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**Overconfidence—Understanding the Root of Financial Crisis from a Behavioral  
Perspective**

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## **1. Introduction**

On the financial crisis of 2008-2009, the CEO and President of Bank of America, Brian T. Moynihan once commented: “Over the course of this crisis, we as an industry caused a lot of damage. Never has it been clearer how mistakes made by financial companies can affect Main Street, and we need to learn the lessons of the past few years.” Indeed, the wound that the global financial meltdown left us can range from a family losing their home to a corporate giant collapsing, and even to a government facing bankruptcy. Now that half a decade has past, it is time to look back and ponder: what have we learnt? Numerous researches have been conducted on the topic and have given various explanations. Whereas most current analyses mainly focus on the structural problems of the modern financial system, this paper, however, takes a behavioraleconomics standpoint, which assumes economic subjects, instead of being perfect rational “homo economicus”, cannot always make optimal financial decisions as a result of psychological biases caused by emotions or personalities (Tourani-Rad, Kirkby, 283). Due to the limitation of the scope I will only investigate the financial crisis in a preliminary depth and concentrate on one specific psychological factor: overconfidence. This paper aims to provide insight on how overconfidence, as a trait commonly exhibited by investors, influences the formation and the development of the financial bubbles in the pre-crisis time.

In the following the behavioural model of overconfidence bias will be intensively discussed and applied to explain certain investor behaviors prior to the crisis. Then further supplementary empirical evidence are presented to support the model. Four studies are closely reviewed: the market entry experiment by Camerer and Lavallo (Study 1), Libby and Rennekamp on self-attribution bias (Study 2), the incentive-augmented experiment by Clark and Frieson (Study 3), and the investor survey conducted by Tourani-Rad and Kirby (Study 4). Finally, by addressing the issue of overconfidence and the limitation of our rationality, I hope to provide another perspective in how to better predict the financial fluctuation and improve the financial stability.

## **2. The Behavioral Economic Model of Overconfidence**

### **2.1. Overconfidence, Self-Attribution, and the Neglect of the Reference Group**

Overconfidence is one of the most often observed psychological biases among investors. It induces people to overrate their own knowledge, overlook risks, and overestimate their influence on uncontrollable events according to psychologists (Nosing, 2001). Especially when assessing their performance vis-à-vis their peers, most people view themselves as better than average, even though usually only half of the population can be. Being positive about their own abilities, people also seem to

forget that the peers with whom they are competing also hold the same belief. Camerer and Lovoallo phrase this phenomenon as “reference group neglect” (306-307). One contributing factor to this perception is the self-attribution bias: we tend to attribute success to our internal characteristics but blame the failures or adverse events to external factors, or even pure bad luck. Self-explanatory as it appears, humans are rarely prevented from falling into this trap.

Another relevant factor contributing to overconfidence is the confirmation of the past success. Because when people believe their past success is a result of an internal factor-- be it their own capability or endeavour, there is no reason to doubt the continuity of further success. Thus overconfidence can be affirmed by positive performances in the past, which increases the degree of recklessness in future decision making.

## 2.2. The Relevance for Financial Instability

Overconfidence is tremendously relevant to investment decision-making and thus the stability of the financial system. The speculative nature of the financial market makes it particularly susceptible to the bias. The financial market is complicated, risky, male-dominated<sup>1</sup>, rich both in technical aspects for one to attribute gains to and in external noises for one to blame the loss on—thus a perfect setting for overconfidence to take place. According to a Gallup/Paine Survey conducted in 2001 shortly after the collapse of the internet bubble, when the investors were asked about their expectation for the next 12- month-return of the stock market, the average answer was 10.3%; however, when being questioned about the expected return of their own portfolio, the investors gave an average response of 11.7% (qtd. in Nofsinger 104). This exemplified the presence of overconfidence in financial world. Trying to understand the cause of the global financial crisis, I put forward the following two major hypotheses: (1). Overconfidence may lead to excessive trading behaviors and the overlook of risks, which plants the seeds for the crisis, and (2). The self-attribution bias demonstrated by investors accelerates the exponential growth of the financial bubbles partly because the earlier bullish market serves as a positive experience that even strengthens the investor’s confidence during the developing phase of the bubble.

## 3. Empirical Evidence

### 3.1. Overconfidence in Relative Skills and Reference Group Neglect

Empirical evidence for overconfidence can be found both in laboratory settings and in reality. When trying to explain the behavioral reasons for the excess market entry,

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<sup>1</sup>Males display a higher level of overconfidence than females in general. The roles genders play here will not be discussed in detail. For reference, see Beyer, 1990; Barber and Odean, 2001.

Camerer and Lovoalio designed a laboratory experiment to decompose the effect of three possible explanations: entry out of rational decision, entry due to reference group neglect, and entry out of overconfidence in one's own ability. The experiment was conducted within a paradigm, where N players made decisions about whether to enter a market given a limited market capacity, which yielded decreasing return as the number of market entries increased. The players were asked to predict both the branch return in general and the numbers of market entries. To distinguish the effect of overconfidence in one's own ability, different control variables were introduced: (1). Payoff to the player depended (besides the number of market entry) on a random ranking (within-subject control); (2). Payoff to the player depended on a skill-based ranking; (3). The players knew in advance that the payoff was skill-dependant therefore the recruited players tended to be those who were confident in their relative skills (between-subject control); (4). The players were recruited under standard instruction (not self-selected). The result of the experiment was summarized in Table 1 based on the data published by Camarer and Lovoalio in 1999.

Table 1- The Result of Market Entry Experiment

	Self-Selected			Standard-Recruited		
	Mean Branch Return Prediction	Mean Total Branch Return		Mean Branch Return Prediction	Mean Total Branch Return	
Random-based Ranking	Original data not available	\$ 13.96		Original Data not available	\$ 19.79	
Skill-based Ranking	Original data not available; but 85% predicted negative branch return	\$ -13.3		Original Data not available; 4 % predicted negative branch return	\$ 10.83	
Difference	1.31	\$ 27.1		2.04	\$9.14	

Note: own adaption based on the data from Camarer and Lovoalio, 1999

The result yielded some significant outcomes: (1). More entries (seen from lower actual branch return) were made when players were betting on their relative skills instead of chance; the tendency was particularly strong for the self-selected group; (2). The Self-selected group was able to predict less return in the skill-based round than in the random-based round. A majority was able to detect the risk of potential negative branch return, yet was still willing to enter the market out of the assumption: "I expect the average entrant to lose money, but not me" (qtd. in Camarer and Lovoalio, 313). These implied humans were not overconfident or "overoptimistic" in the sense that

they underestimated the competition and the risks involved, they were just overconfident in their own skills and their relative positions among their peers. Despite that the selection of the samples were not random and the Chicago/ Wharton business student might only present a small fraction of the population who were more convinced with their own commercial sense and who were at the margin more business-prone, the experiment provided an empirical support over how overconfidence in relative skills affects investment decisions. After all, the investors in reality, to a large extent, are constituted of those business student/graduates.

### 3.2 The Self-attribution Bias

Why then, are people so confident in their abilities, knowledge, and skills? Psychologists suggest that people ascribe the positive outcomes to their own skills and abilities, and failures to external factors (Baddeley, 217). To verify this theory, Libby and Rennekamp devised the following experiment: Groups of participants were asked to complete two rounds of tasks with different levels of difficulty (between-subject). Easier tasks led to relative positive performance among participants and difficult tasks led to relative negative performance, all tasks, however, were ambiguous enough for participants to attribute both external and internal factors to. After the first round, the participants had to give a weight of internal (i.e. skills and effort) and external (i.e. luck and difficulty) factors to explain the result and predict the outcome for the second round.

The result of the experiment confirmed the hypotheses: participants attributed greater weights to internal factors in higher-scored performances than lower-scored ones; and the self-attribution following the encouraging results from the first round increased the confidence in predicting the outcome of the second round. I do not question the general statement that the achieved positive outcomes increase the confidence in future performances, however, I do doubt whether this increased confidence is due to greater weight of self-attribution. In the experiment mentioned, for instance, even the candidates who attribute the good scores obtained to an *objective* external factor, say, the simplicity of the task, this may also lead to candidate to believe that the future tasks remain manageable. Therefore, As long as the external factor is not random noise component, there could be an increased likelihood of positive predictions after positive first-round performances.

### 3.3 Further Empirical Evidence on Investor's Overconfidence

There are also studies that voice doubts over the assessments of overconfidence. On the one hand, as we have seen in the examples mentioned above, the questions raised to the participants can be very ambiguous- so ambiguous that the participants are left

with plenty of leeway to interpret them to their best favor; on the other hand, the conclusions are all drawn from experiments where the participants lack the incentives to be correct in their predictions. To improve the credibility of the overconfidence models, Clark and Frieson improved the experiment in the following ways: they used incentive-based experiment rewarding the participants both on the accomplishment in the tasks and on the accuracy of their prediction. When testing the overconfidence in one's relative skills, they applied the overall actual success rate in the task as a benchmark to compare with the success rate of each individual participant, and kept the participants informed with their prediction errors. The problem of ambiguity was also mitigated since the participants only needed to predict the number of rounds they would win, which was rather intuitive and frequency-based. The tasks were maximizing a function and decoding a word, which involved different skills, quantifiable effort, and space for improvement, resembling the real economic world. In their experiment proof for overconfidence was scarce. Instead they found that participants were able to update their forecasts with feedback. Clark and Frieson argued that it could be explained by the "real effort nature of the tournaments, the prediction" (232), and warned the danger of economists taking overconfidence as a matter of fact when applying the laboratory result to the real world.

Leaving simulated experiments aside, we can also find evidence of overconfidence from diverse investor surveys. Tourani-Rad and Kirby investigated in the overconfidence bias of investors using a sample in New Zealand in 2005. They sent a survey on investors' attitude and belief to 122 investors who are supposed to be most "likely to respond" (285), 64 from which gave effective response. The survey consisted of 18 qualitative questions relating to previous mentioned overconfidence models like what was their expectation on their own and market portfolio, how did they think they were relative positioned in terms of confidence, knowledge, and experience, what were their investment time frames, their beliefs etc. To see the influence that the indicators for overconfidence have on the investment decisions, the portfolios each investor held were examined, and their frequency of trading, level of risk exposure, and degree of diversification were also investigated.

The survey conveyed that 53.6 percent claimed that their portfolio performed better than the market average; 27.54 reported average performance and only 18.84 percent thought their portfolio underperformed the market. On average investors gave an expectation of 9 percent return on their own investment and 7.5 percent on the market. When evaluating their own confidence, knowledge and experience, 61.2% of the respondents thought they had an appropriate level of confidence, 26.6 percent had total confidence. About two-thirds of the respondents considered themselves to be

rather experienced. In the correlation analysis, they found the return expectation was positively related to the level of confidence yet negatively related to the experience of the participants. This yielded an interesting, and somehow wise implication: optimism increased with confidence but decreased with experience. No relationship was found between the future prediction and the past performance. The result also indicated a positive correlation between the level of confidence and the trading frequency of the investors(280-300).

Overall this survey provided some support for the overconfidence models. But both sample size and representativeness are questionable. The participants were to some extent self-selected: those who were generally interested in the survey could be rather experienced, devoted investors.

#### **4. Discussion in Relevance with the Financial Crisis**

To sum up, study 1 (Camerer and Lavallo) and study 2 (Libby and Rennekamp) are lab experiments exploring different aspect of overconfidence. Both confirm the presence of overconfidence in a laboratory environment and draw the conclusion that overconfidence affects certain economic decisions of participants. However, Study 3 (Clark and Frieson) addresses the limitation of the behavioral model of overconfidence and argues that the previous experiments had not provided participants with timely feedback or opportunities for revision when testing their confidence. The survey in Study 4 designs the questions in accordance to these experiments, assuming people who are confident in their relative skills and knowledge in a specific field (in this case: the financial market in New Zealand), who has had positive past performance and are thus confident about future, demonstrates strong overconfidence (Tourani-Rad and Kirby 290). The result supports the hypothesis raised in study 1 that investors tend to be overconfident in their own abilities and relative skills compared to the peers, yet it does not convey evidence for the correlation between self-attribution bias and future expected return, contradictory to the study 2, which predicts investors who did well in the past are likely to render more optimistic forecasts for the future. In view of Clark and Frieson, this deviation may lie in the design of study 2 which provides neither incentives nor enough feedback information for the participants to predict accurately.

Concerning the financial crisis, overconfidence, according to Libby and Rennekamp, to some extent contributed to the aggregated high level of leverage in the real economy (224). In the expansion phase of the bubble prior to the collapse, overconfidence induced by self-attribution and enhanced by the good-year-return is conducive to the overall leverage-up of households, companies and public



institutions alike. This in general put economic subjects under higher risk exposure.

For individual investors and households, overconfidence may cause them to overestimate the stability of their future income and thus increase their optimism in predicting their ability to repay the mortgage. For group and institutional investors, it leads to potential excessive trading. The past success in old trading strategies may encourage undue under-diversification of the portfolio; the general confidence in their underlying business can influence manager's financial decision and increase their propensity to risky highly-gearred structures. The financial instability is thus further deteriorated by excessive leveraging strategies. For financial institutions, overconfidence in the market efficiency and securitization causes banks to give out unrestrained subprime mortgages, to overspread the Collateralized Debt Obligations and to miscalculate the risks involved. Overall this investor overconfidence assists the bubble to grow and expand.

## **5. Conclusion and implication**

To conclude, overconfidence prevails in both laboratory environments and in the real market. Just as a *New York Times* blogger once put it "If you think overconfidence does not affect you, it is probably because you are overconfident." The studies have shown that as human beings, we tend to overestimate our abilities and skills, especially our relative position of our abilities and skills compared to others; in addition, we tend to ascribe favourable outcome to internal factors and blame unwanted result on external disturbance and therefore predict future success with over-optimism. Fortunately, the effect of over-optimism on the accuracy of our prediction can be moderated in real-economic situations where direct incentives and feedback are offered. In general, these behavioral models aim to aid investors and academics by drawing attention to latent mental fallacies and psychological biases, especially those related to overconfidence, hoping to help render better financial predictions. After all, by recognizing its existence, we are already one step closer to adapting it. The models imply that when general investors tend to overestimate the returns and have not taken risks into consideration enough; investors are inclined to buy-in in rising markets and exhibit increased recklessness. More caution needs to be taken as in reality the realized return can be lower to a considerable extent.

In practice, technical innovations have already been devised to control the impact of emotional fluctuation and possibly psychological biases as well: Royal Philips Electric and ABN-Amro have designed an emotional sensing rationalizer system, which provides an "emotional mirror" to investors by reflecting the galvanic skin response and emotional intensity of the trader, generating alerts when a trader is over

excited, signalling them a need for a “time out” to reconsider their decision. In the academic field, the validity of the above mentioned models are continued to be tested overtime, especially in the exact measures of overconfidence, which remain rather weak till now. All in all, improved awareness and progress in behavioral finance model should contribute to the stability of a financial world, which consists of individuals who are not performing strictly rational as an efficient market model would suggest.

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