introduces the term *stock market literacy*. An important construct that assesses investors' knowledge and understanding the accounting fundamentals of stocks, the underpinnings of the stock market, and factors that causes asset price movements along with an emphasis on the investors' goals and investment time horizon. A second construct that is critical to the foundation of investors is the understanding and assessment of their risk profile. The assessment of risk tolerance and investment objectives are tools for managing the expectations of portfolio volatility and achieving the goals of the investor. What is important to investors is the understanding that that the sensitivity of risk aversion and risk perception could change with a change in environment such as a financial shock. Thus, an investor risk profile should be assessed periodically to determine if the investors' circumstances has changed to warrant a change in their risk profile.

Phase II-Determinants involves the understanding of the processes that underlie the decisions and the drivers of risk taking under such extreme market volatility is critical not only to the investor but also to financial advisors, professional money managers, and public policy makers, particularly when investors' life savings are at stake. The influence of heuristic and cognitive biases, loss aversion, emotion regulation, and the construct of time variance on decision-making are discussed.

Phase III-Information processing briefly describes a general framework for human information was developed that emphasized the role of automatic and controlled

processing because economic models do not address automatic and affective (emotional) processing information. The general framework is a two-dimensional that elaborated on the interaction of automatic and controlled processes with cognitive and affective neural functioning of the brain with respect to decision-making. This general framework was the basis for the format of the theoretical framework that is used for this researcher's study.

A two- dimensional theoretical framework is constructed with attributes commonly found in many dual process theories compared to attributes of Epstein's (1994) Cognitive Experiential Self-Theory (CEST) model. The findings of this research is mapped to this framework and discussed. A discussion of Epstein's parallel model and Evan's default-interventionist model using the researcher findings is included. Finally, the answers to the Research Questions are offered, citing the data that were collected in the researcher's body of work.

Chapter 5: Implications, Recommendations, and Conclusions

A longstanding controversy in financial economics is whether investors' rational forces or their emotional responses govern the asset pricing of the financial markets (Lo and Repin, 2002). When faced with crises, investors' quick selling without rational thought of all their risk assets at fire-sale prices in favor of government bonds and cash may not serve their longer-term goals if they maintain these holdings too long (Lo, 2011). Some psychology researchers such as Epstein (1994) and Evans (2008) use a dual process model to help understand peoples' information processing and reasoning. The specific problem is that some investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and automatically in the *System 1* domain, to affect their decisions rather than respond deliberatively and rationally which are ascribed to the *System 2* domain (Epstein, 1994, 2010; Evans, 2008, 2012). The purpose of this case qualitative study was to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. Without evaluating the role that cognitive biases plays in information processing, investors will not understand why they make inauspicious automatic decisions or grasp the steps that could help avoid losses in their stock portfolio (Shariff, Al-Khasawneh, & Al-Mutawa, 2012).

This researcher applied Yin's (2009) recommendation that the case study method is relevant when the research study evaluates either a descriptive question (what happened?) or an explanatory question (how or why did something happen?). Furthermore, an inductive research approach uses case study research methodology to broaden, develop, create, and even extend the theory to understand the phenomena

(Barratt, Choi, & Li, 2011). This research relied on the framework of existing dual process theories as a starting point to better understand how investors describe their heuristics and cognitive biases and experience in their investment decisions when faced with the 2008 Financial Crisis. This researcher used the seminal work of Epstein (1994), who proposed a dual-process model referred to as cognitive-experiential self-theory (CEST) for processing information, as a framework for the study. A multiple-case study research design satisfied the goal of this exploratory research by collecting data from multiple sources, which included in-depth individual interviews, field notes, and archived data as well as allowing subject matter expert (SME) review. The units of analysis is 12 wealthy investors with a financial portfolio of at least $1 million dollars in stock and bonds (Bajteslmit & Bemasek, 2001; Chhabra, 2005; Boscaljon, 2013). The participant selection strategy employed a purposeful small sample using homogeneous participants that was informational rich (Patton, 2002). The interviewing procedure utilized an interview guide, which was field tested to ensure validity and reliability of the questions and to assure consistency in the interviewing process. Furthermore, an interview guide was essential for successful interviews and was designed with exploratory, opinion, and value type questions that enhanced the understanding of the opinions, judgments, perspectives, and values of the participants (Patton, 2002). These open-ended interview questions gained in-depth understanding of participants' perceptions, perspectives, and experiences with the phenomena under study (Patton, 2002). Critically, open-ended questions identified themes and nuances in the participants' answers (Yin, 2009). In addition to collecting archived monthly/quarterly portfolio statements from January 2008

through December 2009 for each participant, handwritten field notes were taken during the interview session to capture participants' key responses (Stake, 1995).

Based on common statements, coding identified themes and keywords that were consistent, referenced, and traceable to the data. Specifically, transcribed participants' responses were coded by headings and interview questions. Coding was both theoretical and inductive in order to identify emerging themes and compared to other coded categories to assess linkages and meanings between cases (Patton, 2002). Thematic analysis developed the patterns, ideas, meanings within the data to identify themes that were consistent with referenced and traceable data. Data analysis and emerging themes provided a narrative that described the observed phenomena

Triangulation approach using transcribed interview data, field notes, and archived documents of portfolio activity corroborated the facts of the observed phenomena (Merriam, 2009; Stake, 2010; Yin, 2009). Furthermore, triangulation of the data of emerging patterns and themes, field notes along with feedback of each interview, and archived portfolio documents of each participant provided the accuracy and validity of the phenomena (Creswell et al., 2007; Jonsen & Jehn, 2009). Another benefit of data triangulation analysis enabled cross-data validity checks of the various data sources in order to achieve accurate and valid findings (Merriam, 2009; Stake, 2010).

The findings of this research were subject to limitations. First, people's self-reporting of data is not often accurate. Rude et al. (2010) warned that the self-report measures are viewed suspiciously because self-reporting is susceptible to demand and self-presentational biases. Some researchers have indicated that individuals do not have full access to their own cognitive processes (Nisbett & Wilson, 1977; Squire, 1994).

Freund and Kasten (2011) explained that many researchers found that self-assessments are biased, mostly in the direction of a positively distorted self-evaluation (Maxwell & Lopus, 1994). Such distortions help individuals establish and maintain a positive self-concept because they enhance peoples' self-esteem and feelings of self-worth. A well-documented distortion in self-assessment is the better-than-average effect, which describes a person's tendency to believe that one's ability is above average (Guenther & Alick, 2010). According to Freund and Kasten (2011), people are not very successful in estimating their own ability level. Thus, the participants' self-profiling of investment experience, goals, and risk profile may not be accurate and influence the researcher's interpretation of their commentary to the questions asked during the interview.

Second, the attributes of the units of analysis could be a limitation of this study. The 12 participants that each have $ 1 million dollar portfolio in stocks and bonds who are located in the Northeast of the United States may not be representative of all investors who own stocks. Professional money managers through pension plans and mutual funds collectively have billions of dollars of assets under management and are the likely driving force of asset price movement. However, these professional money managers also often anticipate investment decisions of private individual investors by selling stocks in anticipation liquidation of fund holders request for cash, especially in times of crisis. These findings are based on analysis of these 12 wealthy individuals and the implications and conclusions drawn may not be applicable to other types of investors who may have less money invested in stocks.

Lastly, respondents' accurate recall of their feelings during a crisis is critical and could be a limitation of this study. Participants' recalling of information was influenced

by a range of factors that are critical to achieving valid conclusions from the interview data. According to Dockerell (2004), these factors include what is to be recalled, the manner of questioning, how the questions influence the accuracy of the response, and the time gap between the event and the interview. Some research studies suggested that the inaccurate recall of emotional events might be due to peoples' focusing on the incident in question rather than other concurrent events (Wilson, Meyers, & Gilbert, 2001, 2003). However, Levine and Edelstein (2009) argued that memories of emotional events could be preserved for many years because significant emotional events enhance information processing in multiple memory systems and they concluded that presence of retrieval cues among other factors such as rehearsal contribute to enhanced memory for emotional information. Notably, Breslin and Safer (2011) acknowledged that people could remember negative public events more accurately than positive events in environments with frequent references to the negative events. The frequent prosody of headline news of the stock market volatility was a constant reminder to investors of the fragility of the value of their investments. For these reasons, participants' accurate recall of past events could lead to the researcher's misinterpretation of their narrative and could be a limitation of this study.

The overarching standard for this research study was to ensure professional and ethical behavior throughout the research study including participants understanding of informed consent procedures, protection from harm, and right to privacy as well as professional colleagues' honest treatment. Research and collection of data started only after this study was granted approval by the IRB. The researcher refrained from exerting any undue pressure on any investor to participate in the study. Importantly, the

researcher did not screen for such factors as age, gender, race, religion, or cultural background to avoid discrimination (Patton, 2002). Volunteers who accepted the invitation to participate were sent an Introductory Letter (Appendix A) and an Informed Consent Form (Appendix B) that included notice that their participation is voluntary, anonymous, and involves little risk and no benefit to be gained by their participation (Yin, 2009). Importantly, each participant was provided the opportunity to opt out of the process at any time during the interview session by addressing any of their questions and concerns (Patton, 2002). Additionally, the participants provided their feedback regarding the interview's content accuracy by reviewing a transcription of their interview (Patton, 2002). The researcher presented truthful positions and statements with respect to all facets of the research process and analysis to ensure academic integrity and honesty (Yin, 2012). Thus, the highest ethical standards were achieved as all the guidelines and procedures were strictly followed with emphasis on the confidentiality and anonymity of each participant and honesty of the researcher.

To provide the insights of the findings of this study, the implications, recommendations, and conclusions are presented next. Implications of this research study include a discussion of each research question within the context of the findings and its relationship with study problem, purpose of the study, and existing literature. Recommendations are provided for practical applications and future research. Finally, the conclusions summarize all the key points of Chapter 5.

Implications

The specific problem is that some professional and individual investors allow cognitive biases, particularly emotion, fear, and intuitions, which operate quickly and

automatically in the *System 1* domain, to affect their decisions rather than respond deliberatively and rationally which are ascribed to the *System 2* domain (Epstein 1994, 2010; Evans 2008, 2012). The purpose of this case qualitative study is to explore how and why investors yielded to either *System 1 or System 2* axis decision-making, when faced with extreme stress impelled during the 2008 Financial Crisis. The findings and implications related to each research question are discussed next.

Research Question 1(RQ1): How did investors yield to either System 1 or System 2-axis decision-making with extreme stress induced during the 2008 Financial Crisis?

Greater financial literacy helps investors overcome the effects of unexpected and devastating macroeconomic shocks (Klapper, Lusardi, & Panos, 2012). Researchers have shown that good financial behavior are positively correlated with higher levels of financial knowledge (Edmiston & Gilet-Fisher, 2006) and financial education and experience positively influence financial knowledge and behavior (Lyons, Palmer, Jayaratne, & Scherpf, 2006). According to Korniotis and Kumar (2013), although intelligence should be correlated with success in financial decision, directly establishing this link is difficult because of the unavailability of data sets that contain both measures of cognition and financial performance. Importantly, past scholars have used a variety of metrics to assess financial understanding and literacy (Banks et al., 2010; Grinblatt, et al., 2011), but to this researcher's best knowledge, no studies have been conducted that specifically focused on the investors' personal literacy of stocks and their understanding of the stock market underpinnings. Based upon the findings of the study, this researcher related investor understanding to *stock market literacy*, as an important factor in the

foundations that is required for investors' sound investment decision-making. As a result of this researcher's triangulation analysis of the data collected in this study including self-profiling data, interview conversations and investment brokerage statements, *stock market literacy* is defined subjectively as the knowledge and understanding that a retail investor has on the fundamental accounting data of individual stocks and the stock market underpinnings' and factors that cause stocks and the stock market valuation to change, with emphasis on the investor's goals and investment time horizon. The findings of this study indicated that those investors who displayed moderate to high *stock market literacy* did not experience any emotions while those investors categorized as negligible or some *stock market literacy* showed emotions during the financial crisis. An investors' decision-making process should be based on what the investors need to know and understand to invest their monies. Thus, investors should seek to learn the fundamentals of investing themselves or trust a third party such as a relative or financial advisor to guide their investment decisions. One implication of the findings of this research is for investors to seek *stock market literacy* that could influence how they yield to *System1* or *System2*-axis information processing in order to achieve sound investment decision-making.

Because investing in stocks does not guarantee the principal value invested, investors' risk profiling in addition to *stock market literacy* are critical factors and considered foundations for investment decisions. The assessment of risk tolerance and investment objectives are tools for managing the expectations of portfolio volatility and achieving the goals of the investor. Importantly, the research findings indicated that investors' risk tolerance changed, particularly when financial market volatility caused

losses in investors' portfolios that led to risk averseness during the period of the 2008 Financial Crisis. Notably, although some researchers have indicated that risk aversion is stable over time (Baucells & Villass, 2010; Sahm, 2008), other scholars have asserted that risk aversion is time variant (Malmendier & Nagle, 2011; Thaler & Johnson, 1990; Staw, 1976). The findings of this study indicated that for those that sold, their time-variant risk aversion and time-variant risk perception would have benefited from Jung and Treibich (2014) argument– that risk aversion should not be assessed just once but periodically because the sensitivity of risk aversion and risk perception could change with a change in environment such as a financial shock. Therefore, the findings of this study provide another implication that investors' risk perception and risk profiling for sensitivity to risk aversion should be assessed periodically to assess any changes in the investors' circumstances.

The findings of this research study revealed that the overarching theme that demonstrated how investors yielded to *System 1* or *System 2*-axis of decision-making is investors' framing of their investment horizon, i.e. myopic loss aversion. Framing is a component of myopic loss aversion, which is a cognitive bias that plays a central role in the prospect theory of decision-making (Kahneman & Tversky, Thaler, 1985). Prospect theory posits that people care more about losses (approximately 2.25 times) more than gains, given the same magnitude of change (Tversky & Kahneman, 1992). Based on past studies, Hardin and Looney (2012) argued that myopic loss aversion consists of loss aversion and mental accounting, which shape investors' risk behavior. While loss aversion describes a cognitive bias whereby investors weigh losses more than gains of equal magnitude, mental accounting refers to the manner which investors cognitively

frame the situation, both influencing the risk preferences. Hardin and Looney (2012) contended that information horizon, evaluation frequency, and decision frequency are critical factors that influence decision problem framing. Information horizon is the time over which prospective probabilities and payoffs are presented. Evaluation frequency is the rate at which investors review the performance and outcome of their investments. Decision frequency is the rate at which an investor adjust (buy or sell) their investment portfolio. Importantly, Hardin and Looney (2012) argued that unless the anticipated gain is much greater than the agony of potential loss; investors would prefer avoiding a loss. Investors faced this dilemma during the 2008 Financial Crisis, and the participants of this research study faced this predicament. The findings of this study revealed that those investors who sold their entire stock portfolio displayed myopic loss aversion as they changed their view of investing from a long-term retirement goal to a narrow, short-term view because of the precipitous loss in portfolio value. The investors who sold did not want to lose any more money and just wanted to preserve what they still had. Investors' maintenance of their investment goals and time horizons, as well as awareness of the existence of myopic loss aversion, are additional implications of the findings of this study.

Findings of this research study revealed that investors reacted in different ways to the 2008 Financial Crisis as they displayed a range of emotions from none to various degrees of nervousness, worry, and fear. In the midst of the turmoil, emotions drove some investors to sell their stock portfolio when they realized that their valuations dropped precipitously, while others waited until they could not tolerate the volatility any longer to sell their stock portfolio, ignoring their financial advisors' recommendations.

Others, at the directions of their financial advisor, reallocated their portfolio by replacing some of their stocks with more conservative guaranteed investments, cash. Some investors showed no emotions and held their stock portfolio while others viewed the financial crisis as an opportunity to add additional stocks to their portfolio. The findings showed that people responded in a variety of ways to the crisis with many investors showing emotions such as nervousness and worry as they experienced dramatic loss in value in their stock portfolio. However, how emotions influence the processing of information is still largely unknown (Frank, Cohen, & Sanfey, 2009; Grecucci & Sanfey, 2014; Phelps, 2009).

Some investors who experienced devastating losses in their portfolio values displayed intractable emotions such as Kellem, Kurt, and Zorro who sold. However, emotion regulation could have been helpful to them during the financial crisis. Emotion regulation refers to strategies that people develop to influence which emotions they have, when they have them, and how they experience and express them (Gross, 1998, 2014). Gross' (1998, 2014) model consists of two broad and distinct classes of emotion regulation strategies depending upon whether the regulation is at the input (i.e. antecedent focused such as cognitive appraisal referred to as reappraisal) or at the output (response focused referred to as suppression). Some people utilize one of these strategies to cope with emotions, which emerge from stressful or difficult tasks or decisions (Wallace, Edwards, Shull, & Finch, 2009). Reappraisal redefines and changes the meaning of the stimulus with the goal of altering the resulting affective state, whereas suppression tend to minimize emotions by ignoring and inhibiting any overt-emotion-expressive behavior while the emotion unfolds (Wallace et al., 2009). Reappraisal involves a cognitive

redirections or refocus of an emotional reaction to the situation at-hand (Richards & Gross, 2000). For this study, Luke appeared to use the reappraisal strategy to regulate his emotion while Norm may have used the suppression scheme. What is important is that the majority of investors appeared to have experienced emotion as identified by nervousness, worry and fear, and they could have benefited from some guidance. Thus, another implication of the findings is for investors when faced with a financial crisis, should seek a third party, one who is knowledgeable of the stock market, to help them navigate through any stock market volatility.

Some scholars have provided insight on how people could react to emotions. For example, Koole et al. (2011) posited that the primary response to emotion, referred to as emotional sensitivity, is determined by any factor that influences peoples' emotional response to the stimuli, including the intensity of the stimuli(e.g. highly arousing stimuli are able to trigger emotions rapidly such as catastrophic losses in investment portfolio), peoples' personality (e.g. higher neurotic people will enter a negative state quicker), and the environment (e.g. during a financial crisis, emotions such as nervousness and fear are more apparent). To exit from the increased emotional intensity, Koole et al. (2011) suggested the people could return to a baseline emotional level without any conscious regulatory effort in a process known as habituation (Rankin, 2009).

Notably, some dual-system theorists ignore the role of emotions (Evans, 2008) or link emotions to *System 1*(Epstein, 1994). Other scholars such as Sun and Mathews (2012) and Evans (2011,2012) posit that emotions although primarily a *System 1* process, also can interact with *System 2*. Strong emotions (*System 1*) such as fear often dominate the information processing and reasoning and inhibit *System* 2 processing. Evans (2012)

argued that emotion is integral with rational processing (*System 2*). When the mind is conflicted between processing of information between *System 1* and *System 2*, Evans (2012) identified this as a cognitive control problem and asserts that emotion and metacognition are key factors. The cognitive control problem refers to which system is allocated control. The cognitive control problem is also influenced by other factors such as peoples' disposition to think analytically before deciding, their motivation to solve the problem correctly, cognitive capacity which depends upon intelligence or working memory capacity, and the environmental factors at the time of the decision including any presence of competing tasks (Evans 2008; Stanovich, 2011). From these propositions on how emotions could influence people, one's reaction to emotion appears to be a function of a number of factors including the intensity of the stimuli, person's personality, nature of the environment, motivation to embrace the situation, and person's cognitive capacity. These factors drive emotional behavior in a wide range of ways before an investment decision is finalized. Thus, another implication of this study is that advisors should understand and recognize that investors react individually and differently to a financial crisis and provide advice to each person according to his personality and situation.

Some investors were influenced by the magnitude of the loss in valuation due to the financial crisis. For example, Kellem, who inherited his portfolio, virtually had no experience in investments and self-profiled himself as knowing very little about financial markets and market investments experienced nearly a $300,000 loss in value as he sold his stock portfolio. Kellem was 10 years from retirement and had little assets other than his inherited portfolio. Importantly, the magnitude of the loss in value of his investment portfolio represented a significant multiple of what he was earning from his job.

Similarly, both Kurt and Zorro were over ten years from retirement as well, self-profiled themselves as having some understanding of the financial markets and market investments. They too experienced nearly a $300,000 loss in value as they also sold their investment portfolio. Similar to Kellem's experience, the magnitude of their losses were a significant multiple of their occupational earnings. For this reason, this researcher believes that the magnitude of losses influences the investors' decision to sell their stock portfolio. To the researcher's best knowledge, there have been no studies made on the influence of the magnitude of loss in valuation of investments on investors' decision-making. Nevertheless, another implication of the results of this study is that magnitude of loss in investment valuation influences the decision-making process.

Another implication of the findings of this study indicated that investors could be categorized into four cohorts (sellers, reallocaters, holders, buyers) of investment decision-makers and mapped onto a two-dimensional framework to help identify how and why investors yielded to the *System 1* or *System 2*-axis of information processing. For those investors that sold, they could be designated into *Quadrant I*, *System1-Experiential* domain, which describes people who are subject to emotions and make decisions nonconsciously, automatically, and rapidly. For investors that reallocated, they could be positioned in *Quadrant III*, *System 2-Experiential* domain, which portrays people who are subject to emotional episodes, but could consider alternative choices (with assistance of an advisor in some cases) after some conscious, controlled, and deliberative thought. For some investors who are holders, they could be identified in *Quadrant II*, *System 1-Rational* domain, which represents people who are subject to emotions and prior experiences whether good or bad, and make decisions

nonconsciously, automatically, and rapidly, never considering alternative choices. Lastly, some who held and those who bought stocks, could be assigned to *Quadrant IV*, *System 2-Rational* domain such that their decisions are reached after some conscious, controlled and deliberative thought. An implication of categorizing people into the four different *Quadrants* is for investors, even through recommendations of their advisors, should migrate their thinking of information processing to the *System* 2-axis. Although the outcome of the thought process and decisions of people classified in the *System 2* domains may not be optimum, the processing of information is at least conscious, controlled, and deliberate and could be satisficing. Satisficing is discussed in the next section.

Research Question 2 (RQ2): Why did investors yield to either System 1 or System 2-axis decision-making when faced with extreme stress induced during the 2008 Financial Crisis?

Research findings indicated that investors' cognitive bias–myopic loss aversion/framing is the reason they yielded to *System 1*-axis processing that led to selling of their stock portfolio. Prior to the financial crisis period, those investors who sold framed their investment horizon as long term (i.e. saving for retirement). However, during the financial crisis, their cognitive bias of loss aversion emerged and they unwittingly changed their investment time frame from long-term to short-term because they wanted to preserve what value of stocks that remained after the precipitous drop in stock valuation. For those investors that reallocated, they were uncertain whether their stock portfolio would go lower and reallocated their stocks to more conservative, less volatile bond investments. Importantly, the investors who reallocated, held, or bought

stocks maintained a broad investment time horizon and believed that the volatility caused by the financial crisis is only a blip in the historical long-term uptrend of stock market valuations. Therefore, the implication is for investors to recognize that the cognitive bias of loss aversion/framing exists and not to frame investments as narrow, short-term investment time horizon, but as a broader longer-term outlook. Importantly, investors should yield to the *System 2* conscious, controlled, deliberative thinking rather than the *System 1* nonconscious, automatic, rapid thinking.

Research findings also indicated that the personality of an investor matters with respect to the influence of emotions on decision-making. For those that sold their stock portfolio, they expressed a large degree of nervousness and immediately prior to selling. Interestingly, Norm, who did not sell his stocks, remarkably expressed a high degree of nervousness throughout the crisis. Lovric, Kaymak, and Spronk (2008) have asserted that personality is an integral factor in their conceptual model of investor behavior. Another implication of the findings is that investors' personality matters and investors themselves and financial advisors should seek to understand the personality of the investor.

Research findings suggested that although investors' decisions may not be optimal, it might be satisficing, even for those investors that sold their stock portfolio. Satisficing decisions are those decisions that are good enough, and the outcome exceeds some acceptable threshold that the decision-maker establishes for himself. Some scholars have found that decisions reached by satisficing processes could result in happier people and better decisions (Jain et al., 2011). Therefore, the implication of satisficing decisions

is that investors need to set a threshold of satisfaction reference point and monitor the value of their portfolio relative to this threshold.

Finally, prior to the financial crisis, not one of the investors needed any of their invested funds for at least 10 years hence of the financial crisis, except for those who were retired and collected their stock dividends to supplement their retirement income needs. The findings showed that each of the investors had diversified portfolios of stocks and bonds. However, investors still suffered at least 25% drop in portfolio value because of the precipitous drop in stock valuations. Notably, while those who were not retired reinvested their dividends and capital gains of their portfolio, those who were retired withdrew their stock dividends to supplement their retirement needs. The implication is that investors should have an investment plan that consists of a well-diversified portfolio that yields dividends to supplement their retirement income with the goal of never requiring monies beyond the dividends or interests of the portfolio, particularly when the stock market drops precipitously. This investment plan assumes that the investor does not need any part of his investments, except for dividends and income for immediate needs.

Recommendations

The results of this study contribute to the ongoing studies on how people make decisions, particularly when under stress such as the 2008 Financial Crisis. To this researcher's best knowledge, this is the first qualitative study of retail investors who experienced the 2008 Financial Crisis. The findings indicate that people have their own individualized traits and will react differently depending upon factors that include the intensity of stimuli, person's personality, nature of the environment, motivation to

embrace the situation, and person's cognitive capacity. These factors drive peoples' emotional behavior and thus, how they process information to reach their final decision. This research study provides some practical applications and future research studies and is discussed next.

Practical applications. Knowledge gain from this study can be applied to investors. For example, stock market literacy and risk profiling are the foundations inherent for successful stock investing. The findings showed that people who reported a good understanding of stocks and stock market underpinnings displayed moderately high to high stock market literacy and did not report any emotions during the 2008 Financial Crisis. Thus, investors who increase their stock market literacy could regulate or even eliminate the emotional aspect of investing.

Risk profiling is important in the determination of the allocation of stocks and bonds and a major factor in the threshold of investors' risk tolerance. The findings indicated that the financial crisis caused some investors to change their risk tolerance and their investment time horizon from long-term to short-term, even though they did not need any part of the money (value of investments) until their retirement years, i.e. 10 year hence. Thus, investors would benefit if they periodically assess their risk profile and investment time horizon such that their financial goals could be met.

The research findings revealed that during a financial crisis that leads to volatile asset pricing, some investors were emotional as they watched their portfolio values drop precipitously. Some scholars argued that this emotion occurs primarily nonconsciously and in the initial phase of a dual-process model of processing information. For this reason, some scholars propose emotion regulation strategies to avoid or suppress these

emotions. For investors who experience such emotion, they could benefit by using emotion regulation strategies such as reappraisal or suppression.

Importantly, the research findings indicated that investors who had moderate to high *stock market literacy* and well-allocated portfolios that provided income that supplemented their retirement income needs reported no emotions during the crisis. Thus, investors with similarly constructed portfolios that provide supplemental income to their retirement needs coupled with their developed high *stock market literacy* could avoid the need to sell any stock positions in time of negative market volatility.

Future research. Additional research related to the problem and purpose of this study is recommended. Scholars have yet to assess accurately people's literacy on stock investments. Korniotis and Kumar (2013) argued that intelligence should be correlated with success in financial decision. Directly establishing this link is difficult because of the unavailability of data sets that contain both measures of cognition and financial performance. Importantly, past scholars have used a variety of metrics to assess financial understanding and literacy but no research have focused on investors' understanding of the fundamentals of stock investing (Banks et al., 2010; Grinblatt, et al., 2011). Although this research has established some subjective assessment of stock market literacy through triangulation of data collected, a more quantitative analysis is required to not only determine the influence of peoples' stock literacy on their investment behavior and decisions, but also will enable professionals and policymakers to provide programs to help investors to navigate through volatile markets with the goal of providing enough capital for their retirement years.

With regard to how and why investors yield to either *System 1* or *System 2*-axes, it is still unclear whether Epstein's (1994) CEST model describes every possible investors' reaction to the 2008 Financial Crisis or the exact mechanism that an investor use to process information in face of a financial crisis. Despite using a two-dimensional framework and meticulous triangulation analysis of the data, this researcher was unable to identify clearly the distinct role of emotion in either the *System 1* or *System 2* information processing, especially when the 2008 Financial Crisis evolved over time rather than a singular one-time event. It is possible the application of Epstein's et al.(1996) Rational-Experiential Inventory Questionnaire, personality tests such as the Five-factor model personality tests (Digman, 1990), and satisfaction metrics (Diener, 1985) to these investors may shed further information on the matter of how emotion influences decision-making process and satisfaction of their decision outcome.

This research study focused on wealthy investors with at least $1 million in investable stocks and bonds. However, this researcher recognizes that the findings from this cohort may not be the same for investors with less money invested or of different sample characteristics. Thus, future research should include the study of investors with less money invested in stocks and bonds and also a representation of different stages of their investment life cycle. Specifically, the cohorts for further study could include differences in age, gender, personality, marital status, occupation, and cognitive ability.

Conclusions

This exploratory research consisted of a multiple-case study design with data collected from multiple sources including in-depth semi-structured interviews and brokerage statements. The researcher interviewed 12 investors who had at least $1

million invested in stocks and bonds and resided in the Northeast Region of the United States. The interview procedure utilized an interview guide that was designed with exploratory, opinion, and value type open-ended questions that enhanced the understanding of the opinions, judgments, perspectives, and values of the participants. Analysis using the triangulation approach of the participants' transcribed data, field notes, and archived documents of the participants' investment portfolio corroborated the facts of the observed phenomena. Limitations of the study included the accuracy of participants' self-profiling of their own investment attributes, accuracy of recall of event that occurred six year prior to the interview for this study, and the relatively narrow sample attributes that may not be representative of the population of investors.

The findings of this research study indicated that *stock market literacy* and risk profiling are foundations for sound investing. When faced with a financial crisis, some investors displayed cognitive biases of emotions such as nervousness, worry, and fear that led to myopic loss aversion, which caused them to sell their entire stock portfolio, or reallocated into more conservative, less risky bonds or cash. However, some investors, with moderate to higher *stock market literacy* displayed no emotions and viewed the financial crisis as an opportunity to add stocks to their investment portfolio and considered the financial crisis as a blip in the long-term upward trend performance of the stock market. For some investors that displayed emotions referred to as cognitive biases because of the financial crisis, emotion regulation strategies were available to help them make more controlled and deliberative investment decisions to navigate through the volatile markets. Nevertheless, the decisions made by investors may be satisficing

because of peoples' bounded rationality, the inherent information processing limitation of the human mind.

Unique Contributions of the Study

The findings of this research study suggested that the introduction of emotion regulation strategies, through self-regulation or a third party such as a financial advisor, could be an effective tool to help some investors navigate through a financial crisis. However, when the emotion is so enormously negative because of devastating loss in value of an investment portfolio, the investors' is overwhelmed by fear affecting their decision-making and causing them to flee to safer investments. Notably, although these investors sold, they may have been satisfied with their decision temporarily. In fact, these investors invested in stocks again within two years after the 2008 Financial Crisis.

References

Ackert, L. Church, B., & Deaves, R. (2010). Emotion and financial markets. *Federal Reserve Bank of Atlanta Economic Review,* 27-34. Retrieved from www.frbatlanta.org/

Agarwal, S., Driscoll, J., Gabaix, X., & Laibson, D. (2006). Financial mistakes over the life cycle. Retrieved from http://www-leland.stanford.edu/group/SITE/archive/SITE_2006/Web%20Session%207/Gabaix_mistakes_aging.pdf

Al-Horani, A., & Haddad, F. (2011) Exploring investor's behavior: Evidence from the Amman Stock Exchange. *Jordan Journal of Business Administration, 7*(3), 481-493. Retrieved from http://journals.ju.edu.jo/JJBA/

Ali, A., & Yusof, H. (2011) Quality in qualitative studies: The case of validity, reliability, and generalizability. *Issues in Social and Environmental Accounting, 5*(1,2), 25-64. Retrieved from http:www.iiste.org

Almunia, M., Bentrix, A., Eichengreen, B., O'Rouke, K., & Rua, G. (2009). From great depression to great credit crisis: Similarities, differences, and lessons. Centre for Economic Policy Research Discussion Paper No. 7564. Retrieved from http://www.cepr.org/pubs/dps/DP7564.asp

Arup, C. (2010). The global financial crisis: Learning from regulatory and governance studies. *Law & Policy, 32*(3), 363–381. doi:10.1111/j.1467–9930.2010.00322.x

Aspers, P. 2009). Empirical phenomenology: A qualitative research approach. *The Indo-Pacific Journal of Phenomenology, 9*(2), 1-12.Retrieved from http://www.ipjp.org

Avgouleas, E. (2009). The global financial crisis, behavioral finance and financial regulation: In search of a new orthodoxy. *European Company & Financial Law Review, 6*(4), 440-475. doi:10.1515/ECFR.2009.440

Baars, B., & Franklin, S. (2003) How conscious experience and working memory interact, *TRENDS in Cognitive Sciences, 7*(4), 166-172. doi:10.1016/S1364-6613(03)00056-1

Babin, C., & Donovan, W. (2000). *Investing secrets of the masters: Applying classical investment ideas to today's turbulent markets.* New York: McGraw Hill.

Bailey, M., Litan, R., & Johnson, M. (2008). Origins of the financial crisis. Business and Public Policy at Brookings. Retrieved from http://www.brookings.edu/~/media/research/files/papers/2008/11/origin%20crisis%20baily%20litan/11_origins_crisis_baily_litan.pdf

Bajtelsmit, V. L., & Bernasek, A. (2001). *Risk preferences and the investment decisions of older Americans*. AARP, Public Policy Institute. Retrieved from http://assets.aarp.org/rgcenter/econ/2001_11_risk.pdf

Baker, H., & Nofsinger, J. (2002). Psychological biases of investors. *Financial Services Review, 11,* 97-116. Retrieved from http:/www.rmi.gsu.edu/fsr/fsrhome.htm

Baker, M., Wurgler, J., & Yuan, Y. (2012). Global, local, and contagious investor sentiment. *Journal of Financial Economics, 104*(2), 272-287. doi:10.1016j.jfineco.2011.11.002

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi:10.1037/0033-295X.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28,* 117-148. Retrieved from http://www.erlbaum.com/Journals/journals/EP/ep.htm

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: Freeman.

Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science, 9,* 75-78. doi:10.1111/1467-8721.00064

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management, 38*(1), 9-44. doi:10.1177/0149206311410606

Bandura, A., & Locke, E. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology, 88,* 87-99. doi: 10.1037/0021-9010.88.1.87

Banks, J., & Oldfield, Z. (2007). Understanding pensions: Cognitive function, numerical ability and retirement saving. *Fiscal Studies, 28*(2), 143-170.doi:10.1111/j.1475-5890.2007.00052.x

Banks, J., O'Dea, C., & Oldfield, Z. (2010). Cognitive function, numeracy and retirement saving trajectories. *The Economic Journal, 120*(548), F381-F410. doi:10.1111/j.1468-0297.2010.02395x

Barber, B.M., Odean, T.,(2000). Trading is hazardous to your wealth: the common stock investment performance of individual investors. *Journal of Finance 55* (2), 773–806. doi:10.1111/0022-1082.00226

Barber, B.M., Odean, T., & Zheng, L. (2005). Out of sight, out of mind: The effects of expenses on mutual fund flows. *Journal of Business, 78,* 2095–2120. doi:10.1086/497042Barberis, N. (2011). Psychology and the Financial Crisis of 2007-2008. In M. Haliassos (Ed.), *Financial innovation: Too much or too little?* (pp. 15-28). Cambridge, MA: MIT Press.

Barberis, N. (2012). Thirty years of prospect theory in economics: A review and assessment. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2177288

Bargh, J., & Morsella, E. (2008). The unconscious mind. *Perspectives on Psychological Science, 3*(1), 73-80. doi:10.1111/1745-6916.2008.00064.x

Baron, J. (2008). Thinking and deciding. New York, NY: Cambridge University Press

Barratt, M., Choi, T., & Li, M. (2011). Qualitative case studies in operations management: Trends, research outcomes, and future research implications. *Journal of Operations Management, 29,* 329-342. doi:10.1016/j.jom2010.06.002

Barro, R., & Ursia, J. (2009). Stock-market crashes and depressions. National Bureau of Economic Research Working Paper No. 14760. Retrieved from http://www.nber.org/papers/w14760

Bateman, H., Islam, T., Louviere, J., Satchell, S., & Thorp, S. (2010). Retirement investor risk tolerance in tranquil and crisis periods: Experimental survey evidence. *Journal of Behavioral Finance, 12,* 201-218. doi:10.1080/154275660.2011.620199

Baucells, M., & Heukamp, F. (2012). Probability and time trade-off. *Management Science, 58*(4), 831-842. doi:10.1287/mnsc.1110.1450

Baumann, N., Kaschel, R., & Kuhl, J. (2007). Affect sensitivity and affect regulation in dealing with positive and negative affect. *Journal of Research in Personality, 41,* 239-248. doi:10.1016/j.jrp.2006.05.002

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Review Report, 13*(4), 544-559. Retrieved from http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf

Bechara, A., Damasio, A., Tranel, D., & Damasio, A. R. (1997). Deciding advantageously before knowing the advantageous strategy. *Science, 275*, 1293–1295. doi:10.1126/science.275.5304.1293

Bele, I. (2005). Reliability in perceptual analysis of voice quality. *Journal of Voice, 19*(4), 555-573. doi:10.1016/j.jvoice.2004.08.008

Benabou, R., & Tirole, J. (2003). Self-knowledge and self-regulation: An economic approach. In I. Brocas & J. Carrillo (Eds.), *The psychology of economic decisions: Volume 1: Rationality and well-being* (pp. 133-167). Oxford, United Kingdom: Oxford University Press.

Berger, C. (2007). A tale of two communication modes. *Journal of Language and Social Psychology, 26*(3), 215-233. doi:10.1177/0261927X06303453

Bernartzi , S. & Thaler, R. (1995). Myopic loss aversion and the equity premium puzzle. *Quarterly Journal of Economics, 110*(1), 73-92. doi:10.2307/2118511

Bettman, J. (1973). Perceived risk and its components: A model and empirical test. *Journal of Marketing Research (pre-1986), 10,* 184-190. doi:10.2307/3149824

Biais, B., & Weber, M. (2009). Hindsight bias, risk perception, and investment performance. *Management Science, 55*(6), 1018-1029. doi:10.1287?mnsc.1090.1000

Blanchette, I., & Richards, A. (2010). The influence of affect on higher level cognition: A review of research on interpretation, judgment, decision making, and reasoning. *Cognition & Emotion, 24*(4), 561-595. doi: 10.1080/02699930903132496

Bohm, G. and Brun, W. (2008) Intuition and affect in risk perception and decision making. *Judgment & Decision Making, 3*, 1–4. Retrieved from sjdm.org/

Bollerslev, T., & Todorov, V. (2011). Tails, fears, and risk premia. *The Journal of Finance, LXVI*(6), 2165-2211. doi: 10.1111/j.1540-6261.2011.01695.x

Bonner, C., & Newell, B. (2010). In conflict with ourselves? An investigation of heuristic and analytic processes in decision making. *Memory & Cognition, 38*(2), 186-196. doi:10.3758/MC.38.2.186

Bordo, M., & James, H. (2010). The great depression analogy. *Financial History Review,17*(2), 127-140. doi:10.1017/S0968565010000193

Boscaljon, B. (2013). Defining an Individual's Critical Wealth Level. *The Journal of Wealth Management*, *15*(4), 17-28. doi:10.3905/jwm.2013.15.4.017

Bossaerts, P. (2009). What decision neuroscience teaches us about financial decision-making. *Annual Review of Financial Economics, 1,* 383-404. doi:10.1146/annurev.financial.102708.141514

Boudoukh, J., Richardson, M., & Whitelaw, R. (1994). A tale of three schools: Insights on autocorrelations of short-horizon stock. *Review of Financial Studies, 7*(3), 539-573. Retrieved from http://rfs.oxfordjournals.org/

Bouffard-Bouchard, T. (1990). Influence of self-efficacy on performance in a cognitive task. *Journal of Social Psychology, 130*(3), 353–363. Retrieved from http://www.taylorandfrancisgroup.com/

Bowen, A. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research, 8*(1), 137–152. doi:10.1177/1468794107085301

Bragues, G. (2011). The financial crisis and the failure of modern social science. *Qualitative Research in Financial Markets, 3*(3), 177-192. doi:10.1108/1755417111176903

Breslin, C., & Safer, M. (2011). Effects of event valence on long-term memory for two baseball championship games. *Psychological Science, 22*(11), 1408-1412. doi:10.1177/095679761141917

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Brocas, I., & Carrilo, J. (2013) Dual process theories of decision-making: A selective survey. *Journal of Economic Psychology,* In press. Retrieved from http:///dx.doi.org/10.1016/j.joep.2013.01.004

Browne, M., & Keeley, S. (2007). *Asking the right questions: A guide to critical thinking.* Upper Saddle River, NJ: Pearson Prentice-Hall.

Bruck, C., Kreifelts, B., & Wildgruber, D. (2011). Emotional voices in context: A neurobiological model of multimodal affective information processing. *Physics of Life Reviews, 8,*383-403. doi:10.1016/j.plrev.2011.10.002

Brunnermeier, M. (2009). Deciphering the liquidity and credit crunch 2007-2008. *Journal of Economic Perspectives, 23*(1), 77-100. doi:10.1257/jep.23.1.77

Brunnermeier, M., & Nagel, S. (2008). Do wealth fluctuations generate time-varying risk aversion? Micro-evidence on individuals' asset allocation. *American Economic Review, 98*(3), 713-736. doi:10.1257/aer.98.3.713

Bucher-Koenen, T., & Ziegelmeyer, M. (2011). Who lost the most? Financial literacy, cognitive abilities, and the financial crisis. Working Paper Series No. 1299. European Central Bank. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1738368

Burham, K., Bogdan,M., & Schrass, D. (2013).Ownership of mutual funds, shareholder sentiment, and use of the internet, 2013. *ICI Research Perspective, 19*(9), 1-48. Retrieved from www.ici.org/pdf/per19-09.pdf

Burns, W., Peters, E., & Slovic, P. (2012). Risk perception and the economic crisis: A longitudinal study of the trajectory of perceived risk. *Risk Analysis, 32*(4), 659-679. doi:10.1111/j.1539-6924.2011.01733.x

Caballero. R. (2010) Sudden financial arrest. *IMF Economic Review, 58*(1). 6-36. doi:10.2139/ssrn.1504985

Cacioppo, J., & Nusbaum, N. (2003). Component processes underlying choice. *Proceedings of National Academy of Sciences*, *100*(6), 3016-3017. doi:10.1073/pnas.0730744100

Calvet, L., Campbell, J., & Sodini, P. (2009). Measuring the financial sophistication of households. *American Economic Review: Papers & Proceedings, 99*(2), 393-398. doi:10.1257/aer.99.2.393

Chenail, R. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *The Qualitative Report, 16*(1), 255-262. Retrieved from http://www.nova.edu/ssss/QR/QR16-1/interviewing.pdf

Calvo, S. (2010). *The Global Financial Crisis of 2008-2010: A view of social sectors.* Human Development Reports, Research Paper 2010/18. Retrieved from United Nations Development Program, Human Development Reports website: http://hdr.undp.org/en/reports/global/hdr2010/papers/HDRP_2010_18.pdf

Camerer, C. & Hogarth, R. (1999). The effects of financial incentives in experiments: a review and capital- labor-production framework. *Journal of Risk and Uncertainty, 19*(1-3), 7–42. doi: 10.1023/A:1007850605129

Camerer, C., Lowenstein, G., & Prelec, D. (2005). Neuroeconomics: How neuroscience can inform economics. *Journal of Economic Literature, 43*(1), 9-64. Retrieved from http://www.aeaweb.org/jel/

Cassotti, M., Habib, M., Poirel, N., Aïte, A., Houdé, O., & Moutier, S. (2012). Positive emotional context eliminates the framing effect in decision-making. *Emotion*, *2*(5), 9-26.

Cavanagh S. (1997) Content analysis: concepts, methods and applications. *Nurse Researcher, 4*, 5–16. Retrieved from http://rcnpublishing.com/journal/nr

Chai, J., Maurer, R., Mitchell, O., & Rogalla, R. (2011). *Lifecycle impacts of the financial and economic crisis on household optimal consumption, portfolio choice, and labor supply.* NBER Working Paper No. 17134. Boston, MA: National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w17134

Chaiken, S. & Trope, Y. (1999). *Dual-process theories in social psychology.* New York, NY: Guilford

Chambers, V., Benibo, B., & Spencer, M. (2011). Reactions to the 2008 economic crisis and the theory of planned behavior. *Academy of Accounting and Financial Studies Journal, 15,* 15-40. Retrieved from http://alliedacademies.org/Public/Default.aspx

Chang, J., Lusk, J., & Norwood, F. (2009). How closely do hypothetical surveys and laboratory experiments predict field behavior. *American Journal of Agriculture Economics, 91*(2), 518-534. doi:10.1111/j.1467-8276.2008.01242.x

Chhabra, A. B. (2005). Beyond Markowitz: a comprehensive wealth allocation framework for individual investors. *The Journal of Wealth Management, 7*(4), 8-34. doi:10.3905/jwm.2005.470606

Chiang, Y., Hirshleifer, D., Qian, Y., & Sherman, A. (2011, March 17). Do investors learn from experience? Evidence from frequent IPO investors. *Review of Financial Studies.* doi:10.1093/rfs/hhq151

Clandinin, D. & Connelly, FD. (2000). Narrative inquiry: Experience and story in qualitative research. In F. Connelly and D. Clandinin (Eds.) *Educational researcher* (pp. 94-118). *San* Francisco, CA: Jossey-Bass

Corr, P. (2010). Automatic and controlled processes in behavioral control: Implications for personality psychology. *European Journal of Personality, 24*, 376-403. doi:10.1002/per779

Creswell, J., Hanson, W., & Plano-Clark, V. (2007). Qualitative research designs: Selection and implementation. *The Counseling Psychologist, 35*(2), 236–264. doi:10.1177/0011000006287390

Crompvoets, S. (2010). Using online qualitative research methods in medical education. *International Journal of Multiple Research Approaches, 4*(3), 206-213. Retrieved from http://pubs.e-contentmanagement.com/doi/pdf/10.5172/mra.2010.4.3.206

Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview based qualitative research. *Social Science Information, 45*(4), 483–499. doi:10.1177/0539018406069584

Dalbar (2011). Helping investors change behavior to capture alpha. *Quantitative Analysis of Investor Behavior.* Retrieved from http://www.qaib.com/public/default.aspx

Damasio, A. (1994). *Descartes' error: Emotion, reason, and the human brain.* New York, NY: Avon Books.

Dane, E., Rockmann, K., & Pratt, M. (2012). When should I trust my gut? Linking domain expertise to intuitive decision-making effectiveness. *Organizational Behavior and Human Decision Processes, 119,* 187-194. doi:10.1016/j.obhp.2012.07.009

Darne, O., & Charles, A. (2011). Large shocks in U.S. macroeconomic time series: 1860-1988. *Cliometrica, 5,* 79-100. doi:10.1007/s11698-010-0052-1

Darlow, A., & Sloman, S. (2010). Two systems of reasoning: Architecture and relation to emotion. *Cognitive Science, 1*(3), 382-392. doi:10.1002/wcs.34

Davis, S., & Madura, J. (2012). How the shift to quality distinguished winners from losers during the financial crisis. *The Journal of Behavioral Finance, 13,* 81-92. doi:10.1080/15427560.2012.65706

Deaton, A. (2012) The financial crisis and the well-being of Americans. *Oxford Economic Papers, 64*(1). 1-26. doi:10.1093/oep/gpr051

De Bondt, W., Forbes, W., Hamalainen, P., & Muradoglu, Y. (2010). What can behavioral finance teach us about finance? *Qualitative Research in Financial Markets, 2*(1), 29-46. doi:10.1108/17554171011042371

De Bondt, W., Palm, F., & Wolff, C. (2004). Introduction to the special issue on behavioral finance. *Journal of Empirical Finance, 11*, 423–427. doi:10.1016/j.jempfin.2004.05.001

De Bondt, W., & Thaler, R. (1985). Does the stock market overreact? *The Journal of Finance, XL*(3), 793-808. doi:10.1111/j.1540-6261.1985.tb05004.x

De Neys, W., & Glumicic, T., (2008). Conflict monitoring in dual process theories of thinking. *Cognition, 106*, 1248-1299. doi:10.1016/j.cognition.2007.06.002

Denes-Raj, V., & Epstein, S. (1994). Conflict between intuitive and rational processing: When people behave against better judgment. *Journal of Personality and Social Pschology, 66*(5), 819-829. doi:10.1037/0022-3514.66.5.819

Denzin, N., & Lincoln, Y. (2005). Introduction: The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 1-42). Thousand Oaks, CA: SAGE Publications.

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75. doi:10.1207/s15327752/jpe4901_13

Digman, J. (1997). Higher order factors of the big five. *Journal of personality and Social Psychology, 73,* 1246-1256. doi:10.1037/0022-3514.73.6.1246

Dijksterhuis, A. (2004). Think different: The merits of unconscious thought in preference of development and decision making. *Journal of Personality and Social Psychology, 87*(5), 586-598. doi:10.1037/0022-3514.87.5.586

Dockrell, J. (2004). How can studies of memory and language enhance the authenticity, validity, and reliability of interviews. *British Journal of Learning Disabilities, 32,* 161-165. doi:10.1111/j.1468-3156.2004.00315

Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2010). Are risk aversion and impatience related to cognitive ability? *American Economic Review, 100,* 1238-1260. doi:10.1257/aer.100.3.1238

Duriau, V., Reger, R., & Pfarrer, M. (2007). A content analysis of the content analysis literature in organization studies: Research themes, data sources, and methodological refinements. *Organizational Research Methods, 10*(1), 5–35. Retrieved from http://proquest.umi.com.proxy1.ncu.edu/pqdweb?did=1188969421&sid=5&Fmt=4&clientId=52110&RQT=309&VName=PQD

Dzielinski, M. (2011). News sensitivity and the cross-section of stock returns. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1889030 doi:10.2139/ssrn.1889030

Edmans, A., Garcia, D., & Norli, O. (2007). Sports sentiment and stock returns. *The Journal of Finance, 62*(4), 1967-1998. doi:10.1111/j.1540-6261.2007.01262.x

Edmiston, K., & Gillett-Fisher, M. (2006). Financial education at the workplace: Evidence form a survey of Federal Reserve Bank Employees. Part I: Knowledge and behavior. Community affairs working paper. Retrieved from http://www.kansascityfed.com/publicat/cap/gillettfisher_edmiston_financial_education_April_2006.pdf

Eisenhardt, K. (1989). Building theories from case study research. *The Academy of Management Review, 14*(4), 532-550. doi:10.5465/AMR.1989.4308385

Eisenhardt, K., & Zbaracki, M. (1992). Strategic decision making. *Strategic Management Journal, 13*(2), 17-37. doi:10.2307/2486364

Eisenhardt, K., & Graebner, M. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25-32. doi:10.5465/AMJ.2007.24160888

Elster, J. (1998). Emotions and economic theory. *Journal of Economic Literature, 36*(1). 47–74. Retrieved from www.aeaweb.org/

Engelmann, J., & Tamir, D. (2009). Individual differences in risk preference predict neural responses during financial decision-making. *Brain Research,1299,*28-51. doi:10.1016/j.brainres.2009.06.078

Epstein, S. (2003). Cognitive-experiential self- theory of personality. In T. Millon and M. Lerner (Eds.) *Handbook of psychology,* Personality and social psychology series, (V.5, pp.159-184). Hoboken, NJ: John Wiley & Sons.

Epstein, S. (1985). The implications of cognitive-experiential self-theory for research in social psychology and personality. *Journal for the Theory of Social Behaviour, 15,* 283-310. doi:10.1111/j.1468-5914.1985.tb00057.x

Epstein, S. (1994). Integration of cognitive and the psychodynamic unconscious. *American Psychologist*, *49*(8), 709-724. doi:10.1037/0003-066X.49.8.709

Epstein, S. (2003). Cognitive-experiential self-theory of personality. In T. Millon & M. Lerner (Eds.), *Comprehensive handbook of psychology, Vol. 5: Personality and social psychology* (pp. 159-184). Hoboken, NJ: Wiley & Sons.

Epstein, S. (2010). Demystifying intuition: What it is, what it does, and how it does it. *Psychological Inquiry, 21,* 295-312. doi:10.1080/10478840X.2010.523875

Epstein, S., Lipson, A., Holstein, C., & Huh, E. (1992) Irrational reactions to negative outcomes: Evidence for two conceptual systems. *Journal of Personality and Social Psychology, 62*(2), 328-339. doi:10.1037/0022-3514.62.2.328

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*(2), 390-405. doi:10.1037/0022-3514.71.2.390

Erb, H-P., Kruglanski, A., Chun., W., Pierro, A., Mannetti, L., & Spiegel, S. (2003). Searching for commonalities in human judgment: The parametric unimodel and its dual mode alternative. *European Review of Social Psychology, 14*(1), 1-47. doi:10.1080/104632803400000009

Ericsson, K. A. (2006). An introduction to the Cambridge Handbook of Expertise and Expert Performance, its development organization and content. In K. A. Ericsson, N. Charness, P. J. Feltovich, & R. R. Hoffman (Eds.), The Cambridge handbook of expertise and expert performance (1st ed., pp. 3–20). Cambridge: Cambridge University Press.

Evans, J. (1984). Heuristic and analytic process in reasoning. *The British Psychological Society, 75,* 451-468. doi:10.1111/j.2044-8295.1984.tb01915.x

Evans, J. (2003). In two minds: Dual process accounts of reasoning. *Trends in Cognitive Sciences, 7,* 454-459. doi:10.1016/j.tics.2003.08.012

Evans, J. (2006a). The heuristic-analytic theory of reasoning: Extension and evaluation. *Psychonomic Bulletin & Review, 13*(3). 378-395. doi:10.3758/BF03193858

Evans, J. (2006b). Dual system theories of cognition: Some issues. In R. Sun (Ed.). *Proceedings of the 28th annual meeting of the Cognitive Science Society* (pp. 202-207). Mahwah, NJ: Erlbaum. Retrieved from http://csjarchive.cogsci.rpi.edu/proceedings/2006/docs/p202.pdf

Evans, J. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology, 59*(1), 255-278. doi:10.1146/annurev.psych.59.103006.093629

Evans, J. (2011). Dual process theories of reasoning: Contemporary issues and developmental applications. *Developmental Review, 31*, 86-102. doi:10.1016/j.dr.2011.07.007

Evans, J. (2012). Spot the difference: Distinguishing between two kinds of processing. *Mind and Society, 11,* 121-131. doi:10.1007/s11299-012-0104-2

Evans, J. & Stanovich, K. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives on Pscyhological Science 8*(223), 223-241. doi:10.1177/1745691612460685

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance, 25,* 385-417. doi:10.1111/j.1540-6261.1970.tb00518.x

Fenton-O'Creevy, M., Soane, E., Nicholson, N., & Willman, P. (2011). Thinking, feeling, and deciding: The influence of emotions on decision-making and performance traders. *Journal of Organizational Behavior, 32,* 1044-1061. doi:10.1002/job.720

Feingold, A. (1994). Gender Differences in Personality: A Meta-Analysis. *Psychological Bulletin, 116*(3), 429–456. Retrieved from http://dx.doi.org/10.1037//0033-2909.116.3.429.

Fex S. (1992). Perceptual evaluation. *Journal of Voice, 6*(2), 155–158. Retrieved from http://www.jvoice.org/article/S0892-1997(05)80130-4/abstract

Fiedler, M. (2011). Experience and confidence in an internet-based asset market experiment. *Southern Economic Journal, 78*(1), 30-52. doi:10.4284/0038-4038-78.1.30

Fiegen, A. (2010). Systematic review of research methods: The case of business instruction. *Reference Services Review, 38*(3), 385-397. doi:10.1108/00907321011070883

Financial crisis inquiry commission. (2011). *Final report of the national commission on the causes of the financial and economic crisis in the United States*. U.S. Government Commission created under the Fraud Enforcement and Recovery Act (Public Law 111-21, 2009). Washington, DC: Superintendent of Documents, Government Printing Office. Retrieved from www.gpo.gov/fdsys/pkg/GPO-FCIC/pdf/GPO-FCIC.pdf

Finucane, M., Alhakami, A., Slovic, P., & Johnson, S. (2005). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making, 13*(1),1-17. doi:10.1002/(SICI)1099-0771(200001/03)13:1<1::AID-BDM333>3.0.CO;2-SForbes, J., & Kara, S. (2010). Confidence mediates how investment knowledge influences investing self-efficacy. *Journal of Economic Psychology, 31,* 435-443. doi:10.1016/j.joep.2010.01.012

Foucault, T., Sraer, D., Thesmar, D.J., 2011. Individual investors and volatility. *Journal of Finance, 66* (4), 1369–1406. doi:10.1111/j.1540-6261.2011.01668.x.

Frank, M., Cohen, M., & Sanfey, A. (2009). Multiple systems in decision making: A neurocomputational perspective. *Current Directions in Psychology, 18*(2), 73-77. doi:10.1111/j.1467-8721.2009.01612.x

Frankfurter, G., McGlun, E., & Allen, D. (2004). The prescriptive turn in behavioral finance. *The Journal of Socio-economics, 33,* 449-468. doi:10.1016/j.socec.2004.04.006

Frankish, K. (2009). Systems and levels: Dual-system theories and the personal-subpersonal distinction. In J.Evans and K. Frankish (Eds.), *In two minds: Dual process and Beyond* (pp. 89-107). Oxford, United Kingdom: Oxford University Press

Frankish, K., & Evans, J. (2009). The duality of mind: An historical perspective. In J. Evans & K. Frankish (Eds.), *In two minds: Dual processes and beyond* (pp. 1-30). Oxford, United Kingdom: Oxford University Press.

Fredrickson, B. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218–226.

Freund, P., Kasten, N. (2011). How smart do you think you are? A meta-analysis on the validity of self-estimates of cognitive ability. *Psychological Bulletin, 19,* 1-26. doi:10.1037/a0026556

Friedman, M., & Savage, L. (1948). The utility analysis of choices involving risks. *Journal of Political Economy, 56,* 279-304. doi:10.1086/256692

Frijda, N. (2008). The psychologist's point of view. In M. Lewis, J. Haviland & L. Barrett (Eds.), *Handbook of emotions* (pp.68-87). New York, NY: The Guilford Press.

Gerrans, P., Faff, R., Hartnett, N. (2012, December). *Individual financial risk tolerance and the global financial crisis.* Paper presented at the 25th Australasian Finance and Banking Conference 2012 at Sydney, Australia. Retrieved from http://dx.doi.org/10.2139/ssrn.1990881

Gervais, S., & Odean, T. (2001). Learning to be overconfident. *Review of Financial Studies, 14*(1), 1-27. doi: 10.1093/rfs/14.1.1

Gibbert, M., & Ruigrok, W. (2010). The "what" and "how" of case study rigor: Three strategies based on published work. *Organizational Research Methods, 13*(4), 710-737. doi:10.1177/1094428109351319

Gibbert, M., Ruigrok, W., & Wicki, B. (2008). What passes as a rigorous case study? *Strategic Management Journal, 29,* 1465-1474. doi:10.1002/smj.722

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *The Annual Review of Psychology, 62,* 451-482. doi:10.1146/annurev-psych-120709-145346

Gilovich, T., & Griffin, D. (2002). Heuristics and biases: Then and now. In T. Glovich, D. Griffin, and D. Kahneman (Eds.), *Heuristics and biases*, (pp. 1-18). Cambridge England: Cambridge University Press.

Glockner, A., & Witteman, C. (2010) Beyond dual-process models: A categorization of processes underlying intuitive judgment and decision-making. *Thinking & Reasoning, 16*(1), 1-25. doi:10.1080/13546780903395748

Gobl, C., & Chasaide, A. (2003). The role of voice quality in communicating emotion, mood, and attitude. *Speech Communication, 40,* 189-212. doi:10.1016/S0167-6393(02)00082-1

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8*(4), 597-607. Retrieved from http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf /

Goodman, G. (1968). *The money game.* New York, NY: Random House

Gohm, C. & Clore, G. (2002). Affect as information: An individual-difference approach. In L. Barrett & P. Salovey (Eds.), *The wisdom of feeling: Psychological processes in emotional intelligence* (pp. 89–113). New York, NY: Guilford Press.

Grecucci, A., & Sanfey, A. (2014). Emotion regulation and decision making. In J. Gross (Ed.) *Handbook of emotion regulation* (2nd ed., pp. 140-156). New York, NY: The Guilford Press.

Grinblatt, M., Keloharju, M., & Linnainmaa, J. (2012). *Journal of Financial Economics, 104,* 339-362. doi:10.1016./j.jfineco.2011.05.016

Groenewald, T. (2004). A phenomenological research design illustrated. *International Journal of Qualitative Methods, 3*(1), 1-26. Retrieved from http://uir.unisa.ac.za/bitstream/10500/2573/1/groenewald_IJQM.pdf

Gross, J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2,* 271–299. doi:10.1037/1089-2680.2.3.271

Gross, J. (2014). Emotion regulation: Conceptual and empirical foundations. In J. Gross (Ed.), *Handbook of emotion regulation* (2nd ed.) (pp. 3-20). New York, NY: The Guilford Press.

Gross, J. & John, O. 2003. Individual differences in two emotion regulation process: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85,* 348–362. doi:10.1037/0022-3514.85.2.348

Guba, E., & Lincoln, Y. (1982). Epistemological and methodological bases of naturalistic inquiry. *Educational Communication and Technology Journal, 30*(4), 233-252. Retrieved from http://link.springer.com/article/10.1007/BF02765185

Guenther, C. L., & Alicke, M. D. (2010). Deconstructing the better-than average effect. *Journal of Personality and Social Psychology, 99,* 755–770. doi:10.1037/a0020959

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59-82. doi:10.1177/1525822X05279903

Guiso, L., & and Jappelli, T. (2008). Financial literacy and portfolio diversification. European University Institute, Department of Economics, Working papers, ECO 2008/31. Retrieved from http://cadmus.eui.eu/bitstream/handle/1814/9811/ECO_2008_31.pdf?sequence=1

Gummesson, E. (2006). Qualitative research in management: Addressing complexity, context and persona. *Management Decision, 44*(2), 167–179.

Haidt J. (2001. The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108*(4). 814–834. doi: 10.1037/0033-295X.108.4.814

Hanna, S., Waller, W., & Finke, M. (2008). The concept of risk tolerance in personal financial planning. *Journal of Personal Finance, 7*(1), 96-108. Retrieved from http://www.wrwaller.com/storage/hanna_etal_jpf2008.pdf

Hanoch, Y., & Vitouch, O. (2004). Information, emotional arousal and the ecological reframing of the Yerkes-Dobson law. *Theory & Psychology, 14*(4), 1427–1452. doi:10.1177/0959354304044918

Hanushek, E., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature, 46,* 607-668. Retrieved from *http:www.aeaweb.org/articles.php?doi=10.1257/jel.46.3.607*

Hardin, A., & Looney, C. (2012). Myopic loss aversion: Demystifying the key factors influencing decision problem framing,. *Organizational Behavior and Human Decision Processes, 117,* 311-331. doi:10.106/j.obhdp.2011.005

Harris, W., & Hahn, C. (2010). Laying new roads to retirement in the post-crash world. *Corporate Finance Review, 14*(4), 35-39. Retrieved from https://ria.thomsonreuters.com/eStore/detail.aspx?ID=CMJP

Harteis, C., & Gruber, H. (2008). Intuition and professional competence: Intuitive versus rational forecasting of the stock market. *Vocations and Learning, 1,* 71-85. doi:10.1007/s12186-007-9000-z

Hayes, S. (2010). Exploring decisions in a behavioral finance framework. *Journal of Family & Consumer Sciences, 102*(2), 56-60. Retrieved from http://www.aafcs.org/resources/journal.asp

Helgeson, V. S. (2003). Unmitigated Communion and Adjustment to Breast Cancer: Associations and Explanations. *Journal of Applied Social Psychology*, *33*, 1643–1661. doi:10.1111/j.1559-1816.2003.tb01967

Hira, T. (2010). *Implications for researchers, educators, and policy makers from a quarter century of financial education*. (The NEFE Quarter Century Project). Retrieved from National Endowment for Financial Education website: http://www.nefe.org/Portals/0/WhatWeProvide/PrimaryResearch/PDF/TheQtrCenturyProject_FinalSeminal.pdf

Hirshleifer, D. (2001). Investor psychology and asset pricing. *The Journal of Finance, 46*(4), 1533-1597. doi:10.1111/0022-1082.00379

Hirshleifer, D. (2014) Behavioral finance for *Annual review of financial economics.*1-69. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2480892

Hirshleifer, D., & Shumway, T. (2003). Good day sunshine: Stock returns and the weather. *Journal of Finance, 58*(3), 1009-1032. doi:10.1111/1540-6261.00555

Hodgkinson, G., Langan-Fox, & Sadler-Smith (2008). Intuition: A fundamental bridging construct in the behavioral sciences. *British Journal of Psychology, 99*(1),1-27. doi:10.1348/000712607X216666

Hoffmann, A., Post., T., & Pennings, J. (2013). Individual investor perceptions and behavior during the financial crisis. *Journal of Banking & Finance,* 37(1), 60-74. doi:10.1016/j.jbankfin.2012.08.007

Hommes, C., & Wagener, F. (2009). Complex evolutionary systems in behavioral finance. In T. Hens & K. Schenk-Hopp (Eds.), *Handbook of Financial Markets: Dynamics and Evolution* (pp. 218-264). Retrieved from http://www1.fee.uva.nl/cendef/upload/2/HommesWagenerChapter4.pdf

Hon-Snir, S., Kudryavstev, A., & Cohen, G. (2012). Stock market investors: Who is more rational, and who relies on intuition? *International Journal of Economics and Finance, 4*(5), 56-72. Retrieved from http://www.ccsenet.org/journal/index.php/ijef/issue/view/470

Hung, A., Parker, A., & Yoong, J. (2009). Defining and measuring financial literacy. Retrieved from http://lbr.rand.org/content/dam/rand/pubs/working_papers/2009/RAND_WR708.pdf

Investment Company Institute. (2008). Ownership of mutual funds, shareholder sentiment, and use of the internet. *Research fundamentals, 17*(6) 1-24. Retrieved from http://www.ici.org/pdf/fm-v17n6.pdf

Jain, K., Bearden, J., Filipowicz, A. (2011). Do maximizers predict better than satisficers? *Journal of Behavioral Decision Making, 26*(1), 41-50. doi:10.1002/bdm.763

Jehn, K. (2009). Using triangulation to validate themes in qualitative studies. *Qualitative Research in Organizations and Management: An International Journal, 4*(2), 123-150. doi:10.1108/17465640910978391

John, Y., Bullock, D., Zikopoulos, B., & Barbas, H. (2013). Anatomy and computational modeling of networks underlying cognitive-emotional interaction. *Frontiers in Human Neuroscience, 7*(101), 1-26. doi:10.3389/fnhum.2013.00101

Johnson, R. (1997). Examining the validity structure of qualitative research. *Education, 118*(2), 282-292. Retrieved from http://www.dralessandro.com/subpages/PDFfiles/Validity%20Structure.pdf

Jonsen, K., & Jehn, K. (2009). Using triangulation to validate themes in qualitative studies. *Qualitative Research in Organizations and Management, 4*(2), 123–150. doi:10.1108/17465640910978391

Joubish, M., Khurram, M., Ahmed, A., Fatima, S., & Haider, K. (2011). Paradigms and characteristics of a good qualitative research. *World Applied Sciences Journal, 12*(11), 2082-2087. Retrieved from http://idosi.org/wasj/online.htm

Jung, S., & Treibich, C. (2014). Is self-reported risk aversion time varying? (Working Paper No. 2014-12). Retrieved from http://hal.archives-ouvertes.fr/docs/00/96/55/49/PDF/wp201412.pdf

Kadariya, S. (2012). Factors affecting investor decision-making: A case of Nepalese capital market. *Journal of Research in Economics and International Finance, 1*(1), 16-30. Retrieved from http://interesjournals.org/JREIF/pdf/July/Kadariya.pdf

Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 49-81). Cambridge, UK: Cambridge University Press.

Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist, 64*(6), 515-526. doi:10.1037/a0016755

Kahneman, D., & Lovallo, D. (1993). Timid choices and bold forecasts: A cognitive perspective and risk taking. *Management Science, 39*(1), 17-31. doi:10.1287/mnsc.39.1.17

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision and risk. *Econometrica, XLVI,* 263-391. Retrieved from http://www.econometricsociety.org/tocs.asp

Kahneman, D., Slovic, P., & Tversky, A. (Eds.) . (1982). *Judgment under uncertainty: heuristics and biases*. New York: Cambridge University Press

Kamstra, M., Kramer, L., & Levi, M. (2002). Winter blues: A SAD stock market cycle. *The American Economic Review, 93*(1), 324-343. Retrieved from www.jstor.org

Kapp, B., Frysinger, R., Gallagher, M., & Haselton, J.(1979), Amygdala central nucleus lesions: Effects on heart rate conditioning in the rabbit. *Physiology and Behavior 23,* 1109–1117. doi:10.1016/0031-9384(79)90304-4

Kennickell, A. (2009) Getting to the top: Reaching wealthy respondents in the SCR. Retrieved from http://www.federalreserve.gov/econresdata/scf/files/ASA200911.pdf

Keren, G., & Schul, Y. (2009). Two is not always better than one: A critical evaluation of two-system theories. *Perspectives on Psychological Science, 4*(6), 533-552. doi :10.1111/j.1745-6924.2009.01164.x

Khan, S. & VanWynsberghe, R. (2008). Cultivating the under-mined: Cross-case analysis as knowledge mobilization. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 9*(1), 1–34.doi:10.1.1.118.4582

Kikooma, J. (2010). Using qualitative data analysis software in a social constructionist study of entrepreneurship. *Qualitative Research Journal, 10*(1), 40–51. Retrieved from http://search.proquest.com/docview/854276689?accountid=28180

Kirkpatrick, L., & Epstein, S. (1982). Cognitive experiential self-theory and subjective probability: Further evidence of two conceptual systems. *Journal of Personality and Social Psychology, 63,* 534-544. doi:10.1037/0022-3514.63.4.534

Klapper, L., Lusardi, A., & Panos, G. (2012). Financial literacy and the financial crisis. Working paper No. 17930. National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w17930.

Knetsch, J., Sinden, J. (1984). Willingness to pay and compensation demanded: experimental evidence of an unexpected disparity in measures of value. *Quarterly Journal of Economics, 99,* (3), 507-521. doi:10.2307/1885962

Konstantinidis, A., Katarachia, A., Borovas, G., & Voutsa, E. (2012). From efficient market hypothesis to behavioral finance: Can behavioral finance be the new dominant model for investing. *Scientific Bulletin-Economic Science, 11*(2), 16-26. Retrieved from http://economic.upit.ro/buletin_cd/Buletin_2012_2.pdf

Koole, S., van Dillen, L., & Sheppes, G. (2011). The self-regulation of emotion. In K. Vohs and R. Baumeister (Eds.), *Handbook of self-regulation* (2nd ed. pp.22-40). New York, NY: Guilford Press.

Korniotis, G., & Kumar, A., (2011). Do behavioral biases adversely affect the macroeconomy? *Review of Financial Studies 24* (5), 1513–1559. Retrieved from www.oup.com/us/

Korniotis, G., & Kumar, A. (2013). Cognitive abilities and financial decisions. In H.Baker & J. Nofsinger (Eds.), *Behavioral finance: Investors, corporations, and markets*. Kolb series in finance (pp. 559-576). Hoboken, NJ: John Wiley & Sons.

Kottner, J., Audige, L., Brorson, S., Donner, A., Gajewski, B., Hrobjartsson, A., Roberts, C., Shoukri, M., & Streiner, D. (2011). Guidelines for reporting reliability and agreement studies were proposed. *International Journal of Nursing Studies, 48,* 661-671. doi:10.1016/j.ijnurstu.2011.01.016

Krauss, R. M., Freyberg, R., & Morsella, E. (2002). Inferring speakers' physical attributes from their voices. *Journal of Experimental Social Psychology, 38,* 618-625.doi:10.1016/s0022-1031(02)00510-3

Krishnamurthy, A. (2009). Amplification mechanisms in liquidity crisis. *American Economic Journal. Macroeconomics, 2*(3), 1-30. doi:10.1257/mac.2.3.1

Kugler, T., Connolly, T., & Ordonez, L. (2010). Emotion, Decision, and Risk: Betting on gambles versus betting on people. *Journal of Behavioral Decision-making, 25*(2), 123-134. doi:10.1002/bdm.724

Kumar, A., & Lee, C., (2006). Retail investor sentiment and return co-movements. *Journal of Finance 61*(5), 2451–2486. doi**:**10.1111/j.1540-6261.2006.01063.x

Kuzmina, J. (2010)**.** Emotion's component of expectations in financial decision making. *Financial Decision Making, 5*(3), 295-306. doi:10.1108/17465261011079721

Lader, M., & Marks, I. (1973). *Clinical anxiety*. London, England: Heinemann

Lang, W., & Jagtiani, J. (2010). The mortgage and financial crisis: The role of credit risk management and corporate governance. *Atlantic Economic Journal, 38,* 123-144. doi:10.1007/s11293-010-9221-7

Larsen, J., Bernston, G., Poehlmann, K., Ito, T., & Cacioppo, J. (2008). The psychophysiology of emotion. In M. Lewis, J. Haviland-Jones, and L. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 180-195). New York, NY: The Guilford Press.

Latif, M., Arshad, S., Fatima, M., & Farooq, S. (2011). Market efficiency, market anomalies, causes, evidences, and some behavioral aspects of market anomalies. *Research Journal of Finance and Accounting, 2*(9), 1-13. Retrieved from http://www.iiste.org/Journals/index.php/RJFA/index

Lazarus, R. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist, 46,* 819-834. doi:10.1037/0003-066X.46.8.819

LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life.* New York, NY: Simon & Schuster.

Lee, C., & Andrade, E. (2011). Fear, social projection, and financial decision making. *Journal of Marketing Research, XLVIII,* S121-S129. doi:10.1509/jmkr.48.SPL.S121.

Lerner, J., & Keltner, D. (2001) Fear, anger, and risk. *Journal of Personality and Social Psychology, 81*(1), 146-159. doi:10.1037/0022-3514.81.1.146

Levine, L. (2012, July 17). An analysis of the distribution of wealth across households, 1989-2010. *Congressional research service.* Retrieved from http://www.fas.org/sgp/crs/misc/RL33433.pdf

Levine, L., & Edelstein, R. (2009). Emotion and memory narrowing: A review and goal-relevance approach. *Cognition & Emotion, 23*(5), 833-875. doi:10.1080/02699930902738863

Lin, H-W. (2011). Elucidating the Influence of Demographics and Psychological Traits on Investment Biases. *World Academy of Science, Engineering and Technology. International Science Index 53, 5*(5), 144-150. Retrieved from http://www.waset.org/journals/waset/v53/v53-25.pdf

List, J. (2011). Does market experience eliminate market anomalies? The case of exogenous market experience. *The American Economic Review, 101*(3), 313-317. doi:10.1257/aer.101.3.313

Lo, A. (2011). Fear, greed, and financial crisis: A cognitive neurosciences perspective. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1943325

Lo, A. (2012) Adaptive markets and the new world order. *Financial Analysts Journal, 68*(2), 18-29. Retrieved from www.cfapubs.org.

Lo, A, & Repin, D. (2002). The psychophysiology of real-time financial risk processing. *Journal of Cognitive Neuroscience, 14*(3), 323-339. doi:10.1162/089892902317361877

Lo, A., Repin, D., & Steenbarger, B. (2005). Fear and greed in financial markets: A clinical study of day-traders, *Cognitive Neuroscientific Foundations of Behavior, 95* (2), 352–359. Retrieved from aerbvi.org

Loewenstein, G., Weber, E., Hsee, C., & Welch, N. (2001). Risk and feelings. *Psychological Bulletin, 127*(2), 267-286. doi:10.1037/0033-2909.127.2.267

Lovric, M., Kaymak, U., & Spronk, J. (2010). Modeling investor sentiment and overconfidence in agent-based stock market. *Human Systems Management, 29,* 89-101. doi:10.3233/hsm-2010-0718

Luce, R. (2000). *Utility of gains and losses: Measurement-theoretical and experimental approaches.* Mahwah, NJ: Lawrence Erlbaum Associates Inc

Lusardi, A. & Mitchell, O. (2011). Financial literacy and retirement planning in the United States. *Journal of Pension Economics and Finance,* 10(4), 509-525. doi:10.1017/S147474721100045X

Lusardi, A., & Tufano, P. (2009) Debt literacy, financial experiences, and over indebtedness, Working paper 14808. National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w14808.pdf

Lyons, A., Palmer, L., Jayratne, K., Scherpf, E. (2006). Are we making the grade? A national review of financial education and program evaluation, *Journal of Consumer Affairs, 40,* 208-235. doi:10.1111/j.1745-6606.2006.00056.x

Makarov, D., & Schornick, A. (2010). Explaining households investment behavior. INSEAD Working Paper No. 2010/44/FIN. Retrieved from http://dx.doi.org/10.2139/ssrn.1623785

Malkiel, B. (2003a). The efficient market hypothesis and its critics. *The Journal of Economic Perspectives, 17*(1), 59-82. doi:10.1257/089533003321164958

Malkiel, B. (2003b). Passive investments strategies and efficient markets. *European Financial Management, 9*(1), 1-10. doi:10.1111/1468-036X.00205

Malmendier, U., & Nagel, S. (2011). Depression babies: Do macroeconomic experiences affect risk taking? *The Quarterly Journal of Economics, 126,* 373-416. doi:10.1093/qje/qjq004

Markowitz, H. (1952). Portfolio selection. *Journal of Finance, 7,* 77-91. doi:10.1111/j.1540-6261.1952.tb01525.x

Marshall, J. (2009). Go with savvy investors. Retrieved from http://www.independent.org/newsroom/article.asp?id=2664

Martin, C. (2012). Private investment companies in the wake of the financial crisis: Rethinking the effectiveness of the sophisticated investor exemption. *Delaware Journal of Corporate Law (DJCL)*, *37*(1). Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2028768&download=yes

Masomi, S., & Ghayekhloo, S. (2010, December). Consequences of human behaviors' in economic: The effects of behavioral factors in investment decision-making at Tehran Stock Exchange. Paper presented at the 2010 International Conference on Business and Economics Research at Kuala Lumpur, Malaysia. Retrieved from http://www.ipedr.com/vol1/50-B10068.pdf

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum: Qualitative Research, 11*(3). Retrieved http://www.qualitative-research.net/index.php/fqs/index

Masood, O., Aktan, B., & Chaudhary, S. (2009). The investment decision-making process from a risk manager's perspective: A survey. *Qualitative Research in Financial Markets, 1*(2), 106-120. doi:10.1108/175541709/10975928

Mauss, I., Levenson, R., McCarter, L., Wilehelm, F., & Gross, J. (2005) The tie that Binds? Coherence among emotion experience, behavior, and physiology. *Emotion, 5*(2), 175-190. doi:10.1037/1528-3542.2.175

Maxwell, N., & Lopus, J. (1994). The Lake Wobegon effect in student self-report data. *The American Economic Review, 84,* 201–205. Retrieved from http://www.aeaweb.org/aer/issues.php

McCarthy, M., Solomon, P., & Mihalek, P. (2012). Financial crisis during 2007 and 2008: Efficient markets or human behavior? *Journal of Applied Business Research, 28*(6), 1275-1281. Retrieved from http://journals.cluteonline.com/index.php/JABRMercer & IRRC Institute. (2010). Investment Horizons: Do managers do what they say? Retrieved from http://irrcinstitute.org/projects.php?project=42

McInerney, M., Mellor, J., & Nicholas, L. (2013). Recession depression: Mental health effects of the 2008 stock market crash. *Journal of Health Economics, 32,* 1090-1104. doi:10.1016/j.jhealeco.2013.09.002

Mack, N., Woodson, C., MacQueen, K., Guest, G., & Naney, E. (2005). *Qualitative research methods: A data collector's field guide.* Research Triangle Park, NC: Family Health International.

Mehra, B. (2002). Bias in qualitative research: Voices from an online classroom. *The Qualitative Report, 7*(1). Retrieved from http://www.nova.edu/ssss/QR/QR7-1/mehra.html

Merriam, S. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Josey-Bass.

Miller, G. A. (1956). The magical number seven plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*(2), 81-97. doi:10.1037/h0043158

Mitchell, D. (2011). The nexus between decision-making and emotion regulation: A review of convergent neurocognitive substrates. *Behavioral Brain Research, 217,* 215–231. doi:10.1016/j.bbr.2010.10.030

Moore, D., & Healy, P. (2008). The trouble with overconfidence. *Psychological Review, 115*(2), 502-517. doi: 10.1037/0033-295X.115.2.502

Morgan, A., & Drury, V. (2003). Legitimizing the subjectivity of human reality through qualitative research method. *The Qualitative Report, 8*(1), 70-80. Retrieved from http://www.nova.edu/ssss/QR/QR8-1/morgan.html

Morse, J., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods, 1*(2), 13-22. Retrieved from https://ejournals.library.ualberta.ca/index.php/IJQM/article/viewArticle/4603

Morse, J., Koven, S., Mundt, C., & Gohmann, F. (2008). The Kentucky initiative in health services contracting: The search for contracting of outcomes measures. *International Journal of Public Administration, 31*(6), 639-653. doi:10.1080/01900690701640994

National Bureau of Economic Research (NBER) (2010). US business cycle expansions and contractions. Retrieved from http://www.nber.org/cycles.html

Nicolosi, G., Peng, L., & Zhu, N. (2009). Do individual investors learn from their trading experience? *Journal of Financial Markets, 12*(2), 317-336. doi:10.1016/j.finmar.2008.07.0001

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231–259. doi:10.1037/0033-295X.84.3.231

Nguyen, T., & Schubler, A. (2012). Investment decisions and socio-demographic characteristics–Empirical evidence from Germany. *International Journal of Economics and Finance, 4*(9), 1-12. doi:10.5539/ijef.v4n9p1

Noth, M., & Puhan, T. (2009). How to hide mutual fund fees. Working paper. University of Hamburg. Retrieved from http://www.wiwi.uni-hannover.de/fileadmin/banken_hcf/2009_SoSem/Finance_Seminar/NP_2009.pdf

Nonthaleerak, P., & Hendry, L. (2008). Exploring the six sigma phenomenon using multiple case study evidence. */ Journal of Operations & Production Management, 28*(3), 279-303. doi:10.1108/01443570810856198

Noor, K. (2008). Case study: A strategic research methodology. *American Journal of Applied Sciences, 5*(1), 1602-1604. Retrieved from http://www.scipub.org/index.html

Norlyk A., & Harder I. (2010). What makes a phenomenological study phenomenological: An analysis of peer-reviewed empirical nursing studies. *Qualitative Health Research, 20*(3), 420–431. doi:10.1177/1049732309357435

Odean, T. (1999). Do investors trade too much? *American Economic Review, 89,* 1279-1298. doi:10.1257/aer.89.5.1279

Ohanian, L. (2010) The economic crisis from a neoclassical perspective. *Journal of Economic Perspectives, 24*(4) 45-66. doi:10.1257/jep.24.4.45

Ohman, A. (2007). Fear. G.Fink (Ed.). In *Encyclopedia of stress,*(pp. 15-19). Walthman, MA: Academic Press

Osman, M. (2004). An evaluation of dual-process theories of reasoning. *Psychonomic Bulletin & Review, 11*(6), 988-1010. Retrieved from www.psychonomic.org

Othman, A. (2012). *Automated market making: Theory and practice*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3524683)

Paravisini, D., Rappoport, V., & Ravina, E. (2012). Risk aversion and wealth: Evidence form person-to-person lending portfolios. NBER (Working Paper No. 16063). Retrieved from http://finance.bwl.uni-mannheim.de/fileadmin/files/areafinance/files/HWS_2012/Ravina.pdf

Paulus, M., & Yu, A. (2012). Emotion and decision-making: Affect-driven belief systems in anxiety and depression. *Trends in Cognitive Sciences, 16*(9), 476-483

Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Pelaccia, T., Tardif, J., Triby, E., & Charlin, B. (2011). An analysis of clinical reasoning through a recent and comprehensive approach: The dual-process theory. *Medical Education online, 16,* 58-90. doi:10.3402/meo.v16i0.5890

Peppard, J. (2010). Unlocking the performance of the Chief Information Officer. *California Management Review, 52*(4). Retrieved from http://www.som.cranfield.ac.uk/som/dinamic-content/media/isrc/unlocking%20the%20performance%20of%20the%20cio.pdf

Perring, C. (2011). Bridging the gap between philosophers of mind and brain researchers: The example addiction. *Brain, Mind, and Consciousness, 9*(1), 193-201. doi:10.4103/0973-1229.77435

Peterson, R. (2007). Affect and financial decision-making: How neuroscience can inform market participants. *The Journal of Behavioral Finance, 8*(2), 70-78. doi: 10.1080/15427560701377448

Peterson, E., & Whiteman, M. (2007). I think I can..: The interrelationships among self-assessed intelligence, self-concept, self-efficacy and the personality trait intellect in university students in Scotland and New Zealand. *Personality and Individual Differences, 43,* 959-968. doi: 10.1016/j.paid.2007.02.019

Pfister, H., & Bohm, G. (2008). The multiplicity of emotions: A framework of emotional functions in decisions making. *Judgment Decision Making, 3,* 5-17. Retrieved from http://journal.sjdm.org/bb1.pdf

Phelps, E. (2006). Emotion and cognition: Insights form studies of human amygdala. *Annual Review of Psychology, 57,* 27-53. doi:10.1146/1nnurev.psych.56.091103.070234

Phelps, E. (2009) The study of emotion in neuroeconomics. In P. Glimcher, C. Camerer, and R. Poldrack (Eds.), *Neuroeconomics: Decision making and the brain,* (pp. 233-250). Waltham, MA: Academic Press.

Polman, E. (2010). Why are maximizers less happy than satisficers? Because they maximize positive and negative outcomes. *Journal of Behavioral Decision Making, 23,* 179-190. doi:10.1002/bdm.647

Polya, G. (1945). *How to solve it: A new aspect of mathematical methods.* Princeton, NJ: Princeton University Press

Pompian, M., & Long, J. (2004). A new paradigm for practical application of behavioral finance: Creating investment programs based on personality type and gender to produce better investment outcomes. *The Journal of Wealth Management, 7*(20, 9-15. doi:10.3905/jwm.2004.434561

Poole, W. (2010). Causes and consequences of the financial crisis of 2007-2009. *Harvard Journal of Law and Public Policy, 33*(2), 421-441. Retrieved from http://www.law.harvard.edu/studorgs/jlpp/

Porcelli, A., & Delgado, M. (2009). Acute stress modulates risk taking in financial decision making. *Psychological Science, 20*(3), 278-283. doi: 10.1111/j.1467-9280.2009.02288.x

Poterba, J., Venti, S., & Wise, D. (2009). The decline of defined benefit retirement plans and asset flows. In D. Wise (Ed.). *Research findings in economics of aging* (pp. 271-304). Chicago, IL: The University of Chicago Press. Chapter retrieved from http://www.nber.org/chapters/c8206.pdf

Prentice, R. (2007). Ethical decision-making: More needed than good intentions. *Financial Analysts Journal, 63*(6), 17-30. doi:10.2469/faj.v63.n6.4923

Prorokowski, L. (2011). Trading strategies of individual investors in times of financial crisis. *Qualitative Research in Financial Markets, 3*(1), 34-51. doi:10.1108/17554171111124603

Prorokowski, L. (2012). Assessment of cross-border implications of economic and financial information for Central European emerging stock market of Poland in times of the current financial crisis. *Qualitative Research in Financial Markets, 4*(1), 36-67. doi:10.1108/17554171211213540

Qu, S., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting & Management, 8*(3), 238-264. doi:10.1108/117660911111620770

Rabin, M., & Thaler, R. (2001). Anomalies: Risk aversion. *The Journal of Economic Perspectives, 15*(1), 219-232. doi:10.1257/jep.15.1.219

Rapee, R. (1991). Generalized anxiety disorder: A review of clinical features and theoretical concepts. *Clinical Psychology Review*, *11*, 419–440. doi:10.1016/0272-7358(91)90116-C

Ravenswood, K. (2011). Eisenhardt's impact on theory in case study research. *Journal of Business Research, 64,* 680-686. doi:10.1016/j.jbusres.2010.08.014

RealtyTrac. (2009, January 15). Foreclosure activity increases 81 percent in 2008. Retrieved from http://www.realtytrac.com/content/press-releases/foreclosure-activity-increases-81-percent-in-2008-4551

Reinhart, C., & Rogoff, K. (2009). The aftermath of financial crises. *American Economic Review, 99*(2), 466-472. doi:10.1257/aer.99.2.466

Reis, H. T., & Gable, S. L. 2000. Event sampling and other methods for studying daily experience. In H. T. Judd & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology*, (pp. 190–222). New York: Cambridge University Press.

Remund, D. (2010). Financial literacy explicated: The case for a clearer definition in an complex economy. *The Journal of Consumer Affairs, 44*(2), 276-295. doi: 10.1111/j.1745-6606.2010.01169.x

Reyna, A. (2004). How people make decisions that involve risk. *Current Directions in Psychological Science, 13,* 60-66. doi: 0.1111/j.0963-7214.2004.00275.x

Reyna, V., Lloyd, F., & Brainerd, C. (2003). Memory, development, and rationality: An integrative theory of judgment and decision making. In S. Schneider & J. Shanteau (Eds.), *Emerging perspectives on judgment and decision research* (pp. 201–245). New York, NY: Cambridge University Press.

Richards, J.,& Gross, J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79,* 410–424. doi:1O.1037/70O22-3514.79.3.410

Rosenberg, J. & Yates, P. (2007). Schematic representation of case study research designs. *Journal of Advanced Nursing*, *60*(4), 447–452. doi:10.1111/j.1365-2648.2007.04385.x

Roszkowski, M., & Grable, J. (2005). Estimating risk tolerance: The degree of accuracy and the paramorphic representations of the estimate. *Financial Counseling and Planning, 16*(2), 29-47. Retrieved from http://afcpe.org/assets/pdf/vol1624.pdf

Rowley, J. (2002). Using case studies in research. *Management Research News, 25*(1), 16-27. doi:10.1108/01409170210782990

Rude, S., Durham-Fowler, J., Baum, E., Rooney, S., Maestas, K. (2010) Self-report and cognitive processing measures of depressive thinking predict subsequent major depressive disorder. *Cognitive Therapy and Research, 34*(2), 107-115. doi:10.1007/s10608-009-9237-y

Sadi, R., Asi, H., Rostami, M., Gholipour, A., & Gholipour, F. (2011). Behavioral finance: The explanation of investors' personality and perceptual biases effects on financial decisions. *International Journal of Economics and Finance, 3*(5), 234-241. doi:10.5539/ijef.v3n5p234

Sahm, C. (2012). How much does risk tolerance change? *Quarterly Journal of Finance, 2*(4),, 1-38. doi:10.1142/s20101392125000206

Sapra, S., & Zak, P. (2009). Neurofinance: Bridging the psychology, neurology, and investor behavior. *Neurology, and Investor Behavior*. Retrieved from http://dx.doi.org/10.2139/ssrn.1323051

Savviness. (2012). In *Merriam-Webster.com*. Retrieved November 19, 2012, from http://www.merriam-webster.com/dictionary/savviness

Scherer, K. (2003. Vocal communication of emotion: A review of research paradigms. *Speech Communication, 40,* 227-256.doi:10.1016/S0167-6393(02)100084-5

Schoemaker, P. (1982). The expected utility model: Its variants, purpose, evidence and limitations. *Journal of Economic Literature, 20*(2), 529-563. Retrieved from http://www.jstor.org

Schunk, D., & Betsch, C. (2006). Explaining the heterogeneity in utility functions by individual differences in decision modes. *Journal of Economic Psychology, 27*, 386–401.doi: 10.1016/j.joep.2005.08.003 Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*(5), 1178-1197. doi:10.1037/0022-3514.83.51178

Seale, C. (1999). Quality in qualitative research. *Qualitative Inquiry, 5*(4), 465-478. doi:10.1177/107780049900500402

Seo, M., & Barrett, L. (2007). Being emotional during decision making–good or bad? An empirical investigation. *Academy of Management Journal, 50*(4), 923-940. doi:10.5465/AMJ.2007.26279217

Seo, M., Goldfarb, B., & Barrett, L. (2010). Affect and the framing effect within individuals over time: Risk taking in a dynamic investment simulation. *Academy of Management Journal, 53*(2), 411-431. doi:10.5465/AMJ.2010.49389383

Seo, M., & Ilies, R. (2009). The role of self-efficacy, goal, and affect in dynamic motivational self-regulation. *Organizational Behavior and Human Decision Processes, 109,* 120-133. doi:10/1016/j.obhdp.2009.03.001

Seru, A., Shumway, T., & Stoffman, N. (2010). Learning by trading. *Review of Financial Studies, 23*(2), 705-739. doi:10.1093/rfs/hhp060

Shah, A., & Oppenheimer, D.(2008). Heuristics made easy: An effort-reduction framework. *Psychological Bulletin, 134*(2), 207-222. doi: 1.1037/0033-2909.134.2.207.

Shank, G. (2006). *Qualitative research: A personal skills approach.* Upper Saddle River, NJ: Pearson

Shariff, M., Al-Khasawneh, J., & Al-Mutawa, M. (2012). Risk and reward: A neurofinance perspective. *International Review of Business Research Paper, 8*(6), 126-133. Retrieved from www.irbp.com

Shefrin, H. (2009). How psychological pitfalls generated the global financial crisis. Forthcoming in *Voices in wisdom: Understanding the global financial crisis.* Edited by Laurence B. Siegel. Charlottesville, VA: Research Foundation of CFA Institute. Retrieved from http://www.cfapubs.org/doi/pdf/10.2470/rf.v2009.n5.14

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63-75. Retrieved from http://www.iospress.nl/

Shiller, R. (2003). From efficient markets theory to behavioral finance. *The Journal of Economic Perspectives, 17*(1), 83-104. doi:10.1257/089533003321164967

Shiv, B, Loewenstein, G., Bechara, A., Damasio, H., & Damasio, A. (2005). Investment behavior and the negative side of emotion. *Psychological Science, 16*(6), 435-439. doi:10.1111/j.0956-7976.2005.01553.x

Shleifer, A. (2000). *Inefficient markets: An introduction to behavioral finance.* New York, NY: Oxford University Press.

Shleifer, A., & Vishny, R. (1997). The limits of arbitrage. *Journal of Finance, 52*(1), 35–55. doi:10.1111/j.1540-6261.1997.tb03807.x

Simon, H., (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69*(1). 99–118. Retrieved from http://qje.oxfordjournals.org/

Simon, H. (1967). Motivational and emotional controls of cognition. *Psychological Review, 74*(1), 29–39. doi:10.1037/h0024127

Simon, H. & Newell, A. (1971). Human problem solving: The state of the theory in 1970. *American Psychologist*, *26*(2), 145-159. doi: 10.1037/h0030806

Sitkin, S., & Weingart, L. (1995) Determinants of risky decision-making behavior: A test of mediating role or risk perceptions and propensity. *Academy of Management Journal, 38*(6), 1573-1592. doi:10.2307/256844

Sitkin, S. & Pablo, A. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review, 17*(1), 9-38. doi:10.5465/AMR.1992.4279564

Sloman, S. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin,* 119: 3–22. doi:10.1037/0033-2909.119.1.3

Sloman, S. (2002). Two systems of reasoning. In T. Gilovich, D. Griffin, D. Kahneman (Eds.), *Heuristic biases: The psychology of intuitive judgment* (pp. 379-396). New York, NY: Cambridge University Press.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research, 177,* 1333-1352. doi:10.1016/j.ejor.2005.04.006

Slovic,P., Peters, E., Finucane, M., & MacGregor, D. (2005). Affect, risk, and decision making. *Health Psychology,24*(4), 835-840. doi:10.1037/0278-6133.24.4835

Smith, E., & DeCoster, J. (2000). Dual-process models in social and cognitive psychology: Conceptual integration and links to underlying memory systems. *Personal Social Psychology Review, 4,* 108-131. Retrieved from http://psr.sagepub.com/content/4/2/108.short

Smith, C., & Ellsworth, P. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48,* 813-838. doi:10.1037/0022-3514.48.4.813

Smith, A., & Harvey, T. (2011). Test of a theory: An empirical examination of the changing nature of investor behavior. *Journal of Management Policy and Practice, 12*(3), 49-68. Retrieved from http://www.na-businesspress.com/jmppopen.html

Sokol-Hessner, P., Camerer, C., & Phelps, E.(2013) Emotion regulation reduces loss aversion and decreases amygdale responses to losses. *Social Cognitive and Affective Neuroscience, 8*(3), 341-350. doi:10.1093/scan,nss002

Solomon, R. (2008). The philosophy of emotions. In M. Lewis, J. Haviland & L. Barrett (Eds.), *Handbook of emotions* (pp. 3-16). New York, NY: The Guilford Press

Solow, K. (2009). Buy and hold is dead (again): The trouble with Quant Models. *Journal of Financial Planning, 22*(9), 58-70. Retrieved from http://www.journalfp.net/

Spencer, L., Ritchie, J., Lewis, J., & Dillon, L. (2003). *Quality in qualitative evaluation: A framework for assessing research evidence.* London, England: Government Chief Social Researcher's Office. Prime Minister's Strategy Unit. Cabinet Office. National Centre for Social Research. Retrieved from national archives government of United Kingdom website: http://webarchive.nationalarchives.gov.uk/+/http://www.cabinetoffice.gov.uk/strategy/downloads/su/qual/downloads/qqe_rep.pdf

Squire, L. R. (1994). Declarative and non-declarative memory: Multiple brain systems supporting learning and memory. In D. Schacter & E. Tulving (Eds.), *Memory systems* (pp. 203–232). Cambridge: The MIT Press

Stake, R. (2010). *Qualitative research*. New York, NY: The Guilford Press.

Stanovich, K. (2012). Dual-process theory and the great rationality debate. In K. Stanovich (Ed.), *Rationality & reflective mind* (pp. 3-28). New York, NY: Oxford University Press.

Stanovich, K., & West, R. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Science, 23,* 645-726. doi:10.1017/S0140525X00003435

Stanovich, K., West, R., & Toplak, M. (2011). The complexity of developmental predictions from dual process models. *Development Review, 31,*103-118. doi:10.1016/j.dr.20111.07.003

Statman, M. (1999). Behavioral finance: Past battles and future engagements. *Financial Analysts Journal, 55*(6), 18-27. Retrieved from http://www.cfapubs.org/loi/faj

Stavros, C., & Westberg, K. (2009). Using triangulation and multiple case studies to advance relationship marketing theory. *Qualitative Market Research: An International Journal, 12*(3), 307-320. doi:10.1108/13522750910963827

Staw, B. (1976). Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational behavior and human performance*, *16*(1), 27-44. doi:10.1016/0030-5073(76)90005-2

Sun, R., & Mathews, R. (2012). Implicit cognition, emotion, and meta-cognitive control. *Mind Society, 11,* 107-119. doI:10.1007/s11299-012-0101-5

Szyszka, A. (2011). Genesis of the 2008 global financial crisis and challenges to the neoclassical paradigm of finance. *Global Finance Journal, 22*, 211-216. doi:10.1016/j.gfj.2011.10.011

Taffler, R., & Tuckett, D. 2010). Emotional finance: The role of unconscious in financial decisions. In H. Baker & J. Nofsinger (Eds.), *Behavioral finance: Investors, corporations, and markets* (pp. 95-11). Hoboken, NJ: John Wiley & Sons, Inc.

Tansey, O. (2007). Process tracing and elite interviewing: A case for non-probability sampling. *PS: Political Science and Politics, 40*(4), 765-772. Retrieved from https://www.apsanet.org/ps/

Taylor, C. (2010). *How to practice evidence-based psychiatry.* Arlington, VA: American Psychiatric Publishing, Inc.

Taylor, S., & Brown, J. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*(2), 193-210. doi:10.1037/0033-2909.103.2.193

Thaler, R. (1985). Mental accounting and consumer choice, *Marketing Science, 4*(1), 199-214. Retrieved from http://www.jstor.org/discover/10.2307/183904?uid=3739696&uid=2&uid=4&uid=3739256&sid=21104401521517

Thaler, R. (1993). Advances in behavioral finance. New York, NY

Thaler, R., & Johnson, E. (1990). Gambling with the house money and trying to break even. *The Management Science, 36*(6), 643-661. Retrieved from http://mansci.journal.informs.org/

Trauth, E. (1997). Achieving the research goal with qualitative methods: Lessons learned along the way. In E. Roch & M. Blaine (Eds.), *Information systems and qualitative research* (pp. 225-245). London, England: Chapman & Hall.

Tuckett, D. (2009). Addressing the psychology of financial markets. *Economics, 3*(4), 1-22. Retrieved from http://www.economics-ejournal.org/economics/journalarticles/2009-40

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and Biases. *Science, 185,* 1124-1131. doi:10.1126/science.185.4157.1124

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing decisions. *The Journal of Business, 59*(4), part 2, 8251-8278. Retrieved from http://www.journals.uchicago.edu/

Tversky, A., & Kahneman, D. (1992). Advances in cumulative prospect theory. *Journal of Risk and Uncertainty, 5*(4), 297-323. doi:10.1007/BF00122574

Tversky, A., & Kahneman, D. (2000). Judgment under uncertainty: Heuristics and biases. In T. Connolly, H. Arkes & Hammond (Eds.), *Judgment and decisions making* (pp. 35-52). New York, NY: Cambridge University Press.

VanDerhei, J. 2009). The impact of recent financial crisis on 401(k) account balances. EBRI Issue Brief No. 326. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1350568&download=yes

van Gelder, J., de Vries, R., van der Pligt, J. (2009). Evaluating a dual-process model of risk: Affect and cognition as determinants of risky choice. *Journal of Behavioral Decision Making, 22,* 45-61. doi:10.1002/bdm.610

van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics, 101,* 449-472. doi:10.1016/j.jfineco.2011.03.006

Vasile, D., Sebastian, T., & Radu, T. (2011). A behavioral approach to the global financial crisis. *Annals of the University of Ordea, Economic Science Series, 20*(2), 340-346. Retrieved from http://steconomice.uoradea.ro/anale/en_index.html

Vlaev, I., Stewart, N., & Chater, N. (2008). Risk preference discrepancy: A prospect relativity account of the discrepancy between risk preferences in laboratory gambles and real world investments. *Journal of Behavioral Finance, 9*(3), 132-148. Doi:10.1080/15427560802336673

von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behavior.* Princeton, NJ: Princeton University Press.

Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Production Management, 22*(2), 195-219. doi:10.1108/01443570210414329

Wallace, J., Edwards, B., Shull, A., & Finch, D. (2009). Examining the consequences in the tendency to suppress and reappraise emotions on task-related job performance. *Human Performance, 22,* 23-43. doi:10.1080/08958280802520957

Wallison, P. (2011). Three narratives about the financial crisis. *Cato Journal, 31*(3), 535-548. Retrieved from www.cato.org/sites/cato.org/files/serials/files/cato.../9/cj31n3-8.pdf

Wang, X. (2006). Emotions within reason: resolving conflicts in risk preference. *Cognition and Emotions, 20*(8), 1132-1152. doi:10.1080/02699930500387428

Wargo, D., Baglini, N., & Nelson, K. (n.d.). The global financial crisis-caused by greed, moral meltdown, and public policy disasters. Retrieved from http://forumonpublicpolicy.com/spring09papers/archivespr09/wargo.pdf

Weber, E., & Johnson, E. J. (2009). Mindful judgment and decision making. *Annual Review of Psychology, 60,* 53–85.

Weber, M., Weber, E., & Nosic, A. (2013). Who takes risks when and why: Determinants of changes in investor risk taking. *Review of Finance, 17*(3), 847-883. doi:10.1093/rof/rfs024

Wheeler, L., & Reis, H. 1991. Self-recording of everyday life events: Origins, types, and uses. *Journal of Personality,* 59: 339–354. doi:10.1111/j.1467-6494.1991.tb00252.x

Wilke, A., & Mata, R. (2012). Cognitive bias. In V. Ramachandran (Ed.). *The encyclopedia of human behavior,* v.1, (pp. 531-535). London, England: Academic Press

Wilson, T., Myers, J., & Gilbert, D. (2001). Lessons from the past: Do people learn from experience that emotional reactions are short-lived? *Personality and Social Psychology Bulletin, 27,* 1648-1661. doi:10.1177/01461672012712008

Wilson, T., Myers, J., & Gilbert, D. (2003). How happy was I, anyway? A retrospective impact bias. *Social Cognition, 21*(6), 421-446. doi:10.1521/soco.21.6.421.28688

Worthington, A., & Valadkhani, A. (2004). Measuring the impact of natural disasters on capital markets: An empirical application using intervention analysis. *Applied Economics*, *36*(19), 2177-2186. doi:10.1080/0003684042000282489

Wright, W. (1980). Cognitive information processing biases: Implications for producers and users of financial information. *Decision Sciences, 11*(2), 284-298. Retrieved from www.wiley.com

Yin, R. (2009). *Case study research: Design and methods* (4th ed.). Applied social research series. V.5. Thousand Oaks, CA: SAGE publications.

Yin, R. (2012). *Applications of case study research* (3rd ed.). Thousand Oaks, CA: Sage Publication, Inc.

Yulek, M., & Randazzo, A. (2012). Refining the story of the financial crises in Europe and the USA. *Insight Turkey, 14*(2) 59-81. Retrieved from http://www.insightturkey.com/

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inference. *American Psychologist, 35,* 151—175. **doi**:10.1037/0003-066X.35.2.151

Zindel, M., Zindel, T., & Quirino, G. (2014). Cognitive bias and their implications on the financial market. *International Journal of Engineering & Technology, 14*(3), 11-17. Retrieved from http://www.ijens.org/IJET%20Vol%2014%20Issue%2003.html

Appendixes

Appendix A: Introductory Letter

Re: Introduction and request for your participation

Dear Sir/Madam,

My name Richard Eng and I am a doctoral student at Northcentral University (Prescott, Arizona). I am conducting a dissertation study involving in-depth interviews to explore investor perceptions and how and why they arrive at their decision during the 2008Financial Crisis. The interview should take approximately an hour to complete, and all responses will be kept strictly confidential and anonymous. You will be asked seven semi-structured questions during the interview. Follow up questions may be asked to seek clarification or additional information. This study is in partial fulfillment of the requirements for the Doctor of Philosophy degree of Business Administration and the results will be published.

The purpose of this qualitative case study is to explore how and why investors arrived at their investment decisions when faced with extreme stress impelled during the 2008 Financial Crisis. Once this study is approved by Northcentral University, you will be provided an electronic copy of my dissertation manuscript.

If you are available for an interview, please reply via e-mail(reng.ncu.edu@gmail.com) or reach me by cell phone at (203) 992-9580. After I receive the authorized form, I will contact you to arrange an interview.

Regards,

Richard Eng, PhD. Candidate

Daphne Halkias, Ph.D., Dissertation Committee Chair

Northcentral University

Appendix B: Informed Consent Form

Exploring investors' perceptions and why and how they arrive at their investor decisions during the 2008 Financial Crisis.

Purpose. My name is Richard Eng and you are invited to participate in a research study conducted for a dissertation at Northcentral University in Prescott, Arizona. The purpose of this qualitative case study is to explore how and why investors arrived at their investment decisions when faced with extreme stress impelled during the 2008 Financial Crisis. There is no deception in this study, and I am interested in your opinions about your organization.

Participation requirements. You will be asked to provide in-depth verbal responses to interview questions asked by the researcher. The researcher will schedule the interview based on your convenience and will conduct the interview session with you by face-to-face meeting or telephonic conversation. The interview session will be recorded and it will last approximately an hour.

Research Personnel. The following person is leading this research project and may be contacted at any time: Richard Eng, phone (203) 992-9580, email: reng.ncu.edu@gmail.com, PO BOX 1414 Wallingford, CT 06492

Potential Risk/Discomfort. There are no risks in this study. Bear in mind that some of the information is personal and there are some questions about your personal investment portfolio. The interview process includes semi-structured questions that are intended to encourage your in-depth responses, perceptions, and comments. If you find the questions to be distressing, you may withdraw at any time and you may choose not to answer any question that you feel uncomfortable in answering.

Potential Benefit. There are no direct benefits to you for taking part in this research. The benefit for your participation in this study includes access to the final dissertation manuscript that will be sent to you after the study is completed and approved by Northcentral University. The results will have educational interest that may in time have benefits for media organizations that are trying to manage change successfully.

Anonymity/Confidentiality. The data collected in this study is strictly private and confidential. Your name will not be attached to any of the results. In addition, the coded data is made available only to those involved in the research.

Right to withdraw. You have the right to withdraw from this study at any time. You may omit answering any interview questions if you do not want to answer them. Your participation in this research is completely voluntary. The Researcher and Dissertation Chair will answer any question that you have about the study. Please contact Richard Eng, phone (203) 992-9580 , email: reng.ncu.edu@gmail.com and Dr. Daphne Halkias, Dissertation Chair at dhalkias@ncu.edu

What if I have questions about my rights as a research participant or complaints? If you have questions about your rights as a research participant, any complaints about your participation in the research study, or any problems that occurred in the study, please contact the researchers identified in the consent form. Alternatively, if you prefer to talk to someone outside the study team, you can contact Northcentral University's Institutional Review Board at irb@ncu.edu of 1-888-327-2877 ex 8014.

Signatures. I have read the above description of the study and understand the conditions of my participation. My signature indicates that I agree to participate in the study "Exploring investors' perceptions and why and how they arrive at their investment decisions during the 2008 Financial Crisis". (You will receive a copy of this authorized document).

Participant's Name: _____

Participant's Signature: _____

Date: _____

Researcher's Name: Richard Eng

Researcher's Signature: _____

Date: _____

Appendix C: Interview Guide Questions

Exploring investors' perceptions and why and how they arrive at their investor decisions during the 2008 Financial Crisis.

Date:_____

Introduction

To Interviewee:
"The interview is recorded for the best possible data. Is this okay? I can turn off the tape recorder along the way if you wish."
"Have you read the information I sent? Have you signed the Informed Consent Form to participate in this study?"
"The purpose of this investigation is to explore how and why investors arrived at their investment decisions when faced with extreme stress impelled during the 2008 Financial Crisis."
"Do you wish to ask any question regarding the study or this procedure before we proceed?"

Exploring Interviewee Perceptions on the Study Topic

To Interviewee: "This is an investigation to determine investors' perception and why and how they arrived at their decisions during the 2008 Financial Crisis."

Part A (Participant Information)

A1. Interviewee pseudonym:_____

A2. Interviewee code: _____

A3. Gender: Male____ Female____

A6. Age:_____

A7. Years of investing experience:_____

A8. Value of investment portfolio on June 30, 2008_____

Part B: Interview Questions addressing why and how investors arrived at their decisions during the 2008 Financial Crisis.

The interviewer will ask the interviewee to answer the following interview questions by freely expressing their beliefs opinions and feelings interviewees will be asked to elaborate on their responses when appropriate and following normal in-depth interview procedures.

B1. Please describe your investment experience, specifically how and why you bought, reallocated, or sold your stocks, prior to the 2008 Financial Crisis and discuss any experience in investment decisions with respect to any volatile moves in the market?

B2. Please describe when and how you learned about the 2008 Financial Crisis?

B3. Please describe the factors that led to your noticing that there was a Financial Crisis?

B4. How did you feel when you learned that there was a financial crisis?

B5. How would you describe your behaviors when you realized that your investment portfolio dropped precipitously?

B6. Looking back at that time of the Financial Crisis of 2008, please identify what you believe was the strongest factor - your feelings or thoughts- guiding your decision to sell, reallocate, hold, or buy because of the financial crisis ?

B7. Can you please explain why one of these processes (state to participants his answer to **B5**- feelings or thoughts) was the dominant factor in your decision to sell, reallocate, hold, or buy during the Financial Crisis of 2008?

Appendix D: Interview Guide

Field Test Solicitation for Interview Guide Assessment

From: r eng
Date: Sunday, April 6, 2014 3:11 pm
Subject: Three questions with respect to Interview Guide for you to answer
To: undisclosed-recipients: ;

I am writing to ask for your collegial participation in a field test pertaining to an Interview Guide, which I have developed for my dissertation with the purpose of exploring how and why investors arrived at their investment decisions when faced with extreme stress impelled during the 2008 Financial Crisis.

The field test consists of reviewing the interview questions and answering three questions. The three questions to be answered follow the Interview Guide Questions.
Interview Guide Questions:
The interviewer will ask the interviewee to answer the following interview questions by freely expressing their beliefs opinions and feelings interviewees will be asked to elaborate on their responses when appropriate and following normal in-depth interview procedures.

1. Please describe your investment experience prior to the 2008 Financial Crisis?
2. Please describe when and how you learned about the 2008 Financial Crisis?
3. Please describe the factors that led to your noticing that there was a Financial Crisis?
4. How did you feel when you learned that there was a financial crisis?
5. How would you describe your behaviors when you realized that your investment portfolio dropped precipitously?
6. Looking back at that time of the Financial Crisis of 2008, please identify what you believe was the strongest factor – your feelings or thoughts- guiding your decision to sell, reallocate, hold, or, buy because of the financial crisis ?
7. Can you please explain why one of these processes (state to participants his answer to 6- feelings or thoughts) was the dominant factor in your decision to sell, reallocate, hold, or buy during the Financial Crisis of 2008?

Please provide your opinion on the Interview Guide Questions by answering the questions as follow:

Were the Interview Guide Questions easy to understand?

Were the Interview Guide Questions relevant to the study?

Were the Interview Guide Questions valid to the study (Stake, 1995)?