國立交通大學

管理科學系

博 士 論 文

N0. 047

樂觀的性別差異—雅虎奇摩財經新聞民調的證據

Gender Difference in Optimism- Evidence from Yahoo! Kimo
Taiwan's Business Poll Center

研 究 生：張玲玲

指導教授：李經遠　教授

中 華 民 國 九十八 年 十一月

國立交通大學

管理科學系

博 士 論 文

N0. 047

樂觀態度性別差異─雅虎奇摩財經新聞民調的證據

Gender Difference in Optimism- Evidence from Yahoo! Kimo
Taiwan's Business Poll Center

研 究 生：張玲玲

研究指導委員會：黃仁宏　教授

　　　　　　　　蔡彥卿　教授

　　　　　　　　李經遠　教授

指導教授：李經遠　教授

中 華 民 國 九 十 八 年 十 一 月

樂觀態度性別差異—雅虎奇摩財經新聞民調的證據

Gender Difference in Optimism- Evidence from Yahoo! Kimo Taiwan's Business Poll Center
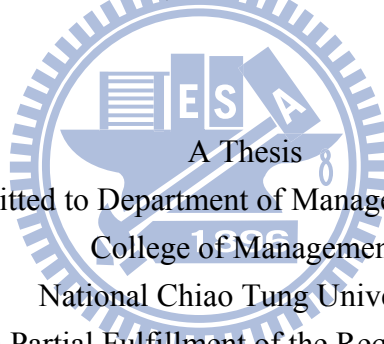
研 究 生：張玲玲　　　　　　　Student：Ling-Ling Chang

指導教授：李經遠　　　　　　　Advisor：Gin-Yuan Lee

國 立 交 通 大 學

管 理 科 學 系

博 士 論 文

A Thesis

Submitted to Department of Management Science

College of Management

National Chiao Tung University

in Partial Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy

In

Management

November 2009

Hsin-Chu, Taiwan, Republic of China

中華民國九十八年十一月

樂觀態度性別差異—奇摩網站財經新聞民調的證據

研究生：張玲玲　　　　　　　　　　　　　　　　指導教授：李經遠

國立交通大學管理科學系博士班

摘　　要

　　社會情緒(social mood)會影響個人情緒及其對財務風險的看法，進而影響風險決策的選擇，過去女性在財務相關決策上被認為比男性更規避風險(risk averse)、自信程度較低且較悲觀。本研究以奇摩網站財經新聞的民調中心資料進行樂觀態度性別差異研究，發現在社會情緒悲觀時，女性比男性更悲觀，而社會情緒樂觀時則視投資標的是否為股票而定。本研究發現社會情緒若悲觀則女性比男性更悲觀，而社會情緒樂觀下，與股市有關議題女性也呈現較悲觀，與前人研究結論相同（Jacobsen, Lee, & Marquering, 2008）。但若非股市相關議題，則社會情緒樂觀，女性比男性更樂觀。

關鍵詞: 性別差異；樂觀；悲觀；社會情緒；風險規避

Gender difference in Optimism- evidence from Yahoo! Kimo Taiwan's Business News Poll Centre

Student：Ling-Ling Chang   Advisor：Gin-Yuan Lee

Department of Management Science

National Chiao Tung University

ABSTRACT

"Social Mood" is one factor that affects people's emotions and their perspectives in risk management, which then impact their final decisions on actual investments. It is believed that women, in general, are more risk aversive, pessimistic and have lower confidence than men. This study investigated the optimism level difference between women and men using data from Yahoo! Kimo Taiwan's Business News Poll Centre. It is proven in this study that social mood does have significant effects on individual's emotional responses. Women respond more pessimistically than men when the social mood is pessimistic; if the social mood is optimistic, women also respond more pessimistically than men on stock-related topics. These finding are consistent with Jacobsen, Lee, & Marquering (2008) experiment. However, women respond more optimistically on non-stock related topics when the social mood is optimistic, which are inconsistent with previous evidence.

Key words: Gender difference, optimistic, pessimistic, social mood, risk aversive.

誌謝

Table of Contents

List of Tables

1. Introduction

Gender differences have become an important issue in social sciences research. As the social status of women rises with higher education and disposable income, their behavior as consumers and investors is becoming more valued. Consequently, studies done on gender differences have become more popular. Previous studies on gender differences in investment or financial issues have focused on whether females are more risk aversive than men, on differences in investment strategy confidence, and differences in information processing in the decision-making process. In the past, studies done on gender differences in investments and financial issues have mostly indicated that women are more risk aversive than men; investments with lower risks involved were often preferred by women (Bajtelsmit, Bernasek, & Jianakopolos, 1999; Bernasek & Shwiff, 2001; Bajtelsmit & VanDerhei, 1997; Jianakoplos & Bernasek, 1998; Schubert, 2006; Sunden & Surette, 1998), while males have more confidence in investment decisions. When it comes to decision making, women tend to put more factors into consideration than men do before taking any action (Chung & Monroe, 2001; Graham, J., Stendardi, Myers, & Graham M., 2002).

In uncertain circumstances, individuals' decisions are subject to the impact of many irrational and emotional factors (Kehnemen & Tversky, 1979). Gender, age, personality characteristics, information sources and methods of interpretation, external stimuli, and

emotional reactions are generally considered to be the primary factors in irrationality

(Maital, Filer, & Simon, 1986; Shefrin, 2001). Previous research has generally concluded

that males appear to be more confident than females, even to the point of overconfidence

(Barber & Odean, 2001). Scholars have proposed reasons such as that risk attitudes are

impacted by the social role played by the individual in question. Other scholars have

suggested that the confidence of females is determined by the certainty of decision results;

more uncertain results lead to less confidence in females.

Other scholars have suggested that the comparatively risk-averse decisions made by

females may not be the result of differences in risk attitudes, but may instead be caused

by differences in information processing. Females tend to process broad amounts of

information and will incorporate uncertain cue information, thereby exhibiting risk

aversion. Males tend towards simplified heuristics in the decision-making process and are

more prone to be more careless in accepting information; females will make detailed

considerations of all usable clues. Scholars suggest that females will use all available

clues and information and are more suited to the processing of broad information; they

also have more positive evaluations of uncertain information, so it appears that women

are more risk-averse than are men.

Loewenstein, Weber, Hsee, & Welch (2001) indicated the attitudes in gender

difference towards risk are caused by emotional fluctuation. People are more optimistic

when they are in good moods and are more pessimistic when they are in bad moods;

consequently, moods may influence the probability of individuals investing in risky

assets. Schubert (2006) noted that risk assessment and behaviors are typically impacted

by cognitive and emotional responses, and emotional responses typically have a stronger

impact on attitude and behavior than do cognitive responses. Consequently, the mood of

a decision-maker and the time of decision will have an impact on decision selection.

Mood is affected by the state of the economy, unemployment rate, and inflation, which

can affect individuals' decisions on purchases and investments. Nofsinger (2005)

suggested that social mood is a strong factor in decision making for the investors,

controlling the atmosphere of financial and economic activities. If there is a high degree

of optimism in a society, then more optimistic investors will be produced, which will

influence the views of decision-makers on risk and uncertainty. Consequently, many

investors will purchase stocks and more companies will become publicly traded, leading

to excessive market transactions. If social emotions become excessively high, extreme

overconfidence and excitement will lead to the bursting of the market bubble. As such,

the stock market itself is an indicator of social mood. Wurgler (2002) emphasized that

investor psychology and actual economic conditions must necessarily be linked and that

media messages at the time of economic incidents have an impact on stock market

3

trading volume or market activities. (Mitchell & Mulherin, 1994；Antweiler & Frank, 2004) Jocobsen, Lee and Marquering (2008) studied the optimism levels of men and women by using consumer confidence data of 18 different country, they reported men are strikingly more optimistic than women about the future performance of key economic and financial indicators. . They suggested the severity of risk aversion may be influenced by the differences in optimism level between men and women. The consumer confidence index is a direct investigation, involving random sampling and the use of set questions to track changes in consumer confidence; the consumer confidence index has the advantage of directly exploring the intentions of people involved. However, sampling subjects may not have considered economic problems in depth, and set questions make it more difficult for respondents to express their views on economic incidents occurring at the time of investigation.

This study emphasizes the confirmation of whether females are more pessimistic than males with regard to expectations of specific economic incidents and, when influenced by social emotions, whether there are differences in the optimism or pessimism of males and females towards specific economic incidents. The data in this study was obtained from the most popular investment portal site in Taiwan – Yahoo! Kimo Taiwan Business News Poll Centre. Data was collected from June 2006 to the 1st quarter of 2009, by an internet survey on financial and related issues. The objective of the

study was to identify the difference in reactions between men and women for positive and negative financial events.

Yahoo! Kimo Taiwan is a popular portal site with a significant number of voting users. Finance-related discussions were particularly popular at the time of data collection; numerous "optimistic and pessimistic contexts" were included in the study. The advantages of using data collected from Yahoo! Kimo Taiwan included: realistic financial issue discussion, close connection to daily experience, voters were frequent internet users that paid attention on financial news with social mood being somehow affected by media and internet news, large quantity of samples, and people who voted were the ones that had thought about the topics and issues already. Data collected from the aforementioned samples are very valuable in terms of testing whether women possess a more pessimistic view on certain financial events than men. Results supported the hypothesis and are consistent with the results from Jacobsen's (2008) study, showing that women are indeed more pessimistic than men when the social mood is gloomy. However, when social emotion is optimistic, the responses of both genders are determined by the target investment. If the investment target is stocks, then female investors exhibit more pessimism than males; for non-stock investment targets, when the social emotion is optimistic, females appear to be more optimistic than males. These results differ from

conclusions of previous research which suggest than women are more pessimistic than

men.
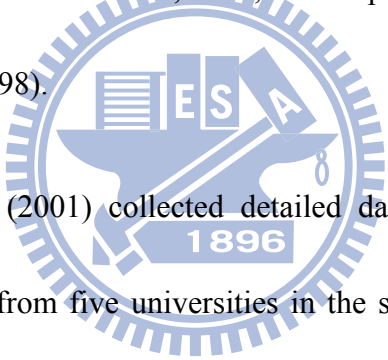
Results of this study show the difference in attitude between men and women on

financial topics, which come from the analysis of data from subjective internet surveys.

The results also explain why women are more conservative in financial and investment

decisions, which can serve as a reference to policy makers and the business world.

However, because the sample consisted of internet users, there may be limitations due to

generalization of the results. The following paragraphs of this paper are arranged as

follows: examines relevant literature, describes the research method, compiles the results

obtained from research, and the final chapter discusses results and provides suggestions

for future research.
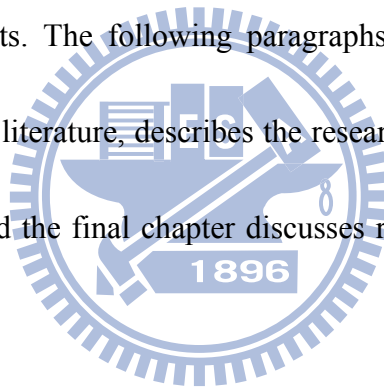
2. Literature Review

2.1 Gender difference in risk aversion

In general, females are said to be more apt than men to choose low-risk cases in the face of risk decisions, preferring to make more conservative investment decisions and exhibiting greater risk aversion. Previous research conclusions have also generally supported the notion that females are more risk-averse than men and that they prefer lower-risk investment portfolios (Bajtelsmit, Bernasek, & Jianakopolos, 1999; Bernasek & Shwiff, 2001; Bajtelsmit & VanDerhei, 1997; Jianakoplos & Bernasek, 1998; Schubert, 2006; Sunden & Surette, 1998).

Bernasek and Shwiff (2001) collected detailed data on the family decisions of faculty and administrators from five universities in the state of Colorado and used this data to analyze the asset allocations of individual defined contribution plans. They found that females included significantly fewer stocks in their retirement portfolios than did males, supporting the argument that females are more risk-averse.

Jianakoplos and Bernasek (1998) used the 1989 Survey of Consumer Finances and the theoretical framework developed by Friend and Blume (1975) to establish an index for measuring risk aversion. This study showed that females are less willing than men to bear financial risk and will adopt more conservative investment strategies.

Bajtelsmit et al. (1999) also used the 1989 Survey of Consumer Finances to test for gender differences in the financial risk chosen in contribution retirement plans; their results showed that women are more risk-averse than men.

Bajtelsmit and VanDerhei (1997) used a database of employee retirement funds and population characteristics to test for the distribution of individual characteristics and retirement funds. Their results showed that females prefer to invest in fixed-return securities and also prefer more conservative investment strategies.

The research results of the scholars described above show that female investors tend to prefer conservative or lower-risk investment portfolios. Consequently, this paper hypothesizes that if the risk aversion of female investors is higher than that of males, females should also be more pessimistic towards economic incidents than males.

2.2 Gender difference in confidence

In uncertain situations, decision-making is subject to the influence of many irrational emotional factors (Kehnemen & Tversky, 1979). Gender, age, personality characteristics, sources and interpretation of information, external stimuli, and emotional responses are considered to be the primary factors in irrationality (Maital, Filer, & Simon, 1986；Shefrin, 2001). Overconfidence refers to the excessive belief in the correctness of one's own judgments in making investment decisions, involving the overestimation of the

information, expert knowledge, and judgment that one possesses, leading to underestimation of the potential risks and overestimation of one's control (Shefrin and Statman, 1994). Lichtenstein, Fischohoff and Phillips (1977, 1982) noted in research on psychological behaviors in human decision-making that people tend to overestimate their own powers of judgment, suggesting that the majority of people exhibit psychological overconfidence. DeBondt and Thaler (1985) asserted that overconfidence will increase the heterogeneity of information. This heterogeneity is the result of selective acceptance of information based on one's own experience principles–selectively discarding undesired information, leading to the ignoring of potential risk. Daniel, Hirshleifer and Subrahmanyam (1998) further suggested that overconfident investors will overemphasize the accuracy of the information they have collected in the course of information processing, and that they selectively believe information supporting their own past investment decisions and that they ignore information not supporting their past investment decisions, thereby maintaining their own confidence and self-esteem. Shefrin and Statman (1985) introduced the "Disposition Effect," which suggests that investors tend to hold losing stocks and sell profitable stocks in order to avoid regret, because selling profitable stocks results in a sense of accomplishment due to the realization of profit and because selling asset-damaging stocks is tantamount to admitting that a prior decision was made in error, which is accompanied by a feeling of regret and the feeling

that the stock will rise in price in the future. Consequently, investors will hold losing

stocks in anticipation of potentially compensating for losses. Odean (1998) noted that

overconfidence in investors will typically lead to early realization of the profitable

portions of investment portfolios and the holding of losing portions, meaning that

overconfident investors will realize profits immediately and put off losses until later.

Such actions help investors to feel that the amount of their correct decisions exceeds the

amount of incorrect decisions, strengthening self-evaluations.

Previous conclusions drawn by research on gender differences in overconfidence

have supported the idea that males appear more confident or overconfident than females

in investment decisions (Barber and Odean, 2001). Potential reasons suggested by

scholars include that personal risk attitudes and personalities are influenced by the social

role played (Voelz, 1985). Consequently, when making risk decisions, males appear more

confident or overconfident compared to females. Scholars have also suggested that

gender differences in self-confidence are derived from the certainty or uncertainty of

decision results; females appear to be less confident when decisions are less certain

(Lenney, 1977).

Evidence suggesting overconfidence in men includes that presented by Odean

(1998), which proposed that overconfident investors will have more risk investment

portfolios than other investors in identical situations of risk and that higher transaction frequencies also result. The overconfidence hypothesis suggests that if investors are overconfident, then profit will be accompanied by more proactive transaction behaviors. Barber, Odean and Zheng (2000) found in testing the overconfidence model that males are more prone to overconfidence than females. Overconfident investors perform transactions with excessive frequencies, leading to losses in net returns; research results did show that the net returns of males are lower than those of females after adjusting for risk. Barber and Odean (2001) performed research after separating data on 35,000 accounts in a brokerage firm offering large sum discounts; their results showed that males perform a greater number of transactions, suggesting that males are significantly more prone to overconfidence than females.
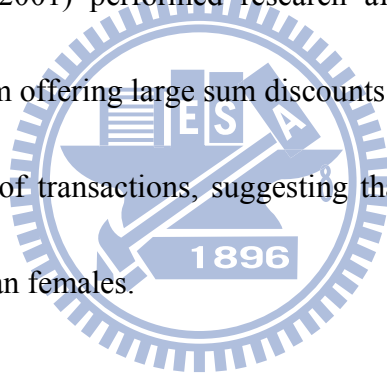
Lenney (1977) asserted that gender differences in confidence are the result of certainty (or uncertainty) in decision results. When results are uncertain or unclear, females seem to be more prone to underestimating their own capabilities; conversely, when the results of decisions are clear and immediate, the confidence of females appears to be no different from that of males. The results of decisions on the stock market are unclear, so females appear to be less confident in stock investment.

It can be seen from the inferences described above that males appear more confident and willing to invest in riskier investment decision targets or appear to have more optimistic attitudes due to expectations of social roles even though they are uncertain of the decision results.

2.3 Gender differences in information processing

Due to uncertainties in decision situations and limitations in information processing cognitive abilities, actual decision making processes pursue "satisfactory" decision results rather than "optimal" decision results. There is more of a tendency to use rules of thumb rather than objective probabilities in making judgments when processing large amounts of information (Kahneman & Tversky, 1979); decision makers evaluate the frequency or probability of an event based on representative heuristics or available heuristics. Meyers-Levey (1986) developed a selectivity model to test for gender differences in information processing and proposed that males tend to use simple heuristics in the decision making process more than females do and are also more prone to roughly accept external information and selectively perform information processing; females will perform detailed consideration of all usable clues prior to decision making. Consequently, the researchers concluded that females have more of a tendency to use all available clues and information and are adept at processing broad amounts of information. Typically, negative messages are given more weight than positive messages. Through

linking a selectivity model and examination of literature on investment decisions, Graham, J., Stendardi, Myers, & Graham M. (2002) proposed that women may make more risk-averse decisions not because of differences in risk aversion, but rather because of differences in information processing. Women tend to process broader information and include uncertain clue information, thereby appearing risk averse.

Evidence from empirical research includes a study by Chung and Monroe (1998), who studied gender differences in information processing based on information auditing methods of accounting students. The study found that females use information more broadly than do males and appear to have higher evaluations for uncertain information. O'Donnell and Johnson (2001) performed research on gender differences in the information usage of employees of auditing firms, and found that significant interaction occurs between task complexity and gender. These results show that males are more efficient at information processing in low-complexity tasks, while females seem to be more efficient at processing information in high-complexity tasks. These results show that females are more adept than males at processing broad and complex information.

Burke (2001) found that gender differences in information processing are more significant lower down in the employee hierarchy. Lower-level female employees tend to

emphasize broad information sources, while there are no gender differences in the information processing methods in partner-level and other high-level employees.

It can be seen that differences in attitudes towards risk arise due to different information processing methods in males and females. Females take into account more uncertain information and so appear more risk-averse than males.

2.4 Association between risk and emotion

In general, expectations towards risk are reflected by cognitive evaluations of risk as expressed through emotion. Loewenstein, Weber, Hsee, & Welch (2001) noted that gender differences in risk attitudes are caused by emotional variables. People are more optimistic in their views when they are in good moods and are more pessimistic when they are in bad moods. Consequently, emotions may impact the probability of individuals investing in risky assets. Schubert (2006) noted that, in general, risk assessment and behavior are subject to the influence of cognitive and emotional responses; the influence of emotional responses typically has a greater impact on attitudes and behavior. As a result, the mood of the decision maker and the decision time at the time of the decision will impact choices made in a decision. Emotions are easily influenced by factors such as economic trends, unemployment rate, and inflation, and may change personal consumption and financial decisions. Elster (1998) noted that happy people are more optimistic and assign higher probabilities to positive events (Wright & Bower, 1992).

Discouragement and risk aversion are directly correlated and increase the correlation between worry and risk aversion. Pretty, Gleicher and Baker (1991) found that individuals often make more detailed analysis and critical evaluations when they are in bad moods. Forgas (1995) asserted that, according to the "Affect Infusion Model," positive emotions can increase risk tolerance, while negative emotions will reduce risk tolerance. Individuals in good moods focus on positive information in their environments, while individuals in bad moods will focus attention on negative characteristics. The influence of emotions on decisions increases as situations become increasingly complex and uncertain. Grable and Roszkowski (2008) found that happy emotions will raise financial risk tolerance. Wurgler (2002) emphasized that links between investor psychology and actual economic situations are necessary, and that media messages have an impact on securities markets activities when economic events occur (Antweiler & Frank, 2004), and that decision makers tend towards making judgments based on conveniently obtainable information (such as events that recently occurred), which become bases for decision-making due to deep impressions, during decision-making due to available heuristics. Clarke and Statman (1998) found that short-term high returns in stock markets are related to increases in investment columnists. The researchers concluded that the emotions of columnists will affect changes in risk tolerance attitudes and mood in the short term. Schubert (2006) noted that females experience fear and

nervousness more strongly than do males. Females are less sensitive to probabilities of favorable circumstances than men and are more pessimistic towards gains. Consequently, if the probabilities for favorable circumstances increase, females will not necessarily alter their original selections; this phenomenon is referred to as risk aversion and also referred to as pessimism. Fehr, Epper, Bruhin and Schubert (2007), however, found that females make optimistic subjective probability appraisals in experiments regardless of favorable or unfavorable circumstances when they are in good moods. In other words, females are easily affected by good moods, while males are unaffected by good moods. The sum of personal emotions forms social mood. Nofsinger (2005) once noted that individuals' decisions, rather than being made independently and in isolation from society, are determined by interactions between individuals and the social environment. As a result of Nofsinger just mentioned "the level of social mood affects the economy because participants interact". Consequently, optimism and pessimism of the social mood will affect the decisions of financial investors. Consequently, social mood directs the atmosphere of financial and economic activities. When a high degree of optimism exists in social mood, more optimistic investors are produced, which will affect the views of decision-makers towards risk and uncertainty. Consequently, many investors will enter the stock market, purchasing more stocks and public listings, leading company managers to actively make more asset expenditures take on more debt, and pursue more mergers

and acquisition activities. If social mood becomes excessively high, extreme self-confidence and excitement will lead to the bursting of the stock market bubble. However, because not all financial decisions can be rapidly completed (for example, Initial Public Offering or performing optimistic and active asset budgeting require time to complete), so when social mood improves, many mergers and acquisition activities, company public listings, and asset expenditures are completed only after a delay of a number of months. By contrast, decisions to invest in asset markets can be executed almost immediately, so the impact of social mood on stock markets is very strong; consequently, the stock market itself is an excellent index for measuring social mood. Jocobsen, Lee and Marquering (2008) once used the consumer confidence indices of 18 countries to perform research on gender differences in optimism and reached the conclusion that males are more optimistic than females, and noted that risk aversion may be influenced by gender differences in optimism. Social mood will influence the optimism and views on risk of investors, thereby influencing investment decisions as a whole. In general, females have stronger responses to fear and nervousness. When they are impacted by negative social mood, females are more prone to adopting conservative decisions toward risk decisions than males.
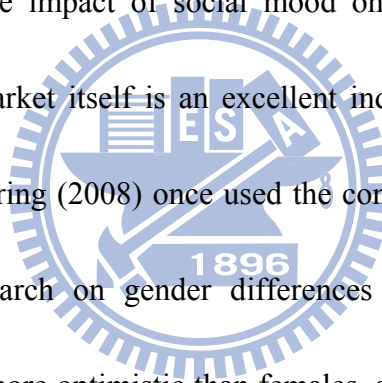
3. Research method

3.1 Data source

The study was based on data from surveys done on financial issues and topics from the Yahoo! Kimo Business News Survey Centre. Testing was performed to observe if there were differences in the optimistic and pessimistic reactions of males and females when facing optimistic economic events and negative economic events.

The advantage of the data used in this study is that the financial issues are real, were closely related to life at the time, and were the subject of concern for many people. Respondents were internet users concerned about financial topics and were many in number. However, the limitations of internet investigation include the sampling process, sample representativeness and voluntary participants. As for the problem of sample representativeness, Hewson et al. (2003) noted that many studies were established on highly homogeneous selective samples, particularly when research topics emphasized specific groups, thereby of necessity facing the problem of an inability to obtain a complete sampling framework. Subjects required for the subject is concerned about the financial and economic topics, that is, a homogeneity sample set. Thereby overcome the problem of sample representativeness. As for the problem of voluntary samples, according to annual report -Taiwan's Broadband Internet Usage Survey of 2009 from the Taiwan Network Information Center, internet usage by the Taiwanese public has

increased by 71% (about 14.19 million individuals). Divided by age range, 4.08 million (about 28.81%) individuals aged 24 and under have used the internet, while 10.10 million (about 71.19%) individuals over the age of 25 have also used the internet. Of internet users, males constitute approximately 7.33 million (51.64%), while females constitute approximately 6.86 million (48.36%); meaning that the number of males is slightly higher than the number of females. The most commonly used type of website is portal websites. With increases in internet penetration throughout Taiwan, because the Yahoo! Kimo website is the most popular online portal and because there are many online browsers and voters, error caused by voluntary samples probably be diluted and decreased, preventing to a certain extent excessive deviation of the sample (Babbie, 1990).

3.2 Selection of the research problem and explanation of investigation topic and social mood
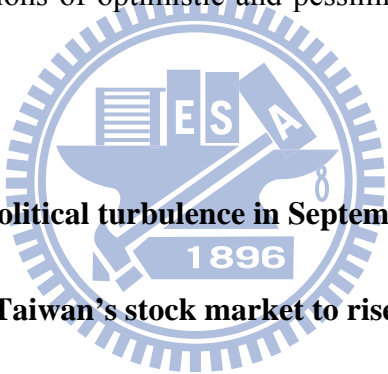
Investor mood indices can be divided into direct indices and indirect emotion indices. Indices established based on regular surveys distributed by agencies to collect the views of respondents on future economic trends (e.g. the Investor Sentiment Index or the Consumer Sentiment Index) are referred to as direct indices, while indices that apply other correlation factors in constructing the expectations of investors towards future market trends (e.g. market transaction quantity or turnover) are referred to as indirect

emotional indices. Methods used in researching gender differences in investment can be divided into experimental, investigative, and indirect data inference methods. The experimental method involves researchers manipulating experimental variables to understand the choice behaviors of test subjects in experimental situations. However, because environmental situations are designed and are not actual dynamic economic environments, because experimental subjects may not be familiar with the topic of research, and because of the difficulty of obtaining large samples, deviations may be produced due to limitations in the results. The investigative method involves actively distributing surveys for investigation, allowing for the understanding of the subjective intent of respondents; however, subjective emotional indices may be unable to capture true intent due to random sampling and because it is unknown whether the sample is concerned about economic topics. In addition, survey questions are set, and respondents may not think about or realize set economic or financial problems. The purpose of this type of investigation is to reflect long-term trends; it is more difficult for these investigations to reflect attitudes towards specific topics at specific times. If gender differences are understood by way of indirect inference from collected individual transaction behaviors rather than through direct association, while specific outward conduct can be observed, an excess of impact factors leads to weaker evidence capacity. As this study focuses on testing whether females have more pessimistic expectations of

specific economic incidents than do men, this study determined to employ the direct

survey results of an online poll distributed from June 2006 to 1st Quarter 2009 in the

financial news opinion center of the largest portal website in Taiwan – Yahoo! Kimo.

After filtering and downloading opinion surveys appropriate for analysis of topics related

to optimism and pessimism, research was performed on whether males and females have

identically optimistic responses in the face of optimistic or pessimistic economic events.

The research period of this study spanned from the second half of 2006 to the first

part of 2009, which included large economic or political incidents that impacted the stock

market or the economy, including protests demanding a presidential recall, massive

inflation of international, food, and goods prices, the financial crisis caused by American

subprime mortgages and the bankruptcy of Lehman Brothers, and the Taiwan's

presidential election in 2008; this period and these events are of great value in examining

gender differences in the responses of internet users towards financial topics. However,

due to the emphasis on gender differences in financial topics, the questions chosen had to

include selections to differentiate optimists and pessimists. In addition, the research topic

had to be able to connect to economic news events of the time in order to differentiate

optimistic and pessimistic social moods.

The investigative problems selected for this study included 12 questions. The questions and answers were directly downloaded from the Yahoo! Kimo website. Relevant news events that occurred in 12 months before the research period were searched using the news database of the China Times series (China Times, Commercial Times, China Times Express) in order to understand the background of the investigation problems; social mood was determined to be optimistic or pessimistic based on the attitudes exhibited by the media towards the topic. The backgrounds, social mood categorizations, and definitions of optimistic and pessimistic responses are explained as follows:

1. **After the political turbulence in September 2006, would you anticipate Taiwan's stock market to rise or fall?**

   (20060828-20060904)

   In 2006, due to charges of corruption involving President Chen Shui-bian and his family, cries for a presidential recall increased and a series of anti-corruption and anti-Chen movements [1] occurred. The political situation was highly unstable, and the media fought to report on relevant conflicts. Investor confidence in the Taiwanese economy was damaged.

---

[1] News reports from 27 August 2006 – [Commercial Times/Fortune/Page C1], 29 August 2006 – [Commercial Times/Fortune/Page C2]

According to Taiwanese investor emotional indices at the time, political issues were the most important factor influencing Taiwanese markets; an investor emotional index fell to -92.82[2], the lowest point of the year. We therefore considered that the social mood was pessimistic. Observations voting "rise" in the stock market were considered optimistic, while "fall" was considered pessimistic.

2. **Will Taiwan's stock market break the 10,000-point threshold?**

(20061228-20070111)

A Taiwan's real estate market conditions quarterly report released by the Architecture and Building Research Institute, Ministry of the Interior showed that Property transactions in Taiwan 2006 broke records standing since 1998; 70% of the news with regard to real estate was positive and uplifting. According to a home demand movement investigation published by the Institute for Physical Planning & Information in the 4th quarter of 2006, the combined confidence of home purchasers across the nation reached 110.27. Home purchasers had optimistic confidence in

---

[2] Shih Hsin University has published an investor mood index every two months beginning December 2003, publishing the index a total of 31 times as of December 2008; the highest index score was 106.8, while the lowest index score was -176.53. As publishing times could not be completely consistent with the research period of this study, only some reports are used. Readers interested in the index can refer to: http://contract.shu.edu.tw/~emotion/aa3.htm

home prices, particularly exhibiting increasing confidence in mid- to

long-term trends. The atmosphere investors were exposed to exhibit an

optimistic atmosphere; we thus considered that the social mood was

optimistic. Votes for that the real estate market "will improve" were

considered optimistic, while votes for that the real estate market "will

worsen" were considered pessimistic.[3]

3. **Will Taiwan's stock market break the 10,000-point threshold?**

(20070424-20070507)

Taiwan's stock market repeatedly rose; the stock index rose from 7,344

to 8,075 between March 5 and April 12 in 2007, constituting a 10%

increase within 6 weeks. The index stayed around 8,000 until the end of

April 2007, this is the first time the index had returned to 8,000 in 7 years.

Together with continual company mergers and acquisitions in Taiwan,

bull markets were pervasive in the world, stimulating the imaginations of

investors. The total transaction value of Taiwanese starts in March was

---

[3] The home price confidence composite score is calculated from weighted views on home prices from three months to 1 year later. The score ranges from 0 to 200. A score of 100 represents there are identical proportions of bullish investors and bearish investors. A score above 100 represents that there is a higher proportion of bullish investors; a score below 100 represents the opposite. The meaning of the home price confidence composite score lies in demand growth and short-term support strength for home prices. If the confidence score exceeds 100, home buyers are psychologically prepared for increases in home prices, providing support for increases in home prices; a score under 100 may pose a challenge to home price stability (Extracted from Institute for Physical Planning & Information).

the second-highest within 10 months, just behind January. As the stock market is a positive measurement indicator of investor mood, we considered social mood to be optimistic. Votes for "yes" were considered optimistic, while votes for "no" were considered pessimistic.

4. **Should the government liberalize investment to mainland China?**

(20070807-20070820)

According to a 3 June 2009 China Times editorial, "the KMT, acting through 44 legislators including Li Jizhu and Lei Jing, proposed a draft amendment to the Cross-strait Ties statute, which proposes that products or operations currently being mass-produced in the mainland China region will not be categorized as illegal as long as they do not contravene international treaties. However, mainland affairs committee chairman Chen Ming-Tong believed that, "This proposal will lead to complete liberalization of Taiwanese investment in the mainland, which will have a huge impact on industry. Taiwanese competitive advantage will disappear in the face of liberalization."

The upward limit of investment in mainland China by Taiwanese companies was previously 40% of net value. Companies competed in

entering the mainland market in order to avoid capital usage limitations.

Capital and companies continually left Taiwan, causing discussion on

whether limitations on mainland investment should be loosened to slow

this trend as well as the pain of worsening unemployment. Optimists

believed that liberalized investment in the mainland could reduce

outward capital flow and allow Taiwan to enjoy the fruits of economic

development on the mainland, while pessimists believed that total

liberalization would lead to outward movement of companies, leading to

a further downturn in Taiwanese industry and exacerbating the problem

of domestic unemployment.4 We classified this social mood as neutral.

Votes for "should" liberalize were categorized as optimistic, while votes

for "should not" liberalize were categorized as pessimistic.

5. **After the presidential election, will you invest in Taiwanese stocks (or Taiwanese funds)?** (20080401-20080410)

After the presidential election results were revealed on March 22, 2008,

the Taiwanese stock market immediately rose by 524 points the next

business day. After the presidential election, a short-term inflow of

---

4From 3 June 2007 - [Commercial Times/News in Policy Focus/ Page A2] editorial: Comment on restrictions on investing Mainland

capital and a sharp increase in potential trade and business activities with

Three-Links between Taiwan and Mainland China brought hope and

prosperity to people. Property transactions were hot again[5] and investors

were expecting the stock market index to break the 10,000-point

threshold. At the same time, however, a global inflation crisis was caused

by an explosion of prices in oil, food, and materials. Moreover, people

were concerned with the potential impact of America's subprime

mortgage crisis on Taiwan's stock market. The unemployment rate stayed

high, potentially impacting Taiwanese stocks. High returns and no returns

were comingled. We classified the social mood as neutral. Votes for "I

will" were considered optimistic, while votes for "I won't" were

considered pessimistic; other options were considered to be neutral.

6. **Do you want mainland investors to invest in Taiwan Stock Market?**

(20080428-20080510)

The Three-Links created many potential market opportunities, causing

domestic stock markets and real estate markets to operate energetically. It

---

[5] From 25 March 2008- [China Times/News in focus/PageA3]　Foreign capital mad to buy, Taiwan stock market burst volume, [China Times/Top News/Page A1]　both stock market and foreign exchange market burst volume, 7 March 2008 - [Commercial Times/News in Policy Focus/Page A2] editorial; Rise in Consumer Price, the Pain Index shot up

was anticipated that opening mainland investment in Taiwanese stocks would lead to capital injection and creation of new cross-strait ties. News media continued to report that potential mainland investments could provide investors with many opportunities in the market. We therefore considered the social mood to be optimistic. Votes for "yes" were considered optimistic, while votes for "no" were pessimistic; other responses were neutral.

7. **With high inflationary pressure and steep falls in Taiwan Stock Market, what do you think?** (20080701-20080710)

In the first half of 2008, international prices of oil, food and materials all increased significantly. The Consumer Price Index (CPI) soared and was breaking historical records. The Academia Sinica modified a 2008 annual economic forecast. The Consumer Price Index (CPI) experienced an annual growth of 3.93%, constituting the highest figure in inflation released by the various Taiwanese economic forecast agencies in 14 years.[6] The Taiwan weighted stock price index fell from a high of 8,865 points following the presidential election to 7,076 points within three

---

[6] From 11 July 2008 – [China Times/Topics/Page A5] Goods Price Index Increases by 4%, a 14-year High

months (July 10), constituting a drop of 20%. Negative news was pervasive, stock markets were continuously falling worldwide, and investors lacked confidence in the future. In the previous month, the government repeatedly encouraged foreign capital to return to Taiwan and was determined to encourage insurance industry-type investment in Taiwan stock market. Publicly listed companies were encouraged to release treasury stocks, and inadequacies in the shareholdings of directors and supervisors in publicly listed companies were to be covered in order to save market confidence. Optimists believed that government intervention would be able to cause the stock market to rise, while pessimists believed that government intervention would not be able to save the stock market in the face of the global crisis. We considered the social mood to be pessimistic. Votes for "that's great" were considered optimistic, while votes for "that's terrible" were considered pessimistic; the rest were considered to be neutral.

8. **Do you think the price of oil will rise to $200 per barrel before the end of the year?** (20080710-20080717)

In 2007, international petroleum prices rose from $54.1/barrel to $94.9/barrel by the end of the year, constituting a 75% rise within a year.

In 2008, oil prices continued to rise in the first half the year, reaching a high of $147/barrel by June, marking a 172% rise over 18 months. Increases in oil prices led to increases in commodities and goods prices, inciting expectations of inflation and leading to hardship from increased goods prices. Oil prices continued to rise, and the prices of electricity, shipping, bulk materials, and commodities faced upward pressure, leading to increased company costs and lowered profits; these forces led to increased goods prices and reductions in consumer demand, a situation creating hardship that was disadvantageous for economic growth. We categorized the social mood as pessimistic. Votes for "will not" were classified as optimistic, while votes for "will" were classified as pessimistic; other responses were neutral.

9. **Are you worried that labor insurance finances are unstable and that you won't be able to receive old age payments?** (20080801-20080810)

The Legislative Yuan of Republic China reviewed and amended the Labor Insurance Act in July 2008, considering the trends of an aging society and low birthrates to establish a labor insurance pension system with an income replacement rate of 1.55% and an initial insurance rate of 7.5%, gradually adjusted upwards to a maximum of 13%. Media reported

that outstanding payments had accumulated to a total of 7-8 hundred

billion NT dollars since July 2008. Performance had been continuously

negative for 6 months.[7] The Council of Labor Affairs indicated that due

to excessively low labor insurance rates, together with an aging society,

labor insurance old-age payments have entered the mature stage. The

number of individuals receiving payments has increased on an annual

basis leading to a fiscal imbalance, has reach substantial loss. Without

other measures, the fund would go bankrupt 19 years after it began

operations. In responding to the advent of the aging era, important

reasons for the Council actively promoting the annuity system may lead

to losses to the labor insurance fund. There remains no adequate response

to the problem of low birthrates. Previously, elderly workers who had

low contribution rates could immediately enjoy the benefits of labor

insurance annuity. However, there was no appropriate principle of

fairness for user payments. A serious gap in insurance fee burdens has

resulted; citizens born in the 1980s must pay 1.8 times that of a citizen

born in the 1930s, and yet they face the potential of not being able to

---
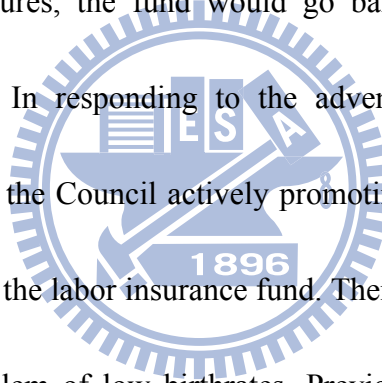
[7] From 18 July 2008 – [Commercial Times/Taxes and Legal Issues/Page A15] News Analysis, Losses Delayed by 19 Years; Problems Have Yet to Be Resolved

receive old age payments. We classified the social mood as negative. Votes for "not worried" were classified as optimistic, and votes for the opposite were classified as pessimistic; other responses were neutral.

10. **Do you believe that this stock market disaster will follow in the footsteps of the 1930s Great Depression?** (20081111-20081120)

In September 2008, the fall of Lehman Brothers created a global financial tsunami, causing severe turbulence in the global financial market. Countries like Taiwan, with its growth of the economy relying on exports, potentially faced serious consequences. Negative news in Europe and the U.S. warning of a depression caused panic among investors. A global trend of unemployment also resulted. Domestic industries faced with poor economic conditions were challenged by the disappearance of orders and indefinite plant shutdowns. A new unemployment high was recorded; companies that did not lay off employees instead chose to reduce production or adopt unpaid leave policies. Though employees did not lose their jobs in full, they were essentially semi-unemployed or approaching unemployment.[8] Economic

---

[8] From 9 November 2008 – [Commercial Times/Global View/Page C3] New York Times; With the Financial Crisis Worsening, is an Economic Crisis in the Making? 10 November 2008 – [Commercial Times/News in Focus/Page A2] Editorial: An Economic Freeze Nightmare Approaches by the Day

growth in Southeast Asia and other developing countries is primarily reliant on consumption in the American and European regions. An economic recession in the United States poses serious problems for export-dependent countries, Taiwan among them. The American financial crisis severely damaged global stock markets, causing instabilities in international financial markets. Former Federal Reserve chairman Alan Greenspan described the situation as a financial crisis seen only once in a hundred years. The media competed to report on economic recessions in the United States and Europe, immersing investors in pessimistic trend reports on a daily basis. The weighted index in Taiwan stock markets fell approximately 2,600 points from a high of 6,800 points at the beginning of September 2008, constituting a 39% drop. Based on figures from an investigation published in October 2008, domestic investment mood dropped from 102 points in April 2008 to a historical record low of -176.53 in October 2008. Economic fundamentals failed to recover. We classified the social mood as pessimistic. Votes for "will not" were considered to be optimistic, while votes for "will" were considered to be negative; other responses were neutral.

11. **Are you continuing to invest in stocks?** (20081212-20081222)

The bankruptcy of Lehman Brothers in September 2008 led to a global financial crisis, causing stock markets to suffer great losses throughout the world. The Taiwan stock market fell by more than 30%. However, the three largest institutional investors purchased a total of $58 billion NTD in the stock market from 8 December to 19 December in 2008, causing investors to consider whether the Taiwanese stock market had hit bottom and if investment could be considered. Losses in the stock market reflected a pessimistic social mood. An investor mood index investigation published in December 2008 also showed that investor mood was highly pessimistic, with an index of -168.15 points. We classified this social mood as pessimistic. Votes for "want to invest or are investing" were classified as optimistic, and votes for the opposite were considered pessimistic.

12. **Do you think that gold prices will continue to rise in the future?**

(20090301-20090310)

13. With an uncertain global economy, the value preservation benefits of gold increased greatly. Floating capital flooding the market moved into

gold markets, causing the price of gold to climb[9]; a gold investment trend also occurred around the same time domestically. Investors remained skeptical due to the global economic recession. With considerations of asset preservation and risk aversion, the capital of European and American investors and opportunists flooded into the gold market, causing the price of gold to climb quickly. Following the bankruptcy of Lehman Brothers, global gold prices rose by over 30% over the previous 6 months. Media continued to report that gold prices were rising and that investors were fighting to invest. We classified the social mood as optimistic. Votes for "will" continue rising were classified as optimistic, while votes for "will not" were considered pessimistic.

For convenient reference, categorizations of investigation questions, investigation period, and social mood are summarized in Table 1. Of a total of 12 investigation questions, from the perspective of social mood categorization, 4 were optimistic, 6 were pessimistic, and 2 were neutral.

---

[9] From 18 February 2009 - [Commercial Times/Financial focus/Page C1] Gold prices hit a new high point , 3 March 2009 - [Commercial Times / Financial Instrument /Page C2] The price of gold and precious metals fund increased by an average of about 20.64% in the past three months

Table 1   Summary of Investigation question, period and social mood

No	Questions	Period	SM
1	After the political turbulence in September 2006, would you anticipate Taiwan's stock market to rise or fall?	20060828-20060904	P
2	What do you think of the real estate business in 2007 as compared to 2006?	20061228-20070111	O
3	Will Taiwan's stock market break the 10,000-point threshold?	20070424-20070507	O
4	Should the government liberalize investment to mainland China?	20070807-20070820	N
5	After the presidential election, will you invest in Taiwanese stocks (or Taiwanese funds)?	20080401-20080410	N
6	Do you want mainland investors to invest in Taiwan Stock Market?	20080428-20080510	O
7	With high inflationary pressure and steep falls in Taiwan Stock Market, what do you think?	20080701-20080710	P
8	Do you think the price of oil will rise to $200 per barrel before the end of the year?	20080710-20080717	P
9	Are you worried that labor insurance finances are unstable and that you won't be able to receive old age payments?	20080801-20080810	P
10	Do you believe that this stock market disaster will follow in the footsteps of the 1930s Great Depression?	20081111-20081120	P
11	Are you continuing to invest in stocks?	20081212-20081222	P
12	Do you think that gold prices will continue to rise in the future?	20090301-20090310	O

Note. Column "SM" denotes social mood; "O" denotes optimistic, "P" denotes pessimistic and "N" denotes neutral;

3.3 Data coding method and testing methods

Responses to questions were categorized into optimistic and pessimistic responses. The coding method for the question responses involved assigning a positive whole number greater than zero based on the degree of optimism and assigning a negative whole number based on the degree of pessimism. A greater absolute value indicated greater strength. Neutral responses were assigned a value of zero. For example, gains in the first question include three different options with differing degrees of gains and also three different options with different degrees of falls. The coding method involves expressing gains (optimism) from lowest to highest by 1-3, while falls (pessimism) are expressed from lowest to highest by (-1)-(-3). After developing a cross-table based on the options and genders determined by the questions, Chi-square χ^2 independence testing was performed. In understanding the distribution of various options, a Mann-Whitney test using two nonparametric independent samples was used to confirm whether females are more pessimistic than males. The Mann-Whitney test, also called the rank sum test, is a nonparametric test that compares two unpaired groups, is for assessing whether two independent samples of observations come from the same distribution. It is one of the best-known non-parametric significance tests and does not assume that the populations follow Gaussian distributions. The Mann-Whitney test compares the medians of two

groups. It is possible to have a tiny P value - clear evidence that the population medians

are different (Motulsky, 2005).

4. Research Results

The number of voters and gender distribution are shown in Table 2. It can be seen from the table that voter numbers gradually increased with the financial news website poll Center was established longer. Samples from 2006 averaged 4,000 individuals, increasing to 8,000 in 2007 and 10,000 in 2008.

Table 2   Number and gender of participants

NO	Total	Male	Female	M%	F%
Q1	3,547	2,303	1,244	65	35
Q2	5,428	3,187	2,241	59	41
Q3	6,919	4,394	2,525	64	36
Q4	10,873	5,979	4,894	55	45
Q5	10,544	5,116	5,428	49	51
Q6	13,160	6,396	6,764	49	51
Q7	7,899	3,856	4,043	49	51
Q8	15,387	6,284	9,103	41	59
Q9	5,879	2,731	3,148	46	54
Q10	13,662	7,001	6,661	51	49
Q11	9,511	5,305	4,207	56	44
Q12	8,363	3,791	4,572	45	55

Note. "M" denotes male, "F" denotes female;

Cross-table analysis and Mann-Whitney testing with two independent samples were performed for questions individually. Cross-table results are as shown in Tables 3 – 14. Chi-square (χ^2) test and Mann-Whitney test results are organized in the format of Table 15 for convenience.

In the cross-table analysis for Table 3, the table for Question 1: "Following the political turbulence in September 2006, would you anticipate Taiwan's stock market to rise or fall?" it can be seen that females are significantly higher than males in the pessimistic options, while males are significantly higher than females in the pessimistic options. Chi-square ($\chi2$) test results showed significant differences (p<0.0001) in pessimism and optimism between males and females. The social mood of this question was pessimistic. It could be seen from the results of both pessimistic and optimistic options that females are more pessimistic than males. Mann-Whitney testing results also showed significant differences in pessimism and optimism between males and females (p<0.0001).
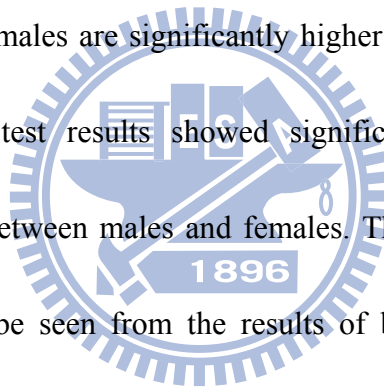
Table 3   Cross table of Question 1: "After the political turbulence in September 2006,

would you anticipate Taiwan's stock market to rise or fall?"

Cross table of Q1

	-3	-2	-1	1	2	3	Total
M	645	373	190	220	341	534	2,303
M%	28.0%	16.2%	8.3%	9.6%	14.8%	23.2%	100.0%
F	370	342	136	118	138	140	1,244
F%	29.7%	27.5%	10.9%	9.5%	11.1%	11.3%	100.0%
Total	1,015	715	326	338	479	674	3,547
Total %	28.6%	20.2%	9.2%	9.5%	13.5%	19.0%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 4, the table for Question 2: "What do you think

of the real estate business in 2007 as compared to 2006?", it can be seen that the

percentage of males who expected real estate to drop was higher than the percentage of

females who expected the same; the proportion of females who believed that real estate

would gain in price was higher than the proportion of males who believed the same.

Chi-square (χ2) test results and Mann-Whitney test results both reached significant levels

(p<0.0001). Expectations towards real estate were categorized as optimistic in terms of

social mood. However, the interesting result of female optimism being significantly

greater than male optimism occurred, differing significantly from previous results that

suggested that females are more pessimistic.

Table 4   Cross table of Question 2: "What do you think of the real estate business in

2007 as compared to 2006?"

Cross table of Q2

	-2	-1	0	1	2	Total
M	510	807	419	1,127	324	3,187
M%	16.0%	25.3%	13.1%	35.4%	10.2%	100.0%
F	161	523	341	854	362	2,241
F%	7.2%	23.3%	15.2%	38.1%	16.2%	100.0%
Total	671	1,330	760	1,981	686	5,428
Total %	12.4%	24.5%	14.0%	36.5%	12.6%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 5, the table for Question 3: "Will Taiwan's

stock market break the 10,000-point threshold?"   it can be seen that the hope of males

that Taiwanese stocks would reach 10,000 points exceeded that of females. The

proportion of females who believed that Taiwanese stocks would not reach 10,000 points

exceeded that of males. Chi-square ($\chi2$) test results and Mann-Whitney test results both

reached significant levels (p＜0.0001). The social mood of this question was categorized as optimistic, and results showed that males are more optimistic than females.

Table 5   Cross table of Question 3: "Will Taiwan's stock market break the 10,000-point threshold?"

Cross Table of Q3

	-2	-1	1	2	Total
M	847	2,199	768	580	4,394
M%	19.3%	50.0%	17.5%	13.2%	100.0%
F	1,073	797	386	269	2,525
F%	42.5%	31.6%	15.3%	10.7%	100.0%
Total	1,920	2,996	1,154	849	6,919
Total %	27.7%	43.3%	16.7%	12.3%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 6, the table for the Question 4: "Should the government liberalize investment to mainland China", it can be seen that the percentage of males who favored investment in China exceeded that of females, while the proportion of females who believed that investment should not be liberalized was higher than that of men. Chi-square (χ2) test results and Mann-Whitney test results both reached significant

levels (p＜0.0001). The social mood of this question was neutral, and the results showed that males are more optimistic than females.

Table 6   Cross table of Question 4: "Should the government liberalize investment to mainland China?"

Cross Table of Q4

	-2	-1	1	2	Total
M	960	583	1,261	3,175	5,979
M%	16.1%	9.8%	21.1%	53.1%	100.0%
F	748	694	1,407	2,045	4,894
F%	15.3%	14.2%	28.7%	41.8%	100.0%
Total	1,708	1,277	2,668	5,220	10,873
Total %	15.7%	11.7%	24.5%	48.0%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 7, the table for Question 5: "After the presidential election, will you invest in Taiwanese stocks (or Taiwanese funds)?" it can be seen that the percentage of males who would choose to invest is higher than the corresponding percentage of females, while the percentage of females who choose not to invest is higher than the corresponding percentage of males; the percentage of females who did not know whether they would invest is also higher than the corresponding

percentage of males. Chi-square (χ2) test results and Mann-Whitney test results also reached significant levels ($p < 0.0001$). The social mood of this question was categorized as neutral, and results showed that females are more pessimistic than males.

Table 7   Cross table of Question 5: "After the presidential election, will you invest in Taiwanese stocks (or Taiwanese funds)?"

Cross Table of Q5

	-1	0	1	Total
M	1,480	594	3,042	5,116
M%	28.9%	11.6%	59.5%	100.0%
F	1,704	1,035	2,689	5,428
F%	31.4%	19.1%	49.5%	100.0%
Total	3,184	1,629	5,731	10,544
Total %	30.2%	15.4%	54.4%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 8, the table for Question 6: "Do you want mainland investors to invest in Taiwan Stock Market?", it can be seen that the percentage of males who wanted mainland investors to invest in Taiwan stocks was higher than the corresponding percentage of females, while the percentage of females who did not want mainland investors to invest was higher than the corresponding percentage of males.

Chi-square (χ2) test results and Mann-Whitney test results both reached significant levels (p＜0.0001). The social mood of this question was optimistic, and the results showed that females are more pessimistic than males.

Table 8   Cross table of Question 6: "Do you want mainland investors to invest in Taiwan Stock Market?"

Cross Table of Q6

	-1	0	1	2	Total
M	2,284	319	1,790	2,003	6,396
M%	35.7%	5.0%	28.0%	31.3%	100.0%
F	2,692	596	2,198	1,278	6,764
F%	39.8%	8.8%	32.5%	18.9%	100.0%
Total	4,976	915	3,988	3,281	13,160
Total %	37.8%	7.0%	30.3%	24.9%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 9, the table for Question 7: "With high inflationary pressure and steep falls in Taiwan Stock Market, what do you think?" it can be seen that a higher percentage of males than females selected the optimistic option, "Excellent! There are cheap assets to scoop up."; a higher percentage of females than males selected the pessimistic option, "This is terrible! Stocks are seriously stuck."

Chi-square ($\chi 2$) test results and Mann-Whitney test results both reached significant levels

($p<0.0001$). The social mood of this question was pessimistic, and the results showed

that females are more pessimistic than males.

Table 9   Cross table of Question 7: "With high inflationary pressure and steep falls in

Taiwan Stock Market, what do you think?"

Cross Table of Q7

	-1	0	1	Total
M	976	1,558	1,322	3,856
M%	25.3%	40.4%	34.3%	100.0%
F	1,095	2,073	875	4,043
F%	27.1%	51.3%	21.6%	100.0%
Total	2,071	3,631	2,197	7,899
Total %	26.2%	46.0%	27.8%	100.0%

Note. "M" denotes male, "F" denotes female;

In the cross-table analysis for Table 10, the table for Question 8: "Do you think the

price of oil will rise to $200 per barrel before the end of the year?", it can be seen that the

percentage of females who selected the pessimistic option, that oil prices would exceed

$200/barrel, exceeded the percentage of males who chose the same option. A higher

percentage of males selected the optimistic option, that they believed oil prices would not

exceed $200/barrel. In addition, a greater percentage of females than males selected the

"I don't know" option. Chi-square (χ2) test results and Mann-Whitney test results both

reached significant levels (p＜0.0001). The social mood of this question was pessimistic,

and the results showed that females are more pessimistic than males.

Table 10   Cross table of Question 8: "Do you think the price of oil will rise to $200 per

barrel before the end of the year?"

Cross Table of Q8

	-1	0	1	Total
M	3,294	1,202	1,788	6,284
M%	52.4%	19.1%	28.5%	100.0%
F	5,017	2,622	1,464	9,103
F%	55.1%	28.8%	16.1%	100.0%
Total	8,311	3,824	3,252	15,387
Total %	54.0%	24.9%	21.1%	100.0%

Note. "M" denotes male, "F" denotes female;

It can be seen from Table 11, the cross-table analysis for Question 9: "Are you

worried that labor insurance finances are unstable and that you won't be able to receive

old age payments?", that a greater percentage of females than males had chosen the

option that they were worried that labor insurance finances were unstable and that they

wouldn't be able to receive old age payments; the percentage of males who selected that they were not worried about labor finance instability was higher than the corresponding percentage of females. Chi-square ($\chi 2$) test results and Mann-Whitney test results both reached significant levels ($p < 0.0001$). The social mood of this question was pessimistic, and the results showed that females are more pessimistic than males.

Table 11   Cross table of Question 9: "Are you worried that labor insurance finances are unstable and that you won't be able to receive old age payments?"
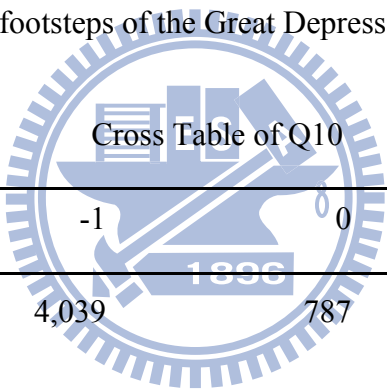
Cross Table of Q9

	-2	-1	0	1	Total
M	1,747	620	117	247	2,731
M%	64.0%	22.7%	4.3%	9.0%	100.0%
F	2,287	590	99	172	3,148
F%	72.6%	18.7%	3.1%	5.5%	100.0%
Total	4,034	1,210	216	419	5,879
Total %	68.6%	20.6%	3.7%	7.1%	100.0%

Note. "M" denotes male, "F" denotes female;

It can be seen from Table 12, the cross-table analysis for Question 10: "Do you believe that this stock market disaster will follow in the footsteps of the Great Depression in the 1930s?", it can be seen that a greater percentage of females than males believed

that the stock market disaster would follow in the footsteps of the global Great Depression. Conversely, the percentage of males who selected the optimistic option which suggested that it wouldn't be the case was higher than the corresponding percentage of females. Chi-square (χ^2) test results and Mann-Whitney test results both reached significant levels ($p < 0.0001$). The social mood of this question was pessimistic, and the results showed that females are more pessimistic than males.

Table 12   Cross table of Question 10: "Do you believe that this stock market disaster will follow in the footsteps of the Great Depression in the 1930s?"

Cross Table of Q10				
	-1	0	1	Total
M	4,039	787	2,175	7,001
M%	57.7%	11.2%	31.1%	100.0%
F	4,016	1,101	1,544	6,661
F%	60.3%	16.5%	23.2%	100.0%
Total	8,055	1,888	3,719	13,662
Total %	59.0%	13.8%	27.2%	100.0%

Note. "M" denotes male, "F" denotes female;

It can be seen from Table 13, the cross-table analysis for Question 11: "Are you continuing to invest in stocks?", that the percentage of males who would continue

investing in stocks was higher than the corresponding percentage of females. The

percentage of females who selected the pessimistic option, that they would not continue

to invest in stocks, was higher than the corresponding percentage of males. Chi-square

(χ2) test results and Mann-Whitney test results both reached significant levels (p＜

0.0001). The social mood of this question was pessimistic, and the results showed that

females are more pessimistic than males.

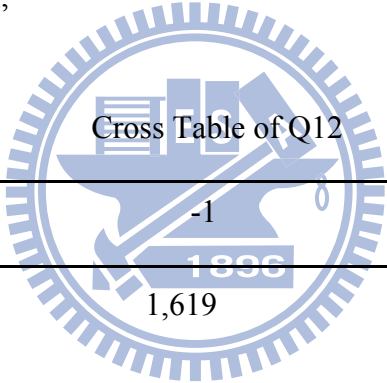Table 13　Cross table of Question 11: "Are you continuing to invest in stocks?"

	Cross Table of Q11		
	-1	1	Total
M	2,891	2,413	5,304
M%	54.5%	45.5%	100.0%
F	2,614	1,593	4,207
F%	62.1%	37.9%	100.0%
Total	5,505	4,006	9,511
Total %	57.9%	42.1%	100.0%

Note. "M" denotes male, "F" denotes female;

It can be seen from Table 14, the cross-table analysis for Question 12: "Do you think

that gold prices will continue to rise in the future?", that the percentage of males who

believed that gold price would continue to rise was lower than the corresponding

percentage of females, while the percentage of males who selected the pessimistic option,

that gold price would not continue to rise, was higher than the corresponding percentage

of females. Chi-square ($\chi 2$) test results and Mann-Whitney test results both reached

significant levels ($p < 0.0001$). The social mood of this question was optimistic, and the

results showed that females are more optimistic than males.

Table 14　Cross table of Question 12: "Do you think that gold prices will continue to
rise in the future?"

Cross Table of Q12			
	-1	1	Total
M	1,619	2,172	3,791
M%	42.7%	57.3%	100.0%
F	1,600	2,972	4,572
F%	35.0%	65.0%	100.0%
Total	3,219	5,144	8,363
Total %	38.5%	61.5%	100.0%

Note. "M" denotes male, "F" denotes female;

Table 15 compiles the test results of Tables 3 through 14 and arranges them

according to social mood classification. As shown in Table 15, questions with pessimistic

social moods include the six questions of 1, 7, 8, 9, 10, and 11. In investigation questions

with pessimistic social moods, aside from Question 7, overall respondent responses were

pessimistic. More respondents answered neutrally to Question 7, in which males are

shown to be more optimistic and females shown to be more pessimistic if neutral

responses are discarded. Investigation questions of optimistic social mood include the

four questions of 2, 3, 6, and 12. In the investigative questions with optimistic social

moods, aside from Question 3, overall responses were optimistic. There were more

pessimistic responses to Question 3, possibly because short-term gains in Taiwan Stock

Market did not keep pace with global economic gains, causing respondents to have not

yet modified their views on the stock market. Questions 4 and 5, classified as having

neutral social moods, both contained positive messages; consequently, overall responses

were generally optimistic. It can be seen from the above responses that social mood will

indeed influence individual emotional response. In optimistic social moods, individuals

will be influenced and exhibit optimistic attitudes; conversely, when the social mood is

pessimistic, individuals are also influenced and exhibit predominantly pessimistic

attitudes. These results are identical to the results of Nofsinger's research (2005).

Table 15   Summaries of Test Result

No.	SM	Pessimistic M%	Pessimistic F%	Optimistic M%	Optimistic F%	Neutral M%	Neutral F%	χ^2	Cramer's V	M-W Test Z-value
Q1	P	52.5	68.2	47.5	31.8	-	-	127.08***	0.189***	-7.593***
Q7	P	25.3	27.1	34.3	21.6	40.4	51.3	166.50***	0.145***	-8.784***
Q8	P	52.4	55.1	28.5	16.1	19.1	28.8	414.23***	0.164***	-9.126***
Q9	P	86.7	91.4	9.0	5.5	4.3	3.1	58.67***	0.100***	-7.516***
Q10	P	57.7	60.3	31.1	23.2	11.2	16.5	150.98***	0.105***	-5.906***
Q11	P	77.4	76.3	14.0	9.6	8.6	14.1	56.00***	0.077***	-7.483***
Q2	O	41.3	30.5	45.6	54.3	13.1	15.2	128.94***	0.154***	-9.616***
Q3	O	69.3	74.1	30.7	25.9	-	-	451.10***	0.255***	-14.751***
Q6	O	35.7	39.8	59.3	51.4	5.0	8.8	309.21***	0.153***	-12.169***
Q12	O	42.7	35.0	57.3	65.0	-	-	52.05***	0.079***	-7.214***
Q4	N	25.8	29.5	74.2	70.5	-	-	182.11***	0.129***	-8.987***
Q5	N	28.9	31.4	59.5	49.5	11.6	19.1	147.79***	0.118***	-7.959***

Note1. "M" denotes male, "F" denotes female;

Gender differences in economic topics all reached significant levels ($p < 0.0001$). Under circumstances of pessimistic or neutral social moods, females appear to be more pessimistic than males, results consistent with the research conclusions of Jacobsen et al. (2008). Under circumstances of optimistic social moods, gender differences in optimism are determined by investment targets – if investment targets are divided into stock and non-stock targets, females exhibit significant pessimism or optimism significantly less

than that of males under optimistic social moods on stock market-related topics

(Questions 3 and 6); for investigative questions regarding non-stock investment targets

such as gold or real estate (Questions 2 and 12), this study found that females are

significantly more optimistic than males. This conclusion differs from previous research

which stated that females are more pessimistic than males on financial topics.

5. Conclusions and suggestions

Data and samples in this study were collected from the Yahoo! Kimo Taiwan Business News Survey Centre, investigating optimism level differences in women and men. It is demonstrated in this study that social mood does have significant effects on an individual's emotional responses. Women respond more pessimistically than men when the social mood is pessimistic; if the social mood is optimistic, women also respond more pessimistically than men on stock-related topics. These finding are consistent with Jacobsen et al's (2008) experiment. However, women respond more optimistically than men on non-stock related topics when the social mood is optimistic.

Interestingly, the correlation between the real estate and stock markets is as high as 90%. The real estate prices tend to rise as stock markets go bullish. Since real estate prices are strongly affected by economic factors, real estate properties and transactions are distinctive and not very mutually substitutable, raising real estate speculation prices. Due to the large sizes of single transaction amounts, real estate purchasers typically apply for mortgages. Purchasers who use leverage to make investments in real estate seek to profit from real estate resale or rental. However, individual's recurrent revenue may be reduced when economic downturn. This results in increased risk since debts must still be paid even in the face of reduced income. Thus the real estate investment can not be classified to low risk assets. In the past, gold was viewed as a noble metal, attracting

investors looking for a safe investment haven. Deals in the global gold markets are at all times, and gold is quoted in USD. Consequently, investing in gold requires greater awareness of international trends and currency exchange risks compared to investing in stocks or bonds. Gold's function of store of value, as claimed before, only exists in situations where other factors impacting supply and demand of gold do not exist. If gold's supply far exceeds its demand, gold prices will plunge. In addition, price fluctuations will also occur across long periods of time. Once investors' capital is in lockup, long-term holding of gold entails high costs inasmuch as gold does not produce dividends or interest. Large amounts of capital from investors flowed into gold markets following the financial crisis. In addition to hedging, investors also expected gold prices to rebound quickly. Consequently, the Wall Street Journal considered gold a high-risk investment since gold prices would fluctuate wildly and returns would be unpredictable. With sharp fluctuations in international gold prices in recent years and the speculative natures of real estate market, neither real estate nor gold can be considered low-risk investment targets.
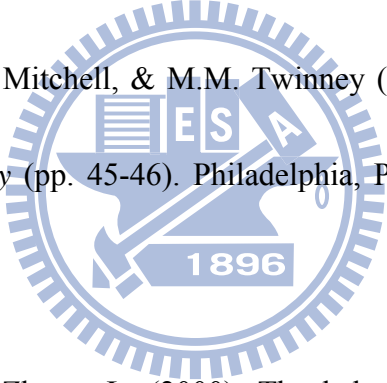
However, females have exhibited optimistic responses stronger than those of men. It is possible that females do not view these investment targets as being high-risk. It is also possible that females may prefer physical assets to intangible financial assets. Females' tendencies to purchase real estate may indicate their pursuit of independent living space

and security after they become financially independent. Females prefer gold probably because gold provides confidentiality and also because gold constitutes psychologically value-storing and aesthetically pleasing fortune. As previously studied investment combinations were generally analyzed on the basis of stocks and riskless assets, females were classified as risk-averse investors due to their disfavor of stocks. Future researchers should further include other risky assets in order to clarify this point.

However, the sample of this study consisted of internet users and was limited to the results of news polls on financial topics. As internet use has not reached 100%, inferences are limited to a certain extent. However, with the universality of the internet, the influence of this problem will decrease.
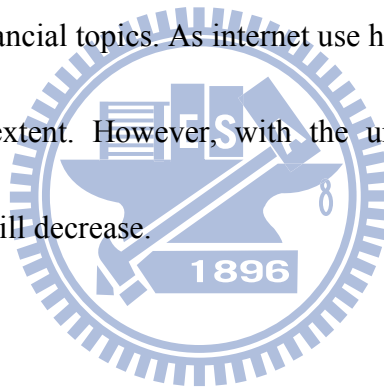
Reference

Antweiler, W. & Frank M. Z. (2004). Is all that talk just noise? The information content of internet stock message boards, *Journal of Finance*, 59, 1259- 1294.

Babbie, E. (1990). Survey Research Methods, 2nd ed., Belmont, Calif.: Wadsworth.

Bajtelsmit, V. L., Bernasek, A. & Jianakopolos, N.A. (1999). Gender differences in defined contribution pension decisions. *Financial Services Review,* 8, 1-10.

Bajtelsmit, V.L. & VanDerhei, J.L. (1997). Risk aversion and pension investment choices. In M.S. Gordon, O.S. Mitchell, & M.M. Twinney (Eds.), *Positioning pensions for the twenty-first century* (pp. 45-46). Philadelphia, PA: University of Pennsylvania Press,

Barber, B., Odean, T., & Zheng, L. (2000). The behavior of mutual fund investors. *Unpublished working paper.* University of California, Davis. Mimeographed.

Barber, B. M. & Odean, T. (2001). Boys will be Boys: gender, overconfidence, and common stock investment, *The Quarterly Journal of Economics*, 116(1), 261-292.

Bernasek, A. & Shwiff, S. (2001). Gender, risk, and retirement. *Journal of Economic Issues*, 35(2), 345-356.

Beyer, S. & Bowden E. M. (1997). Gender differences in self-perceptions: convergent evidence from three measures of accuracy and bias, *Personality and Social Psychology Bulletin*, 23(2), 157-172.

Burke, R. J. (2001). Information sources: is there a gender issue? Corporate Communications, 6(1), 7-11.

Chung, J., & Monroe, G. (2001). A research note on the effects of gender and task complexity on an audit judgment. *Behavioral Research in Accounting*, 13, 111-25.

Clarke, R.G., & Statman, M. (1998). Bullish or bearish. *Financial Analysts Journal, 54,* 63-72.

Daniel, K., Hirshleifer, D. & Subrahmanyam, A. (1998). Investor psychology and security market under and overreactions. *Journal of Finance*, 53, 1839-1885.

Debondt, W. & Thaler, R. (1985). Does the stock market overreact? *Journal of finance*, 40, 3, 793-805.

Elster, J. (1998). Emotions and economic theory. *Journal of Economic Literature*, 36, 47–74.

Fehr-Duda, H., De Gennaro, M., & Schubert, R. (2006). Gender, financial risk, and probability weights. *Theory and Decision*, 60(2), 283-314.
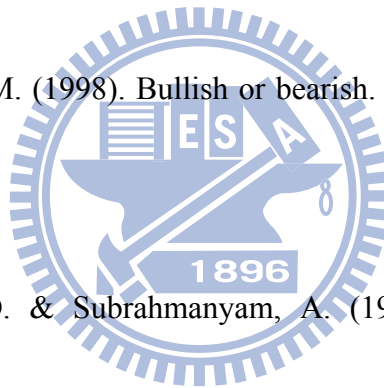
Fehr, H., Epper, T., Bruhin, A., & Schubert, R. (2007). Risk and rationality: The effect of incidental mood on probability weighting. Working paper no. 0703. Zurich: socioeconomic Institute, University of Zurich (Switzerland).

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, 117(1), 39-66.

Friend, I. & Blume, M. E. (1975). The Demand for Risky Assets. *American Economic Review*, 65, 900-22.

Grable, J. E. & Roszkowski, M. J. (2008). The influence of mood on the willingness to take financial risks. *Journal of Risk Research*, 11(7), 905-923

Graham, J. F., Stendardi Jr., E. J., Myers, J. K., & Graham. M. J. (2002). Gender differences in investment strategies: An information processing perspective. *The International Journal of Bank Marketing*, 20(1), 17-26.

Hewson, C., Yule, P., Laurent, D., & Vogel, C.（2003）. Internet research methods: A practical guide for the social and behavioral sciences. London: Sage.

Jacobsen, B., Lee, J. B., & Marquering, W. (2008, July). Are men more optimistic? In S. Banerjee (Chair), Behavorial Finance 2. Paper presented at the meeting of Asian

FA-NFA 2008 International Conference: The Mission of Financial Studies in Globalized Economy, Yokohama, Japan.

Jianakoplos, N. A. & Bernasek, A. (1998). Are women more risk averse? *Economic Inquiry*, 36, 620-30.

Kahneman, D. & Tversky, A., (1979). Prospect theory: an analysis of decision under risk, *Econometrica*, 47, 263-291.

Lenney, E. (1977). Women's self-confidence in achievement settings. *Psychological Bulletin*, 84, 1-13.

Lichtenstein, S., Fischhoff, B., & Phillips, L. D. (1977). Do those who know more also know more about how much they know? Organizational Behavior and Human Performance, 20, 159-183.

Lichtenstein, S., Fischhoff, B., & Phillips, L. D. (1982). Calibration of probabilities: The state of the art to 1980. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), Judgment under uncertainty: Heuristics and biases Cambridge, UK: Cambridge University Press.

Loewenstein, G. F., Weber, E U., Hsee, C K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267-286.
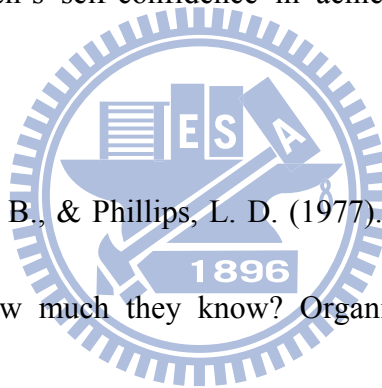
Maital, S., Filer, R., & Simon, J. (1986). What do people bring to the stock market (besides money)? The Economic Psychology of Stock Market Behavior, In B. Gilad and S. Kaish (EDS.), Handbook of Behavioral Economics Behavioral Macroeconomics, vol. B Greenwich, Connecticut, JAI Press Inc., 273-307.

Meyers-Levy, J. (1986). Gender differences in information processing: a selectivity interpretation. In P. Cafferata & A. Tybout (Eds.), *Cognitive and Affective Responses to Advertising* (pp. 219-260). Lexington, MA: Lexington Books.

Mitchell, M. L., & Mulherin, J. H. (1994). The impact of public information on the stock market, *Journal of Finance*, 49, 923-950.

Motulsky, H. (1999). Analyzing data with GraphPad Prism (p.56-58). San Diego, CA: GraphPad Software Inc. http://www.graphpad.com. GraphPad Software Inc., San Diego, Calif. (last updated, 1999; last accessed, 9 October, 2009).

Nofsinger, J. R. (2005). Social mood and financial economics. *The Journal of Behavioral Finance*, 6(3), 144-160.

Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *Journal of Finance,* 53, 1887-1934.

Olson, K. R. (2006). A literature review of social mood. Journal of Behavioral Finance, 7(4), 193-203.

O'Donnell, E., and Johnson, E. N. (2001). The effects of auditor gender and task complexity on information processing efficiency, *International Journal of Auditing*, 5, 91-105.

Petty, R. E., Gleicher, F., & Baker, S. (1991). Multiple roles for affect in persuasion. In J.P. Forgas (Ed.), Emotion and social judgments (pp. 181–200). Elmsford, NY: Pergamon Press.

Schubert, R., Brown, M., Gysler, M., & Brachinger H. W. (1999). Financial decision-making: are women really more risk-averse? *The American Economic Review*, 89(2), 381-385.

Schubert, R. (2006). Analyzing and Managing risk – on the importance of gender differences in risk attitudes. *Managerial Finance*, 32(9), 706-715.

Shefrin, H. (2001). Behavioral Corporate Finance, Journal of Applied Corporate Finance, 14, 113-124.

Sunden, A. E. & Surette, B. J. (1998). Gender differences in the allocation of assets in retirement savings plans. *American Economic Review*, 88(2), 207-212.

Voelz, C. (1985). Effects of gender role disparity on couples' decision making processes, *Journal of Personality and Social Psychology*, 49(6), 1532-1540.

Wright, W. F., & Bower, G. H. (1992). Mood effects on subjective probability assessment. *Organizational Behavior and Human Decision Processes*, 52, 276-291.

Wurgler, J. (2002). Comment on: Investor psychology in capital markets. *Journal of Monetary Economics*, 49, 211-214.
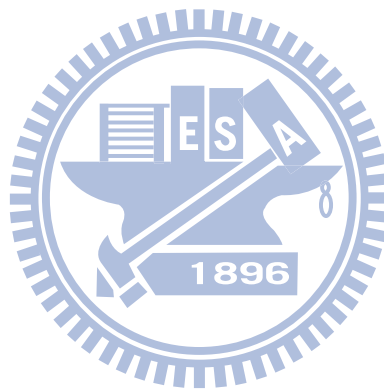
Appendix Investigation Questions

No	Questions

Q1   After political turbulence, do you believe that stock prices will rise or fall in September 2006?

□ Rise more than 10%

□ Rise between 5% and 10%

□ Rise less than 5%

□ Fall less than 5%

□ Fall between 5% and 10%

□ Fall more than 10%

Q2   How do you believe that real estate prices will change in 2007 compared to 2006?

□ Improve dramatically

□ Improve slightly

□ Insignificant or no change

□ Worsen slightly

□ Worsen greatly
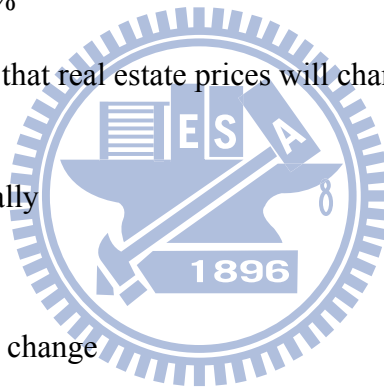
Q3   Will the Taiwan stock index reach 10,000 points this year?

□ It definitely will (Optimistic)

□ It may

□ It may not

□ It definitely will not (Pessimistic)

Q4   Should the government open investment to mainland China?

□ Definitely should

□ Probably should

□ Probably should not

□ Definitely should not

Q5   Will you invest in Taiwanese stocks (or Taiwanese funds) after the presidential election?

□ Yes

□ No

□ I don't know

Q6   Do you want mainland Chinese to invest in Taiwanese stocks?

□ Very much so

□ Yes, to a certain degree

□ No

□ I don't know

Q7   What are your thoughts as the world faces high inflationary pressure and deep losses in Taiwanese stocks?

□ This is excellent! I can purchase stocks for cheap.

□ This is terrible! Stocks are stuck.

□ I don't invest. This is irrelevant to me.

Q8   Do you think that oil prices will reach $200/barrel by the end of the year?

□ Yes

□ No

□ Don't know

Q9   Are you worried that unstable labor insurance finances will prevent you from receiving old age payments?

□ Not worried, the government will find a way
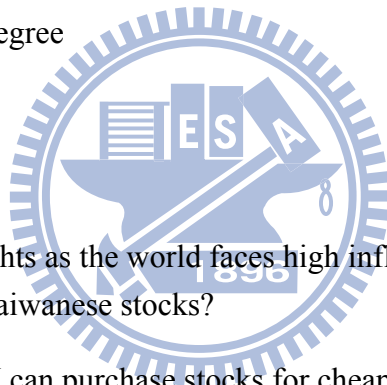
□ Somewhat worried, I hear about major losses to the stock market occasionally

□ Very worried, I'm still very far from retirement and fear that I won't receive payments when the time comes

□ Don't know

Q10　Do you think that this stock disaster will follow in the footsteps of the 1930s Great Depression?

□ Yes

□ No

□ Don't know

Q11　Are you continuing to invest in stocks?

□ Yes, or I want to

□ No

Q12　Do you think that gold prices will continue to rise?

□ Yes

□ No

個人簡歷

學歷

國立交通大學管理科學系博士 (2004.09 - 2009.11)

國立交通大學管理科學系碩士 (1994.09 - 1997.01)

國立中興大學會計學系學士 (1985.09 - 1989.06)

證照

高考會計師（1989）

經歷

鉅晶電子(股)公司財務長特別助理	2008.7-2009.1
明泰科技股份有限公司會計資深經理	2006.8-2007.2
東海大學、中華大學、明新科大等校兼任講師	2003.8-2008.6
大葉大學會計資訊系專任講師	2003.8-2006.8 & 1997.2-2000.7
台灣積體電路股份有限公司會計主任管理師	2000.8-2003.7
友訊科技股份有限公司資深內部稽核管理師	1992.7-1996.1
安侯協和會計師事務所審計員	1990.2-1991.9

在學期間著作

A. 期刊論文

Ling-Ling, Chang, Yann-Ching Tsai, Gin-Yuan Lee, 2009. Gender difference in
Optimism-evidence from Yahoo Kimo Taiwan's Business News Poll Centre,
Social Behavior and Personality, 38(2).   Accepted for publication in *March 2010*
(SSCI).

張玲玲、權福生、楊千 (2004)，台灣區域網路產業供應商轉型實務研究_以友訊
科技公司爲例，大葉學報，第 13 卷第 2 期， 97-108。