

Individual Investor Behaviour on the Shenzhen Stock Exchange

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Investigations of investor behaviour currently adopt one of three major viewpoints. From a macro perspective, studies tend to focus on the relationship between stock market indices and macro-economic indicators such as exchange rates, interest rates and consumer price index. From the firm's perspective, studies focus on the impact of the firm's management on stock price movements. From the micro perspective, the impact on individual investor behaviours has received attention. While these studies are informative, the theoretical underpinnings differ between each context. While macro and firm-level studies tend to assume rational decision-making and efficient markets, studies of the micro perspective highlight the behavioural underpinnings of investor choice. Moreover, these studies overwhelmingly focus on Western market contexts. Few consider East Asian markets which encompass different circumstances that affect investor behaviour.

This study addresses these issues. First, it provides a comparative assessment of influences on investor behaviours among macro, firm-level and micro perspectives. To investigate macro-economic influences the study adopts cointegration analysis of monthly data covering the period 2001 to 2010, to assess the relationship between macro-economic variables and stock market volatility. To examine firm-level context for individual investors, 15 interviews were conducted with senior executives from five major companies listed on the Shenzhen Stock Exchange (SZSE). This study also uses a survey of n=193 respondents to explore individual investor behaviour on the SZSE. Second, these studies all focus on the SZSE. This enables a close examination of factors specific to the Chinese context.

The study produced several major findings. The correlation between stock market volatility and macro-economic indicators was found to be relatively weak. For firms, the study finds considerable agency problems and ineffective investor relations functions, thus reducing the perceived trustworthiness of these firms for investors. However, the study does find that micro-level factors, such as financial knowledge, herd behaviour and mental account, do have significant effects on investment income. These findings contrast with those recorded in Western contexts.

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A thesis in Fulfilment of the requirements for the degree
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Abstract

Investigations of investor behaviour currently adopt one of three major viewpoints.

From a macro perspective, studies tend to focus on the relationship between stock market indices and macro-economic indicators such as exchange rates, interest rates and consumer price index. From the firm's perspective, studies focus on the impact of the firm's management on stock price movements. From the micro perspective, the impact on individual investor behaviours has received attention. While these studies are informative, the theoretical underpinnings differ between each context. While macro and firm-level studies tend to assume rational decision-making and efficient markets, studies of the micro perspective highlight the behavioural underpinnings of investor choice. Moreover, these studies overwhelmingly focus on Western market contexts. Few consider East Asian markets which encompass different circumstances that affect investor behaviour.

This study addresses these issues. First, it provides a comparative assessment of influences on investor behaviours among macro, firm-level and micro perspectives.

To investigate macro-economic influences the study adopts cointegration analysis of monthly data covering the period 2001 to 2010, to assess the relationship between macro-economic variables and stock market volatility. To examine firm-level context for individual investors, 15 interviews were conducted with senior executives from five major companies listed on the Shenzhen Stock Exchange (SZSE). This study also uses a survey of n=193 respondents to explore individual investor behaviour on the SZSE.

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the Shenzhen Stock Exchange. *In: ABMC Official Conference Proceedings, 2012.*

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Abbreviations

List of Abbreviations and Acronyms

Term	Meaning
ADF	Augmented Dicky-fuller
AIC	Akaike Information Criterion
AGFI	Adjusted Goodness of Fit Index
ARCH	autoregressive conditional heteroskedasticity
ARIMA	autoregressive integrated moving average
ASEAN	the Association of Southeast Asian Nations
ASX	Australian Stock Exchange
AVE	average variance extracted
BPT	behavioural portfolio theory
BPT-MA	behavioural portfolio theory-a multiple mental account version
BPT-SA	behavioural portfolio theory-a single mental account version
CAPM	capital asset pricing model
CBOE	Chicago Board Options Exchange
CFA	confirmatory factor analysis
CFO	chief financial officer
CFI	comparative fit indices
CPI	consumer price index
ECM	error-correction model
EFA	exploratory factor analysis
EG	Engle-Granger two-step model
EMH	efficient markets hypothesis
EVA	economic value added
exchangerate	exchange rate
FDA	Food and Drug Administration
GDP	gross domestic product
GEM	growth enterprise market
GFI	goodness of fit index
ibwai	the inter-bank weighted average interest rate
IMF	International Monetary Fund
interestrate	short-term interest rate
ipgr	industrial production growth rate
IPO	initial public offering
IR	investor relations
JJ	Johansen and Juselius procedure
LM	lagrange multiplier
MAR	mean-adjusted returns
MLE	maximum likelihood estimation
m1	money supply 1
MVE	market value added
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-operation and Development
OLS	ordinary least-square
P/E ratio	price-earnings ratio
PPI	producer price index

QFII	Qualified Foreign Institutional Investor
RMSEA	root mean square error of approximation
SBC	Schwarz Bayesian criterion
SDR	special drawing rights
SEM	structural equation modelling
sfer	state foreign exchange reserves
SHSE	Shanghai Stock Exchange
SME	small and medium enterprises
SML	security market line
SZSE	Shenzhen Stock Exchange
szsem	SZSE Manufacturing Index
TLI	Tucker Lewis Index
UAE	United Arab Emirates
UK	United Kingdom
US	United States
VECM	vector error-correction model

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Chapter 1 Introduction

1.1 Introduction

Alan Greenspan used the term 'irrational exuberance' to describe the behaviour of stock market investors on 5 December, 1996. This behaviour dramatically affected the world stock market in the following days (Shiller, 2000a, p.1). Shiller (2000a) used the phrase 'irrational exuberance' as the name of his book to put forward the view that the American stock market had been experiencing a bubble, but that most people, not only ordinary investors but also the government and even the famous and professional economists who believed in clever statistics modelling, had not realised this. Shiller applied a wide range of published research as well as historical evidence to support his argument. At the same time, he combined psychology and social science with finance analysis to sustain his argument.

Shiller (1990) provided evidence of his research through popular models by using three typical topics: the stock market crash of 1987, the estate boom in the late 1980s and underpricing of initial public offerings. He concluded that among the popular models, investor psychology is such an important factor that it can drive the market, which is especially reflected in the stock market. This conclusion also constitutes the empirical basis for the behaviour analysis in this research.

'Irrational exuberance' systematically outlined Shiller's anxiety about the bubble of the American stock market. In particular, Shiller addressed several events which occurred outside the stock market but affected it, such as the popularity of the internet, the baby boom, capital gains tax cuts, analysts' increasingly optimistic forecasts and the expansion of defined contribution pension plans. This evidence showed that social

factors were also important components of the entire financial market system (Shiller, 2000a).

Investigations of investor behaviour currently adopt one of three major viewpoints.

From a macro perspective, studies tend to focus on the relationship between stock market indices and macro-economic indicators such as exchange rates, interest rates and consumer price index (CPI). From the firm's perspective, studies focus on the impact of the firm's management on stock price movements. From the micro perspective, studies concentrate on the specific impact on individual investor behaviour.

Currently, there are few comparative studies of the relative effects of the three perspectives on investor behaviour, though several combine survey responses and the trading record of investors. Moreover, the current suite of studies of investor behaviour focuses on Western market contexts. While most analyses of macro-economic environment for investors concentrate on the Western context, several researchers also pay attention to the stock markets in Asian countries such as Korea and Malaysia. This is problematic given the emergence of China and other Asian markets as some of the world's largest capital markets.

This study addresses these issues. Firstly, it focuses on investor behaviour in China.

Through an investigation of the Shenzhen Stock Exchange (SZSE), the study shows that the SZSE has several particular characteristics, which means that investors on the SZSE face a unique investment environment. Secondly, the study provides a comparative assessment of influences on investor behaviour among macro, firm-level and micro perspectives.

To investigate macro-economic influences the study adopts cointegration analysis of monthly data covering the period 2001 to 2010 to assess the relationship between macro-economic variables and stock market volatility. To examine the firm-level context for individual investors, 15 interviews were conducted with senior executives from five major companies listed on the SZSE. Lastly, this study uses a survey of n=193 respondents to explore individual investor behaviour on the SZSE.

This chapter offers a brief review of background literature relating to the research topic, an overview of the SZSE on which the study is based, a discussion of related research questions, a discussion of methods used and a summary of the thesis structure.

1.2 Background literature

1.2.1 Debates between standard finance and behavioural finance

This section discusses two major debates between standard finance and behavioural finance: the efficient markets hypothesis (EMH) and rational economic man. A discussion of these debates is important in carrying out the following analyses with regard to behavioural finance.

1.2.1.1 Efficient markets hypothesis

Malkiel and Fama (1970) formalised the EMH, proposing a strong efficient financial market in which the price of securities always fully reflects all available information, both public and private. The existence of rational investors and a competitive market regime were assumed in the EMH (Malkiel and Fama, 1970, pp.387-388). It is based on three arguments which depend on progressively weaker assumptions (strong, semi-strong and weak): firstly, investors are rational, so they treat securities rationally. Secondly, to the extent that investors are not rational, their selections are random and

therefore cancel each other without affecting price. Finally, investors are irrational in similar ways, but they are met in the market by rational arbitrageurs who can eliminate their influence on price (Shleifer, 2000, pp.5-6).

However, financial markets in most scenarios are not expected to be efficient. One relatively early summary of the inconsistencies in the EMH was published in a special issue of the *Journal of Financial Economics* (Jensen, 1978). It brought together the anomalous evidence in regard to market efficiency (Jensen, 1978). Related tests involved the EMH with the two equilibrium models of asset price determination (the model has the ability to measure and predict abnormal stock returns) (Vaz, 2011). Ball (1978) examined the stock price reaction to earnings announcements. The evidence from 20 studies showed that abnormal returns were due to inadequacies in the two parameter asset pricing model used in those studies to adjust for risk differentials. In summary, Ball (1978) rejected the EMH because of the problems in the two parameter asset pricing model.

In a later study, Watts (1978) also found significant abnormal returns, even after controlling for the effect of the two parameter asset pricing model. He concluded that the abnormal returns were due to market inefficiencies rather than pricing model deficiencies. Galai (1978) conducted another discussion of whether the prices of stocks on the New York Stock Exchange (NYSE) and the prices of their respective call options on the Chicago Board Options Exchange (CBOE) behaved as a single synchronised market. Galai (1978) suggested that the CBOE market for options could not be efficient, since the two markets (NYSE and CBOE) did not behave as a single synchronised market and positive profits could be obtained from the trading rule. Chiras and

Manaster (1978) reached similar conclusions, finding that a trading strategy that used the information content of the implied variances of future stock returns yielded abnormally high returns. Besides these studies, Grossman and Stiglitz (1980) also challenged EMH. They argued that there was a crucial conflict between the efficiency with which markets spread information and the incentives to obtain information. Information was costly, so prices could not fully reflect the available information, because if it did, those who used resources to retrieve it would receive no compensation (Grossman and Stiglitz, 1980). Thus, Grossman and Stiglitz (1980) believed it was not possible for a competitive economy to always be in equilibrium. Apart from the above arguments, several studies challenged market efficiency on the basis of particular effects, such as seasonal effects, day-of-the-week effects and momentum effects. For example, Rozeff and Kinney (1976) presented evidence of seasonality in monthly rates of return on the NYSE, especially the large January return. They pointed out that it was possible for investors to earn abnormal rates of return as a result of that obvious seasonal pattern, although they also argued that seasonality would not raise serious problems for the efficient market model. Similarly, the empirical results of Gibbons and Hess (1981) showed persistent negative mean returns on Monday, as well as below-average returns for bills on Monday (the Monday effect). On the other hand, Rogalski (1984) examined trading and non-trading day returns in order to better understand the Monday effect. His research stated that all the average returns from Friday close to Monday close occurred during the non-trading period, and that average trading day returns were related to the January effect and firm size. Besides the January effect and the Monday effect, Jegadeesh and Titman (1993) found that the strategies which bought stocks that had performed well in the past and sold

stocks that had performed poorly in the past produced obviously positive returns over three- to 12-month holding periods. This result is referred to as the momentum effects, meaning that the recent performance of stocks could last for a period of time.

1.2.1.2 Rational economic man

Standard finance relied on three assumptions from neoclassical economics: (1) people have rational preferences among outcomes that can be identified and associated with a value; (2) individuals maximise utility and firms maximise profits; (3) people act independently on the basis of full and relevant information (Weinstein et al., 1980). By contrast, behavioural finance is the investigation of human fallibility in competitive markets, and theories in the field of behavioural finance rest on two foundations: limited arbitrage and investor sentiment (Shleifer, 2000).

Traditional arbitrage in financial markets requires no capital and entails no risk (Shleifer and Vishny, 1997). In regard to limited arbitrage, Shleifer and Vishny (1997) pointed out that some expert arbitrageurs in the financial markets invested the capital of outside investors. At the same time, investors used arbitrageurs' performance to prove their capability to invest profitably. As a result, this kind of specialised performance-based arbitrage might have one implication for securities pricing: namely, the arbitrage might not be completely effective in bringing securities prices to fundamental values, especially under extreme circumstances. Therefore, in fact, almost all arbitrage required capital and was risky (Shleifer and Vishny, 1997).

Although expert arbitrageurs offered considerable average returns by avoiding extremely volatile arbitrage positions, the fluctuation still 'exposes arbitrageurs to risk of losses and the need to liquidate the portfolio under pressure from the investors in the fund' (Shleifer and Vishny, 1997, p.54). The model Shleifer and Vishny (1997) used

in their paper showed that limits to arbitrage might partly explain the appearance of anomalies in the financial markets. In a later study, Hirshleifer (2002) discussed the importance of investor psychology for securities prices, by summarising a number of theories based on behavioural research that implied investor rationality was overstated. He found that arbitrage was a 'double-edged blade', that is, rational investors arbitrated away inefficient pricing, while irrational traders arbitrated away the effects of efficient pricing. Hirshleifer (2002, p.1537) also suggested that bias was the thing that human beings found impossible to avoid, implying that bias could manifest itself as 'idiosyncratic mispricing'.

A number of studies in the field of behavioural finance have been conducted in regard to investor sentiment, covering various types of investors' behavioural biases. For example, in a relatively early study, Tversky and Kahneman (1973, p.209) pointed out that frequent events were easier to recall or imagine than infrequent ones; so availability was an valid clue for the judgement of frequency. At the same time, availability was affected by other factors that were unrelated to actual frequency, and they might affect the proposed frequency. Then the use of the availability heuristic leads to systematic biases (Tversky and Kahneman, 1973).¹ De Bondt and Thaler (1985, p.793) pointed out that expectations of expert stock analysts and economic forecasters showed the same overreaction bias. Thus, they explored whether investors' overreactions to unexpected events mattered at the market level. They stated that portfolios of prior 'losers' outperformed prior 'winners', because they found that the

¹ Kahneman won the Nobel Prize in 2002 for 'having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty' (Nobel Prize, 2002).

losing stocks had made profits of 25% more than the winners 36 months after portfolio formation (De Bondt and Thaler, 1985, p.793). Black (1986, p.5) referred to the difference between 'rational traders' and 'noise traders': rational traders made decisions based on news, including facts and forecasts, whereas noise traders made decisions relying on anything else. Statman (1999) argued that some of the differences between rationality and irrationality were similar to the distinctions between utilitarian characteristics (such as risk) and value-expressive characteristics (such as sentiment) in the investment context. In particular, he gave an explanation of market efficiency: 'security prices are rational—that is, reflect only fundamental or utilitarian characteristics, such as risk, but not psychological or value-expressive characteristics, such as sentiment' (Statman, 1999, p.18).

In sum, the development of behavioural finance theory has undermined the hegemony of EMH and the proposition of rational economic man. A large number of scholars have challenged those two classical arguments using new models, theories and experimental evidence (Tversky and Kahneman, 1992; Thaler, 1993; 1999; Shiller, 2000b; Shleifer, 2000; Shefrin and Statman, 1994; 2000).

1.2.2 Macro-economic context for individual investors

The status of economic activity was found to be an important reference for investors when they made investment decisions; in other words, macro-economic activity was the factor that significantly influenced investors' choices (Shiller, 2000a; Al-Tamimi and Emirates, 2006; Merikas et al., 2011; Nagy and Obenberger, 1994). At the same time, the research into the economic activity was conducted on the basis of the industry environment and firm performance, and the industry environment could be

represented by the collected macro-economic indicators, such as exchange rates, interest rates or inflation rates (Vaz, 2011).

In a number of developed countries, such as the United States (US) and the United Kingdom (UK), there was a positive relationship between stock market fluctuations and changes in economic activity; in other words, stock prices were a leading indicator of the business cycle (Lenten and Moosa, 2003). Furthermore, Næs et al. (2011) argued that the composition of investors' portfolios varied with the volatility of the business cycle, and investor participation could be motivated by market liquidity. Nevertheless, in China, some researchers held the view that the correlation between China's stock market volatility and economic activity was weak, and even showed a status of deviation (Jin, 2011; Wang, 2000; Huang, 2004; Yan et al., 2004).

Collected macro-economic indicators have been included in discussions regarding the cointegration relationship between stock market fluctuations and movements of macro-economic indicators, including exchange rates, interest rates, money supply, inflation rates and industrial production. Some indicators were found to be positively related to stock prices, such as industrial production (Schwert, 1990; Ratanapakorn and Sharma, 2007). In contrast, a few indicators have various effects on stock prices because of different time periods, such as inflation rates or interest rates (Crowder, 2006; Vaz et al., 2008; Mandelker and Tandon, 1985; Luintel and Paudyal, 2006).

1.2.3 Firm-level context for individual investors

Influences of corporate operations on individual investors can be explored from a series of perspectives, including corporate governance, corporate management and the relationship between social environment and corporate performance. The relationship between ownership structure and the firm's performance has been the

core issue in corporate governance (Mutairi, 2011). In particular, agency theory could be used to explain the conflicts of interest between inside owners and outside shareholders (Eisenhardt, 1989).² In addition, related studies have revealed that managers as agents of shareholders might not act in the best interest of the shareholders all the time (Mutairi, 2011).

With regard to the impact of social environment (in terms of sustainability and social responsibility) on corporate performance, relevant studies have shown mixed results. For example, Mcguire et al. (1988) found that an increase in perceived social responsibility could improve the image of the firm's management and reputation. Furthermore, socially responsible activities could improve a firm's standing with important constituencies, such as investors (Mcguire et al., 1988). In contrast, a few studies indicated that issues regarding environmental concerns had negative effects on firm performance, because firms had to invest in considerable resources which were used to produce sustainable services and goods; this kind of behaviour then might destroy shareholders' value (Judge Jr and Krishnan, 1994; Freeman, 1994).

Apart from the aspects discussed above, investor relations (IR) has been another crucial function in corporate operations. IR deals with communication between the company and investors, and is a subset of marketing (Brown, 1997; Rao and Sivakumar, 1999; Dolphin, 2004). In the West, companies had effective IR units that could materially enhance company values. At the same time, establishing an IR unit could have a significantly positive effect on the firm's interactions with other stakeholders, especially individual investors (Bushee and Miller, 2005; Hockerts and Moir, 2004; Laskin, 2007).

² Agency theory is further discussed in Chapter 2.

1.2.4 Micro-level influences on investor behaviour

A number of studies in the field of behavioural finance have been conducted in regard to the effects of behavioural biases on investment behaviour, such as emotional and cognitive biases. For example, Shefrin (2002) used case studies to explain how psychological biases affected investors as well as financial markets, based on three categories: heuristics-driven bias, framing dependence and inefficient markets. He argued that investors underestimated how vulnerable they were to psychologically induced errors, and that the investors were not as intelligent as they believed themselves to be (Shefrin, 2002). Similarly, Shiller (2000a) raised the classic case of Ponzi schemes to explain the amplification mechanism in the stock market.³ In doing this, he provided evidence of investors' high confidence, expectations and emotions. He pointed out that naturally occurring Ponzi processes induced speculative bubbles in the stock market, and that what worked in the processes was speculative feedback loops (Shiller, 2000a, p.56).

Collected behavioural biases have been included in discussions in relation to investor behaviour, such as self-control, herd behaviour, overconfidence, mental account and risk aversion. For example, when looking at investor trading behaviour, Odean (1999) discussed the effects of investor overconfidence on their portfolio returns. He found that overconfident investors might trade excessively, despite the fact that sometimes their expected returns could not cover the trading cost (Odean, 1999). Even when the trading cost was ignored, these overconfident investors lowered their gains through too much trading. Odean (1999) also referred to the disposition effect, namely that

³ A Ponzi scheme is an investment fraud that involves the payment of purported returns to existing investors from funds contributed by new investors (U.S. Securities and Exchange Commission, 2013).

investors were prone to selling stocks that had increased rapidly in recent days, and they were found to sell more winners than losers. One explanation proposed by Odean was that these investors did not obtain useful and correct information that they were misinterpreting (Odean, 1999, p.1296). In a further study of overconfidence, Barber and Odean (2001) confirmed that overconfident investors traded too much, and they found that men were more prone to overconfidence than women, so that men performed worse than women. They also emphasised that it was impossible for investors to behave with extreme rationality on financial markets, and the deviations from rationality were usually systematic. In another study regarding behavioural biases, Kumar (2009) found that overconfidence and disposition bias were more obvious and strong when there was higher market-level uncertainty. Empirical results using investor-level data in this study also showed that when stocks were more difficult to value, individual investors behaved with more overconfidence bias and disposition effect. There is further discussion relating to each of the behavioural biases in Chapter 2.

1.2.5 Research gaps

Based on the background literature, several major gaps in the research can be found. First, the previous literature has mainly focused on the stock market or investment environment in Western countries; few studies have considered Eastern contexts. This study investigates individual investor behaviour in the Chinese context, especially the case of the SZSE.

Second, few studies have combined the exploration of investor behaviour with the macro-economic or firm-level context. This study not only explores individual investor

behaviour on the SZSE, but also discusses the macro-economic environment and firm-level context for individual investors in China.

Finally, few studies have concentrated on the effects of behavioural factors on investors' investment decisions. This study explores a series of behavioural biases that investors may have in the investment process, investigating the impact of related behavioural biases on investors' investment income on the SZSE.

1.3 Overview of the Shenzhen Stock Exchange

The study considers the SZSE as the primary empirical context. This facilitates an exploration of investor behaviours in a market context that is focused on small and medium businesses and high-tech innovative enterprises.

Apart from Hong Kong, which is now part of a special economic zone, two stock exchanges—namely the Shanghai Stock Exchange (SHSE) and the SZSE—have almost exclusive dominance of the mainland Chinese securities markets. While the SHSE began trading in securities in the 1860s (falling into disrepair in the post-World War II period and re-established in 1990), the SZSE was established on 1 December, 1990. Both are self-regulated legal entities under the supervision of the China Securities Regulatory Commission. Functions of the SZSE include providing a facility for securities trading, formulating operational rules, arranging securities listing, organising and supervising securities trading, offering membership supervision and oversight of listed companies, as well as managing and publicising market information.

Because of the particular design of the SZSE, most emerging listed companies are generated from private rather than from state-owned enterprises. Since the economic reform process began in China since 1979, state-owned enterprises have been

retained; however, the private sector has been allowed to emerge and develop quickly (Basu et al., 2007a). The SZSE is committed to developing China's multi-tier capital market system (Shenzhen Stock Exchange, 2013). The SZSE not only gives full support to the development of small and medium businesses but also to the implementation of a national strategy for independent innovation. A Small and Medium Enterprises (SME) Board was launched in May 2004, and another submarket called the ChiNext Growth Enterprise Market (GEM) was inaugurated five years later in October 2009. Thus, the SZSE provides the framework for a multi-tier capital market system by coordinating the combination of the main board, SME and GEM. On 30 September 2011, the SME Board had 618 listed companies; GEM now has 267 listed companies (Shenzhen Stock Exchange, 2013).

The Chinese stock market has its own characteristics, which constitute a unique environment for investors on the SZSE. The main purpose of this research is to investigate individual investor behaviour on the SZSE. Thus, in order to demonstrate the particular investment environment for investors in China, this section discusses specific features of the Chinese stock market from five perspectives: the performance of the SZSE, investor composition, the relationship between investors and the market, stock market conditions and government interventions.

1.3.1 Performance of the SZSE composite index, 1991 to 2010

In the 20 years to 2010, the development of the Chinese stock market can be categorised into four stages: (1) the bull market from 1992 to 2001; (2) the bear market from late spring 2001 to the middle of 2005; (3) significant bull and busts from the middle of 2005 to 2007; and (4) a fluctuating period of falls and adjustments from

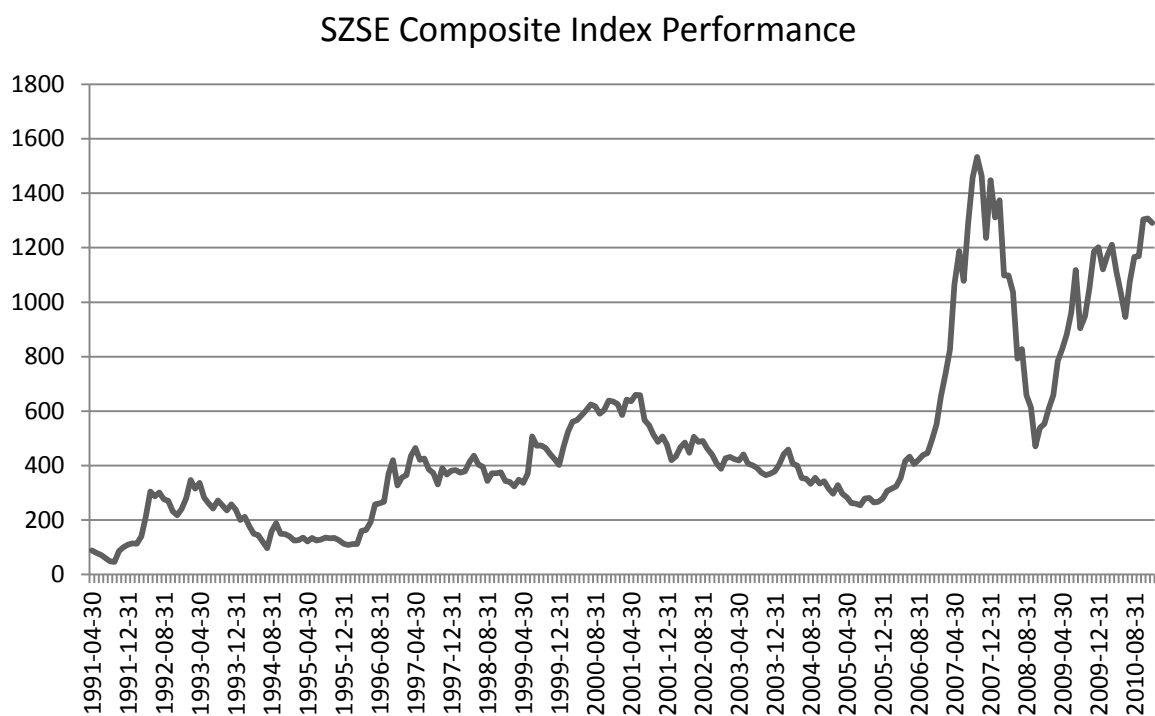
2008 to 2010. Figures 4.1 and 4.2 show the tendencies of the SZSE composite index and the component index from 1991 to 2010.⁴

In 1991, the initial stage of establishment of the SZSE featured unilateral inflation or correction. The lowest point was 396.52, evident on 7 September, 1991. The closing price was 407.54 on 20 September, 1991, constituting the bottom closing price of the SZSE over the 20 years.

From 1992 to 2001, the Chinese stock market experienced an overall bull market with a large degree of volatility. The initial four years were unstable (Tan, 2008). From late 1991, the SZSE component index climbed and reached 2718.53 as the closing price on 2 June, 1992. However, the market dropped by 7% the next day, and continued to decrease to hit the bottom in the following days (Xiao, 2003). After three months' adjustment, the SZSE component index achieved a new height of 2883.45 on 10 August, 1992. The highest closing price in 1993 was 3268.75 on 23 February, yet after that the index adjusted to 1192.5 in April 1994 and then slipped down to 970.39 on 28 July within the same year.

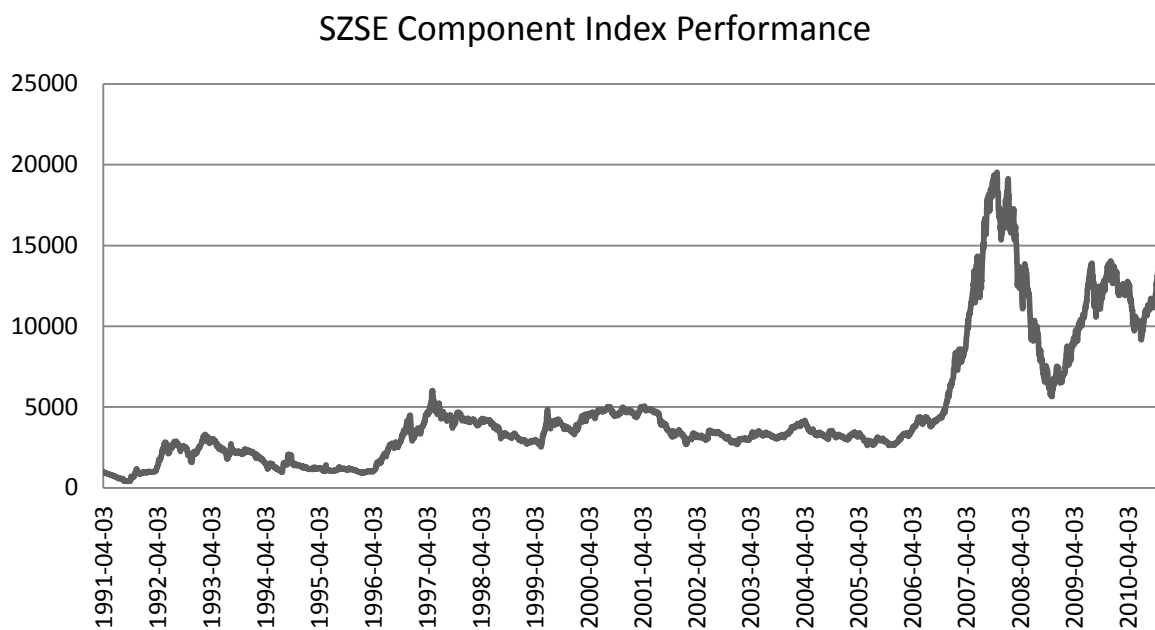
⁴ The index shares of the composite index refer to all the stocks listed on SZSE. The SZSE composite index was established at 100 points on 3 April, 1991, which was the predominant measure of the overall performance of the SZSE. Another index, called the 'SZSE component index', is usually used to represent the market activity of the SZSE, being an index of 40 stocks that are traded on the SZSE. The SZSE component index was published on 23 January, 1995; the index is 1000 points on 20 July, 1994 as the base date. These two indexes move simultaneously. Here, the SZSE composite index is used to describe the tendency of the SZSE.

Figure 1.1 Performance of the SZSE composite index, 1991 to 2010



Source: Resset Database (2011)

Figure 1.2 Performance of the SZSE component index, 1991 to 2010



Source: Resset Database (2011)

During the following years, until 2001, the indices of the two stock exchanges in mainland China trended up gradually and the bull market remarkably turned upwards. The SZSE index reached a high point of 5033.79 on 18 April, 2001. Over this period, the SHSE index climbed by 270% and the SZSE index as much as 460% (Xiao, 2003).

Generally, the SZSE experienced frequent fluctuations during the first 10 years and matured gradually.

From the second quarter of 2001 to 2005, the Chinese stock market experienced a period of bear market. After a dramatic decrease in July 2001, it was stagnant over the next 15 months (Tan, 2008). The indices had some improvements until the last two months of 2003. A slight rise appeared at the beginning of 2004, and finally the SZSE component index went up to 4051.96 on 9 April. However, this kind of rise did not fundamentally affect the tendency of the bear market. The SZSE component index bottomed out at 2590.53 on 3 June, 2005, which was the first time after October 1996 it hit a point under 2600.

From then on, the Chinese stock market touched the bottom and bounced back up, then significant bull and busts lasted from the middle of 2005 to 2007 (Harriss, 2007).

After the low ebb in 2005, a sharp increase of 100.39% occurred in the SZSE and 135.54% in the SHSE in 2006. The highest point of the SZSE component index during this period was 19600.03 on 10 October, 2007; this also became the historical high point for the past 17 years. Throughout 2007, the Chinese stock market operated under thriving circumstances. Investors who obtained stock bargains in 2005 would possibly have earnings five to ten times higher in 2007 (Hu, 2011).

The bear market started from 2008, with the substantial decline lasting for a whole year. The SZSE component index hit a low of 5577.23 on 28 October. Then the Chinese stock market trended up for several months until achieving a peak of 13943.44 on 5 August, 2009. Overall, the market was erratic with fluctuating falls and adjustments from 2008 to 2010.

In sum, the SZSE was established in the early 1990s, so it was still under development at the time of this research. The growth process was accompanied by a large degree of volatility and unpredictability, which resulted in unsettled market conditions (Girardin and Liu, 2003).

1.3.2 Investor composition

Statistics show that there were huge numbers of individual investors in the Chinese stock market: at the end of 2000, the total number of A-share accounts on both the SHSE and the SZSE was 57.79 million, yet of these only 1.35 million accounts were held by institutional investors (Wang and Chin, 2004). By the end of 2007, from the perspective of the proportion of investment share, individual investors accounted for 51.29% of the total. By contrast, securities investment funds only accounted for 25.68% (Yang, 2008). According to the data published on October 2007, from January to August, the accounts held by individual investors, whose cash and stock market value was less than one million yuan accounted for 99.3% of all the accounts actually holding the stocks (Shenzhen Stock Exchange, 2007b). The transaction amount of the accounts held by these individual investors accounted for 73.6% of the total transaction value, and the share market value of their accounts accounted for 45.9% of the total market value (Shenzhen Stock Exchange, 2007b). The data shows that individual investors are

the main force on the China stock market, but unfortunately this situation has nothing to do with their obtained benefits (Harriss, 2007).

The Chinese stock market has also been a 'narrow' market, because A shares were only available for Chinese domestic institutions and investors (except the Qualified Foreign Institutional Investor (QFII)),⁵ and B shares were set up for foreign investors before the market was opened to local investors in February 2001 (Wang and Chin, 2004; Tan, 2008). On the other hand, a large number of individual investors reflected the reality of limited investment styles and poor portfolio diversification instruments in China (Wang and Chin, 2004).

1.3.3 Relationship between investors and the market

Share prices in Hong Kong or in the US were traded on the basis of more fundamental valuation measures; however, the Chinese stock market was very 'thin' owing to the nature of its market participants, since individuals who invested relying on technical analysis or news flows dominated the market (Harriss, 2007).

Nam et al. (1998, p.78) stated that the 'casino' character of the Chinese stock market was its main feature, and most investors treated it like a 'casino'. Thus, investing on the two stock exchanges in mainland China was a risky business. It was hard for investors to make high capital gains even in a bull market (Nam et al., 1998). Measured by the variance in capital income, risk was regarded as skyrocketing in such a speculative market (Girardin and Liu, 2003). At the same time, Chinese investors believed that a cheap stock was one that had a low price, rather than a low price-earnings (P/E) ratio (Nam et al., 1998; Tan, 2008).

⁵ The Qualified Foreign Institutional Investor (QFII) program was launched in 2002 in the People's Republic of China to allow licensed foreign investors to buy and sell Yuan-denominated A shares on China's mainland stock exchanges (in both Shanghai and Shenzhen).

Unsophisticated domestic investors who had little experience or skills showed strong herd behaviour when they invested on the stock market (Nam et al., 1998). They were prone to exhibiting behavioural biases (such as overconfidence or representativeness bias), and to making poor investment decisions. Sometimes the degree of sophistication did not really mitigate investors' behavioural errors, or improve their investment performance (Chen et al., 2004). Overall, the relationship between investors and the stock market has in reality not been rational in the Chinese case.

1.3.4 Specific market conditions

The Chinese stock market has not been regarded as the indicator of the direction of the Chinese economy, because the fluctuating performance of the indexes for the two exchanges cannot adequately reflect China's real economic conditions (Harriss, 2007). This phenomenon can be partly explained by two particular features of the Chinese stock market. Firstly, the P/E ratio on average on the Chinese stock market is higher than elsewhere. For the case of the SZSE, the P/E ratio on the SME Board was 35, and that of the Chinext GEM was 50 (Zhao and Tao, 2013). By contrast, the average P/E ratio on the NYSE was 14.5 and the Australian Stock Exchange (ASX) was 15 (Jia, 2007). One of the factors causing the high P/E ratio was that the Chinese economy has had a high growth rate over the last two decades, which increased the P/E ratio. China's gross domestic product (GDP) in 1991 was 2,178,100 million yuan, compared with 30,067,000 million yuan in 2008, which can be calculated as a growth of 1280.42% (National Bureau of Statistics of China, 1999; 2000; 2001; 2002; 2003; 2004; 2005; 2006; 2007; 2008). This growth is much greater than in America and Australia. China's GDP growth rate per year on average from 1991 to 2008 was 10.3%, while in the US it was only about 3% (Xi, 2007; National Bureau of Statistics of China, 1999-2008).

The second feature of the Chinese stock market is that it has actually not been an open market, as a result of China's closed capital account. At the time of this research, the Chinese currency yuan for capital account was not generally allowed to be freely changed from or to other currencies, as well as not being allowed to move freely in or out of the country. Extremely strict rules and restrictions were enforced for foreign investors who wanted to enter the domestic market, and similar restrictions were also in force for local investors who tried to go outside (Harriss, 2007).

1.3.5 Government intervention and rigorous regulations

There is direct and frequent government intervention in the Chinese stock market. Furthermore, rigorous regulations have also been enforced for relevant listed companies.

Basically, listed companies would raise the supply of equity to arbitrage the difference if the equity price exceeded their fundamental value. This was called the 'automatic market correction mechanism', which was evidenced in the measures taken by US firms issuing equity when their market value was high (Baker and Wurgler, 2002). However, a similar process has not worked well in the Chinese stock market. Since strict government intervention was enforced on company initial public offering (IPO), most steps in the process of companies dealing with their equity became somewhat political (Mei et al., 2005). The indispensable prerequisite for listed firms to sell their equity was to obtain approval from related regulations and governments. Because of government regulation of the IPO process, examination procedures usually took a long time; the complicated steps even restricted qualifying companies from taking advantage of optimum market conditions to arrange their shares (Mei et al., 2005). On the other hand, as will be argued from the data from management interviews in

Chapter 5, companies that wanted to implement IPO really needed local government support, with more helpful resources and financial assistance.

Previous literature has mainly discussed share tradability restrictions and short-sales constraints unique to the China stock market, so the discussion in this section focuses on the issues of state share reduction in listed companies (Mei et al., 2005; Tan, 2008; Wang and Chin, 2004). According to the half-yearly reports of listed companies on both the SHSE and the SZSE in 1998, the number of companies in which the ratio of stated-owned shares exceeded 50% in the total share capital reached 237, accounting for 33.58% of the 813 companies. Notably, among those 237 companies, 112 had a total share capital of more than 400 million yuan. In those 112 companies the majority were stated-owned shares, because in more than 50 companies the proportion of state share was over 70%. However, on the basis of this kind of company capital composition, the large proportion of state shares resulted in imperfect corporate governance structure, serious corruption, loss of state assets and a large number of economic crimes (Yuan, 2000).

In order to rectify the corporate governance structure and improve the efficiency of corporate operation, the 'state share reduction' pilot proposal was introduced in 1999. After several years' discussion and attempts at implementation, the measures to reduce stated-owned shares were formally implemented from 2005 (Zhu, 2009). This approach suggested adjusting stated-owned shares as one of the policy instruments that could regulate the development of the economy. Furthermore, it achieved the goal of equity diversification in state-holding enterprises, gradually forming standardised corporate governance (Dong, 2009). Nevertheless, four industries or

areas are still controlled by the state: (1) industries involving issues of national security (such as important military or nuclear industry); (2) natural monopolistic industries (including basic telecommunications, railways, electricity, gas and water); (3) industries providing important public goods and services (such as environmental protection facilities, urban public transport and some financial and insurance industries); and (4) pillar industries and key enterprises in high-tech industries (such as large-scale mining, oilfields or iron and steel, automobile manufacturing, and electrical and mechanical equipment manufacturing enterprises) (China's Central Government, 1999). This is one of the reasons for applying the SZSE manufacturing index to the cointegration analysis with macro-economic variables instead of the SZSE composite index in this research. Because the most important enterprises in dominant industries are state owned, using the manufacturing index gives another perspective for examining the relationship between SZSE volatility and economic activities in China.

To summarise, the Chinese stock market has its own characteristics which are different from markets in other countries. These characteristics have existed for several reasons, including investors on the market, government intervention and strict regulations.

1.4 Research questions

This study addresses the influences on investor behaviour from three perspectives: the macro-economic environment, firm-level context and micro-level influences on investor behaviour. Therefore, research questions from these three perspectives form the basis of this study.

First, to understand the macro-economic environment for individual investors on the SZSE, the study considers the following question:

- How does stock exchange volatility relate to movements of macro-economic indicators in the case of the SZSE?

Second, to understand the influences of firm-level factors on investor behaviour, the study asks:

- What activities do firms listed on the SZSE undertake to influence investor behaviour and how effective they are?

Third, to understand the specific micro-level influences on individual investor behaviour, the study investigates the following question:

- What are the major factors that influence individual investor behaviour on the SZSE that emerge in their micro environment and what is the impact of related factors?

1.5 Methodology

To align with and address the research questions, the study adopts three empirical approaches. The related methods used in this study are summarised in the following three sections.

1.5.1 Macro-economic context

To examine the relationship between macro-economic variables and stock market volatility, the study adopts two macro-level modelling techniques in terms of cointegration analysis, namely the Engle-Granger two-step model (EG) and the Johansen and Juselius procedure (JJ) (Edmonds and Kennedy, 2012). The EG is used here in the cointegration analysis for two variables, whereas the JJ which adopts maximum likelihood process is suitable for multiple variables (Engle and Granger, 1987; Johansen and Juselius, 1990).

Relevant macro-economic indicators include exchange rates, interest rates, inflation rates, domestic real activity and the level of money supply. The monthly data employed in this research covers the period from January 2001 to December 2010, and the sample has 114 observations. The data were obtained from the RESSET Financial Database, the National Bureau of Statistics of China, the People's Bank of China and the Shenzhen Stock Exchange Fact Book, 2001 to 2010 (Resset Database, 2011; National Bureau of Statistics of China, 2012; The People's Bank of China, 2013; Shenzhen Stock Exchange, 2002-2011b).

1.5.2 Firm-level context

To demonstrate the firm-level context for individual investors, the second major element of this study uses a qualitative approach. A series of face-to-face interviews were conducted in 2011 with CEOs and senior executives from five major companies listed on the SZSE.

This approach uses a narrative analysis to explore attempts of senior executives to influence individual investors for listed companies on the SZSE. The related discussions cover three main aspects: (1) the social context for listed companies; (2) internal biases in listed companies, such as agency problems and managers' overconfidence; and (3) IR function and individual investor behaviour from the viewpoint of senior executives.

1.5.3 Survey of individual investors on the SZSE

To examine the impact of micro-level factors on individual investor behaviour, this part of the study uses a survey of individual investors on the SZSE. A total of 217 responses were received, constituting a 27% response rate.

The questionnaire consisted of five parts: (1) personal information; (2) investment experience and basic financial knowledge; (3) individual investors' decision

frameworks and investment strategies; (4) attitudes of individual investors; and (5) follow-up information. The follow-up information in the questionnaire explores factors influencing individual investors' decisions on the SZSE. Structural equation modelling (SEM) is used to analyse the survey data.

1.5.4 Contribution of this study

The study makes several significant contributions. First, it considers individual investor behaviour in the Chinese context, especially in the case of the SZSE; thus, it is an important step in understanding how individual investors behave in an Eastern context. Second, this study not only investigates investor behaviour, but also explores both macro-economic and firm-level contexts for investors. Related contexts can demonstrate the investment environment for investors, as well as further explaining investor behaviour on the SZSE. Last but not least, this study uses the survey approach to investigate individual investor behaviour, especially exploring the effects of behavioural factors on investors' investment income. This step is also important in that it increases the behavioural relevance of investors' investment decisions.

1.6 Structure of the study

The structure of this study is summarised in Table 1.1.

Table 1.1 Structure of the study

Chapter	Contents
1 Introduction	This chapter introduces the study and summarises its contents.
2 Literature review	This chapter provides an overview of the three major perspectives of the study (macro-economic context, firm-level context and investor behaviour). It contains a critical review of the relevant literature for each perspective and identifies research gaps.
3 Methodology	This chapter demonstrates the primary methods used in the study. It is designed to give the reader a basic understanding of each without excessive detail.
4 Macro-economic context for individual investors on the SZSE	This chapter discusses the macro-economic context for individual investors from a statistical perspective, using cointegration analysis (the EG and the JJ) to explore the relationships between the SZSE index and a series of macro-economic variables.

5 Firm-level context for individual investors on the SZSE	This chapter demonstrates the firm-level environment for individual investors through a qualitative approach, by face-to-face interviews with CEOs and senior executives in five emerging Chinese companies listed on the SZSE.
6 Analysis of the survey of individual investor behaviour on the SZSE	This chapter discusses effects of behavioural biases that investors may have during the investment process on investors' performance, based on the survey conducted with individual investors on the SZSE. It also includes the process of conducting SEM, related survey sampling and demographic information of the participants.
7 Discussion and conclusion	This chapter discusses the results of the study, combining both macro-economic and firm-level perspectives with findings of the survey. It also addresses limitations of this study and suggestions for further research.

1.7 Conclusion

To summarise, this study seeks to make positive contributions to the field of

behavioural finance, investigating the relevance of individual investor behaviour. In

addition, it examines the macro-economic environment and firm-level context for

individual investors on the SZSE, further helping to explain investor behaviour.

In other words, this study is interested in discovering whether there are irrational

factors on the SZSE which are reflected in the overall pricing of stocks. If the stock

market is indeed rational, this means that all participants in the market act rationally;

the movements in the stock market will then be able to be fully accounted for in terms

of a mix of fundamentally important macro-economic real and nominal variables. In

empirical terms, there should be a cointegration of these macro-economic variables

with the movements in the value of the stock market over time. If the empirical results

in this study show that movements in the stock market cannot be fully accounted for

by movements in these macro-economic variables, then the conclusion must be that

there are some irrational factors at play. These irrational factors might operate on

either side of the market: (1) within the firms listed on the SZSE; or (2) among the

investors investing on the related stock market. Therefore, the study explores both

possibilities by using narrative techniques (Chapter 5) and survey methods (Chapter 6) for firms and investors, respectively.

This chapter has discussed related background literature, and has provided an overview of the SZSE and methods used in this study. Chapter 2 will review relevant literature and identify gaps in the literature.

Chapter 2 Literature review

2.1 Introduction

The purpose of this chapter is to constitute the theoretical and empirical basis for the analyses that will be conducted in the following chapters. Related discussion provides an overview of the three major perspectives of this study (macro-economic environment, firm-level context and individual investor behaviour).

The sequence of the discussion in this chapter is as follows: first, three basic theories in relation to investor behaviour and two theories in relation to investor decision-making and preference, namely utility theory and competing theories of financial anomalies, are discussed, constituting the theoretical empirical basis for the analysis of investor behaviour in this study. Second, literature regarding the relationships between stock market volatility and movements of macro-economic indicators are explored (these relationships are further analysed in Chapter 4 which constitutes the macro-economic context for individual investors). Third, studies pertaining to corporate operations are reviewed, and the discussion also covers corporate management as well as the relationship between social environment concern and its impact on corporate performance (the analysis regarding to corporate operation will be further explored in Chapter 5, namely the firm-level context for individual investors). Last, but not least, behavioural biases that may occur in the process of investment are investigated (these related studies comprise the theoretical and empirical basis of the analyses in Chapter 6). Gaps in the literature and limitations of existing studies in relation to different perspectives will be explicated respectively in each section.

2.2 Discussion of five basic theories in relation to investor behaviour

In the field of behavioural finance, three basic theories, namely prospect theory, behavioural capital asset pricing theory and behavioural portfolio theory (BPT), have been proposed to explain general theoretical principles in relation to human behaviour (Kahneman and Tversky, 1979; Shefrin and Statman, 1994; 2000). These three theories constitute the theoretical basis for the analysis of investor behaviour in this research. In addition, investor decision-making and preference has been widely discussed in economic research, and development of utility theory as well as competing theories of financial anomalies are adopted here to support the application of the model building in this study based on the survey data (Stigler, 1950; Baker and Haslem, 1974; Baker et al., 1977; Brav and Heaton, 2002; Von Neumann and Morgenstern, 2007).

2.2.1 Prospect theory

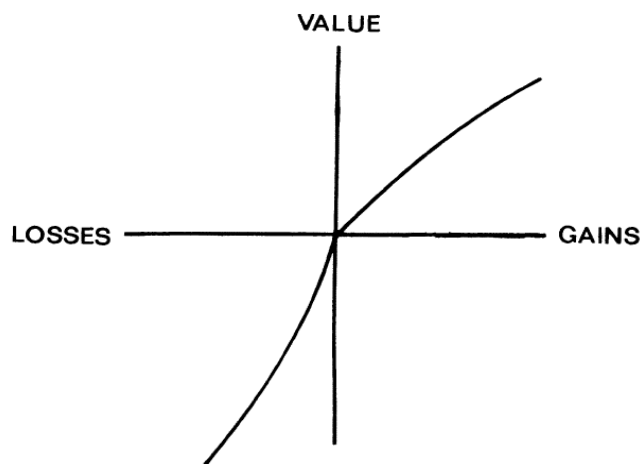
Kahneman and Tversky (1979) proposed prospect theory as a theoretical basis of critique of expected utility theory and then extended it in several respects in a later study (1992). The use of expected utility theory in the choices among prospects (that is, investors' expectations) is based on three rules: expectation, asset integration and risk aversion (Kahneman and Tversky, 1979, p.263). Through a series of experiments, Kahneman and Tversky (1979, pp.265-273) provided presumptive evidence against the expected utility theory including 'certainty, probability and possibility', 'the reflection effect', 'probabilistic insurance' and 'the isolation effect'.

In prospect theory, the choice process is categorised into two parts: 'editing' and 'evaluation'. Decision-makers in the editing part adopt a preliminary analysis of the offered prospects in order to bring about clearer representation of these prospects, including coding, combination, segregation and cancellation. After the editing, the

decision-maker compares each of the edited prospects and then chooses one prospect of highest value (Kahneman and Tversky, 1979, pp.274-277).

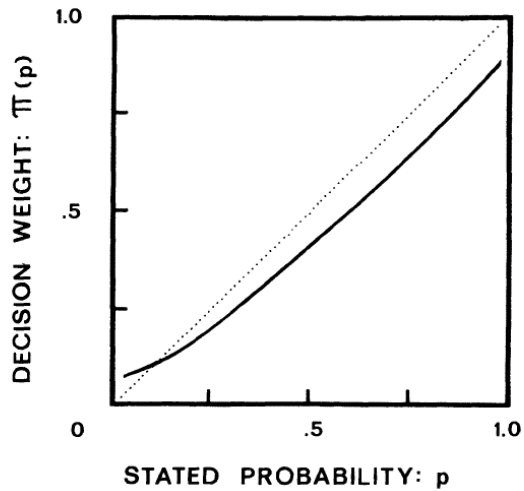
The value function in prospect theory has three essential features: firstly, the value function is affected by two factors consisting of 'the asset position that serves as reference point', and 'the magnitude of the change from that reference point' (Kahneman and Tversky, 1979, p.277). Moreover, the carriers of value are changes in wealth or welfare, not in final states. Secondly, the value function is generally concave for gains, while it is usually convex for losses. Finally, for the changes in welfare, the value function is steeper for losses than for gains. The value function is displayed in Figure 2.1. As shown in Figure 2.1, 'the proposed S-shaped value function is steepest at the reference point' (Kahneman and Tversky, 1979, p.279).

Figure 2.1 A hypothetical value function of decision-making



Source: Kahneman and Tversky (1979, p.279)

Figure 2.2 A hypothetical weighting function of decision-making



Source: Kahneman and Tversky (1979, p.283)

The weighting function (the value of each outcome is multiplied by a decision weight π in prospect theory) of decision-making in prospect theory has four properties for small probabilities as measures of degrees or beliefs: subadditivity, overweight for low probabilities, subcertainty and subproportionality. In sum, highly unlikely events are either overweighted or ignored, and the difference between high probability and certainty is either exaggerated or neglected. Thus, π is not well-behaved near the end-points (Figure 2.2), since people are limited in their ability to evaluate extreme probabilities (Kahneman and Tversky, 1979, p.282).

2.2.2 Behavioural capital asset pricing theory

Behavioural capital asset pricing theory was put forward by Shefrin and Statman (1994) to challenge the price efficiency and the capital asset pricing model (CAPM) which was developed by Sharpe (1964), Lintner (1965) and Black et al. (1972).

Markowitz (1952) undertook an analysis of diversification and then put forward modern portfolio theory, based on CAPM. CAPM indicates that the expected return of

securities is the sum of risk-free rate and risk premium. It should be emphasised that only information traders exist in the market for CAPM.

The formula for CAPM is:

$$E(R_i) = R_f + \beta_i * [E(R_M) - R_f]$$

where

$E(R_i)$: the expected return of security i

R_f : risk-free interest rate (such as interest arising from government bonds)

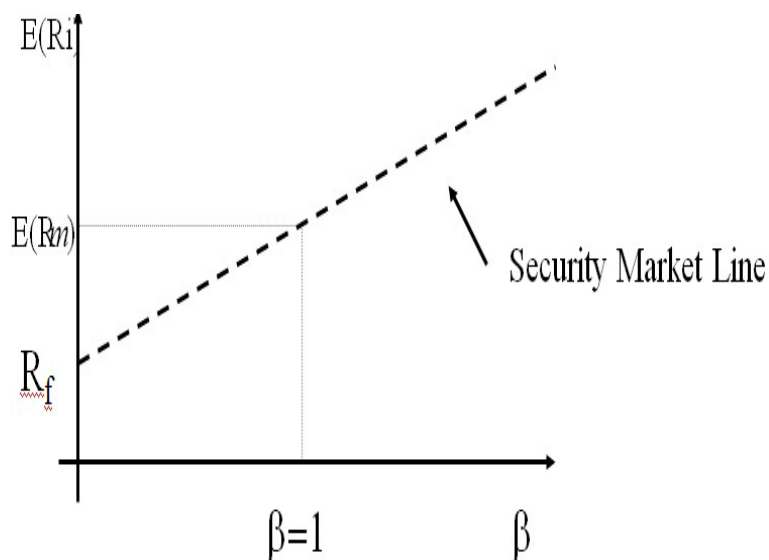
β_i : (the β coefficient) the sensitivity of the expected excess asset return of i to the expected excess market return

$E(R_M)$: expected return of the market

$E(R_M) - R_f$: risk premium

CAPM also can be described as the security market line (SML). SML indicates the linear positive relationship between the expected return of securities and market risk β . The market risk premium is determined by the slope of the SML (Figure 2.3).

Figure 2.3 The expected return of the capital asset and market risk β



Source: Black et al. (1972, pp.79-121)

Behavioural capital asset pricing theory combines noise traders with information traders together in the market. At the same time, it includes the determination of the mean-variance efficient frontier, the return in the portfolio, the term structure and option prices (Shefrin and Statman, 1994, p.323).

Information traders estimate the returns according to Bayes' rule; by contrast, noise traders commit cognitive errors because they adopt a non-Bayes' rule.⁶ When the price is efficient, the security price and its volatility are determined by a single driver. However, conditions for the efficiency of the price are not compelling. As a result, noise traders become a second driver which leads to price ineffectiveness. Among various securities and time, noise traders result in different effects:

For example, the impact of noise traders on the return to the market portfolio is less pronounced than the impact on the term structure. For the term structure, volatility is especially pronounced in long-term rates. Moreover, noise traders can cause inefficient inversions in the term structure. Noise traders also distort option prices by affecting the relevant implied return moments, including volatility (Shefrin and Statman, 1994, p.346).

Furthermore, noise traders also affect the volume of trading. Even if the price is efficient, noise traders are not eliminated in the market. Instead, to some extent, price efficiency protects noise traders and noise traders can help increase the trading volume. However, not all noise traders are protected by the market.

In particular, Shefrin and Statman (1994) argued for a new theory on the anatomy of return anomalies, because abnormal returns could not be well explained by the CAPM.

⁶ Bayes' rule is a direct application of conditional probabilities, and it allows researchers to combine new data with their existing knowledge or expertise. In probability theory, Bayes' theorem shows the relation between one conditional probability and its inverse. In particular, Bayes' rule relates the odds of event A_1 to event A_2 , before and after conditioning on event B (Murphy, 2000).

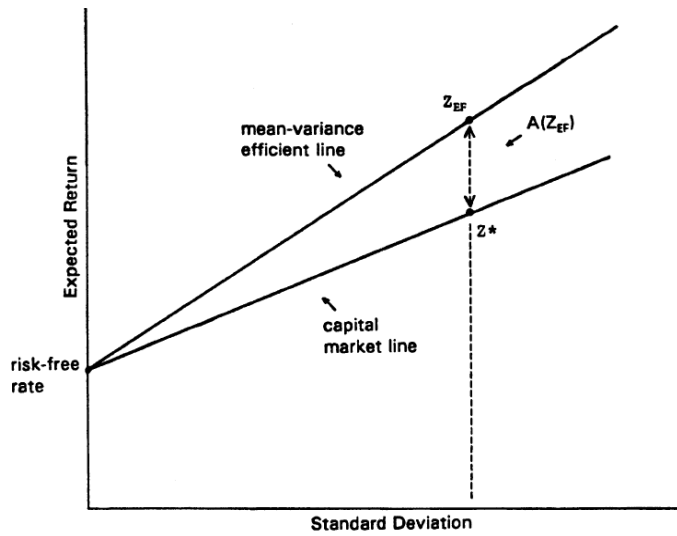
Figure 2.4 shows the mean-variance efficient risk-return line from the risk-free rate through the risk-return point Z_{EF} for P_{mv} , and also describes the capital market line from the risk-free rate through the risk-return point Z^* for the market factor p^* .

Shefrin and Statman explained the model in this way:

Let p^* be a mean-variance factor (P_{mv}) for the case in which prices are efficient. Let P^* be a function of P_w , the return on the market portfolio. We call P^* the market factor. Let $\beta^*(Z)$ be the beta of security Z measured relative to the market factor p^* . Call β^* the market beta of Z . We call $A(Z)$ the expected abnormal return. If prices are efficient and we price the risk of any security in terms of p^* , then $A(Z)$ is zero. However, suppose we use p^* as the sole factor to price risk when prices are inefficient. In this case, we should expect to find nonzero abnormal returns. This is because risk is priced in terms of P_w only when prices are efficient. Let $\beta(Z)$ be the mean-variance beta of any portfolio Z relative to P_{mv} : $\beta(Z)$ is the "true" beta (Shefrin and Statman, 1994, p.341).

To summarise this model, 'Hypothetically, suppose that we are to sort all securities according to the value of the ratio $\beta(Z)/\beta^*(Z)$. Consider a group of securities that share the same value for $\beta(Z)/\beta^*(Z)$ ' (Shefrin and Statman, 1994, p.343). Figure 2.4 shows that 'the expected abnormal is increasing in market beta $\beta^*(Z)$. In other words, the highest abnormal returns within each group will be associated with the highest market betas' (Shefrin and Statman, 1994, p.343). As a result, empirical evidence can be analysed involving abnormal returns, market beta as well as cognitive errors (Shefrin and Statman, 1994, pp.341-343).

Figure 2.4 Mean-variance efficient line and capital market line



Source: Shefrin and Statman (1994, p.342)

2.2.3 Behavioural portfolio theory

Shefrin and Statman (2000) proposed an additional theory to explore investor

behaviour in financial markets. BPT contains both a single mental account version

(BPT-SA) and a multiple mental account version (BPT-MA). According to this theory,

BPT-SA investors put their portfolios into a single account, while BPT-MA investors

place their portfolios into various accounts due to different expectations of securities' returns.

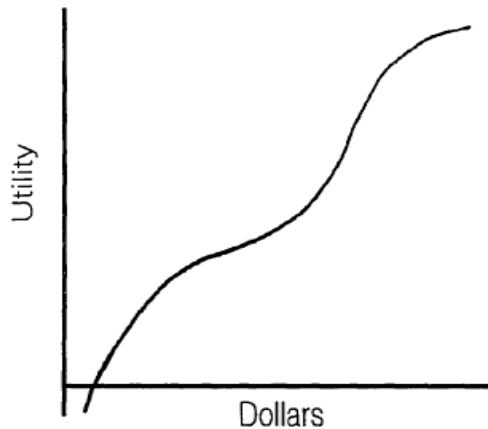
The optimal portfolios of BPT investors are similar to a combination of bonds and

lottery tickets, consistent with the Friedman and Savage (1948) puzzle. Friedman and

Savage provided a solution to the insurance lottery puzzle based on a utility function

that featured both concave and convex portions.

Figure 2.5 Friedman-Savage's Utility Function



Source: Shefrin and Statman (2000, p.129)

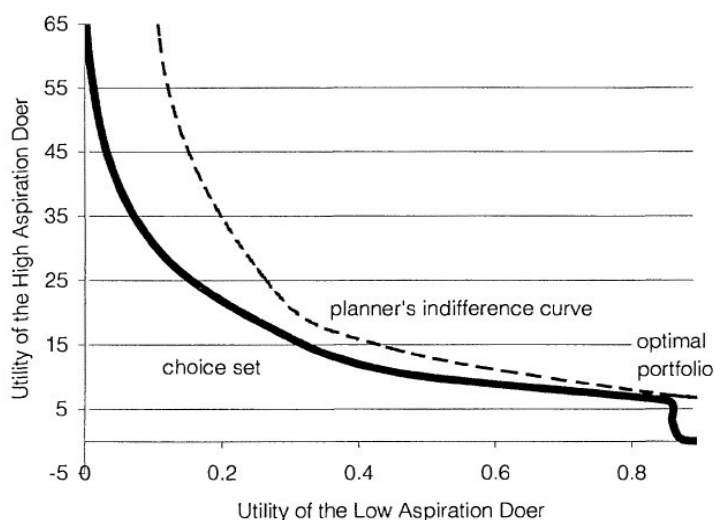
As shown in Figure 2.5, 'the concave parts are consistent with the purchase of insurance policies and the convex parts are consistent with the purchase of lottery tickets' (Shefrin and Statman, 2000, p.128). BPT-SA investors consider the covariance and then integrate their portfolios into a whole account, while BPT-MA investors commonly neglect the covariance and then segregate their portfolios into various mental accounts. In BPT, BPT-MA portfolios are similar to layered pyramids. Shefrin and Statman (2000) developed a two-layer portfolio in which the low aspiration layer plan is to avoid poverty, while the high aspiration layer plan is to obtain a huge sum of wealth.

Shefrin and Statman gave an example using Figure 2.6 to explain the choice set of BPT-MA investors:

Consider a specific example. Imagine that the investor faces two securities D and E. D has an expected return of 3% with a standard deviation of 1%, while E has an expected return of 5% with a standard deviation of 10%. Figure 2.6 depicts the utilities of each of the two doers under each feasible division of the \$1 current

wealth. It also depicts the optimal portfolio of each doer. The optimal portfolio for the planner is composed of an allocation of \$0.20 for the low aspiration doer and \$0.80 for the high aspiration doer. The low aspiration doer places 93% of his wealth in the low expected return security D, while the high aspiration doer places 100% of his wealth in the high expected return security E. The probability that the low aspiration doer will miss his aspiration level is 5.8%, while the probability that the high aspiration doer will miss his aspiration level is lottery-like, greater than 99.9% (Shefrin and Statman, 2000, p.143).

Figure 2.6 The choice set of BPT-MA portfolios available to a planner with two doers and the optimal portfolios of a planner



Source: Shefrin and Statman (2000, p.144)

In sum, BPT-MA investors match their different accounts with various aspirations. The two accounts are not integrated. Consequently, BPT-MA investors can take offsetting positions by applying leverage: borrowing in their high aspiration accounts while lending in their low aspiration accounts. For the portfolios and securities in the real world, 'Treasury' (negotiable debt obligations of the US government which guarantees that interest and principal payments will be paid on time) is suitable for very low aspiration levels, while equity participation is suitable for higher aspiration levels.

Investors with much higher aspiration levels may choose stocks, and those with yet higher aspiration levels can choose out-of-the-money call options as well as lottery tickets (Shefrin and Statman, 2000, p.149).

In conclusion, behavioural finance researchers challenged the traditional standard finance hypotheses by developing three sequential theories, namely prospect theory, behavioural capital asset pricing theory and BPT.

2.2.4 Utility theory

Utility theory was initially taken as a way to measure investors' preferences for wealth and the extent of risk they were willing to bear in the hope of obtaining more wealth (Stigler, 1950). Economic utility theory proposed that individuals' investment decisions were like a 'trade-off' between immediate consumption and deferred consumption. Individual investors compared the benefits consumed today with the benefits that could be gained by investing unconsumed funds in order to enjoy more considerable consumption some day. Thus, if the individual chose to postpone the consumption, it meant that he or she selected the portfolio which could maximise long-term satisfaction. Furthermore, the individual investor tried to minimise the risk while choosing the portfolio that maximised expected return (Stigler, 1950; Nagy and Obenberger, 1994, p.63).

Expected utility theory dealt with the analysis of choices among risky projects with outcomes. The first application was first carried out under the name of the Von Neumann-Morgenstern utility theorem (Von Neumann and Morgenstern, 2007). Von Neumann and Morgenstern proposed the axioms that investors were completely rational, able to deal with complex choices, risk averse and wealth maximising (Nagy and Obenberger, 1994; Von Neumann and Morgenstern, 2007).

The research on utility theory mainly focused on explaining aggregate market behaviour, rather than emphasising the decision processes of individual investors. Nevertheless, there were still several studies which examined the utility theory constructs concentrating on individuals (Nagy and Obenberger, 1994). For instance, Baker and Haslem (1974) examined 43 variables used by individual investors in analysing stocks. Their empirical results using factor analysis revealed three significant constructs: dividends, future expectations and financial stability. Another study conducted by Baker et al. (1977) analysed the beforehand risk-return preferences and expectation of individual investors on the stock market. The evidence of the statistical tests showed that: (1) the relationship between risk and expected annual rate of return was positive; (2) the correlation between risk and dividends was negative; and (3) the association between risk and capital appreciation appeared positive. Baker et al. (1977, p.378) also pointed out that investors did take into account the trade-off function between risk and expected return.

Nevertheless, the economic man defined in expected utility theory was different from a real man in real life. Also, the stock market was not a weighing machine (Graham et al., 1934; Nagel, 1999).

Kahneman and Tversky published the article 'Prospect Theory: an Analysis of Decision under Risk' in 1979 and put forward an alternative model—prospect theory—to take the place of expected utility theory (Kahneman and Tversky, 1979). In 1992, they further developed prospect theory by publishing 'Advances in Prospect Theory: Cumulative Representation of Uncertainty' (Tversky and Kahneman, 1992). They criticised expected utility theory which did not provide an adequate description of

individual choice. Prospect theory explained the economic behaviour widely discerned in markets by showing investors' choices under uncertainty as well as risk.

De Bondt and Thaler (1994) also argued that psychological factors were relevant to investor behaviour. Furthermore, it would be unsound to model market behaviour based on the assumption of common knowledge of rationality (De Bondt and Thaler, 1994). Competing theories of financial anomalies are discussed in the following section to dispel related assumptions.

2.2.5 Competing theories of financial anomalies

Competing theories of financial anomalies were proposed to explore the discrepant arguments in traditional models (Brav and Heaton, 2002). The traditional models were based on efficient markets, rational expectations and asset pricing theory. Asset pricing theory had two important features: (1) investors were assumed to have complete knowledge of the structure of their economy; and (2) investors were assumed to hold complete and effective information and to be able to make satisfactory decisions (Brav and Heaton, 2002; Sargent, 2011; Shefrin and Statman, 1994). However, evidence has been found to challenge the traditional propositions. Competing theories of financial anomalies consisting of behavioural theories and rational structural uncertainty theories have mounted arguments against previous assumptions (Wang, 2004).

Behavioural theories dispelled the assumption that investors were completely rational information processors. From the perspective of behavioural finance theories, investors were prone to making cognitive and behavioural biases or errors when investing; thus the process could not be completely rational (Thaler, 1993; Brav and Heaton, 2002).

'Rational structural uncertainty' theories also relaxed the assumption that investors had complete knowledge of the structure of their economy. 'Rational structural uncertainty' pointed out the difference between 'rationality' and 'rational expectations', and this difference could also be described as the distinction between 'information exploitation' and 'information availability' (Friedman, 1979; Brav and Heaton, 2002, p.575-577). Inside the rational expectation world, rational investors could make ideal systematic decisions in a world in which they owned all related structural knowledge; while outside the rational expectations world, rational investors could still make ideal systematic decisions, yet they lacked critical structural knowledge (Kurz, 1994; Brav and Heaton, 2002). 'Rational structural uncertainty' theories generated financial anomalies from biases or risk premiums that were caused by incomplete information (Brav and Heaton, 2002, p.577).

The research of individual investor behaviour gradually developed from the 1970s. Cohn et al. (1975) used a mail questionnaire covering demographic characteristics and investment attitudes to explore the effect of wealth on the proportions of individual portfolios allocated to risky assets. The empirical results demonstrated that when wealth increased, the individual involved committed a higher proportion of the total to risky assets, which meant that investors' wealth increased while risk-aversion decreased. Lewellen et al. (1977) discussed the portfolio decision process of the individual equity investor using data obtained from a large-scale survey comprising 972 valid questionnaires in which the respondents were asked to evaluate on a scale of one to five, to observe both influences of their portfolio behaviour and how the portfolio was being influenced by the investors' reaction to their market environment. The researchers found that age, sex, income and education affected investors' choices for

capital gains, dividend yield and annual portfolio return (Lewellen et al., 1977). Blume and Friend (1978) analysed a comprehensive survey which examined how demographic variables influenced investors' choices and portfolio composition processes. The researchers found that actual degree of diversification for 70% of the investors was lower than suggested by the number of securities in the portfolios (Shefrin, 2002). They also suggested the most efficient ways to encourage individual stock ownership. Barnewall (1987) explored the psychographic characteristics of individual investors and concluded that their behaviours could be predicted by lifestyle characteristics, risk aversion, control orientation and occupation. Lebaron et al. (1989, p.24) assessed the risk tolerance of individual investors using 94 questionnaires, covering 72 items about risk. The results proved that it was not enough for investment managers to make decisions based only on 'science' (including instruments, techniques, procedures and apparatus), and 'problems, questions, functions and goals' also needed to be taken into account, especially the risk (Maslow, 1946). Warren et al. (1990) verified the use of demographics as a basis for segmenting the market for financial services, and pointed out that lifestyle dimensions not only affected investor behaviour types (active or passive), but could also differentiate between light and heavy investors in investment choices (such as stocks or bonds).⁷ Riley Jr and Chow (1992) discussed individual asset allocation and risk preferences, employing the financial data of a large random sample of US households. The empirical results showed that the risk aversion decreased when an individual's age, education, income

⁷ 'Light investors' here refers to investors who tended to have investments in instruments other than stocks or bonds; 'heavy investors' are investors who hold heavier concentrations of their portfolio in the form of stocks or bonds. Heavy investors were prone to having high self-confidence, and most of them were married with children, having higher education and income levels (Warren et al., 1990, p.76).

and wealth increased. In particular, the risk aversion decreased significantly as an individual's wealth moved into the top 10% of the population (Riley Jr and Chow, 1992, p.37).

However, most of the previous research has mainly focused on the influences of demographic characteristics and risk on individual investors' decisions and income, such as the relationship between demographic information and investors' choices for portfolio return or the correlation between risk aversion and the degree of education (Lewellen et al., 1977; Riley Jr and Chow, 1992). Furthermore, few researchers placed the behavioural studies in the Eastern context, especially incorporating both macro-economic environment and the situation of related listed companies.

This gap points to the content of this research: the relationships between behavioural factors and investment income. As a result, related model measures and hypotheses regarding individual investor behaviour are based on prevailing theories, and the elements used in the model are derived from the previous literature. The detailed discussion of related elements is discussed in following sections.

2.2.6 Discussion of five major theories in this research

Table 2.1 Discussion of five major theories in this research

Theory	Major content	Application in this research
Prospect theory	The choice process is categorised into two parts: editing and evaluation	In the decision-making process, highly unlikely events may be either overemphasised or ignored; the difference between high probability and certainty may be exaggerated or neglected
Behavioural capital asset pricing theory	Combining noise traders with information traders in the market	Noise traders commit cognitive errors; they become a second driver which leads to price ineffectiveness

Behavioural portfolio theory	Containing both a single mental account version and a multiple mental account version	Investors with mental account commonly neglect the covariance and then segregate their portfolios into various mental accounts; they match their different accounts with various aspirations
Utility theory	Being a way to measure investors' preferences for wealth	Individual investors try to minimise risk while choosing the portfolio that maximises expected return
Competing theory of financial anomalies	Consists of behavioural theories and rational structural uncertainty theories	Investors are prone to making behavioural biases when investing

Table 2.1 summarises the five basic theories in relation to investor decision-making and behaviour used in this research. As discussed in Sections 2.2.1 to 2.2.5, these five theories constituted both theoretical and empirical bases for the analyses in the following chapter. Accordingly, behavioural theory challenged the assumptions of standard finance. In particular, there were noise traders in financial markets who were prone to committing cognitive errors when investing.

2.3 Macro-economic context for individual investors

This section reviews the studies pertaining to the macro-economic context (Chapter 4) for individual investors on the SZSE, namely the relationships between stock market fluctuations and macro-economic indicators. First, the literature related to stock prices and economic conditions will be addressed, and then a number of specific classical relationships between stock prices and macro-economic variables (such as stock prices and exchange rates, stock prices and interest rates, stock prices and money supply, stock prices and inflation rates as well as stock prices and industrial production).

2.3.1 The relationship between stock market volatility and the economy for individual investors

Vaz (2011) demonstrated that, according to effective empirical studies, there is a strong positive relationship between stock market fluctuations and movements of economic activity. He argued that in general stock prices increased or decreased ahead of the economic cycle, since stock prices reflected prospects of future returns on the basis of investors' anticipations about the future situation of the domestic economy. The research into the economy was based on the industry environment and firm performance, and the industry environment could be represented by the various macro-economic indicators, such as exchange rates and interest rates. Stock prices were considered an important indicator of anticipated economic activity.

Moore (1975, 1983) conducted research, based on the analysis of Standard and Poor's index of 500 common stocks, to explore the relationships between stock prices and the business cycle. He found that 23 recessions or contractions of the US economy happened between 1873 and 1970. Furthermore, the majority of these 23 recessions or contractions occurred at the same time as a downslide in stock prices. Similarly, Fama and French (1989) showed that the dividend yield changed in a similar way to long-term business conditions during the period 1953 to 1973. They also pointed out that expected profits on bonds and stocks would increase to induce substitution from consumption to investment under the circumstances of poor business conditions and low income; on the other hand, the market cleared at lower levels of expected returns when business conditions were good and incomes were high.

Following related studies in 1980s, Chauvet (1999) also investigated stock market changes and the business cycle, and found that the stock market index could provide

the ability to predict the state of the business cycle in real time, forecasting the turning points and reflecting available information. They argued that the stock market factor was quite an efficient instrument in real time. After this study, multivariate results obtained from Darrat and Dickens (1999) showed that there were obvious interrelations among real (represented by industrial production), monetary (represented by money stock), and financial (represented by the S&P 500 index) sectors of the US economy. They also proposed that the stock market was an important leading indicator for both monetary policy and economic activities. By exploring the relationships between stock prices, inflation and prices levels in Japan, Lenten and Moosa (2003) also pointed out that stock prices were a leading indicator of the business cycle, and that they were negatively related to inflation as measured by the price level. After Chauvet's investigation on the relationship between stock market changes and the business cycle, Destefano (2004) examined whether broad movements in stock returns could be explicated by changes in economic factors. Empirical results showed that expected stock returns fluctuated inversely with changes in economic conditions, which meant that 'realized returns are especially poor indicators of expected returns prior to turning points in the business cycle' (Destefano, 2004, p.527). Andreou et al. (2001) looked at the fluctuations of weekly financial factors with regard to the business cycle in the US and UK economies, and they concluded that in the US leading indicator information could be provided by stock returns and short interest rates; however, in the UK, financial variables might lag behind the business cycle. Similarly, Beaudry and Portier (2004) discussed the effects of productivity on stock prices. They argued that permanent movements in productivity increases were preceded by stock market booms. They emphasised that

changes in technological opportunities should be central to the volatility of the business cycle.

Compared to the studies focusing on the relationship between stock market changes and the volatility of the business cycle, Yang et al. (2009) adopted stock and bond return data from 1855 to 2001 for both the US and UK to explore the correlations between stocks and bonds in terms of changing business conditions. They found that bonds might be a better hedge against the risk in the stock market and that they provided investors with more diversification benefits in the US than in the UK. They also emphasised that in the 150-year sample period, two macro-economic indicators—namely short interest rates and inflation rates—were positive predictors of stock-bond correlations. Næs et al. (2011) found a significant relation between stock market liquidity and the business cycle. At the same time, the composition of investors' portfolios varied with the volatility of the business cycle, and investor participation could be motivated by market liquidity (Næs et al., 2011, p.139).

2.3.2 Influences of macro-economic activity on investor behaviour

A number of studies examine the correlation between stock market volatility and the business cycle. The following five specific macro-economic variables used in this research will be applied to the discussion: exchange rates, interest rates, money supply, inflation rates and industrial production. These variables have been widely discussed in previous literature, and studies with respect to each subsection will be summarised separately in Table 2.2 to 2.5.

2.3.2.1 The relationship between stock exchange volatility and exchange rates for individual investors

Exchange rates are the value of one country's currency expressed in terms of another currency (Goldberg and Knetter, 1996). According to the studies listed in Table 2.2, stock prices can be influenced by exchange rates through which earnings are made more risky or are negatively affected by unfavourable changes. Furthermore, the movements of exchange rates can also increase the volatility of firms' realised cash flows, and then affect firm performance (Vaz, 2011).

Table 2.2 Summary of studies on the relationship between stock exchange volatility and movements of exchange rates

Author (Year)	Focused stock exchange	Sample period	Methods	Relevant findings
Franck and Young (1972)	NYSE	1967-1971	Non-parametric tests	The study was unable to show consistent effects
Aggarwal (1981)	NYSE	1974-1978	Econometric analysis	Trade-weighted exchange rates were positively related to stock prices
Bahmani-Oskooee and Sohrabian (1992)	NYSE	1973-1988	Granger causality test and cointegration technique	Bidirectional causality existed between stock prices and exchange rates, yet no long-term relationship between two variables
Abdalla and Murinde (1997)	Stock markets of India, Korea, Pakistan and the Philippines	1985-1994	A bivariate vector autoregressive model	Unidirectional causality existed from exchange rates to stock prices in all the sample countries, except the Philippines
Kim (2003)	NYSE	1974-1998	Johansen's cointegration analysis	The S&P 500 stock price was negatively related to exchange rates
Morley (2007)	London Stock Exchange	1984-2002	Monetary model and autoregressive	Stock prices significantly affected the exchange rate

			distributed lags approach	in the short run
Kolari et al. (2008)	NYSE	1973- 2002	A zero-investment factor approach	Relation between expected returns and foreign exchange exposure is non-linear, but market price of foreign exchange risk is negative
Mcsweeney and Worthington (2008)	Australian Securities Exchange (ASX)	1980- 2006	Multifactor static and dynamic models	Exchange rates were an important factor for excess returns in the banking and financial industries
Alagidede et al. (2011)	Stock markets of Australia, Canada, Japan, Switzerland and UK	1992- 2005	Granger causality and Hiemstra-Jones tests	Causality from exchange rates to stock prices was found for Canada, Switzerland, and UK through Granger causality test

2.3.2.2 The relationship between stock exchange volatility and interest rates for individual investors

As shown in the studies listed in Table 2.3, interest rates can affect the stock market through different transmission mechanisms, such as income effects or discount rate effects. Generally, the changes in interest rates indicate the expected status of the economy. Higher interest rates, sometimes in response to higher expected inflation, can deliver restrictive monetary policy, and can also reduce the demand for stocks. In sum, interest rates are found to be an important macro-economic factor that can partly explain stock market fluctuations.

Table 2.3 Summary of studies on the relationship between stock exchange volatility and movements of interest rates

Author (Year)	Focused stock exchange	Sample period	Methods	Relevant findings
Stone (1974)	None	None	The linear market-index model	A two-index model involving return on the equity and debt markets is a useful framework for quantifying the concept of systematic interest-rate risk
Martin and Keown (1977)	NYSE	1973-1975	The single-index market model	The returns for some stocks tend to be highly interest-rate sensitive
Chance and Lane (1980)	NYSE	1972-1976	A stochastic model using stochastic return generating process	The utility stock sample with the note and bond indices produced higher percentage of securities sensitive to interest rates
Jensen and Johnson (1995)	NYSE	1962-1991	Mean-adjusted returns (MAR)	The stock market patterns cannot easily be attributed to changes in interest rates
Jensen et al. (1997)	NYSE	1968-1991	Both parametric and nonparametric tests	Significant differences existed in interest rates sensitivity across industries to interest rates changes
Lobo (2000)	NYSE	1990-1998	An asymmetric autoregressive exponential GARCH model (ASAR-EGARCH)	Increases in interest rates resulted in stronger negative responses than decreases in interest rates
Kia (2003)	Toronto Stock Exchange and NYSE	1975-1999	Conintegration analysis and superexogeneity test	If interest rates were above the level associated with the central bank reaction function, the growth of the stock price would fall indicating lower dividend payments
Faff et al. (2005)	ASX	1978-1998	A multivariate	Finance corporations' sensitivity to interest rates

			GARCH-M model	was significant, while the smallest in the pre-deregulation period, increased dramatically in the post-deregulation period to match that of small banks
Crowder (2006)	NYSE	1970-2003	A structural vector autoregression	Positive innovations in the prices index resulted in increases in the federal fund rates but lower S&P 500 returns
Vaz et al. (2008)	ASX	1990-2005	The market model	Australian bank stock returns are not negatively impacted by the announced increases in official interest rates

2.3.2.3 The relationship between stock exchange volatility and the money supply for individual investors

The money supply 1 (narrow money) means all cash in circulation plus demand

deposits in commercial banks, whereas 'broad money' includes 'narrow money' and all

other deposits in commercial banks (see full explanations in Chapter 4). According to

the previous literature, significant interactions occur between the money supply and

other macro-economic variables (such as inflation and interest rates). Furthermore,

monetary policy also has effects on economic activity, which then affect stock prices

(Table 2.4).

Table 2.4 Summary of studies on the relationship between stock exchange volatility and movements of money supply

Author (Year)	Focused stock exchange	Sample period	Methods	Relevant findings
Homa and Jaffee (1971)	NYSE	1954-1969	The regression analysis; Cochrane and Orcutt method	A good fit and significant correlation between the money supply and the index of common stocks

Hamburger and Kochin (1972)	NYSE	1880-1970	The regression analysis	Changes in the money supply had an important short-term impact on the stock market
Fama (1981)	NYSE	1953-1977	The regression analysis	Strong relationships existed between stock prices and expected inflation rates implied by the money demand
Klemkosky and Jun (1982)	NYSE	1954-1980	The ordinary least-square (OLS) regression	The market risk premium would be an increasing function of monetary changes given that the two component effects of money are positive
Geske and Roll (1983)	NYSE	1947-1980	The autoregressive integrated moving average (ARIMA) transfer function model	The negative relationship between stock prices and inflation could be partly explained by the money supply that lower activity resulted in a reduction in the demand for money
Schnabel (1985)	Toronto Stock Exchange	1956-1983	The regression analysis	The volatility of the share market was affected by contemporaneous and future variances of money supply growth rates
Friedman (1988)	NYSE	1961-1986	The multiple regression analysis	The money supply 2 demanded in regard to income was positively related to stock prices and lagged by three quarters, yet negatively related to the contemporaneous stock prices
Durham (2003)	Stock exchanges of 16 countries	1956-2000	Sensitivity analyses by analysing cross-sectional variance	The relationship between monetary policy and stock returns was less robust than previous studies had indicated

Conover et al. (2005)	NYSE and NASDAQ	1963-2001	Time series and cross-sectional analyses	A highly consistent relationship between monetary conditions and stock returns was evident over time; small-cap companies were more sensitive than large-cap companies to changes in monetary conditions
Ratanapakorn and Sharma (2007)	NYSE	1975-1999	Cointegration and the causality analyses	Stock prices were positively related to the money supply
Black et al. (2009)	NYSE	1959-2005	Johansen's Vector Error Correction Model (VECM)	There was a significant negative relationship between the value premium index and both industrial production and the money supply

2.3.2.4 The relationship between stock exchange volatility and inflation rates for individual investors

According to the research summarised in Table 2.5, the relationship between stock prices and inflation rates shows mixed results. Generally, over the short term, when inflation rates increase, negative income effects imply that stock values may decrease; whereas over the long run, assuming that firms can pass on rising costs and achieve expected profitability, stocks should be a good 'hedge' against inflation (Vaz, 2011, p.81).

Table 2.5 Summary of studies on the relationship between stock exchange volatility and movements of inflation rates

Author (Year)	Focused stock exchange	Sample period	Methods	Relevant findings
Fama and Schwert (1977)	NYSE	1953-1971	The regression analysis	Common stock returns were negatively related to the expected component of the inflation rate

Fama (1981)	NYSE	1953-1977	The regression analysis	There was a negative relationship between stock returns and inflation due to a negative relationship between real activity and inflation
Mandelker and Tandon (1985)	Stock markets of six countries	1966-1979	The regression analysis	There was a negative relationship between stock returns and the inflation, though the evidence was weak
Kaul and Seyhun (1990)	NYSE	1947-1985	ARIMA time series models	There was a negative relationship between stock returns and expected and unexpected inflation proxy for the negative effects of relative price variability on the stock market
Domian et al. (1996)	Stock markets of US, Canada, UK and Germany	1951-1983	The money-demand-based model	There was a negative relationship between stock returns and inflation in the post-war period; these relationships depended on the equilibrium process in the monetary sector
Murphy and Sahu (2001)	NYSE	1957-1995	The regression analysis	Current earnings yields and forecasted inflation could be used to predict most long-term stock market volatility; long-term stock returns were positively related to inflation rates
Luintel and Paudyal (2006)	London Stock Exchange	1955-2002	Cointegration and stability analyses	Positive relationships existed between stock prices and inflation
Lee (2008)	London Stock Exchange	1830-2000	The bivariate vector autoregressive model	A positive shock to inflation that did not have a negative impact on stock returns
Quayes and Jamal (2008)	NYSE	1950-2000	A demand-supply model and estimated	Inflation had an adverse effect on stock prices; inflation would have a complex impact

			the coefficients from the reduced form	on an individual's assets
Humpe and Macmillan (2009)	Stock markets of US and Japan	1965-2005	A general vector autoregressive model	US stock prices were influenced negatively by inflation; industrial production was negatively related to inflation rates

2.3.2.5 The relationship between stock exchange volatility and industrial production for individual investors

Table 2.6 Summary of studies on the relationship between stock exchange volatility and movements of industrial production

Author (Year)	Focused stock exchange	Sample period	Methods	Relevant findings
Fama (1990)	NYSE	1953-1987	Regression analysis	Growth rate of IR could explain 43% of the market return variance
Schwert (1990)	NYSE	1889-1988	Regression analysis	A strong positive relationship existed between stock returns and future growth rates
Ferson and Harvey (1994)	18 national equity markets	1970-1989	Multiple beta models	Industrial production was significant was an explanatory variables for average portfolio returns
Hamilton and Lin (1996)	NYSE	1965-1993	Bivariate model	A reasonable co-movement existed between stock returns and industrial production
Ratanapakorn and Sharma (2007)	NYSE	1975-1999	Cointegration and the causality analyses	Stock prices were positively related to industrial production

Changes in real activity influence stock prices since stock prices reflect investors' desire about ideal firms' performance in terms of cash flows, return rate and growth. Table 2.6 shows that real activity fluctuation has significant impact on stock market volatility,

and the real activity represented by industrial production is positively related to stock prices.

2.3.3 Gaps and limitations in the view of macro-economic analysis in the literature

Most previous studies of the relationship between macro-economic indicators and stock market volatility have focused on developed countries, such as the US, the UK, Japan and Canada. Even when discussed in some emerging markets, few studies have concentrated on Chinese stock markets, especially the SZSE. The analysis in Chapter 4 will focus on the relationship between macro-economic variables and SZSE volatility, covering a series of variables including exchange rates, short-term interest rates, CPI, ex-factory price indices of industrial products, industrial production growth rate, money supply 1, the inter-bank weighted average interest rates and state foreign exchange reserves.

In this section, empirical evidence has shown the substantial relationship between stock market fluctuation and the business cycle. A series of classic macro-economic variables have been applied to the discussion of their effects on stock market volatility, including exchange rates, interest rates, money supply, inflation rates and industrial production. The empirical evidence has shown that these macro-economic indicators had an important effect on stock prices in several developed countries, such as the US, UK, Japan and Canada, which provides an empirical basis for the cointegration analysis in Chapter 4 of this research, namely the macro-economic context for individual investors on the SZSE.

2.4 Firm-level context for individual investors

In this section, the discussion of corporate issues will be conducted from three perspectives: the relationship between the social environment and corporate

performance, corporate governance and corporate management. The studies of the relationship between corporations' social environment (in terms of sustainability and social responsibility) and its impact on corporation performance are addressed first; the description of corporate governance focuses on the relationship between ownership structure and the firm's performance; and the discussion of corporate management mainly refers to the behaviours of management as agents of shareholders.

2.4.1 Social environment and corporate performance

2.4.1.1 Categories of stakeholders for corporations

The studies in previous literature of the relationship between corporations' social environment (in terms of sustainability and social responsibility) and its impact on corporate performance showed mixed results.

Discussion of sustainability has covered the aspects of environmental, economic and social sustainability. A few researchers have categorised stakeholders into different groups based on the pressure that they exerted on firms regarding practices of sustainability. Stakeholders have been defined as 'any group or individual who can affect or is affected by the achievement of the organization's objectives' (Freeman, 1984, p.46). Henriques and Sadorsky (1999) divided stakeholders into four groups: regulatory stakeholders, organisational stakeholders, community stakeholders and the media. According to Henriques and Sadorsky (1999), regulatory stakeholders included governments, trade associations, informal networks and a given firm's competitors. Organisational stakeholders might contain customers, suppliers, employees and shareholders—people who were directly related to the corporation. Community groups, environmental organisations and other potential lobbies comprised

community stakeholders. The fourth group, media, could influence society's perception of the corporation in terms of mass communication (Henriques and Sadorsky, 1999).

Apart from the categories suggested by Henriques and Sadorsky (1999), Buysse and Verbeke (2002) proposed three groups of stakeholders: regulators, primary stakeholders and secondary stakeholders. They divided primary stakeholders into external (such as domestic and international customers) and internal (such as employees and shareholders). The practices of delivering sustainability have been carried out gradually (Kaidonis et al., 2010). Furthermore, Waddock et al. (2002, p.133) emphasised that the emergence of global principles and standards constituted a social institutional pressure on company management.

2.4.1.2 Corporate social responsibility and its impact on corporate performance

Discussion of corporate social responsibility has covered the aspects of environmental responsibility, transparency, accountability, standards and stakeholder-demanded integrity (Waddock et al., 2002; Mutairi, 2011). Henriques and Sadorsky (1999) found that managers' perceptions of stakeholders' roles were crucial to their views on the importance of stakeholders. Therefore, if a firm wanted to make environmental issues a priority, it might need to hire managers who reacted positively to stakeholders who represented the company values it wanted to espouse (Henriques and Sadorsky, 1999). Similarly, Buysse and Verbeke (2002) pointed out that the link between environmental strategy and internal primary stakeholders (employees and shareholders) was significant. In sum, management's environmental awareness was a crucial dimension for explicating corporate environmental behaviour (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2002).

Investigation of the impact of environmental issues on a firm's performance showed various results in different studies. Early findings indicated that issues regarding environmental concerns had negative effects on firm performance, because they had to invest in considerable resources to produce sustainable services and goods, and this behaviour might destroy shareholder value (Judge Jr and Krishnan, 1994; Freeman, 1994). On the other hand, several recent studies have shown that responsible environmental awareness and related proactive strategies could reduce costs and improve revenue, which might bring about long-term economic gain (Aragon-Correa and Rubio-López, 2007; Galdeano-Gómez et al., 2008; Wahba, 2008; Mutairi, 2011).

2.4.2 Corporate governance and corporate performance

Effective corporate governance is formally defined by the Organisation for Economic Co-operation and Development (OECD): 'The corporate governance framework should promote transparent and efficient markets, be consistent with the rule of law and clearly articulate the division of responsibilities among different supervisor, regulatory and enforcement authorities' (Organisation for Economic Co-Operation and Development, 2004, p.29). Corporate governance involves a series of essential aspects, including: (1) the rights of shareholders and key ownership functions; (2) the equitable treatment of shareholders; (3) the role of stakeholders in corporate governance; (4) disclosure and transparency; and (5) the responsibility of the board (Organisation for Economic Co-Operation and Development, 2004). In a recent study, Pacy Sifuna (2012, p.346) argued that corporate governance was a logical system of law and sound approaches by which corporations were directed and controlled, focusing on both the internal and external corporate structures with the intention of monitoring the actions

of management and directors and thus mitigating agency risks deriving from devious deeds of relevant corporate officers.

The relationship between ownership structure and the firm's performance has been the core issue in the corporate governance framework literature during the last few decades, and has produced a number of relevant discussions (Mutairi, 2011). In an early study, Berle and Means (1932) proposed the separation of ownership and control, since an inverse correlation could be found between concentration of shareholdings and firm performance. Agency theory is also relevant to the relationship between ownership structure and the firm's performance. Agency theory suggests that principal-agent relationships should reflect efficient organisation of information and risk-bearing costs (Eisenhardt, 1989). It tries to solve two crucial problems which may occur in agency relations: (1) it is hard for the principal to figure out what the agent is actually doing or whether the agent behaves properly, agency problems could arise; and (2) when the principal and agent have differing attitudes to and opinions about risk, then the problem of risk sharing will occur (Eisenhardt, 1989). As a result, agency theory is useful to explain the conflicts of interest between inside owners and outside shareholders. Jensen and Meckling (1976) pointed out that, in the US, individuals entrusted a large amount of money deriving from personal wealth to the care of managers of corporations, based on a complicated set of contracting relationships which delineated the rights of the parties involved. Despite the agency costs inherent in the corporate form, the growth in both the use of the corporate form and market values suggested that creditors and investors had not been disappointed with the results. They also found that both the law and formal contracts related to modern corporations were the products of a 'historical' process in which there were strong

incentives for individuals to minimise agency costs (Jensen and Meckling, 1976, p.357). Moreover, institutional ownership was found to be inversely related to the level of debt financing and managerial equity holdings in the corporation, that is, institutional investors were considered to be effective monitoring agents and helped in decreasing agency costs (Bathala et al., 1994, p.48).

2.4.3 Ownership types and management behaviour

Studies have revealed that managers as agents of shareholders might not act in the best interest of the shareholders all the time (Mutairi, 2011). For example, Myers and Majluf (1984) started from an assumption that management knew more about the firm's value than potential investors. The empirical results showed that when managers had superior information, and stock was issued to finance investment, the stock price would fall, other things equalled. This action was nevertheless in the stockholders' interest. If the firm issued a safe proportion of debt to finance investment, stock price would not fall. Pandey and Bhat (1990) stated that, in India, managers did not tend to maximise the market value of their corporations when making financial decisions. They also believed that fundamental objectives of managers were to maximise profits and the growth rate of investment return, thus the fund availability could be ensured. On the other hand, on the basis of a survey on capital structure decisions of 259 listed firms on the Hong Kong stock exchange, Fan and So (2000, p.360) reported that the most important principle of financial managers' decisions with respect to capital structure was 'maximization of shareholders' wealth'. Anand (2002) also conducted a survey-based study and similarly found that the shareholder value maximisation objective was widely applied to corporation operations in India; that is, large firms and growth firms placed substantial emphasis

on the economic value added (EVA) maximisation target. He also argued that firm size had significant impact on the practice of corporate finance; that is large firms were more likely to follow market value added (MVA) maximisation objectives than small firms (Anand, 2002, p.51). Brounen et al. (2004) also used the survey of 313 chief financial officers (CFOs) in the UK, the Netherlands, Germany and France to investigate capital budgeting, cost of capital, capital structure and corporate governance. They found that patterns of corporate governance were different in the different countries. For instance, in the UK and the Netherlands senior management were consciously making efforts to maximise their shareholders' wealth, whereas it was a low priority in Germany and France (Brounen et al., 2004). They also concluded that the operations of corporate finance were significantly influenced by firm size, rather than shareholders' orientation (Brounen et al., 2004). Brealey et al. (1998) argued that shareholders were the principals and senior managers were their agents; however, middle managers and stakeholders (including employees) were in turn agents of senior management. Therefore, senior managers became agents of shareholders and principals of the rest of the firm. As a result, senior management needed to make everyone work together to maximise value (Brealey et al., 2008).

To summarise, studies in relation to three aspects, namely the relationship between social environment and corporate performance, corporate governance and corporate management, constitute the empirical basis in this research for the analysis of firm-level context (Chapter 5) for individual investors on the SZSE. The debates on the effects of social environmental concerns on corporation performance have demonstrated mixed results, both negative and positive. Research shows that the practices of effective corporate governance had crucial effects on the development of

corporations, and that senior management played an important role, since they were agents of shareholders and principals of the rest of the firm. In section 2.5, relevant empirical evidence with respect to investor behaviour will be explicated.

2.4.4 Gaps and limitations in the view of firm-level analysis in the literature

Previous research on corporate operation has rarely included Chinese firms, especially the emerging high-tech listed companies. Studies have focused on the behaviour of senior management, and there is little research covering the relationship between senior management and individual investors. This research will not only describe the practices of corporate governance of listed companies on the SZSE, but also discuss what senior personnel think about their relationship with investors and investor behaviour.

2.5 Behavioural biases of individual investors

This section addresses frequently discussed psychological and behavioural biases of investors on financial markets on the basis of three categories: biases in the will and decision process, emotional biases and cognitive biases (Chen, 2003). Table 2.7 summarises a series of behavioural biases that investors may have during the process of investment.

Table 2.7 Summary of behavioural biases of individual investors

Category	Biases in the will and decision process	Emotional biases	Cognitive biases
1	Self-control	Overconfidence	Anchoring and adjustment heuristic
2	Herd behaviour	Mental account	Availability heuristic
3		Risk aversion	Frame dependence
4		Loss aversion	Representativeness heuristic

2.5.1 Biases in the will and decision process

Investors use the will process to make investment decisions, which may give rise to several biases affected by cognitive process and emotional process. For instance, these biases include self-control and herd behaviour (Chen, 2003).

2.5.1.1 Self-control

Self-control refers to an ability to control one's desire and emotion (Thaler and Shefrin, 1981). The individual at one point is both a 'farsighted planner' and a 'myopic doer'; this kind of conflict is similar to the agency conflicts between owners and managers in a firm. However, sometimes people cannot make rational decisions due to self-control (Thaler and Shefrin, 1981, p.392).

Shefrin and Statman (1984) gave an example to represent the performance of self-control. They argued that investors who were accumulating savings for their retirement might encourage savings and discourage dissaving from already accumulated wealth. These investors favoured high-dividend yield stocks because they thought using dividends for living costs would not expend their own capital.

2.5.1.2 Herd behaviour

Herd behaviour in humans refers to the phenomenon of a large number of people taking actions in the same way at the same time. For example, in the stock markets, investors often join the crowd in a rush to get in or out of the market investment, which probably results from greed in the bubbles or fear in the crashes (Brunnermeier, 2001).

Bikhchandani et al. (1992) stated that herd behaviour might arise from private information not publicly shared. One of the significant studies on herd behaviour was conducted by Shiller (2000a). He pointed out that people might take part in herd behaviour when they took the judgements of others into account, even if they knew everyone else was behaving in a 'herd-like' manner. Even if individual behaviour was rational, the group behaviour was irrational in a well-defined sense. One of the reasons for this kind of herd behaviour could be information cascade (Shiller, 2000a, , pp.151-153).

2.5.2 Emotional biases

According to psychological research, investors may produce emotional biases owing to their own predilections, personalities, beliefs and feelings (Shiller, 2000a; Odean, 1999; Dorn and Huberman, 2005). For example, these biases include overconfidence, mental account, risk aversion, loss aversion and regret aversion (Chen, 2003).

2.5.2.1 Overconfidence

The overconfidence effect is a bias in which people's subjective confidence in their judgement is reliably greater than their objective accuracy, especially when the level of confidence is relatively high (Pallier et al., 2002). In the field of behavioural finance, Shiller (2000a, p.145) explained overconfidence by conducting a survey after the American stock crash of 19 October, 1987. When investors were asked if they knew when a good rebound would happen at any point on that day, 47.1% of individual investors said 'yes' and 47.9% of institutional investors said 'yes'. Even among investors who did not trade on that day, 29.2% of individual investors and 28.0% of institutional investors said 'yes'. The investors were then asked how they knew when a good rebound would occur. The answers included 'intuition', 'gut feeling', 'historical

evidence and common sense' and 'market psychology', which obviously lacked solid grounding. This kind of hindsight led to investors' indifference to self-examination of their own behaviours.

In a relatively early study in the psychological field, overconfidence was discussed by Lichtenstein et al. (1981, pp.15-17). They pointed out that when interviewees were asked some questions, they would be prone to overrating the probability of correct answers; even if they made sure they had given correct answers, the probability of wrong answers was nearly 20%.

Odean (1999) examined the effects of overconfidence on the basis of his experiments. He argued that investors would trade too much owing to overconfidence. The securities the investors bought underperformed on the market over the following year. However, securities they sold performed as well as the market over the following year. Furthermore, investors who were overconfident traded excessively even if their expected gains could not offset trading costs. As a matter of fact, overconfident investors always lowered their returns through trading even when the trading costs were ignored.

2.5.2.2 Mental account

Shefrin and Statman (2000) put forward the concepts of behavioural portfolio theory-single account (BPT-SA) and behavioural portfolio theory-multiple account (BPT-MA) after developing BPT. BPT-SA referred to investors integrating their portfolios into a single mental account, whereas BPT-MA referred to investors segregating their portfolios into several different mental accounts.

Shefrin and Statman (2000, p.129,150) also pointed out that the optimal portfolios of BPT investors were similar to those observed by Friedman and Savage (1948),

combinations of bonds and lottery tickets. The BPT investors who were consistent with investors in the 'Friedman-Savage puzzle' were simultaneously risk averse and risk seeking. The BPT investors who had low aspirations had risk aversion with the lower risk account (similar to a bond account), while those who had high aspirations had risk preference with the higher risk account (similar to a lottery account).

2.5.2.3 Risk aversion

'Risk aversion' refers to a kind of human behaviour whereby people attempt to reduce uncertainty when they are exposed to that uncertainty; that is, people who start from a position of certainty are unwilling to take bet which is 'actuarially fair' (Arrow, 1971, p.90). This term was a crucial element in standard finance theory of lottery choice, asset valuation and contracts (Holt and Laury, 2002).

In an early study, Fama and Macbeth (1973, p.1175) explored the relationship between portfolio return and risk for NYSE common stocks, and found that the pricing of common stocks reflected the attempts of risk-averse investors to hold portfolios which were 'efficient' with respect to expected value and dispersion of return. They used this empirical result to support the hypothesis of efficient capital market, that is, that securities prices could reflect fully sufficient information (Fama and Macbeth, 1973). Blake (1996) argued that poor investors were more risk averse than rich investors, yet they took on less risk. He also found that investors were reluctant to hold risky equities unless they were compensated with a considerably high risk premium, according to the high extent of risk aversion that they estimated (Blake, 1996).

Both risk-averse and risk-tolerant investors were supposed to hold a well-diversified portfolio in financial markets. However, empirical evidence showed that investors

were not capable of distinguishing systematic risk from unsystematic risk (Kroll et al., 1988; Siebenmorgen and Weber, 2003). Consequently, risk tolerant investors might take on both kinds of risk (systematic and unsystematic), which would make their portfolios less diversified. Furthermore, people might trade into or out of securities as a result of changes in risk aversion, although some investors might change portfolios for speculative purposes (Kroll et al., 1988; Siebenmorgen and Weber, 2003; Dorn and Huberman, 2005).

2.5.2.4 Loss aversion

'Loss aversion' was a term used by Kahneman and Tversky (1979, pp.268-269) to refer to the fact that investors were strongly prone to preferring avoiding losses than obtaining gains. From the psychological perspective sometimes losses were twice as powerful as gains. Loss aversion led to risk aversion when investors evaluated possible gains (Tversky and Kahneman, 1991).

Loss aversion can be regarded as an explanation for the 'endowment effect'. It suggests that people estimate higher values for the objects they have than the objects they do not have (Thaler, 1980, pp.43-47). Kahneman et al. (1991, pp.199-200) argued that losses were more unbearable than gains if people took the status quo as their reference point, so people preferred the current situation.

2.5.2.5 Regret aversion

'Regret aversion' referred to a tendency for people to avoid making decisions owing to a fear that their decisions would turn out suboptimal in hindsight; as a result, people always suffered from taking wrong actions (Ehrlich et al., 1957). Ehrlich et al. (1957, pp.98-99) provided a clear example to support this proposition: a person who had bought a car attempted to reduce dissonance, so he always read the advertisements

for his own car to support his choice while avoiding obtaining information on other cars.

2.5.3 Cognitive biases

Several phenomena occur based on sense, perception, memory, thinking and language, which lead to systematic cognitive biases in the cognitive process. These phenomena include the anchoring and adjustment heuristic, availability heuristic, frame dependence and representative heuristic (Chen, 2003).

2.5.3.1 Anchoring and adjustment heuristic

‘Anchoring and adjustment’ refers to a psychological heuristic which affects people’s intuitive estimate. Through this heuristic, people start with an implicitly suggested reference point (anchor) and made adjustments to it to form their conclusions. A person begins with a first approximation (anchor) and makes adjustments based on additional information, which may insufficiently estimate the whole event. Different reference points could produce a variety of estimates (Tversky and Kahneman, 1974). In the field of behavioural finance, Shefrin (2002) argued that financial analysts in the stock market did not revise their earnings estimates to reflect new information: ‘Consequently, positive earnings surprises tend to be followed by more positive earning surprises, the negative surprises by more negative surprises’ (Shefrin, 2002, p.20).

Shafir et al. (1997) pointed out that according to results of experiments, anchoring could lead to the ‘money illusion’, which influenced people’s perception and emotion in facing inflation. They conducted an experiment that explained their results as follows:

As an example, consider a person who receives a 2 percent raise in salary in times of 4 percent inflation. (We assume that the person is aware of inflation, and momentarily ignore other factors, such as the possible social significance of a salary raise.) Naturally, this person would be happier with the same raise in times of no inflation. However, because the nominal evaluation is positive (i.e., the person is making more money), we expect the person to find the change less aversive than a 2 percent cut in times of no inflation, in which both the nominal and the real evaluations are negative. Thus, we propose that holding real change constant, people's reactions will be determined by the nominal change. Moreover, in some situations a nominal change may even offset a real change, as will be illustrated below (Shafir et al., 1997, p.347).

2.5.3.2 Availability heuristic

The 'availability heuristic' is a phenomenon whereby people usually predict or judge an event, frequency or probability based on how easily an example can be brought to mind (Tversky and Kahneman, 1974). According to research conducted by Tversky and Kahneman (1973, p.228): 'Sometimes only one relevant instance comes to mind, perhaps because it is most memorable'. They argued that it was impossible for people to obtain all the relevant information from memory; thus, the availability heuristic occurred.

Fischhoff et al. (1977) conducted research which suggested that people usually underestimated the frequency or probability of an event as a result of relying on more availability in memory of the other events. The most significant development of this idea in the field of behavioural finance was made by Shiller (2000a). He proposed that, to a large extent, investors thought the development of internet technology caused the exuberance of the stock market in the late 1990s: 'It is much easier to imagine the consequences of advances in this technology than the consequences of improved

shipbuilding technology or new developments in materials science', because most investors had not heard much about the research in such fields as shipbuilding technology or materials science (Shiller, 2000a, pp.17-19).

2.5.3.3 Frame dependence

'Frame dependence' referred to the phenomenon whereby if people faced problems which had the same substance but different forms, they would make different decisions for cognitive reasons. In other words, the way people thought and behaved depended on their own framework. As a result, a pure economic decision was made when a person acted with frame independence. Besides, minds often took a short cut when measuring complex probabilities according to frame dependence (Tversky and Kahneman, 1981, pp.457-458).

2.5.3.4 Representativeness heuristic

The representativeness heuristic is a rule which people usually use to judge or predict the probability or frequency of a hypothesis according to how much the hypothesis resembles previous experience as opposed to using a Bayesian calculation (Tversky and Kahneman, 1974).

Kahneman et al. (1982) provided the instance of 'flight training' to explain this phenomenon:

An improvement will usually follow a poor performance and deterioration will usually follow an outstanding performance, even if the instructor does not respond to the trainee's achievement on the first attempt. Because the instructors had praised their trainees after good landing and admonished them after poor ones, they reached the erroneous and potentially harmful conclusion that punishment is more effective than reward (Kahneman et al., 1982, pp.10-11).

They pointed out that the failure to understand the effects of regression led people to overestimate the effectiveness of punishment and to underestimate the effectiveness of reward.

De Bondt and Thaler (1985, p.804) used the phrase 'winner loser effect' to make another refinement of the representativeness heuristic. They explained that according to the 'winner loser effect', because of the representativeness heuristic, current investors performed too pessimistically owing to a prior loser portfolio and too optimistically because of a prior winner portfolio. Through tests of the overreaction hypothesis they concluded that portfolios of prior losers were found to outperform those of prior winners.

In sum, this section has covered a series of psychological and behavioural biases, introducing their definitions, applications and related studies, thus constituting the theoretical basis for Chapter 6 which will analyse individual investor behaviour and explore the causal relationships between behavioural biases and investors' investment income.

2.5.4 Gaps and limitations in the view of investor behaviour in the literature

Previous studies have mainly focused on psychological and behavioural biases of investors and few studies have investigated the factors actually affecting investors' choices or the relationship between those behavioural factors and investment income, also involving variable wage income. This research will explore the factors that influence individual investor choice. Moreover, the causal relationship between behavioural biases and investors' investment income will be analysed.

Apart from the main discussion of individual investor behaviour on the SZSE, this research will involve both macro-economic and firm-level contexts to provide an overall context for individual investors and to help explain individual investor behaviour from other perspectives. The four features of the Chinese stock market discussed in section 1.3 provided a unique perspective for analysing individual investor behaviour on the SZSE.

2.6 Conclusion

This chapter has outlined both the theoretical and empirical basis for this research.

Apart from the introduction of the development of investor behaviour theory, utility theory and competing theories of financial anomalies, it provided the empirical basis for the analysis of investor behaviour conducted in this study.

For the macro-economic context for individual investors, empirical evidence has shown that there are significant relationships between macro-economic indicators and stock market fluctuation on mature markets in several countries. For the firm-level context for individual investors, relevant studies show that the practices of effective corporate governance have had crucial effects on the development of corporations, where senior management personnel played an important role. For the discussion of individual investors, a series of behavioural biases which might occur in the process of investment have been explored. Empirical results show that these biases can influence investors' decisions and choices, which then affect investors' investment income. In Chapter 3, the methods applied to this research and related empirical evidence will be discussed.

Chapter 3 Methodology

3.1 The approaches of this research

The main purpose of this research is to explore individual investor behaviour on the SZSE by examining factors influencing investors' choices and the relationships between behavioural factors and investors' investment income. In order to describe the situation of individual investors, as well as helping explain investors' actual behaviours, this research also refers to discussions of the macro-economic environment and firm-level context for individual investors on the SZSE.

This research will use three approaches to conduct different kinds of studies, respectively in Chapters 4, 5 and 6. First, Chapter 4 will employ the explanatory design within the observational approach to investigate the macro-economic context for individual investors, using cointegration analysis by the Engle-Granger two-step model (EG) and the Johansen and Juselius procedure (JJ) (Edmonds and Kennedy, 2012). Second, Chapter 5 will use the descriptive design within the narrative approach to describe the firm-level context for individual investors, employing face-to-face interviews with senior executives in listed companies on the SZSE (Edmonds and Kennedy, 2012). Third, Chapter 6 will use the cross-sectional design within the survey approach to examine the individual investor behaviour on the SZSE, conducting both printed and online anonymous questionnaires (Edmonds and Kennedy, 2012).

3.2 An investigation of the macro-economic context for individual investors on the SZSE

3.2.1 Research question

How does stock exchange volatility relate to movements of macro-economic indicators in the case of the SZSE?

3.2.2 Research objectives

The objective of the macro-economic analysis in this research is to demonstrate the macro-economic context for individual investors on the SZSE by investigating relationships between stock exchange volatility and movements of macro-economic indicators using cointegration analysis. The cointegration analysis combines long-term stable relationships and short-run dynamics.

3.2.3 Approach background

For the macro-economic analysis, the EG and the JJ will be used to examine the relationships between SZSE volatility and macro-economic variables. Studies regarding the relationships between SZSE fluctuations and the economic activity have been described in Chapter 2; a brief literature review in relation to the EG and the JJ will help place this study in context.

As demonstrated in Table 3.1, initially, most studies focused on the stock exchanges in developed countries, such as US, UK and Japan. Some studies have gradually been conducted for emerging markets, such as Malaysia and Korea. For the case of Malaysia, empirical results based on the cointegration approach did not support the strong form of information efficiency for the Malaysian equities (Ibrahim, 1999). Similarly, stock indices were found not to be a leading indicator for economic variables in the Korean stock market (Kwon and Shin, 1999). Furthermore, some other cointegration studies for the relationships between stock prices and macro-economic variables have been conducted sequentially for a series of countries. Following the findings of previous studies, this research focuses on a specific market: the SZSE, using time-varying analysis to build up the macro-economic environment for individual investors.

Table 3.1 Summarised studies relating to cointegration analysis used in this study

Author (Year)	Focused stock exchange or market	Sample period	Methods	Relevant findings
McQueen and Roley (1993)	NYSE	1977-1988	Time-series models	Stock market's response to macro-economic news depended on prevailing economic conditions
Ibrahim (1999)	Malaysian stock market	1977-1998	Both bivariate and multivariate analyses under cointegration approach	Empirical results did not support the strong form of information efficiency for the Malaysian equities
Gjerde and Saettem (1999)	Norwegian stock market	1974-1994	Vector autoregressive models	Changes in interest rates affected both stock returns and inflation; stock market showed a delayed response to changes in real activity
Mookerjee and Yu (1997)	Singaporean stock market	1984-1993	Both cointegration and causality techniques	Narrow and broad money supply as well as foreign exchange reserves exhibited a long-run equilibrium relationship with stock prices, but not exchange rates
Kwon and Shin (1999)	Korean stock market	1980-1992	Cointegration tests and the Granger causality	The stock indices were not a leading indicator for economic variables
Liljeblom and Stenius (1997)	Finnish stock market	1920 - 1991	VAR models	A predictive power in both directions, from the stock market volatility to macro-economic movements, and also from macro-economic volatility to the stock market
Liu and Shrestha (2008)	Chinese stock market	1992-2001	GARCH models and cointegration analysis	Chinese stock market did noticeably react to changes in the macro-economic variables in the long run, although it was highly speculative in the short run

Wongbangpo and Sharma (2002)	Stock markets in five ASEAN countries	1985-1996	The JJ	Past values of macro-economic variables in these ASEAN countries were able to predict future changes in their stock price indices
Nasseh and Strauss (2000)	Stock markets in six European countries	1962-1995	The JJ	Stock prices in the long run were determined by macro-economic activity

Note: ASEAN means the Association of Southeast Asian Nations

3.2.4 Philosophical underpinnings

The study of the macro-economic context for individual investors on the SZSE uses the explanatory design within the observational approach, based on quantitative methods for non-experimental research (Edmonds and Kennedy, 2012). The sequence of the design is illustrated as follows:

Table 3.2 Explanatory design within the observational approach

Method	Quantitative
▼	▼
Research	Non-experimental
▼	▼
Approach	Observational
▼	▼
Design	Explanatory

Source: Edmonds and Kennedy (2012, p.95)

Research in quantitative methods essentially refers to the application of the steps of the scientific method, while using quantitative properties to investigate relationships or effects of specific variables; furthermore, research in quantitative methods is referred to as a deductive process and iterative in nature (Edmonds and Kennedy, 2012). Non-experimental research is used when the variables of interest cannot be controlled through the means of manipulation, inclusion, exclusion or group assignment. Much of the knowledge regarding cause and effect relationships is derived

from the non-experimental research of observational data (Edmonds and Kennedy, 2012).

The observational approach to non-experimental research is considered as a correlation approach which does not use experimental control. The observational approach uses correlational analyses and regression analyses. The two most common designs within the observational approach are explanatory and predictive designs. This research uses the explanatory design which attempts to explain the degree of association between two or more variables (Edmonds and Kennedy, 2012).

Consequently, the explanatory design within the observational approach is suitable for investigating interrelations between stock exchange volatility and movements of macro-economic indicators in this research.

3.2.5 Justification for this study

As mentioned in Chapter 2, using cointegration analysis to explore both long-term and short-run relationships between stock market fluctuations and changes in macro-economic indicators have been widely discussed in developed countries, as well as in some developing countries. Furthermore, several related studies have been conducted for the SHSE, but few concentrated on the SZSE.

Consequently, this research examines the relationships between the SZSE index and a series of macro-economic variables based on the cointegration approach, using the EG and the JJ. Related macro-economic indicators include exchange rates, interest rates, inflation rates, domestic real activity and the level of money supply.

3.2.6 Analytical approach

In order to demonstrate the macro-economic environment for individual investors on the SZSE through a statistical approach, this research will conduct the cointegration

analyses using both the EG and the JJ, to investigate the relationships between stock market fluctuations and macro-economic indicators. The EG is used in the cointegration analysis for two variables, whereas the JJ which adopts maximum likelihood process is suitable for multiple variables (Engle and Granger, 1987; Johansen and Juselius, 1990).

Macro-economic time series data are often non-stationary, so the statistical inference obtained from regression analysis is not reliable. In these cases, cointegration analysis is more suitable (Liu and Shrestha, 2008). Cointegration is a statistical property of time series variables. Two or more time series can be cointegrated if they each share a common type of stochastic drift, which means to a limited degree the fluctuations share a certain style of behaviour in terms of their long-term relationship. If two time series move in a similar way, they will be cointegrated (Granger, 1981).

In statistics, a sequence or a vector of random variables will be homoscedastic if all the random variables in the sequence have constant finite variance. By contrast, if the random variables have different variances, they will be heteroscedastic (Park, 1966).

Both the EG and the JJ are estimations for homoscedasticity; autoregressive conditional heteroscedastic (ARCH) processes, on the other hand, are the estimations for heteroscedasticity (Engle and Granger, 1987; Johansen and Juselius, 1990). Engle and Granger (1987) proposed a two-step estimator to test for cointegration, which combined the problems of unit root tests with parameters unidentified under the null. Johansen and Juselius (1990) applied the method of maximum likelihood and likelihood ratio tests to their model to produce a simple parametric form, by which they could drive estimates and test statistics for the hypothesis of a given number of

cointegration vectors, as well as estimating and testing for linear hypotheses about the cointegration vectors and their weights. A detailed application of these two procedures will be demonstrated in Chapter 4.

3.3 An exploration of the firm-level context for individual investors on the SZSE

3.3.1 Research question

What activities do firms listed on the SZSE undertake to influence investor behaviour and how effective they are?

3.3.2 Research objectives

The objective of the firm-level study in this research is to demonstrate the firm-level context for individual investors on the SZSE, using face-to-face interviews with senior executives in newly listed companies. The study covers the aspects of corporate governance, investor relations and social environment of listed companies on the SZSE to investigate the status of listed companies on the SZSE and explore individual investor behaviour from the perspective of senior executives.

3.3.3 Approach background

Table 3.3 Summarised studies relating to corporate issues used in this study

Author (Year)	Methods	Relevant findings
La Porta et al. (2000)	Comparative approach	Legal protection of investors can be a potentially effective way for efficient corporate governance
Shefrin (2001)	Case studies	Managers and investors should recognise both internal and external behavioural impediments to the firm
Cunningham (2002)	Narrative analysis	In the world of behavioural finance, neither the market for corporate control nor that for managerial labour was as potent as it was in efficient stock markets
Dolphin (2004)	Empirical research using both interviews and questionnaires	Investor relations function played a strategic role among British organisations

The following discussions based on the narrative approach in the field of behavioural finance draw an overview of studies of senior executives' viewpoints and behaviours in regard to corporate governance and investor behaviour (Table 3.3). For instance, using the comparative approach across different countries La Porta et al. (2000) argued that the legal protection of investors (including shareholders and creditors) could be considered a potentially effective way for efficient corporate governance. They also discussed the feasibility of the reform of investor protection, even though there were difficulties (such as the legal structure of each country and regulation of financial markets).

Shefrin (2001) argued that managers and investors should recognise both internal and external behavioural impediments for the firm. Internal obstruction, called behavioural costs, stemmed from psychologically induced errors made by managers or employees. External obstructions stemmed from psychologically induced errors, but were made by analysts or investors. Shefrin (2001) argued that it was important for board members to initiate government via effective group processes to attenuate such errors.

Cunningham (2002) similarly argued that in the world of behavioural finance, the social or legal culture could no longer be content to rely on market signals. Neither the market for corporate control nor that for managerial labour was as potent as it was in efficient stock markets. Fiduciary duties, disclosure, and accounting played an important role for the management process. Capital structure and allocation decisions were the substantive decisions and manifestations of managerial probity and intelligence. For the investors, investor sentiment rather than rational economic calculation contributed significantly to stock price formation. Limited arbitrage, coupled with investor sentiment, could yield pricing that did not equate to value.

It is this behavioural finance research tradition that forms the basis for the study that follows. It shows that behaviours of individual investors are closely related to the performance of listed companies. In other words, the performance of individual investors is affected by the changes in the listed companies in which they invest. Therefore, this research used face-to-face interviews with senior executives in the listed companies on the SZSE to explain individual investor behaviour, as well as analysing the macro-economic environment.

3.3.4 Philosophical underpinnings

The study of the firm-level context for individual investors on the SZSE uses the descriptive design within the narrative approach, based on qualitative methods for non-experimental research. The sequence of the design is illustrated as follows:

Table 3.4 Explanatory design within the narrative approach

Method	Qualitative
▼	▼
Research	Non-experimental
▼	▼
Approach	Narrative
▼	▼
Design	Descriptive

Source: Edmonds and Kennedy (2012, p.111)

The qualitative method is often used to explore the ‘how’ and ‘why’ system and human behaviour (Edmonds and Kennedy, 2012, p.112). In particular, it is a method for examining phenomena, and the process is generally inductive. Research using the qualitative method is considered emerging and non-experimental (Edmonds and Kennedy, 2012).

The narrative approach involves gathering information in the form of participant storytelling for the purpose of understanding a phenomenon. The narrative approach

includes descriptive, explanatory and critical designs. The descriptive design includes the description of: (1) individual or group narratives of specific life events; (2) the conditions or contextual factors supporting the story; and (3) the relationships between individual stories and the culture stories are embedded within (Edmonds and Kennedy, 2012). Consequently, the descriptive design within the narrative approach is suitable for investigating how listed companies behave and senior executives' viewpoints in relation to individual investor behaviour in China's context.

3.3.5 Justification for this study

As mentioned in Chapter 2, few studies have focused on newly listed companies on the SZSE. Furthermore, little literature referred to the relationships between listed companies and individual investors from the perspective of senior executives in China. Therefore, this research conducts face-to-face interviews with senior executives in newly listed companies on the SZSE to investigate the behaviour and performance of listed companies, and it also explores investor behaviour from senior executives' viewpoints. Senior executives' answers provide a particular angle to explain individual investor behaviour on the SZSE.

3.3.6 Analytical approach

The descriptive design within the narrative approach is applied to the firm-level study in this research. An individual face-to-face interview was conducted with each senior executive in listed companies. The application of the descriptive design is conducted as follows: (1) identify a phenomenon; (2) use purposeful sampling; (3) collect stories; (4) retell stories; (5) collaborate with the participants; (6) write stories about the participants' experience; and (7) validate the accuracy of the narrative account (Edmonds and Kennedy, 2012).

3.4 An investigation of individual investor behaviour on the SZSE

3.4.1 Research question

What are the major factors that influence individual investor behaviour on the SZSE that emerge in their micro-environment and what is the impact of related factors?

3.4.2 Research objectives

The objectives of the survey of individual investors are to explore individual investor behaviour on the SZSE by discussing investors' decision and strategy framework, risk attitudes, behavioural bias they may have during the investing process and factors influencing investors' choices. This research also investigates the impact of behavioural factors on investors' investment income.

3.4.3 Approach background

Table 3.5 Summarised studies relating to investor behaviour used in this study

Author (Year)	Sample size	Focused stock exchange or market	Methods	Relevant findings
Lease et al. (1974)	990	NYSE	Survey approach	Short-term stock price movements could not be predicted with any confidence
Lease et al. (1976)	Less than 1000	NYSE	Survey approach	Segmentation existed in the stock market
Bart and Masse (1981)	607	Toronto Stock Exchange	Survey approach	Buyers of a stock were more optimistic about its future price than sellers
Nagy and Obenberger (1994)	137	NYSE	Survey approach	Individual investors placed the highest value on classical wealth-maximisation criteria, undervaluing the benefits of valuation models
Al-Tamimi and Emirates (2006)	343	Abu Dhabi securities market	Survey approach	Six factors, such as past performance of the firm's stock significantly influenced investors' choices

Benartzi and Thaler (2002)	Two surveys: 1. 170; 2. 351	NYSE	Survey approach	Investors preferred the information for the median portfolio selected by their peers to the information they picked for themselves
Clark-Murphy and Soutar (2004)	361	ASX	Conjoint analysis based on survey approach	For most long-term individual investors, accounting fundamentals were less important determinants than company's management to cause changes in share price
Dorn and Huberman (2005)	1345	German stock market	Survey approach	Risk attitudes of investors were key to understanding two of the most puzzling aspects of their behaviour: poor diversification and high turnover
Durand et al. (2008)	21	ASX	Survey approach	There was indeed a relationship of personality with investment decisions and performance

The following paragraphs discuss the empirical studies in relation to individual investor behaviour based on the survey approach (Table 3.5). Lease et al. (1974) were confronted with a rich body of evidence about the characteristics, attitudes, portfolio selection rules, and realised investment returns. They distributed over 1000 questionnaires, containing 130 separate questions, spanning 12 pages, including multiple-choice categories, frequency and importance rating and ranking, and the insertion of dollar values for various classes of asset holdings and items of income and expenditure. Covering the period 1964 to 1970, 990 useful questionnaires were analysed. They firstly made a comparison between the demographic characteristics of the sample and a previous NYSE survey, and discussed the quality of the responses in

terms of investment strategies, decision process, the portfolio context and investor options. In addition, Cohn et al. (1975) continued the previous study to discuss the risk aversion of individual investor. Using questionnaires Lease et al. (1976) also discussed individual investor investment behaviour to suggest that there is segmentation in the stock market. A sample of 2500 customers of a brokerage house were selected, and less than 1000 forms were returned.

Bart and Masse (1981) explored the relationship between stock risk and its divergence of opinion (divergence of opinion means that under uncertainty, potential investors in a stock make a different assessment of expected return) by conducting an investor survey on the Toronto Stock Exchange. About 2700 questionnaires were sent to buyers, sellers, owners, and security analysts who have any one of the three common stocks: a regulated communication company, a petroleum resource company and a mineral resource company, and then 607 questionnaires were analysed to prove that buyers of a stock were more optimistic about its future price than sellers, and price expectations of market participants for each stock, and across stocks, were not homogeneous. Nagy and Obenberger (1994) analysed 137 usable responses from 500 questionnaires which were mailed to experienced shareholders, to explore which kinds of factors influenced individual investors' decisions. Factors were classified into seven categories: neutral information, accounting information, self-image/firm-image coincidence, classic, social relevance, advocate recommendation and personal financial needs, which would be adapted to the study on the Shenzhen stock market. The results suggested that individual investors placed the highest value on classic wealth-maximisation criteria, but they sometimes undervalued the benefits of valuation models.

Following that factor analysis study, Al-Tamimi and Emirates (2006) analysed 343 effective questionnaires to identify the factors influencing individual investors in both the Dubai financial market and Abu Dhabi securities market in UAE (United Arab Emirates). The questionnaire consisted of 34 items belonging to five categories. The results suggested that six factors including expected corporate earnings, get rich quick, stock marketability, past performance of the firm's stock, government holding, and the creation of an organised financial market should be the most influential factors. However, religious reasons and the family members' opinions were two factors which had unexpectedly least influence on the investor behaviour in UAE. Benartzi and Thaler (2002) also conducted two surveys through the University of California, Los Angeles (UCLA) and SwedishAmerican Health System incorporated to discuss the value of the freedom of choice, namely they aimed to investigate how much investors benefited from being able choose their own retirement portfolios. They received 170 responses in the UCLA survey and analysed 351 questionnaires through the saving plan offered by SwedishAmerican Health System incorporated. The results showed that because investors did not have well-defined preferences, they preferred the information for the median portfolio selected by their peers to the information they picked for themselves. A similar but less comprehensive method was employed by Clark-Murphy and Soutar (2004), using conjoint analysis to analyse factors influencing investing decisions in Australia. They firstly conducted qualitative interviews to confirm 11 attributes, and then coded 361 questionnaires on the basis of interviews to analyse the results. They found that for the majority of long-term individual investors, accounting fundamentals such as debt-equity ratio, dividend yield and price/earning ratios were less important

determinants than the company's management to cause recent proximate movements of share price.

Unlike the studies above, Dorn and Huberman (2005) conducted research focusing on behavioural biases that investors might have during the process of buying stocks. They combined survey responses and trading records of a German retail broker to examine proximate causes for an apparent anomaly in buying and holding well-diversified portfolios. Information such as subjective investor attributes gathered from the surveys helped identify portfolio allocation and asset allocation decisions. In sum, these related studies were described to design the general structure and specific questions for the survey on investor behaviour on the SZSE in this research.

3.4.4 Philosophical underpinnings

The study of individual investor behaviour on the SZSE uses the cross-sectional design within the survey approach, based on quantitative methods for non-experimental research (Edmonds and Kennedy, 2012). As discussed in section 3.2.3, research in the quantitative method is referred to as a deductive process and iterative in nature. The sequence of the design is illustrated as follows:

Table 3.6 Cross-sectional design within the survey approach

Method	Quantitative
▼	▼
Research	Non-experimental
▼	▼
Approach	Survey
▼	▼
Design	Cross-sectional

Source: Edmonds and Kennedy (2012, p.95)

The survey approach is the most common form of non-experimental research, and it is used to survey a randomly selected sample of individuals in an entire population.

Surveys are used to observe trends in, and attitudes or opinions of the population. Participants are usually selected to discover related incidence, distribution and interrelations of educational, sociological, behavioural or psychological variables. The survey approach has cross-sectional and longitudinal designs. The cross-sectional design allows the researcher to collect data at one point in time. The common application of this design is to gather opinions and attitudes from one specific group (Edmonds and Kennedy, 2012). Consequently, the cross-sectional design within the survey approach is suitable for investigating individual investor behaviour on the SZSE.

3.4.5 Justification for this study

As mentioned in Chapter 2, previous literature mainly focused on the effects of objective indicators (such as age and education) on investors' income. Few studies explored the relationships between behavioural factors and investors' investment income, especially on the SZSE.

Therefore, this research not only investigates the relationships between behavioural factors and investors' investment income, but also employs both the macro-economic and firm-level contexts to help explain individual investor behaviour on the SZSE. Four aspects of investors' decision framework and investment strategies, namely investors' expectations, future returns, opinions about the current situation of the SZSE, and risk and return on the SZSE, will also be discussed to further explore investors' investment strategies and attitudes.

3.4.6 Analytical approach

The cross-sectional design within the survey approach is used in this research. The structural equation modelling (SEM) procedure is used to analyse the survey data. The procedure of applying SEM consists of seven steps (Hair et al., 1998; Byrne, 2001;

Hoyle, 1995): (1) designing the preliminary model based on prior theories; (2) illustrating the 'path diagram'; (3) explaining the path diagram to measurement and structural models; (4) estimating and testing the models; (5) evaluating the identification of the structural model; (6) assessing goodness-of-fit indices; and (7) modifying and interpreting the final model. A detailed explanation of the SEM process will be demonstrated in Chapter 6.

3.5 Conclusion

This chapter provided an overview of the three methods used in this research: first, cointegration analysis consisting of the EG and the JJ was used to test the relationship between stock exchange volatility and movements of macro-economic indicators, demonstrating the macro-economic environment for individual investors. Second, face-to-face interviews were conducted with senior executives in listed companies to examine the relationships between listed companies and individual investors, examining the firm-level context for individual investors. Third, the survey of individual investors on the SZSE was conducted to investigate individual investor behaviour, especially the influences of behavioural factors on investors' investment income. In Chapter 4, the cointegration analysis combining long-term relationships and short-run dynamics will be conducted, employing data consisting of the SZSE index and a series of macro-economic variables.

Chapter 4 Macro-economic context for individual investors on the SZSE

4.1 Introduction

Chapter 3 reviewed the approaches and methods used in this research, and also referred to aspects of data collection. To complement the overview of the characteristics and the particular situation of the Chinese stock market examined in Chapter 2, this chapter will discuss the macro-economic context for individual investors from a statistical perspective, using cointegration analysis to explore the relationships between the Shenzhen Stock Exchange (SZSE) index and macro-economic variables.

Numerous studies have been undertaken to analyse how stock market indices react to domestic macro-economic activity. Previous studies established the correlation between the macro-economy and stock market movements in many countries (Fama, 1990; Mukherjee and Naka, 1995). Fama (1990) and Mukherjee and Naka (1995) argued that there was a long-term equilibrium relationship between stock prices and real economic activity in the US and Japan. This research issue has been widely addressed in other developed countries, as well as in several emerging markets (Bilson et al., 2001; Kwon and Shin, 1999; Ibrahim, 1999; Liljeblom and Stenius, 1997; Gjerde and Sættem, 1999).

In China, however, unlike in other countries, researchers found varying evidence about this issue. Some argued that there was not only a stable long-term relationship between the stock market and macro-economic variables, but also a correlation over the short-term fluctuations (Jing and Yu, 2001; Zhang and Wang, 2000; Wang and Xu, 2001; Shang and Li, 2002). On the other hand, other researchers held the point of view that the correlation was weak between China stock market volatility and economic

activity, and even showed a status of deviation (Jin, 2011; Wang, 2000; Huang, 2004; Yan et al., 2004). Both the long-term and short-term relationships will be tested in this chapter using the Engle-Granger two-step approach (EG) and the Johansen and Juselius procedure (JJ), to explore the macro-economic environment for individual investors on the SZSE.

The structure of this chapter is organised as follows: section 4.2 outlines the hypotheses that will be tested in this chapter, based on previous related theoretical and empirical studies; section 4.3 demonstrates the data and methods applied to the analysis; section 4.4 discusses the empirical results yielded by the EG and the JJ analyses; and in conclusion, section 4.5 proposes limitations to the approach and the procedures used in this chapter.

4.2 Hypotheses development

Studies relating to the theoretical foundation and framework for the relationships between stock exchange volatility and macro-economic indicators have been discussed in Chapter 2. The literature demonstrated that there were obvious interrelations between stock exchange volatility and the business cycle (Moore, 1975; Moore, 1983; Fama and French, 1989; Chauvet, 1999; Lenten and Moosa, 2003; Destefano, 2004; Næs et al., 2011). Therefore, this section focuses on the hypotheses that will be tested in the following sections. According to the empirical results summarised from previous studies, eight hypotheses will be tested in this chapter:

As discussed in the literature regarding the relationship between the stock exchange index and exchange rates, stock prices can be affected by exchange rates which make earnings more risky; furthermore, exchange rates increase the volatility of a firm's realised cash flows, and then affect the firm's performance (Abdalla and Murinde,

1997; Kim, 2003; Morley, 2007; Kolari et al., 2008; Alagidede et al., 2011). In addition, state foreign exchange reserves are used here as an indicator to reflect the level of exchange rates (Jin, 2011). To examine the effects of exchange rates on stock exchange volatility, Hypotheses 4.1a and 4.1b are proposed:

H4.1a: There is a negative and significant relationship between stock exchange fluctuations and changes of exchange rates on the SZSE.

H4.1b: There is a negative and significant relationship between stock exchange fluctuations and changes of state foreign exchange reserves on the SZSE.

As discussed in previous studies regarding the relationship between the stock exchange index and interest rates, higher interest rates which are in response to higher expected inflation can lead to restrictive monetary policy, and can also reduce the demand for stocks (Jensen and Johnson, 1995; Jensen et al., 1997; Lobo, 2000; Faff et al., 2005; Vaz et al., 2008). Besides, inter-bank weighted average interest rates are used here as an indicator to reflect the level of interest rates (Jin, 2011). To estimate the effects of interest rates on stock exchange volatility, Hypotheses 4.2a and 4.2b posit that:

H4.2a: There is a negative and significant relationship between stock exchange fluctuations and changes of interest rates on the SZSE.

H4.2b: There is a negative and significant relationship between stock exchange fluctuations and changes of inter-bank weighted average interest rates on the SZSE.

As discussed in previous literature regarding the relationship between the stock exchange index and inflation rates, over the short-term, when inflation rates increase, negative income effects imply that stock values may diminish; on the other hand, over

the long-term, if the firms can overcome rising costs and achieve expected profitability, stocks should be a good hedge against inflation (Fama, 1981; Mandelker and Tandon, 1985; Kaul and Seyhun, 1990; Domian et al., 1996; Murphy and Sahu, 2001; Luintel and Paudyal, 2006; Humpe and Macmillan, 2009; Vaz, 2011). To examine the effects of inflation rates on stock exchange volatility, Hypothesis 4.3 posits that:

H4.3: There is a negative and significant relationship between stock exchange fluctuations and changes of inflation rates on the SZSE.⁸

As discussed in previous studies in regard to the relationship between the stock exchange index and real activity, changes in real activity have a significant positive impact on stock prices (Fama, 1990; Schwert, 1990; Ferson and Harvey, 1994; Ratanapakorn and Sharma, 2007). In this chapter both industrial production and producer price index are used to represent the real activity (Jin, 2011). Therefore, to estimate the effects of the real activity on stock exchange volatility, Hypotheses 4.4a and 4.4b posits that:

H4.4a: There is a positive and significant relationship between stock exchange fluctuations and changes of producer price index on the SZSE.

H4.4b: There is a positive and significant relationship between stock exchange fluctuations and changes of industrial production on the SZSE.

As discussed in previous literature regarding the relationship between the stock exchange index and money supply, influences of money supply on stock exchange volatility showed mixed results: some researchers argued that money supply was negatively related to stock prices (Geske and Roll, 1983; Friedman, 1988; Black et al.,

⁸ As mentioned in Chapter 3, Consumer price index (CPI) is used here to represent inflation rates.

2009). On the other hand, some researchers demonstrated that there was a consistent relationship between monetary conditions and stock prices (Conover et al., 2005; Ratanapakorn and Sharma, 2007). To estimate the effects of money supply on stock exchange volatility, Hypothesis 4.5 posits that:

H4.5: There is a positive and significant relationship between stock exchange fluctuations and changes of money supply on the SZSE.

4.3 Methods and Data

4.3.1 Methods

The EG is used here in the cointegration analysis for two variables, whereas the JJ , which adopts maximum likelihood process, is suitable for multiple variables (Engle and Granger, 1987; Johansen and Juselius, 1990). Three essential steps will be carried out to demonstrate the cointegration analysis using both the EG and the JJ (Ibrahim, 1999; Bi, 2007; Liu and Shrestha, 2008; Jin, 2011; Fukač, 2012).

The first step is to establish the order of integration of the used variables. In detail, if a variable is stationary after differencing d times, it can be said to be integrated of order d, namely I(d). In other words, the variable is non-stationary if it is integrated of order greater than or equal to 1. Augmented Dicky-fuller (ADF) unit root tests are employed in this chapter to examine whether the variable is stationary (Dickey and Fuller, 1981), relying on the following regression:

$$\Delta x_t = \alpha + \beta_t + p_{t-1} + \sum_{i=1}^k \phi_i \Delta x_{t-1} + \varepsilon_t$$

where x is the variable under the test and t is a trend term. The examination for unit roots amounts is used to test whether the estimated value for p is significantly less than 0. Thus, if the result rejects the null hypothesis that p=0, the series is stationary

(Ibrahim, 1999). The time series should be integrated of the same order, which is a necessary condition for the further testing procedure (Fukač, 2012).

After establishing the order of integration for each variable, the second step in the analysis process is to evaluate the cointegration relationship among the data. As mentioned in Chapter 3, the cointegration relationship among the data, namely the relationship between the stock exchange index and macro-economic indicators, suggests the existence of a long-term relationship that involves their movements. In other words, the variables are not supposed to drift away from each other arbitrarily, despite the fact that the variables are individually non-stationary (Fukač, 2012).

The EG model, which is used in the analysis for two variables, includes the estimation of the following cointegration regression:

$$y_t = \alpha_0 + \alpha_1 x_{1t} + \dots + \alpha_k x_{kt} + \varepsilon_t$$

where it is assumed that each of the $(k+1)$ series $y_t, x_{1t}, \dots, x_{kt}$ has a single unit root.

Then each of the $(k+1)$ series is taken as being cointegrated if series ε_t is stationary (Liu and Shrestha, 2008). The null hypothesis of no cointegration is rejected if the unit root results fall below the standard critical values. It should be emphasised that the EG has its own criteria of critical values for the ADF test (Mackinnon, 1990; Wooldridge, 2009). The analyses in this chapter follow the standard statistics that are summarised in Table 4.1.

Table 4.1 Asymptotic critical values for the Augmented Dicky-fuller test in the EG

Asymptotic critical values for cointegration test: linear time trend				
Significant level	1%	2.5%	5%	10%
Critical value	-4.32	-4.03	-3.78	-3.50
Asymptotic critical values for cointegration test: no time trend				
Significant level	1%	2.5%	5%	10%
Critical value	-3.90	-3.59	-3.34	-3.04

Source: Mackinnon (1990); Wooldridge (2009)

Compared to the EG which involves only one cointegrating vector, the JJ can identify multiple vectors using maximum likelihood process (Engle and Granger, 1987; Johansen and Juselius, 1990). Max-eigenvalue test is used in this chapter to examine the number of cointegration vectors. The test is based on a canonical correlation analysis of residuals from two vector autoregressions: (1) Δx_t on $\Delta x_{t-1}, \dots, \Delta x_{t-p+1}$ and (2) x_t on $\Delta x_{t-1}, \dots, \Delta x_{t-p+1}$, where x is a vector of the variables used in the analysis and p is the order of autoregression (Johansen and Juselius, 1990; Johansen et al., 1995; Ibrahim, 1999).

After evaluating cointegration properties of the variables, the third step is to examine dynamic relations among the data using error-correction model (ECM). In other words, the second step demonstrates long-run relationships among the data, whereas the ECM in the third step is used to evaluate short-run relations (Engle and Granger, 1987). Therefore, the short-term dynamic causal link from m (such as a macro-economic variable) to p (such as the stock exchange index) can be shown as follows:

$$\Delta p_t = \alpha_1 + \sum_{i=1}^r \beta_{1i} \Delta p_{t-i} + \sum_{i=1}^s \phi_{1i} \Delta m_{t-i} + \gamma_1 EC_{t-1} + v_{1t}$$

where EC is the error correction term from the long-run relationship of the variables. Thus, here the ECM combines the long-run adjustments of the stock exchange index and short-run dynamics (Engle and Granger, 1987; Ibrahim, 1999).

Besides the three steps described above, this research also employs the Granger causality test to further examine the causal relationship among the data. It needs to be emphasised that the Granger causality test should be run on $I(0)$ series (Engle and Granger, 1987; Fukač, 2012). EViews 7 Student Version is the software that is used for the analyses in this chapter (Eviews 7 Student Version, 2012).⁹

4.3.2 Data

Cointegration analysis is applied in this research for investigating both the long- and short-term relationships between SZSE index volatility and macro-economic variables, using the EG for two-variable analysis, and the JJ for multiple variables. The monthly data employed in this research covers the period from January 2001 to December 2010 and the sample has 114 observations (see Appendix A for full data). The data were obtained from the RESSET Financial Database, the National Bureau of Statistics of China, the People's Bank of China and the Shenzhen Stock Exchange Fact Book, 2001 to 2010 (Resset Database, 2011; National Bureau of Statistics of China, 2012; The People's Bank of China, 2013; Shenzhen Stock Exchange, 2002-2011b).

Table 4.2 shows the list of variables used in the cointegration analysis. For the independent variables, financial indicators are usually published by the People's Bank of China, and most economic data are released through the National Bureau of Statistics of China. The definitions of several variables were endowed with specific

⁹ A two-year-license student version of EViews 7 is bundled with this research. Funding for purchasing this software was provided by School of Business, UNSW@Canberra.

characteristics in China's context. For instance, because of the incomplete structure of interest rates in China, the inter-bank borrowing/lending rates were not a reliable benchmark for interest rates (Zhou, 2010). The same situation also occurred with money supply 1. Since cheques could not be directly converted into cash, there was in reality not enough currency in circulation (Wei, 2009).

As the dependent variables, the SZSE manufacturing index was applied to the cointegration analysis instead of the SZSE composite index and the SZSE component index. Logarithmic difference is taken to measure the SZSE volatility (Liljeblom and Stenius, 1997). One of the reasons that the SZSE manufacturing index was used in this research is that most financially important enterprises in dominant industries are state owned. As a result, using the manufacturing index will be more representative of the volatility of the stock market in the market economy (Yuan, 2000). Another reason for adopting the manufacturing index is that previous studies have mainly focused on the SZSE composite index which was used to represent the SZSE (Yan et al., 2004; Liu and Shrestha, 2008; Hu and Zhang, 2009; Cong et al., 2008; Soenen and Johnson, 2001).¹⁰ Thus, this research intends to examine the relationship between stock market fluctuation and macro-economic performance from another perspective.

¹⁰ In this research, in fact, the SZSE composite index was tried before the manufacturing index was used. However, it was difficult to find an obvious cointegration relationship in each group of two variables. After referring to related journal articles and discussing this problem with Professor Satish Chand, it was decided to substitute the manufacturing index for the composite index.

Table 4.2 Definitions of applied variables in the Chinese context

<i>Variables</i>	Definition	Particular characteristics in China	Issuing agency
<i>SZSE Manufacturing Index</i>	Paasche price index; index sample selection criteria: all stocks listed in SZSE belonging to the wholesale and manufacturing industry	None	SZSE
<i>Exchange Rate</i>	The price of one country's currency expressed in another country's currency	Managed floating exchange rate system; capital controls	People's Bank of China
<i>Short-term Interest Rate</i>	The benchmark one-year deposit rate	Control of interest rate and restrictions on floating range	People's Bank of China
<i>CPI</i>	Measures changes in the price level of consumer goods and services purchased by households	Lower proportion of housing prices included in the estimation of CPI	National Bureau of Statistics of China
<i>Ex-factory Price Indices of Industrial Products (Producer Price Index) (PPI)</i>	Measures average changes in prices received by domestic producers for their output	None	National Bureau of Statistics of China
<i>Industrial Production Growth Rate</i>	Annual percentage increase in industrial production	None	National Bureau of Statistics of China
<i>Money Supply 1 (m1)</i>	M0 (cash in circulation) plus demand deposits of enterprises, institutions, organisations, military units, schools and other units in the bank	Cheques cannot be directly converted into cash; not enough currency in circulation (Wei, 2009)	People's Bank of China

<i>The Inter-bank Weighted Average Interest Rate</i>	The weighted average interest rate in the inter-bank borrowing/lending market	Irrational structure of interest rate; it is difficult to use the inter-bank borrowing/lending rates as the benchmark of interest rates (Zhou, 2010)	People's Bank of China
<i>State Foreign Exchange Reserves</i>	Foreign currency deposits and bonds held by central banks and monetary authorities, commonly including foreign exchange, gold, special drawing rights (SDRs), and International Monetary Fund (IMF) reserve positions	The policy of stable gold reserves	State Administration of Exchange Control

Source: Shenzhen Stock Exchange; National Bureau of Statistics of China; People's Bank of China;

Notes: The Paasche price index is an index formula used in price statistics for measuring the price development of the basket of goods and services that is consumed in the current period (Paasche, 1874; Anghelache et al., 2012).

The following notation in Table 4.3 will be employed in the rest of this chapter:

Table 4.3 List of notations for variables used in this study

Notation	Variable
<i>szsem</i>	SZSE Manufacturing Index
<i>exchangerate</i>	Exchange Rate
<i>interestrates</i>	Short-term Interest Rate
<i>CPI</i>	Consumer Price Index
<i>PPI</i>	Producer Price Index
<i>ipgr</i>	Industrial Production Growth Rate
<i>m1</i>	Money Supply 1
<i>ibwai</i>	The Inter-bank Weighted Average Interest Rate
<i>sfer</i>	State Foreign Exchange Reserves
<i>lnx</i>	logged variables
<i>D(x)</i>	first difference of variables

These shortened forms of the variables will be used to represent the indicators. In order to eliminate the effects of heteroscedasticity, all variables have been converted into natural logarithms except for *ipgr* (Bi, 2007).

4.4 Results

The cointegration analyses will be conducted in this section, using both the EG and the JJ, to investigate the relationships between stock market fluctuations and macro-economic indicators. In each of the analyses, long-run relationships will be first tested, followed by short-run adjustments using the ECM. Then Granger causality tests are used to further explore the causal relationships between SZSE index volatility and movements of macro-economic indicators.

4.4.1 Engle-Granger two-step approach

4.4.1.1 Long-run relationship test

Because *lnszsem* is $I(1)$, the first step is to test whether other time-series are $I(1)$, which is a basic condition for using a further testing process. The standard ADF test is used to examine whether the time-series is stationary. Unit roots are first tested in the cases where intercept and trend are involved in the regression; secondly when the intercept only is present; and finally using 'none', namely without intercept and trend (Fukač, 2012). If the null hypothesis that the variable has a unit root cannot be rejected, the first difference is applied for the original time-series. Table 4.4 shows that *lnPPI* and *ipgr* are stationary, which indicates that these two variables are not suitable for the next procedure; thus, H4.4a and H4.4b have already been disproved at this stage. Likewise, *lnm1* which becomes stationary after the second difference cannot be adopted for cointegration analysis with *lnszsem* by the EG, which means that H4.5 has also been rejected. Therefore, *lnexchangerate*, *lninterestrates*, *lnapi*, *lnibwai* and *lnsfer*

which are all stationary after the first difference are tested in order to ascertain whether they have a long-run relationship with *lnszsem*.

Long-run relationships are then estimated for each group of two variables. Then the regression residuals are obtained from the equations. The next step is to examine whether the residuals are stationary using the standard ADF test, for which the process is same as the procedure discussed in the previous paragraph.

If the statistic can reject the null hypothesis that the residual series has a unit root, it can be concluded that the two variables are cointegrated of the order $CI(1,1)$, otherwise a cointegration relationship does not exist between the two variables.

Table 4.5 shows that the residuals of three equations are stationary after the first difference, which means that the relationships between (1) *lnszsem* and *ln CPI*, (2) *lnszsem* and *lnsfer* and (3) *lnszsem* and *lnibwai* are $CI(2,1)$. As a result, no cointegration relationship can be detected respectively by CPI, the inter-bank weighted average interest rate and state foreign exchange reserves with stock market volatility, in terms of the EG. That means that H4.3, H4.1b and H4.2b have been disproved at this stage.

The long-run relationship between *lnszsem* and *lnexchangerate* is estimated as follows (H4.1a):

Equation 4.1:

$$\begin{aligned} \lnszsem = & 1.57842278804 + 1.06241772693\lnszsem(-1) - 0.153155155391\lnszsem(-6) - \\ & (2.758457) \quad (31.42931) \quad (-4.143092) \\ & 0.489483463155\lnexchangerate(-1) \\ & (-2.520325) \\ R^2 = & 0.974347 \quad DW = 2.157583 \end{aligned}$$

Table 4.4 Augmented Dicky-fuller unit root test results for all variables

<i>Variables</i>	ADF t- statistic (trend and intercept)	Critical value at 1% (trend and intercept)	Critical value at 5% (trend and intercept)	ADF t- statistic (intercept)	Critical value at 1% (intercept)	Critical value at 5% (intercept)	ADF t- statistic (none)	Critical value at 1% (none)	Critical value at 5% (none)	Conclusion
<i>Inszsem</i>	-1.762932	-4.041280	-3.450073	-0.208322	-3.489117	-2.887190	0.884543	-2.585587	-1.943688	Non-stationary
<i>D(Inszsem)</i>	-5.617134	-4.042819	-3.450807							Stationary
<i>Inexchangerate</i>	-2.124130	-4.043609	-3.451184	0.061511	-3.490772	-2.887909	-1.684467	-2.586154	-1.943768	Non-stationary
<i>D(Inexchangerate)</i>	-6.030953	-4.042042	-3.450436							Stationary
<i>Ininterestrates</i>	-3.209094	-4.041280	-3.450073	-0.701800	-3.489117	-2.887190	-1.020604	-2.585587	-1.943688	Non-stationary
<i>D(Ininterestrates)</i>	-9.733786	-4.042819	-3.450807							Stationary
<i>Incpi</i>	-2.318268	-4.051450	-3.454919	-2.175323	-3.496346	-2.890327	0.519166	-2.588059	-1.944039	Non-stationary
<i>D(Incpi)</i>	-4.684959	-4.051450	-3.454919							Stationary
<i>InPPI</i>	-4.067084	-4.042042	-3.450436							Stationary
<i>ipgr</i>	-3.770104	-4.042042	-3.450436	-3.802131	-3.489659	-2.887425				Stationary
<i>Inm1</i>	-1.678826	-4.051450	-3.454919	1.003620	-3.496346	-2.890327	2.037320	-2.588059	-1.944039	Non-stationary
<i>D(Inm1)</i>	-2.270633	-4.051450	-3.454919	-1.987536	-3.496346	-2.890327	-0.367110	-2.588059	-1.944039	Non-stationary
<i>D(Inm1, 2)</i>	-6.913883	-4.051450	-3.454919							Stationary
<i>Inibwai</i>	-2.960461	-4.041280	-3.450073	-2.961356	-3.489117	-2.887190	-1.087022	-2.585587	-1.943688	Non-stationary
<i>D(Inibwai)</i>	-12.21714	-4.042042	-3.450436							Stationary
<i>Insfer</i>	0.269021	-4.041280	-3.450073	-2.968382	-3.489117	-2.887190	6.499474	-2.585773	-1.943714	Non-stationary
<i>D(Insfer)</i>	-8.633133	-4.042042	-3.450436							Stationary

Notes: (1) Results are from EViews 7 Student Version (Eviews 7 Student Version, 2012).

(2) In order to maintain the authenticity of the data as a reflection of real economic meaning, seasonal adjustments were not applied for the variables (Liu, 2001).

Table 4.5 Augmented Dicky-fuller unit root test results of the residuals of the two-variable equations

<i>Residual of the equation for each two-variable group</i>	ADF t-statistic (trend and intercept)	Critical value at 1% (trend and intercept)	Critical value at 5% (trend and intercept)	ADF t-statistic (intercept)	Critical value at 1% (intercept)	Critical value at 5% (intercept)	ADF t-statistic (none)	Critical value at 1% (none)	Critical value at 5% (none)	Conclusion
<i>Inszsem and Inexchangerate</i>	-3.414679	-4.044415	-3.451568	-3.442535	-3.491345	-2.888157	-3.457210	-2.586350	-1.943796	Stationary
<i>Inszsem and Ininterestrates</i>	-2.581012	-4.041280	-3.450073	-2.616092	-3.489117	-2.887190	-2.627372	-2.585587	-1.943688	Stationary
<i>Inszsem and Incpi</i>	-1.727902	-4.041280	-3.450073	-0.646619	-3.489117	-2.887190	-0.655853	-2.585587	-1.943688	Non-stationary
<i>D(residual of Inszsem and Incpi)</i>	-9.559505	-4.042042	-3.450436							Stationary
<i>Inszsem and Inibwai</i>	-1.670136	-4.041280	-3.450073	-0.181593	-3.489117	-2.887190	-0.195777	-2.585587	-1.943688	Non-stationary
<i>D(residual of Inszsem and Inibwai)</i>	-5.900468	-4.042819	-3.450807							Stationary
<i>Inszsem and Insfer</i>	-1.965064	-4.042819	-3.450807	-1.915673	-3.490210	-2.887665	-1.920758	-2.585962	-1.943741	Non-stationary
<i>D(residual of Inszsem and Insfer)</i>	-5.592707	-4.042819	-3.450807							Stationary

Notes: (1) Results are from EViews 7 Student Version (Eviews 7 Student Version, 2012).

As shown in Equation 4.1, the coefficient -0.489483463155 measures the long-term relationship between *lnszsem* and *lnexchangerate*, which means that changes in exchange rates have significantly negative effects on SZSE volatility. Because there is serial correlation in the equation which does not have any lags in terms of the Q-statistics test (Table 4.6), suitable lags are added into the equation, and it is confirmed that the residual series is stationary.

According to the results of the Breusch–Godfrey serial correlation Lagrange multiplier (LM) test, it can be evidenced from Table 4.7 that the null hypothesis of no serial correlation in the residuals cannot be rejected; so it can be concluded that serial correlation is not present in the residuals of Equation 4.1.

Table 4.6 Results of Ljung-Box Q-statistics for residuals of equations with no lag

Sample: 2001M07 2010M12
Included observations: 114

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.948	0.948	105.28	0.000
		2	0.888	-0.118	198.33	0.000
		3	0.808	-0.221	276.04	0.000
		4	0.718	-0.121	337.97	0.000
		5	0.601	-0.302	381.75	0.000
		6	0.479	-0.097	409.80	0.000
		7	0.374	0.193	427.05	0.000
		8	0.257	-0.184	435.30	0.000
		9	0.142	-0.084	437.82	0.000
		10	0.024	-0.106	437.90	0.000
		11	-0.080	-0.089	438.73	0.000
		12	-0.186	-0.092	443.23	0.000

Table 4.7 Results of Breusch-Godfrey Serial Correlation LM tests for Equation 4.1

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.764785	Prob. F(2,102)	0.4681
Obs*R-squared	1.595617	Prob. Chi-Square(2)	0.4503

Similarly, the equation which indicates the long-term relationship between *lnszsem* and *lninterestrte* can be presented as follows (H4.2a):

Equation 4.2:

$$\begin{aligned} \lnszsem = & 0.630333481841 + 0.0661492109495 \lninterestrte + 1.07539712251 \lnszsem (-1) - \\ & (1.821359) \quad (1.547743) \quad (26.74208) \\ & 0.325627506918 \lnszsem (-6) + 0.188999273657 \lnszsem (-7) \\ & (-2.982654) \quad (1.940739) \end{aligned}$$

$$R^2 = 0.974896 \quad DW = 2.125046$$

In Equation 4.2, the coefficient 0.0661492109495 measures the long-term relationship between *lnszsem* and *lninterestrte*, which means that movements of short-term interest rates have a positive impact on SZSE fluctuations. However, this coefficient (1.547743) is not as significant as the one (-2.520325) in Equation 4.1, which means that changes in interest rates have no remarkable impact on stock market fluctuations.

4.4.1.2 ECM estimation

After estimating the long-term relationship, ECM is used to involve the short-period adjustments in the equation. As a result, the residual of the long-term relationship equation is built into the ECM estimation.

After making the first difference of the two equations, ECM can be illustrated as follows:

Equation 4.3:

$$\begin{aligned} D(\lnszsem) = & 1.13404874687 D(\lnszsem (-1)) - 0.330968476722 D(\lnszsem (-6)) - \\ & (4.424172) \quad (-3.266283) \\ & 3.71733892402 D(\lnexchangerate (-1)) - 1.16152324953 resid(-1) \\ & (-1.563034) \quad (-4.216277) \end{aligned}$$

$$R^2 = 0.178542 \quad DW = 1.886147$$

Equation 4.4:

$$\begin{aligned}
D(\ln szsem) = & 0.167128951863D(\ln interstrate) + 1.09692919267D(\ln szsem (-1)) - \\
& (1.762426) \qquad \qquad \qquad (3.925550) \\
& 0.359285654587D(\ln szsem (-6)) + 0.325770909588D(\ln szsem(-7)) - \\
& (-3.463681) \qquad \qquad \qquad (3.189870) \\
& 1.10763434727resid(-1) \\
& (-3.681976)
\end{aligned}$$

$$R^2 = 0.183088 \quad DW = 1.980099$$

The ECM model is used to estimate short-term relationships, in which the error correction (namely *resid* in the equation) reflects the impact of short-term fluctuation on long-run equilibrium; so the variables after the first difference on the right side of the equation demonstrate the effects of short-term volatility. Equations 4.3 and 4.4 show that the error corrections constitute significant effects on $D(\ln szsem)$; that is the absolute value of the coefficients for both is over 1 ($\beta = -1.16152324953$ in Equation 4.3 and $\beta = -1.10763434727$ in Equation 4.4). Usually the equation works out when $-2 < \beta < 0$, though it could be better if $-1 < \beta < 0$ (Banerjee et al., 2001; Wooldridge, 2009). If the error correction coefficient β is less than -1, it means that other important control variables may be omitted in the ECM. As seen in Equations 4.3 and 4.4 above, each equation only covers the short-term relationships between two key variables.

The argument from Equations 4.3 and 4.4 can be summarised as follows: although stable long-term relationships exist between stock market change and a few financial indicators, there is still a large degree of instability over the short term.

4.4.2 Johansen and Juselius procedure**4.4.2.1 Johansen system cointegration test**

In addition to the analysis of the EG for two variables, the JJ in this section is suitable for the cointegration test for more than two variables. The cointegration test is applied

to all the I(1) time series, consisting of *lnszsem*, *lninterestrates*, *lnibwai*, *lnexchangerate*, *lnapi*, and *lnsfer*. After confirming the presence of cointegration vectors, the results of the cointegration equation can be generated, and this is followed by the ECM estimation to examine the short-term adjustment for the cointegration relationship.

Table 4.8 Results of Johansen system cointegration test

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesised No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.381695	52.40427	40.07757	0.0013
At most 1 *	0.325025	42.84568	33.87687	0.0033
At most 2 *	0.225289	27.82390	27.58434	0.0466
At most 3	0.149358	17.63231	21.13162	0.1442
At most 4	0.083497	9.503692	14.26460	0.2466
At most 5 *	0.040206	4.473015	3.841466	0.0344

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Both Trace and Max-eigenvalue tests can be used to examine the cointegration relationships. This research adopted the Max-eigenvalue test through which we can see that the hypothesis of no cointegration vectors can be rejected at the 0.05 level. However, the hypothesis of three cointegration vectors can be accepted (Table 4.8). Therefore, the cointegrating equation between the dependent variable (*lnszsem*) and the independent variables (consisting of *lninterestrates*, *lnibwai*, *lnexchangerate*, *lnapi*, and *lnsfer*) can be concluded as follows (Table 4.11):

Table 4.9 Results of cointegrating equation

1 Cointegrating Equation(s): Log likelihood 1553.345

Normalised cointegrating coefficients (standard error in parentheses)

LNSZSEM	LNINTERESTRA TE	LNIBWAI	LNEXCHANGER ATE	LNCPI	LNSFER
1.000000	-0.113043 (0.32253)	-0.085211 (0.18882)	11.06551 (1.68633)	-6.614748 (2.51025)	0.754874 (0.10846)

As shown in Table 4.9, the long-term cointegration relationships between the SZSE manufacturing index and macro-economic indicators can be described as follows:

$$lnszsem - 0.113043lninterestrates - 0.085211lnibwai + 11.06551lnexchangerate - 6.614748 lncpi + 0.754874 lnser = 0$$

According to the equation above, Equation 4.5 can be concluded after transposing the variables:

Equation 4. 5:

$$lnszsem = 0.113043lninterestrates + 0.085211lnibwai - 11.06551lnexchangerate + 6.614748 lncpi - 0.754874 lnser$$

Equation 4.5 shows that over the long term, movements of short-term interest rates, the inter-bank weighted average interest rates and CPI have positive effects on the SZSE manufacturing index. By contrast, the relationship between the SZSE manufacturing index and exchange rates, as well as state foreign exchange reserves, is found to be negative.

4.4.2.2 Vector error-correction model estimation

Similar to section 4.4.1.2, the vector error-correction model (VECM) is used here to specify short-term adjustments between the SZSE manufacturing index and macro-economic activity. The number of lags is decided by either the Schwarz Bayesian criterion (SBC) or the Akaike Information Criterion (AIC). According to the principle of

AIC minimisation, it results in the use of two period lags in ECM estimation. The estimation result of the VECM is shown in Table 4.10.

Table 4.10 Vector error-correction estimates

Vector Error Correction Estimates

Date: 06/29/12 Time: 17:28

Sample (adjusted): 2001M10 2010M12

Included observations: 111 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1					
LNSZSEM(-1)	1.000000					
LNINTERESTRATE(-1)	-0.762107 (0.44866) [-1.69863]					
LNIBWAI(-1)	-0.075915 (0.27068) [-0.28046]					
LNEXCHANGERATE(-1)	8.608667 (2.34064) [3.67791]					
LNCPI(-1)	-14.26798 (3.38060) [-4.22055]					
LNSFER(-1)	0.929767 (0.15286) [6.08253]					
C	26.75563					
Error Correction:	D(LNSZSEM)	D(LNINTEREST RATE)	D(LNIBWAI)	D(LNEXCHANG ERATE)	D(LNCPI)	D(LNSFE R)
CointEq1	0.100009 (0.03496) [2.86047]	0.034032 (0.03284) [1.03629]	0.071491 (0.06228) [1.14786]	-0.002301 (0.00129) [-1.78466]	0.010894 (0.00224) [4.86619]	0.002545 (0.00593) [0.42957]

According to Table 4.10, Equation 4.6 can be summarised as follows after removing the coefficients that were not significantly related:

Equation 4.6:

$$\begin{aligned}
D(\lnszsem) = & 0.100000\lnszsem(-1) + 0.860867\lnexchangerate(-1) - 1.426798\ln cpi(-1) + 0.093978 \\
& (2.86047) \quad (3.67791) \quad (-4.22055) \\
& \lnsfer(-1) - 0.173896D(\lnszsem(-1)) - 0.168574D(\lnibwai(-1)) - 0.185529D(\lnibwai(-2)) - \\
& (6.08253) \quad (-1.52920) \quad (-2.93965) \quad (-3.12363) \\
& 1.113153D(\lnsfer(-2)) + 2.675563 \\
& (-1.79058)
\end{aligned}$$

From Table 4.10 and Equation 4.6 it can be seen that the error correction terms have a significant effect on the change in the SZSE manufacturing index. As a result, the conclusion here is the same as the one described in section 4.4.1 when using the EG: although the SZSE manufacturing index fluctuation and macro-economic indicators have a long-term equilibrium relationship, this relationship is not stable over the short term. Therefore, this result of the JJ for multiple variables further confirms that the correlations between SZSE change and macro-economic indicator movements are not significant in the short run.

4.4.3 Granger causality tests

Through the Granger causality tests, it can be further proved that the causality between SZSE volatility and macro-economic activity is not significant. It should be emphasised that the Granger causality test must be run on $I(0)$ series; so in this case, all the variables used are stationary and they become stationary after the first difference (Fukač, 2012).

As shown in Table 4.11, the changes in inter-bank weighted average interest rates do cause the SZSE fluctuations, significantly at the 5% level. However, conversely, the hypothesis that 'SZSE fluctuation does not cause changes in inter-bank weighted average interest rates' cannot be rejected. Movements of state foreign exchange reserves and the SZSE manufacturing index fluctuations do not cause each other. The

same situation also occurs for the changes in exchange rates and the SZSE manufacturing index volatility, for which the result is inconsistent with the estimation of Equation 4.1 that a long-term cointegration relationship exists between exchange rates and the SZSE manufacturing index.

SZSE fluctuation does cause movements of interest rates according to the F-Statistic in Table 4.11, significantly at the 1% level. On the other hand, changes in interest rates do not Granger cause movements of SZSE index. Similarly, SZSE fluctuation does have a causal influence on CPI change, significantly at the 10% level. However, CPI fluctuation causing SZSE volatility cannot be found.

Table 4.11 Results of Granger causality tests

Pairwise Granger Causality Tests

Date: 08/11/12 Time: 17:16

Sample: 2001M07 2010M12

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLNSFER does not Granger Cause DLNSZSEM	111	1.48392	0.2314
DLNSZSEM does not Granger Cause DLNSFER		0.09962	0.9053
DLNINTERESTRATE does not Granger Cause DLNSZSEM	111	0.21483	0.8070
DLNSZSEM does not Granger Cause DLNINTERESTRATE		7.42868	0.0010
DLNIBWAI does not Granger Cause DLNSZSEM	111	3.19608	0.0449
DLNSZSEM does not Granger Cause DLNIBWAI		2.08768	0.1290
DLNEXCHANGERATE does not Granger Cause DLNSZSEM	111	0.29079	0.7483
DLNSZSEM does not Granger Cause DLNEXCHANGERATE		0.64806	0.5251
DLNCPI does not Granger Cause DLNSZSEM	111	0.25491	0.7755
DLNSZSEM does not Granger Cause DLNCPI		2.56503	0.0817

The results from the EG and the JJ showed that only two groups of long-term relationships existed, namely (1) exchange rates and SZSE volatility and (2) short-term interest rates and SZSE volatility, but they did have substantial fluctuations over the

short-term. The results of the Grange causality tests showed that only three groups of causal relationships existed between SZSE volatility and most macro-economic indicators. Therefore, the results in this section are consistent with the conclusion obtained from both the EG and the JJ, which proves that there is no close correlation between SZSE volatility and most macro-economic indicators in China.

4.5 Findings and discussion

This chapter has focused on the macro-economic context for individual investors on the SZSE. An overview of the SZSE was given in Chapter 1, which provided a descriptive context for investors, in terms of particular characteristics of the Chinese stock market. Evidence showed that the Chinese stock market has several drawbacks and limitations, which leads to an inadequate relationship with investors.

The analyses of this chapter have focused on both the long-run equilibrium and the short-run adjustment relationships between SZSE volatility and macro-economic changes. Cointegration analysis was conducted using the EG for two-variable analysis and the JJ for multiple variables. The empirical results for the EG showed that long-term cointegration relationships only exist between the SZSE manufacturing index and exchange rates, as well as interest rates. However, there was a large degree of instability over the short term. A similar result was also found for the JJ for multiple variables, and finally the Granger causality test further proved the existence of weak correlation between SZSE index change and macro-economic movements. As discussed in previous studies, macro-economic activity is still not the barometer of stock market volatility in the SZSE case (Jin, 2011; Wang, 2000; Yan et al., 2004; Huang, 2004).

Therefore, it is difficult for investors to predict changes in the stock market based on the status of macro-economic activity. The process by which individual investors take

into account macro-economic activity when they invest on the SZSE will be further explored in Chapter 7. Because this research is mainly concerned with the application of behavioural finance theory using surveys and interviews, this chapter did not employ further analyses for VAR, including stability condition checks, impulse responses and variance decomposition analyses.

In addition, empirical results of the EG and the JJ analyses have shown the absence of relationships between macro-economic variables and SZSE volatility in the short term; that is, non-rational behaviour was suggested by this deviation of the stock market situation from macro-economic activity. The nature of that non-rational behaviour is explored in the following chapters (Chapters 5 and 6).

After discussing the macro-context for investors, the micro-context, that is firm-level background, will be investigated in the next chapter. The analyses of face-to face individual interviews will examine the situation of some emerging listed companies on the SZSE, the relationships between listed companies and investors, as well as investor behaviour observed from the perspective of company senior executives.

Chapter 5 Firm-level context for individual investors on the SZSE

5.1 Introduction

Chapter 4 focused on the macro-economic context for the individual investors on the Shenzhen Stock Exchange (SZSE). This chapter will investigate the firm-level context. This is another crucial perspective to help describe the situation of individual investors, as well as explaining investors' actual behaviours. In particular, the aim of this chapter is to build the firm-level environment for individual investors through a qualitative approach, by face-to-face interviews with CEOs and senior executives in five emerging Chinese companies listed on the SZSE. As mentioned in Chapter 3, overall the fieldwork was completed even though some unexpected incidents occurred. Fieldwork interviews were conducted in China over an eight-week period in May and June 2011. The investigation concentrates on five companies listed on the SZSE. The chapter attempts to explain investor behaviour from three aspects: (1) the social context for listed companies; (2) internal biases in listed companies, such as agency problems and managers' overconfidence; and (3) investor relations (IR) function and individual investor behaviour from senior executives' viewpoints. Interviewing CEOs and senior executives working in the companies provided a fresh perspective to understand particular investor behaviour on the SZSE.

The structure of this chapter will be as follows: section 5.2 discusses background literature in relation to the themes discussed in this chapter; section 5.3 covers the sample selection, interview question development and data gathering, as well as introducing the general background of target companies. Section 5.4 uses interview content to examine the reality derived from previous studies, and determine three

propositions applicable in China's context. Section 5.5 concludes the analyses in this chapter.

5.2 Literature background

5.2.1 Social context and governmental regulations for listed companies

As discussed in Chapter 1, state-owned companies have held a dominant position in mainland China, thus, newly listed companies emerging from private companies have been in a unique social context. For example, Che and Qian (1998) discussed these issues in China for township-village enterprises, noticing how the institutional setting affected company policy. The social environment for private enterprises that developed from such humble beginnings is full of uncertainties and instabilities not found in emerging state or quasi-state enterprises seeking a public placement, for the following three reasons. Firstly, private enterprises were not allowed to operate until 1981, so they have had a shorter period in which to identify and claim their property rights. Secondly, private enterprises suffered more severely from political crackdowns, because the security of private property rights was not guaranteed to apply uniformly but only on a case-by-case basis. Finally, private enterprises often sought protection from government interference while trying to attract private investment. They then found themselves in a contradictory situation not conducive to enhancing ownership value. In sum, irrespective of the political fallout, these emerging companies could be expected to be more sensitive to institutional change. At the same time, because of financial constraints, they might have been forced to rely on one government department to protect them from excessive interference by another department.

Outside China, such as in the US, governments play an important role in corporate affairs (Coglianese et al., 2004). They play various roles, including analyst, policymaker

and enforcer, depending on circumstances. According to Moon (2004), governments have recently become the prime movers in legislating for corporate social responsibility. In the UK this process has become increasingly institutionalised, with measures taken by the Thatcher and Blair governments to encourage implementation of unpredictable social agendas (Moon, 2004).

On the basis of previous literature, it can be concluded that private enterprises that seek listing are particularly sensitive to political changes, yet must rely on protection from excessive government intrusion into their affairs. Furthermore, governments play an important role in corporate affairs, while being a crucial driver in regulating the development of enterprises.

5.2.2 Internal biases in listed companies

As mentioned in Chapter 2, effective corporate governance is formally defined by the Organisation for Economic Co-operation and Development (OECD) as: 'The corporate governance of framework should promote transparent and efficient markets, be consistent with the rule of law and clearly articulate the division of responsibilities among different supervisor, regulatory and enforcement authorities' (Organisation for Economic Co-Operation and Development, 2004, p.29). The implementation of corporate governance involves a series of essential aspects, including: (1) the rights of shareholders and key ownership functions; (2) the equitable treatment of shareholders; (3) the role of stakeholders in corporate governance; (4) disclosure and transparency; and (5) the responsibility of the board. Nevertheless, listed companies have various kinds of agency problems and internal biases (Shefrin, 2001; Morck, 2004; Morck and Yeung, 2010).

Two major behavioural influences affected company policy, according to Shefrin (2001).

The first were internal to the firm, such as behavioural costs, including loss which results from cognitive errors and emotional factors. The others were external to the firm, and might be caused by behavioural imperfections on the part of analysts and investors. Shefrin (2001) examined two cases to elaborate the impact of behavioural influences on the development of companies using a novel technique known as primary document analysis. Shefrin (2001) argued that the measures taken by company directors to remedy the influences of behavioural errors rely on effective group process, as dysfunctional office groups were prone to amplifying individual biases.

Similarly, Morck (2004) identified two unique types of agency problems in corporate governance in companies in undeveloped countries. The first occurs 'if an individual acts for herself when social welfare would be higher if she acted as an agent'; the other occurs 'if an individual acts as an agent when social welfare would be higher if she acted for herself' (Morck, 2004, p.22). Morck (2004) emphasised the importance of particular behaviour issues in corporate governance, including reflexive subservience, cognitive dissonance and reciprocal favour trading.

Related literature also demonstrated that irrational behaviour could occur in boardroom deliberations, partly because of managers' overconfidence and over-optimistic attitudes. In an earlier study, Scharfstein and Stein (1990) discussed some of the forces that might result in herd behaviour in investment. They found that sometimes managers simply mimicked the investment decisions of other managers, ignoring substantive private information. Although this behaviour was inefficient from

a traditional paradigm, it could make sense from the perspective of managers who were concerned about their reputation in the labour market. Heaton (2002) argued that optimistic managers believed that capital markets undervalued a firm's risky securities, causing positive net present value to be downplayed as a criterion for project evaluation. Moreover, optimistic managers overvalued their own corporate projects and might wish to invest in negative net present value projects for behavioural reasons, rather than in the interests of shareholders. More recently, Malmendier and Tate (2005a) reviewed the relevant psychology and experimental evidence on confidence, summarising previous results on the impact of overconfidence on corporate investment. They developed an alternative approach to measure confidence relying on the perception of outsiders rather than the CEO's own actions. They proposed the possibility that executive overconfidence altered perceptions about incentive mechanisms. The selection of board members was another important issue influencing capital allocation decisions.

Morck and Yeung (2010) also discussed agency problems and the fate of capitalism from the perspective of managerial behaviour. They argued that although the predominant economic paradigm held that firms maximise value and people maximise utility, firms were nevertheless run by humans. If firm insiders were inefficient in performing their fiduciary duties, then production and capital allocation would be distorted. Together with rapid growth these matters weaken the sector, inevitably causing investor confusion, generating the appearance of irrational behaviour. Morck and Yeung (2010) argued that political economy problems and agency problems in firms might thus be mutually destructive, undermining the quality of corporate governance. In the interest of improving managerial decision-making, they proposed

that the corporate boardrooms should have more shareholder democracy than was currently the norm. Thus, on the basis of previous studies, it can be concluded that different kinds of agency problems existed in listed companies, in terms of internal biases and managerial behaviour, and corporate boardrooms should allow for more shareholder accountability to improve the efficacy of management decision-making.

5.2.3 Investor relation functions and the individual investor

IR deals with communication not only between the company and investors but also dealings with intermediaries, most often with security analysts once listing is achieved. It is a function sometimes seen as a subset of marketing because it effectively involves attempting to boost the value of the company's shares, akin to marketing the company's produce (Brown, 1997; Rao and Sivakumar, 1999; Dolphin, 2004). IR professionals describe their work as providing financial media with prompt, complete and exact information about company fundamentals and future prospects (Farraghe et al., 1994).

In the West, serious research on the IR function of corporations has been conducted since the early 1990s. A seminal finding by Farraghe et al. (1994) noticed a significant inverse relationship between the quality of IR and the accuracy of analysts' earnings per share forecasts. Marston and Straker (2001) sent postal questionnaires to 80 European companies to examine the importance and development status of IR. Most did have well-established IR functions, but surprisingly they found these functions were more important than was often acknowledged by senior management.

Dolphin (2004) explored the strategic roles of IR in the UK, using interviews with 21 communication executives. His results verified the close connection between the IR and corporate strategy functions of these companies. Another empirical study

published in the same year by Hockerts and Moir (2004) noted the beneficial effect of IR on relationship management, facilitating behavioural interaction both within and outside the organisation. Bushee and Miller (2005) and Laskin (2007) extended this finding, asserting that implementing an IR intervention program could result in increasing a firm's visibility with all significant stakeholders, including share- and debt-holders, as well as their intermediaries such as analysts and credit rating agencies. Bushee and Miller (2005) combined surveys with personal interviews of over 200 small- and mid-cap companies. On the basis of the above research, it can be concluded that in the West companies had effective IR units that could materially enhance company values; furthermore, establishing an IR unit could have a significantly positive impact on the firm's interactions with other stakeholders, especially individual investors.

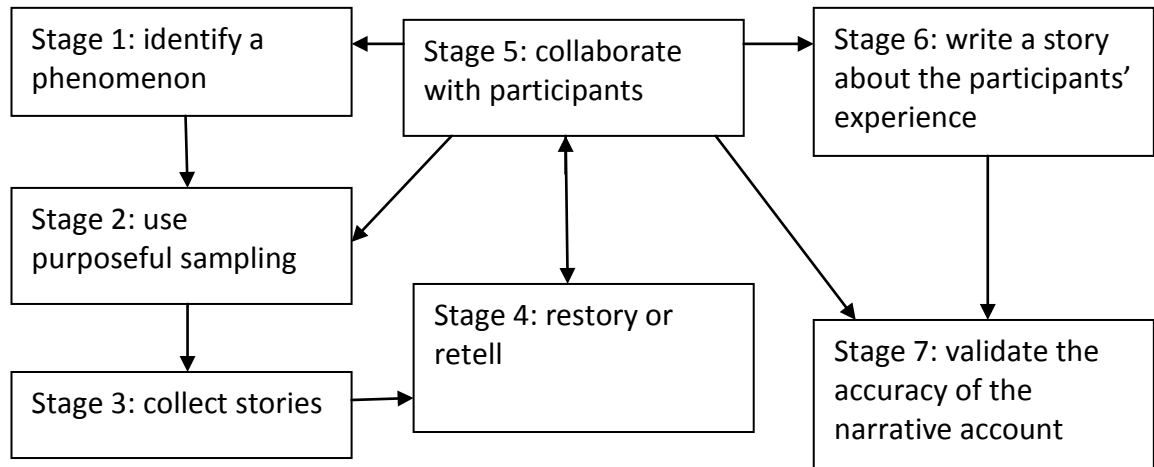
5.3 Sample selection and data gathering

5.3.1 Method

Unlike the quantitative methods used in Chapter 4, the analysis in this chapter adopts the qualitative method. As discussed in Chapter 3, the qualitative method is used to examine a kind of phenomena, thus, the process is inductive (Edmonds and Kennedy, 2012).

The descriptive design within narrative approach is used to conduct the discussion in this chapter, investigating behaviours of listed companies on the SZSE and senior executives' viewpoints of individual investor behaviour in the context of China (Edmonds and Kennedy, 2012). Figure 5.1 illustrates the procedure of descriptive design.

Figure 5.1 Descriptive design



Source: Edmonds and Kennedy (2012, pp.131-132)

According to Figure 5.1, in Stage 1 this research explored behaviours of listed companies and influences of listed companies on investor behaviour. Therefore, purposeful sample, namely senior executives in five newly listed companies on the SZSE, was conducted (Stage 2). During Stage 3, stories from the interviewees were collected. The fourth stage involved identification of analysis categories and then rearrangement by sequencing and organising elements of the story. In the fifth stage, the interviewees needed to be consulted to ensure the validity of the individual experiences. The narrative report was completed in Stage 6 and during Stage 7 the accuracy of the narrative account was validated (Edmonds and Kennedy, 2012).

5.3.2 Sample selection and interview question design

Five companies listed on the main and subsidiary boards of the SZSE were approached to participate in this research. Since investors assisting in this research were investing on the SZSE, companies approached should be listed on the SZSE as well. As discussed in Chapter 1, the SZSE is committed to developing China's multi-tier capital market system, giving full support to the development of small and medium businesses

generated from private enterprises. Consequently, companies were approached on the basis of the following set of criteria: (1) identifying transition recently to a successful listing on the SZSE; (2) a low operating beta company which derived most of its share value from a positive and steady net cash flow; and (3) a rapid-growth high-tech company which derived most of its share value from growth potential. Companies with these characteristics can broadly represent the small and medium high-tech swift-growth newly listed companies on the SZSE.

The interview questions distributed to participating executives of the companies were designed to elicit their thoughts and viewpoints about corporate governance, IR and the social environment (Appendix B). The question categories followed the six groupings used by Klapper and Love (2004): covering the aspects of corporate governance were personal background, disciplines, transparency and responsibilities. Questions also related to company social awareness and the institutional environment, including queries soliciting information about the complexity of the market and if government regulations were onerous or not. Other questions were more direct, including relationships with security analysts and investors. Some categories were revised to address China's unique context.¹¹

5.3.3 Overview of interviewees and company background

Interview questions covered three general aspects: corporate governance, IR and the social context (Appendix B). As a result, three aspects would be answered respectively by chief financial officers, IR personnel and general managers (Klapper and Love, 2004). However, in the target companies, most of the senior executives had more than one

¹¹ For instance, some of the questions were related to China securities Regulatory Commission or local governments in China's context.

designation, thus, two or three separate interviews covering different aspects were conducted with one interviewee. Overall, 15 separate interviews were conducted.

Table 5.1 summarises interviewee characteristics.

Fieldwork in China which involved cultural and social network factors was a tough process. While some interviews went smoothly, some appointments did not achieve expected results because they were delayed or not well co-ordinated. The general background of each company is demonstrated Table 5.2.¹² The process of data gathering is discussed in Appendix C.

Table 5.1 Overview of interviewees in target companies on the SZSE in 2011

Interviewee Name	Sex	Approximate age	Industry experience (years)	Designation(s)	Company
Yang	Female	Late 30s	Nearly 10	Securities Consultant	KK
Cui	Male	Mid 40s	Nearly 15	General Manager & Chief Financial Officer	
Huang	Male	Mid 40s	Nearly 15	Deputy General Manager & Secretary of the Board	
Tai	Male	Late 30s	Nearly 10	Deputy General Manager & Chief Financial Officer	OMH
Liu	Male	Early 30s	Nearly 8	Deputy General Manager & Secretary General Director	DGT
Zheng	Male	Mid 40s	Nearly 15	Securities Consultant & Chairman of Board of Supervisor	CNM

¹² According to the ethics approval requirements and the commitment on the consent forms, the real names of companies cannot be disclosed. Although all the information stems from the company's official website, in order to protect the privacy of the companies, the data source, including webpage links and authors, is not disclosed in the thesis.

Bin	Male	Mid 30s	Nearly 10	Chief Financial Officer & Secretary of the Board & Deputy General Manager	PHQ
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Notes: Pseudonyms were allocated to all interviewees.

Table 5.2 Overview of the background of target companies on the SZSE in 2011

Company	Main business	Listing time	Related achievements and awards	SZSE Board Category
KK	Candle and glass manufacture	December 2006	The titles of the China Famous Brand, the China Export Famous Brand and the State Key High-tech Enterprise	SME Board
OMH	Development, production and distribution of appliances parts	January 2011	Leading Enterprise in the Field of Manufacturing Special Parts for Appliance and Electrical Instruments	SME Board
DGT	Production and design of cubicle-type substations	October 2009	A member of the Standardization Technical Committee for China's electric power supply industry; a member of the China Power System Distribution Technical Cooperation Network	ChiNext market
CNM	R&D of industrial information technology	October 2006	The title of State Innovation Enterprise; certified as the 'National Key High-tech Enterprise'	SME Board
PHQ	Production, marketing and R&D of intravenous solution	August 2010	The company reached the requirements of the American Food and Drug Administration (FDA), the European pharmacopoeia standard and national Chinese standards	ChiNext market

5.3.4 Validity and reliability

Ethics approval for the interviews of senior executives in the listed companies was issued by UNSW@ADFA Human Research Ethics Advisory Panel on 21 April, 2011 and was valid for 12 months (Appendix D). Interviews were conducted in China over an eight-week period in May and June 2011.

Information provided by the interviewees might have suffered because of the manner in which interview data was acquired. As company policies did not permit real-time voice recordings, responses were initially typed on a laptop as the interview progressed. However, all interviewees signed off on the interview consent forms (Appendix E and F).

The interviews varied in length, from one hour to almost half a day in one case. Written transcripts of responses were given to interviewees to ensure authenticity, signifying agreement by both interviewer and interviewee that the record of what had transpired was largely accurate, if perhaps not a verbatim rendition of what was said and how it was said. Expression inflections and body language were therefore missing. Also, as the English translation of the Mandarin transcript took place some weeks later in Australia, some information might be lost in the translation process and/or interviewer recollections. Interview transcripts were sorted manually using Word 2007 (Cox and Lambert, 2009). Interview content was translated sentence by sentence, assuring that related effective data was used in the analysis.

5.4 Narrative analysis in relation to social context, agency problems and investor relations

After examining previous studies, the following analyses of interviews with senior executives in listed companies on the SZSE are used to test whether the conclusions derived from related literature apply to the current situation in China. This section conducts the narrative analysis based on the interview content from three perspectives: social context for listed companies (question group six); internal biases existed in listed companies (question group one to four); and influences of IR function on individual investor behaviour (question group five). Because of government

intervention in China, government is the medium between companies and investors. Thus, the demonstration of social context shows the relationships between listed companies and local governments from the perspective of senior executives in newly listed companies on the SZSE. The discussion of internal biases shows an overview of agency problems and management style in listed companies on the SZSE from the perspective of behavioural finance. The demonstration of IR focuses on the relationship between listed companies and investors based on an examination of effectiveness of IR function in newly listed companies.

5.4.1 Social context and government regulations for listed companies on the SZSE

The final group of questions (question group six) pertains to the social context in which the companies listed on the SZSE found themselves. On the basis of the interview data in this research, both assistance and potential obstacles existed in the environment—from the social to the political—that companies face. Moreover, many emerging high-tech companies originating from private enterprises differed from those that developed from state-owned cooperatives in the way they had formerly interacted with their environment during their rapid growth phase.

The preponderance of responses in the interviews related to the political ramifications generated by China's social context. The political power of local officials was seen as a key factor to ensure distributional equality in order to protect the interests of small shareholders. For example, according to Bin of PHQ Company, local authorities would see to it that wealth was reinvested in expanding productive capacity or 'actual industry', rather than allowing it to be dissipated in speculative activities:

Local authorisers' concern is that large shareholders may occupy the company's interests. Usually the boss was quite cunning, so that local authorisers are more to

make supervisions on listed companies, to protect the interests of small shareholders. The rules state that the raised funds should be invested in actual industry, rather than trading stocks which can be risky and dangerous. (Bin, PHQ)

Similar to Bin's response, Huang of KK Company argued that, 'at the threat of delisting, local authorities can ensure that irregularities will not occur in newly listed companies. However, as long as the listed companies do not have significant irregularities, the regulatory authorities will not de-list them from the market'. In addition, Huang's point was that private enterprises could not be listed on the stock exchange without the assistance of the government officials. In particular, on the grounds that successfully listed companies could expand the tax base, enabling socially beneficial projects to be started, they could thus effectively recoup some of the profits that would otherwise be spent on ostentatiously or on speculative activities.

Tai from OMH Company addressed the important role that local governments played in the process of company's growth:

The steps to a successful listing on any exchange were so fraught with administrative difficulties that it was inconceivable for an initial public offering (IPO) to be successful without the support of a government instrumentality. Anything non-standard according to their rules would have made listing too difficult. The local governments gave us full support at that stage. They helped us find useful resources and brokers, even placed a target for us to get listed. In fact, the IPO process had complicated steps, so we could not get listed without the support from governments. Non-standard rules and matters existed in the previous development of OMH company, and some of them were actually difficult to figure out, even after the company's listing. (Tai, OMH)

According to Tai, some companies might require a considerable transition period, especially after listing. Unless companies broke the rules of the stock exchange or misappropriated state property, then initial non-standard behaviours should not have become a larger problem later. Some ambiguous policies might therefore be tolerated in the interests of good administration. Moreover, in order to support the development of emerging listed companies, benevolent attitudes were embedded in the standard operating procedures of some government departments.

Based on the responses of the senior executives, another reason that the development of corporations relied on the support of governments could be found in the rather complicated auditing steps required for listing on the Chinese stock exchanges. Each aspect of this process often needed to be co-ordinated by disparate government departments. Respondents freely admitted that the process began with close inspection by the relevant authorities of the company's annual reports. This was often the key factor to determine whether the company could proceed to be listed. Moreover, verification through cross-audits needed to be implemented, as was the case with scientific instrument manufacturer DGT:

Substantial proof is necessary, including the support certificates of the Science & Technology Bureau and the Industrial & Commercial Bureau, a social security certificate, an environmental certificate, as well as the financial reports. (Liu, DGT)

In sum, these interviewed newly listed companies on the SZSE face a more uncertain and difficult environmental context than the blue-chip companies on the SHSE,

affecting the independence of companies. Therefore, the proposition in relation to the social environment of newly listed companies can be summarised as follows:

Finding 1: Governments play an important role in corporate affairs, regulating the development of companies. In the case of the SZSE, the social context for the newly listed companies has two contradictory aspects: on the one hand, local governments give full support to the growth of emerging companies and, on the other hand, the relevant authorities interfere with corporate affairs in order to protect the interests of small investors. However, in reality there is no social penalty for not providing punctual and complete information to investors during the transition period of newly listed companies.

5.4.2 Internal biases in listed companies on the SZSE

In the interviews with senior managers in China, internal behavioural biases were addressed. Because most emerging listed companies originated from private companies initially operated by individuals, the board proceedings and daily management might have already involved behavioural interference. Besides, internal biases could be detected from a close examination of some executives' responses to the interview questions. When I asked what kinds of mechanism the company had taken to carry out punishment of the executive or management committee in the event of mismanagement, several management executives described the mechanism as not strictly balanced, as more punishment occurred than reward. The following quotation from Mr Cui reflects the unbalanced mechanism:

For example, the customers made a claim for compensation, because goods did not arrive in time and that time lag caused their loss. Because something was wrong with the logistics process, the department of logistics should have been

responsible for the loss. However, the chairman of the board did not deal with the accident in that way. The chairman of the board believed that every related department should have been responsible for the loss; as a result, the responsibility was magnified, so the management committees of many sectors such as the sales or supply departments were also blamed and consequently punished. (Cui, KK)

The quotation above shows that the chairman of the board was able to be somewhat subjective when handling such matters, which was one of the problems generic to private-owned enterprises. Another type of behavioural bias that majority shareholders may have is the abuse of undisclosed information. For example, when two interviewees referred to why the domestic market did not recommend the disclosure of clear plans for company targets, they explained that some of the 'immoral' majority shareholders could potentially use the information gap for speculation and profiteering (Bin, PHQ; Liu, DGT).

Interview responses on the topic of management style showed that recently listed companies seemed to presume that an authoritarian style of management was superior to a more democratic style, perhaps because of the private sector roots from which they emerged where autocracy rules. The alleged benefits of a centralised management system was exemplified by the following response received from Mr Cui of KK Company:

The chairman of the board believes that he is strong enough to make the impossible become possible. I think the 'mission statement' is a reflection of the 'boss style'. For example, if the chairman of the board does not pay attention to check on work attendance, he will not care whether the staff are

late or not. What he really cares about is how the staff can finish the tasks perfectly and their work efficiency. (Cui, KK)

Similarly, when asked about a decision made by senior executives apparently to benefit directors at the expense of shareholders, a typical response was:

Usually if the project is related to large shareholders' interests, it is likely to be unfair. In fact, large shareholders have the strength to control the results, so the company also pays attention if the project has related party transactions which should be subject to the regulation. (Liu, DGT)

Besides these fiduciary perceptions, opinions on corporate culture, the size of the board and efficiency also influenced perceptions of democratic behaviour, as the response of Liu of PHQ Company illustrates:

The board consist of nine directors: four inside directors, two outside directors who are not involved in company management and three independent directors. As long as no related party transactions exist, the board of directors is efficient. However, once the related party transactions occur, the board of directors is only a formality. (Liu, DGT)

Furthermore, company executives often asserted, if there was some controversy over an acquisition or a new project, that the final decision would be made by 'the boss', rather than distinguishing the CEO of the company from the chairman of the board. Although directors expressed their own views or analysis over the new project, including pros and cons, Bin of PHQ said, 'whether your views could be accepted or not depended on the boss's preference'.

Given such attitudes, if representative, the proposition regarding internal biases in newly listed companies, including related agency problems and an authoritarian management style, can be summarised as follows:

Finding 2: In the context of China, an imperfect mechanism was found to exist in the five interviewed companies listed on the SZSE. Furthermore, their authoritarian management style remained evident after listing. This kind of imperfect mechanism and management style may diminish investors' profits.

5.4.3 Investor relation functions and the individual investor on the SZSE

In China, IR is not yet such a clearly defined field of study as it is in the West. Unlike research in marketing, it is not regarded as a separate and delineated corporate function worthy of independent study. Indeed, in the interviews conducted with senior executives in the fieldwork sample, IR seemed to be seen as a subset of marketing. A number of factors can be adduced to explain this state of affairs. Firstly, in China the IR function was not usually handled by an independent department in private companies that subsequently sought listing. According to the interviews with senior executives, the company secretary normally took charge of issues that would in the West be the responsibility of IR professionals. However, this company secretary also held other responsibilities simultaneously and so the IR function received scant attention.

Secondly, the rigorous procedures and standards involved in IR issues in more developed countries were still immature in mainland China. This was made clear in the following response to an open-ended question pertaining to the IR function in KK Company:

The function of investor relations is more a formality than content in China now. Foreign stock markets mainly consist of institutional investors. However, domestic stock markets are almost totally comprised of small and individual investors whose investments are highly speculative, relying on fluctuations in stock price discrepancy. Furthermore, the average price/earning ratio is 45 for the SME Board on the SZSE, too high to control properly. (Huang, KK)

This response shows that the IR function did not work as effectively in the interviewed listed companies as senior executives expected.

Furthermore, communication between IR personnel and securities analysts was often limited to telephones and online platforms. The face-to-face communications were somewhat casual, rather than being formal or 'real', as Mr Huang would say. As a result, basically IR was not yet seen as a worthwhile profession to cultivate in companies that saw success as a function of technological prowess. Overall, what this situation conveys is that IR was indeed recognised but as a relatively insignificant area of these newly listed companies on the SZSE.

In addition, in these newly listed companies, IR was perceived to be an adjunct to corporate strategy, of value primarily in boosting sales of products. The responses to open-ended interview questions indeed revealed this as the case. Even in the few companies that acknowledged the crucial role that could be played by an effective IR team, senior executives rarely believed that it should be allocated resources to enable the team to play its role. According to Liu's response, this was currently the case at DGT, which saw IR as a 'neutral' player in the broader scheme of things:

It is very hard to define the role of investor relations. Generally it is neither a curse nor a blessing, so it is neutral. Because investors do not care about IR, it is

useless for company executives to be concerned about that. The IR function is only a weak form. The roadshow is an effective channel to recommend our company, but the company rarely does that. (Liu, DGT)

Perhaps the reason why the IR function was seriously underestimated as a powerful development tool in DGT emanated from a perception that it could have an undesirable distributional impact. One manager, for example, was concerned that enhancing IR might encourage speculation and hence destabilise share prices. By being better informed, institutional analysts and individual investors might react unpredictably, exacerbating volatility, as if the market were not to be trusted. In the interviews it rarely seemed to matter that this very process enhanced market efficiency. An instance of this was provided by the concerns of Bin of PHQ Company, who said:

Individual investors do not care about the company performance. What they are pursuing is speculation, and institutional investors prefer to trade the 'theme stock' as well ... The investors do not ask about the performance of the company, they only care whether the company will send out bonus shares or not. (Bin, PHQ)

Another instance of this distrustful stance is provided by Liu, who saw IR as working against the company rather than for it, or at least exaggerating company 'facts' to its detriment. For this reason IR personnel do not play an important role in formulating DGT strategy:

Our company focuses on healthy, stable and rapid development, as well as avoiding over-inflated expectations. However, the media in China is not in good health, tending to exaggerate the facts in the reports. (Liu, DGT)

Apart from the weakness of IR function in listed companies, according to executives' responses, analysts and investors were thought to use the information to obtain speculative income. This perception seemed to be widespread among some analysts and investors with scant regard for the fiduciary laws pertaining to insider trading. Senior executives were generally concerned about the relationship between listed companies and analysts when dealing with issues about information disclosure and the access of analysts to the companies:

From the perspective of domestic information disclosure form, we only have adequate communications with analysts on the public information, because if analysts know any inside information, institutional investors will use this chance for speculation and profiteering. (Bin, PHQ)

If the analysts' purposes are not to detect company insider information (such as private placement), they will have good access to senior managers and obtain the effective information they are seeking. (Liu, DGT)

Strategies and styles of investors often not recognised by company executives were also evident:

The investor phenomenon in China is determined by the investors' profiteering attitude. The results that investors want are not a fair competition; nevertheless, they want a market which can provide them with a satisfactory income. When they obtain the ideal income they expect, they will not have any complaints. (Liu, DGT)

The investors do not ask about the performance of the company, they only care whether the company will send bonus shares or not. (Bin, PHQ)

If any conclusion can be discerned from the discussion in this section, it is that for these recently listed companies on the SZSE, the IR function was not yet perceived to play a significant role in publishing effective information. To some extent, IR function also diminished the efficacy of the transmission process of information. At the same time, senior executives expressed the view that Chinese investors used relevant information to obtain speculative income. Thus, the proposition regarding IR function and investor behaviour can be summarised as follows:

Finding 3: In the West, an effective IR function plays an important role in the firm's interaction with other stakeholders; however, in newly listed companies in China, the IR function is still a relatively insignificant area, even diminishing the efficacy of the transmission of information to investors. As a result, investors cannot obtain timely and comprehensive information from listed companies. On the other hand, the perspective of senior executives was that Chinese investors were prone to profiteering.

5.4.4 Conclusions

This section conducted the narrative analysis based on face-to-face interviews with senior executives in five newly listed companies, covering the aspects of behavioural emphases on social context, agency problems and IR. Each of aspects had related conclusions which were summarised from previous studies; interview contents were used to examine whether the conclusions were applicable in China's context. Four propositions were summarised after the examination.

5.5 Conclusions

On the basis of the interview sample of five recently listed companies on the SZSE, it can be concluded that these formerly private companies faced significant challenges in adjusting to an open market for their management mechanism and IR function. These

challenges stemmed from three perspectives, including: (1) the development of emerging companies depended on the support of local governments, while on the other hand, authorities regulated corporate behaviour to protect small investors. However, there is no social penalty for not providing punctual and comprehensive information to investors on the SZSE. Also, (2) agency problems and an authoritarian management style in listed companies on the SZSE may detract from profits of investors; and (3) IR function did not work well in listed companies, especially in the interaction with stakeholders, and on the other hand, investors were considered to prefer speculative investments.

In addition, in Chapter 4, the weak correlation between stock market volatility and macro-economic activity showed that there was room for non-rational behaviour to affect the SZSE. The analyses based on interview data also ascertained that there was likely to be some irrationality in newly listed companies on the SZSE. In particular, there were agency problems, an authoritarian management style and informational asymmetries in target companies included in this research. The analysis of investor behaviour in Chapter 6 will reveal the irrationality of the SZSE from the perspective of individual investors.

In sum, this chapter introduced the firm-level context for individual investors on the SZSE from three perspectives: social context, agency problems and IR, based on the interviews with senior executives in five newly listed companies. Senior executives believed that individual investors did not invest rationally, while, on the other hand, listed companies on the SZSE had their own limitations and imperfectness. There is further discussion of senior executives' viewpoints in relation to individual investor

behaviour in Chapter 7. In Chapter 6, the analysis of the survey of individual investor behaviour in the SZSE will be conducted.

Chapter 6 Analysis of the survey of individual investor behaviour on the SZSE

6.1 Introduction

In the last two chapters, time-series models and company management interviews have been used to separately elaborate the macro-economic and firm-level contexts for individual investors on the Shenzhen stock exchange (SZSE). Chapter 4 demonstrated the Chinese macro-economic background was expressed by the relationship between the stock exchange fluctuations and macro-economic variables. The empirical findings showed that it was hard for investors to predict the changes of the stock market based on macro-economic activities, since obviously stable relationships could not be proved between stock market volatility and macro-economic indicators, especially in the short term, in the SZSE case.

Firm-level exploration through individual interviews with CEOs and senior executives in emerging listed companies on the SZSE, showed agency problems and authoritarian management styles in the companies, which might diminish investors' profits.

Moreover, the IR function did not work efficiently, not maintaining a high standard of media interaction with analysts and investors. It could be concluded from the above evidence that the investment environment faced by individual investors is not very optimistic or flourishing.

After examining the context for individual investors in order to understand their investment situation, this chapter will directly focus on their specific behaviours in relation to decision frameworks and investment attitudes, on the basis of survey data obtained for this study (hereafter called the SZSE Investment Survey) for individual investors who have had investment experience on the SZSE. Previous research on

investor behaviour focused on the influences of objective indicators, such as investors' gender, age or education level (Lease et al., 1974; Lease et al., 1976; Chen et al., 2004). By contrast, this research, based on international behavioural research, discusses effects of subjective factors on investors' performance, namely behavioural biases investors may have during the investment process (Clark-Murphy and Soutar, 2004; De Bondt, 1998; Dorn and Huberman, 2005; Shiller, 1998; 2000b; 1987; Durand et al., 2008; Nagy and Obenberger, 1994; Al-Tamimi and Emirates, 2006). The related model discusses the causal relationships between behavioural factors and investors' investment income.

The analyses of this chapter are categorised into three parts: (1) the process of conducting structural equation modelling (SEM) and the justification of SEM in this research; (2) survey sampling and demographic information; and (3) the kind of impact the behavioural factors have on investors' investment income.

6.2 Method used in data analysis: a description of SEM

This section will outline the definition of SEM and justifications for using it, as well as its advantages and limitations. It will also explain the process of conducting SEM and the sample size criteria.

6.2.1 Definition and the description of SEM

SEM is a statistical methodology which uses a confirmatory approach to the analysis based on a structural theory under a certain circumstance (Byrne, 2001). In particular, this approach represents 'causal' processes which could produce observations on multiple variables (Bentler and Chou, 1987). As a result, this technique could be described as a combination of factor analysis and multiple regression analysis (Hair et

al., 1998; Ullman, 2006). It allows an examination of a blend of relations among one or more independent variables, and one or more dependent variables (Ullman, 2006).

The SEM technique employs two procedural steps: first, the processes under study are represented by a blend of estimated equations; and second, these estimated relations can be structured pictorially to build a clearer conceptualisation of the substantive theory in the study (Byrne, 2001).

The hypothesised models in the study can be tested statistically in a simultaneous analysis of the entire system of both observed and latent variables to decide the extent to which the proposed model is consistent with the data. Latent variables are those that are not measured directly in the model, and they are assumed to bring about observed indicators (Anglim, 2007). Then if the related goodness-of-fit indices are adequate, the models represent the 'plausibility' of estimated relations among variables; if the indices are inadequate, the 'tenability' of those relations is rejected (Byrne, 2001).

6.2.2 Justification for using SEM in this research

SEM is a reasonable and appropriate approach for this research for several reasons.

Firstly, SEM is suitable for testing 'complex' relationships between latent variables and observed measurements, and also relationships between two or more latent variables, which are advantages that other approaches do not have. SEM explores multivariate relationships in an integrated manner (Anglim, 2007). Secondly, the models proposed in this chapter also assume the relationships among latent variables, to help build the entire framework of all variables, so SEM is the ideal method for testing those relationships. Last but not least, since the development of SEM in the 1970s, it has been widely used in educational, social, psychological, marketing, ecological and

behavioural research (Maccallum and Austin, 2000; Golob, 2003; Baumgartner and Homburg, 1996; Cuttance and Ecob, 2009; Pugesek et al., 2003). This research focuses on individual investor behaviour on the basis of the theories of behavioural finance, so SEM is suitable for the data analysis.

6.2.3 Steps in SEM used in this study

Theory development, 'measurement model' specification and 'structural model' building constitute the three basic stages of SEM construction. A measurement model is a confirmatory factor analysis (CFA) model which places no constraints on the relationships between the latent variables and only tests the specified relations between observed indicators and latent variables (James et al., 1982). It is equivalent in fit to a model that would free all structural coefficients in paths between distinct latent variables. Nested within the measurement model is the structural equation model which specifies certain structural paths between latent variables are zero. If the measurement model is correctly specified, the only source of lack of fit would be in the specification in the structural equation model of relations between latent variables (Byrne, 2001). In sum, the measurement model is equivalent to a structural equation model in which all paths between latent variables are freed. Thus it can be considered a surrogate for the least restricted model of the relations between the latent variables, with the structural equation model to be evaluated a more constrained model (James et al., 1982).

The procedure of applying SEM consists of seven steps (Hair et al., 1998; Byrne, 2001; Hoyle, 1995): (1) designing the preliminary model based on prior theories; (2) illustrating the 'path diagram'; (3) explaining the path diagram to measurement and structural models; (4) estimating and testing the models; (5) evaluating the

identification of the structural model; (6) assessing goodness-of-fit indices; and (7) modifying and interpreting the final model. All the steps will be explained in the following seven sections.

6.2.3.1 Step 1: Designing the preliminary model based on prior theories

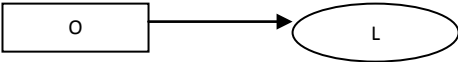
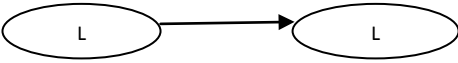
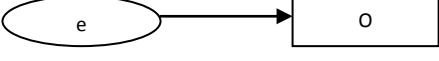
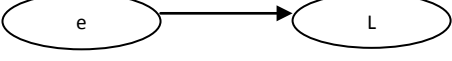
In this first step, four criteria are the prerequisites for proving the causal relationships among variables in the models: the first criterion is that there is sufficient association between the two studied variables; the second is that there is temporal antecedence between cause and effect; the third is that the relationships lack alternative causal variables; and the final criterion is that the relationships are based on prior theories (Hair et al., 1998). Overall, the relationships among the specified variables which comprise the entire identified model are designed on the basis of prior knowledge of related theories (Ullman, 2006). It should be emphasised that systematic errors may occur in the process of building the models. The most significant error is caused by the omission of important 'predictive' variables. Nevertheless, the constraints of SEM also need to be considered when designing variables of the proposed model.

6.2.3.2 Step 2: Illustrating the path diagram

Schematic representations of models are named the 'path diagram' since they demonstrate a visual portrayal of the relationships among the variables in the study (Byrne, 2001). The proposed models are schematically described by particular configurations of four geometric symbols: (1) an ellipse; (2) a rectangle; (3) a single-headed arrow; and (4) a double-headed arrow. The ellipses represent unobserved latent variables (L); the rectangles show observed indicators (o); single-headed arrows represent the impact of one variable on another; and double-headed arrows show co-

variances and correlations between two variables. The following configurations with descriptions show the important components of the models:

Table 6.1 Bentler-Weeks symbols used for drawing path diagrams

Configurations	Explanations
	Path coefficient for regression of an observed variable onto an unobserved variable
	Path coefficient for an unobserved variable to another unobserved variable
	Measurement error associated with an observed variable
	Residual error in the prediction of an unobserved variable

Source: (Byrne, 2001)

Notes: O represents observed variables; L represents latent variables; e represents measurement error

Path diagrams are particularly suitable for drawing complicated sets of equations and both AMOS and EQS are capable of conducting path diagrams.¹³ This research employs the software 'IBM SPSS AMOS 20' to carry out SEM procedures (Arbuckle, 2011).

6.2.3.3 Step 3: Explaining the path diagram to measurement and structural models

Apart from presenting casual processes through pictorial descriptions, a series of regression equations can also be used to demonstrate relationships among variables in a more formal way (Byrne, 2001). This process is the crucial step in comparing the theoretical assumptions with the results of empirical data used in the path diagrams. Since regression equations show the influence(s) of one or more variables on another variable, and these influences are symbolised using single-headed arrows in path

¹³ AMOS and EQS are the popular programs for SEM (Albright and Park, 2009). AMOS is supported by the UNSW@CANBERRA, and EQS is currently not supported.

diagrams. In summary, each equation presents the impact of all relevant variables in the model on one specific variable. Therefore, one approach to formulate the equations is to observe each variable that has one or more arrows pointing towards it, and then mark records of the influences of independent variables on dependent variables (Byrne, 2001).

6.2.3.4 Step 4: Estimating and testing the models

This process includes deciding whether to use a variance-covariance input matrix or a correlation input matrix, and evaluating whether the assumptions of SEM are consistent with the empirical data. Because a variance-covariance input matrix can identify the differences among variables, it is the most common input form used in SEM (Hair et al., 1998; Ullman, 2006).

The prerequisites for the establishment of SEM are several: independent observations, a random sampling of respondents, the normal distribution of data and the linearity of all relationships. These criteria need to be assessed before producing the structural model.

6.2.3.5 Step 5: Evaluating the identification of the structural model

The identification of the structural model focuses on whether a unique set of parameters exists consistently with the data. This point bears on the transposition of the variance-covariance matrix of observed variables into the parameters of the structural model in the study. If a unique solution can be found for the values of parameters, the model is considered to be identified. By contrast, if different parameter values define the same model, the model cannot be identified (Byrne, 2001).

Structural models can be categorised into three types: just-identified, over-identified or under-identified models. A just-identified model means that the number of variances and covariances equals the number of predictive parameters. However, the just-identified model is not practical because it has no 'degrees of freedom' and thus it can never be rejected. An over-identified model contains more data points (variances and covariances of observed variables) than the parameters to be estimated, so this circumstance creates positive 'degrees of freedom' that allow for rejection of the model, which makes the model scientifically interesting compared to the just-identified one (Byrne, 2001).

6.2.3.6 Step 6: Assessing goodness-of-fit indices

Preliminary fit criteria and overall model fit measures comprise the process of assessing goodness-of-fit of the model.

The preliminary fit criteria are summarised as follows (Bagozzi and Yi, 1988):

- (1) no negative error variances
- (2) error variances significantly different from zero (unless defensible)
- (3) correlations among variables not too close to one
- (4) factor loadings not too small or too large
- (5) no large standard errors.

A number of goodness-of-fit indices are used to measure the proposed model. The basic common criteria that will be used in this research are summarised in the following table (Bagozzi and Yi, 1988):

Table 6.2 Overall model fit measures

Statistical criteria	Fit measures and critical value
χ^2	p-value ≥ 0.05
NC value (χ^2 /degree of freedom)	$1 < NC < 3$
Root mean square error of approximation (RMSEA)	< 0.05 (good fit) < 0.08 (reasonable fit)
Goodness of fit index (GFI)	> 0.90
Adjusted goodness of fit index (AGFI)	> 0.90
Tucker Lewis index (TLI) (NNFI)	> 0.90
Comparative fit indices (CFI)	> 0.90

Once the criteria for overall model fit have been achieved, the measurement of each construct can be considered to be reliable and unidimensional.

6.2.3.7 Step 7: Modifying and interpreting the final model

The correspondence between the results and the prior theory needs to be examined after verifying the model (Hair et al., 1998). The model can be modified according to the ‘modification indices’, and normally the default value of the ‘modification indices’ is 4 in the software system (Bagozzi and Yi, 1988). The important points of the model interpretations include specifying the relationships between the variables are positive or negative, justifying whether the correlation coefficients are statistically significant or not, and arguing if the results are consistent with the proposed posit. After interpreting the final model, limitations in the model procedure and suggestions for improving the model fit could be explained.

6.2.4 Sample size criteria for using SEM

Variances and covariances which are the essential components in SEM are not stable when calculated from a small sample. Moreover, parameter estimates and the chi-square test are sensitive to sample size. Therefore, large sample sizes are necessary for SEM analysis. Nevertheless, it is possible to construct the models with the small sample if the data is reliable (Ullman, 2006; Bentler and Yuan, 1999).

The common rule of thumb suggests that the ratio of sample size to number of parameters should be 15:1. However, the research shows various points of view: when the latent variables have many indicators and the associated factor loadings are large, that ratio could be 5:1 under the common criterion. However, a ratio of 10:1 is appropriate for 'arbitrary distribution' based on normal recommendations (Bentler and Chou, 1987).

If cases are more than 100 in number, they are considered a small sample. Medium samples encompass the numbers of cases between 100 and 200. The cases over 200 are taken to be large samples (Kline, 2005).

In this research, the first model, which focuses on the relationship between influencing factors on investors' choices and investors' investment income, employs 28 separate parameters with 192 cases, so each parameter has about 7 subjects. The second model, which discusses the impact of behavioural factors on investors' investment income, has 9 separate parameters with 148 cases, thus each parameter has 16 subjects.

6.2.5 A critique of SEM

Several advantages of SEM make it different from traditional multivariate analyses.

Firstly, SEM introduces a confirmatory rather than an exploratory analysis to the estimation procedure, and relations among variables should be specified based on the theory. Therefore, SEM is the procedure for 'inferential' purposes through which the hypothesis can be tested with less difficulty than former multivariate analyses (Byrne, 2001). Secondly, SEM incorporates both observed and latent (unobserved) variables for the estimation, whereas older generation procedures only employ measurable variables. Lastly, several 'causal relationships' can be estimated simultaneously

through the SEM procedures, which cannot be conducted in traditional regression analyses (Hair et al., 1998; Ullman, 2006).

Like other techniques, SEM also has its limitations. Firstly, because the latent variables are based on artificial constructs, errors are prone to occur over the estimation process. In fact, the combination of latent variables with observed indicators increases the possibility of 'systematic error' (Hair et al., 1998). A second limitation is that since a theoretical basis is necessary before data analysis, it leads to more prerequisites for and more constraints on using SEM (Ullman, 2006; Anglim, 2007).

This section has elaborated the procedures of SEM which is the most important technique applied to the data collected in this research. The content covered the definition, justifications, advantages, limitation, sample size criteria and the entire process of using SEM. In the next section, the issues related to the sample for the survey conducted towards individual investors on the SZSE are discussed in detail.

6.3 Survey sampling and selection

After demonstrating the method used in this chapter, this section discusses survey development, population and sample frame, questionnaire data gathering and respondents' demographic information.

6.3.1 Survey development

The questionnaire in all consisted of four parts: personal information; investment experience and basic financial knowledge; individual investors' decision frameworks and investment strategies; and attitudes of individual investors. It also provided for follow-up information: this section explored factors influencing individual investor behaviour on the SZSE. It included six categories: neutral information, accounting information, self-image/firm-image coincidence, classic/traditional investment

criterion, advocate recommendation and personal financial needs (Appendix H).

Related questions and scales in the questionnaire were derived from previous studies regarding individual investor behaviour (Nagy and Obenberger, 1994; Clark-Murphy and Soutar, 2004; Al-Tamimi and Emirates, 2006; Merikas et al., 2011; Maditinos et al., 2007; Chen et al., 2004; Dorn and Huberman, 2005; Lease et al., 1974; Shefrin and Statman, 2000; Shiller, 2000b; Ji, 2010). Questionnaires were sent for review to two academics and one investor on the SZSE, confirming that related questions and scales were applicable in China's context.¹⁴

A separate ethics approval was sought for the survey. An ethics approval letter was issued by UNSW@ADFA Human Research Ethics Advisory Panel on 16 December, 2010.

It was valid for 12 months from the date of their meeting (3 November, 2011).

Appendixes I, J and K are related ethics approval and standard consent forms for survey respondents (both English and Chinese versions).

6.3.2 Population

The sample frame derives from the population of Chinese individual investors who have accounts on the SZSE. The term 'individual investors' is commonly used to refer to small investors, who purchase small quantities of stocks for their own portfolio, compared to institutional investors (Lease et al., 1976). The institutional investor refers to a non-bank organisation that trades securities in large enough share quantities or in a large number of funds so that the organisation qualifies for professional treatment and lower commissions. Institutional investors embrace fewer protective regulations, since they are considered to be more knowledgeable and capable of regulating

¹⁴ In order to keep the reviewers' information private and to avoid them being identified, their names do not appear in the thesis.

themselves (Hu, 2002; Lin et al., 1998; Webb et al., 2003). Generally, individual investors lack the financial resources to engage in larger trades (Lease et al., 1976). This research has focused on Chinese individual investors for two reasons. Firstly, focusing on individual investors using a survey approach provided a new perspective to explore an overview of investor behaviour on the Chinese stock market, since Chinese individual investors faced a particular investment environment in China's context and had their own characteristics. Secondly, individual investors hold the majority of shares in the stock markets in China. Individual investors still occupied the majority of China's A-share market, which was in a different situation from most stock markets in other countries. Most stock markets in other countries were comprised of 60% to 70% institutional investors, with the proportion of individual investors generally less than 30%, while in the SHSE and the SZSE in China, the composition proportion ratio was reversed. Individual investors accounted for more than 70% of the market, and proportion of institutional investors was no more than 30% (Lian, 2012).

According to statistics in *The Overview of SZSE in 2011* (Shenzhen Stock Exchange, 2011a), the total number of investor accounts was 101.228 million, of which 0.334 million were institutional investor accounts. As the ratio of the number of investor accounts to the total number of investor accounts showed, institutional investors only account for 0.3% of the total on the SZSE. Thus, the total number of individual investors on the SZSE to 2011 was 100.894 million. The overview of the number of new investors' accounts on the SZSE from 2004 to 2011 is shown in the Table 6.3.

Table 6.3 shows the number of new investor accounts has had negative growth from 2008 to 2011 except for 2009. The reasons for the negative growth have been

discussed in Chapter 4, namely, that the Chinese stock market was experiencing a bear market in that period. Although China's exports maintained a double-digit increase, Chinese individual investors on average lost 42,000 0 yuan per person in 2011 on the stock market (Huang, 2011). Therefore, although about 100 million individual investors had accounts on the SZSE and SHSE, more than 11 million of those accounts were not active from 2011 (Jones, 2012). During August 2011 on the SZSE and SHSE, the number of valid accounts involved in transactions was only 24.136 million, accounting for 17.84% of the total accounts. By contrast, 111.15 million accounts on these two markets did not participate in transactions, accounting for up to 82.16%. These figures mean that more than 80% of investors chose not to participate in the markets, holding fixed stocks or leaving their accounts empty after selling all their stocks (Zhao, 2011).

Table 6.3 The overview of new investor accounts on the SZSE from 2004 to 2011 (million)

Year	Categories	The total number of investors' accounts	Cumulative new investors' accounts in this year	Change on year-on-year basis (new accounts)	Increase or decrease (%) (new accounts)
2004	Total	34.674	0.834	0.186	28.71%
	Institutional	0.153	0.006	-0.001	-17.72%
2005	Total	35.369	0.717	0.117	14.00%
	Institutional	0.159	0.007	0.001	21.11%
2006	Total	38.120	2.842	2.124	296.16%
	Institutional	0.172	0.017	0.010	143.42%
2007	Total	68.316	30.195	27.354	962.60%
	Institutional	0.229	0.062	0.044	258.12%
2008	Total	75.076	8.304	-21.978	-72.58%
	Institutional	0.247	0.030	-0.033	-52.61%
2009	Total	85.678	10.251	1.935	23.26%
	Institutional	0.281	0.039	0.009	30.81%
2010	Total	94.308	8.906	-1.346	-13.13%
	Institutional	0.309	0.031	-0.007	-19.02%
2011	Total	101.228	7.131	-1.775	-19.93%
	Institutional	0.334	0.029	-0.003	-9.24%

Source: Shenzhen Stock Exchange (2004a-2011a)

6.3.3 Sample frame

Both online and printed questionnaires were distributed to individual investors on the SZSE. Online distribution by Survey Monkey used snowball sampling; printed questionnaires were distributed in Beijing in the social education classes in one university and one securities company.¹⁵

In the university, questionnaires were distributed to the students attending the social education classes who had investment experience. In the securities company, questionnaires were disseminated to the clients who had an account there. The reason for distributing questionnaires in these two places is that the sample would have the diversity of the stock account locations, because most students in the social education classes in the university were from the second-tier, third-tier or other cities; by contrast, the majority of the clients in the securities company were living in Beijing, a first-tier city. As a result, a stratified sampling method was applied to the questionnaire. Cities in China were categorised into four groups: first-tier, second-tier, third-tier cities and others. All the participants for the survey were asked to choose which tier city he or she was living in. The T-test will be conducted in two independent samples to confirm that there was no response bias in the selected sample.

6.3.4 Data gathering

During the process of data gathering, a valid response rate was reduced for several reasons: (1) length of the questionnaire (six pages); (2) a whole group of questions were skipped; and (3) no incentives were offered. Therefore, 800 questionnaires were

¹⁵ In order to keep the information of the distributors and respondents private and to avoid them being identified, the names of the university, the securities company and the distributors do not appear in the thesis.

distributed to individual investors on the SZSE. At the end of the survey data collection, a total of 217 responses were received, constituting a 27% response rate.

Of the 217 collected questionnaires, 163 (148 valid) were paper and 54 (45 valid) were online. For the printed questionnaires, 13 investors who had never invested on the SZSE also answered the questions, but their data could not be used for the data analysis. Two respondents skipped whole pages of questions, therefore, their questionnaires were also invalid. A similar situation occurred with the online questionnaires: four respondents had no experience in investing on the SZSE and five investors skipped a large number of questions. As a result, the total number of valid responses $n=193$.

6.3.5 Sample profile

Table 6.4 shows the demographic information for all 193 survey respondents. The sample had a majority of males (59.1% of the total); most of the respondents were in the age group 26-35 years, and those over 50 only constituted 1%; the percentage of married respondents was 7.2% higher than of single respondents; 36.8% of the total had dependent children, and more than half the sample did not live with their parents; a majority of the sample worked in the commercial field; 96.9% of the respondents had an undergraduate university degree or higher; for 80.4% of the respondents, annual wage income was 10,000 RMB or less; only five investors' income exceeded 10,000 RMB per year. In particular, according to the statistics in a survey report in 2002, investors aged between 25-55 were the majority of total surveyed investors, namely 77.59% of the sample (Chen et al., 2002). Likewise, as the data shows in Table 6.4, the percentage of respondents who were in the age group 26-49 was 81.8% in this study, which constituted a similar age structure to the previous report. Table 6.5

shows that approximately half the respondents live in first-tier cities, such as Beijing, Shanghai and Guangzhou. These cities have rapid economic development and high population density.

Table 6.4 Profile of respondents (193 questionnaires)

Demographic variable	Valid % of respondents	Mean	Standard Deviation
Gender		1.59	0.493
Female	40.9		
Male	59.1		
Age		2.0052	0.60808
<=25	17.1		
26-35	66.3		
36-49	15.5		
50-59	1.0		
Marital status		1.5596	0.52819
Single	45.6		
Married	52.8		
Divorced	1.6		
Dependent children		0.3679	0.48348
No	63.2		
Yes	36.8		
Living with parents		0.3420	0.47560
No	65.8		
Yes	34.2		
Employment		3.4404	1.61304
Directors	15.0		
Professionals	10.9		
Clerical personnel	10.4		
Commercial service	59.1		
Equipment operators	0.5		
Retired or unemployed	0.5		
Others	3.6		
Education		4.1710	0.54657
Uneducated	0.5		
Secondary education	1.0		
College degree	1.6		
University degree	74.6		

Graduate and above	22.3		
Wage income (RBM per year)		3.4611	1.27875
No income	3.1		
<=32000	18.7		
32000-58000	36.3		
58000-100000	22.3		
100000-150000	13.0		
150000-200000	4.1		
>=200000	2.6		

Table 6.5 Investor stock account location and questionnaire format (193 questionnaires)

Variable	Valid % of respondents	Mean	Standard Deviation
Living in city		3.3264	0.84297
First-tier	5.7		
Second-tier	7.3		
Third-tier	35.8		
Others	51.3		
Questionnaire format		0.7668	0.42394
Online questionnaire	23.3		
Paper questionnaire	76.7		

Note: In China, the rural population occupied 47.4% of total population by 2012, thus, respondents who lived in 'other' cities, including fourth-tier cities and rural areas, occupied 51.3% of the sample (Cui, 2013).

An overview of investors' general portfolios can be found in Table 6.6. Of the sample, 90.1% held no more than five stocks, and only one respondent had over 15 stocks; more than half of the respondents (54.4%) had no funds when they filled in the questionnaires. It seemed the respondents did not spend much time in research on investing, since 48.2% of the sample spent no more than three hours per week on investment research. The investment income of the sample was not very encouraging, since 49.2% of the respondents were still operating in deficit, and only 4.1% had more than 5,8000 RMB investment income. In terms of investment experience, 54.9% of the

respondents participated in the stock market since 2008, which meant that more than half the respondents (54.9%) had less than four years' investing experience.

Table 6.6 Investment portfolio of 193 respondents

Variable	Valid % of respondents	Mean	Standard Deviation
Number of stocks		2.2902	0.98887
0	22.8		
<=2	37.8		
3-5	29.5		
6-9	7.8		
10-15	1.6		
>=15	0.5		
Number of funds		1.5699	0.68960
0	54.4		
1-4	34.2		
>=4	11.4		
Spending hours in investment		1.8653	1.01164
<=3	48.2		
4-10	27.5		
11-30	14.0		
>=30	10.4		
Investment income		1.9585	1.24513
Deficit	49.2		
Balance out	24.9		
<=32000	13.5		
32000-58000	8.3		
58000-100000	2.6		
100000-150000	1.0		
>=200000	0.5		
Investment period		4.3161	0.94571
December,1990-July,1996	1.6		
August,1996-June, 2001	5.7		
July, 2001-July, 2005	7.3		
August, 2005-December, 2008	30.6		
after 2008	54.9		

This section has provided an overview of the sample used in this research, covering the aspects of survey development, the population of the sample, the process of data selection and demographic characteristics of the respondents. The next section is data analysis: including an outline of the conceptual framework and hypotheses, the results of non-response bias testing, common method bias specification and model results respectively.

6.4 Investigating effects of behavioural factors on individual investors' investment income on the SZSE

6.4.1 Introduction

The analysis in this section focuses on the impact of behavioural factors on investors' investment income, adopting both a measurement model and a structural model. A group of behavioural factors which have been discussed in previous studies of other stock markets—including investment experience, financial knowledge, overconfidence, self-control, risk-aversion, mental account and herd behaviour—were applied to the model (Shiller, 2000b; Dorn and Huberman, 2005; Chen et al., 2004). Besides these indicators, investors' wage income was also introduced into the analysis.

In terms of the SEM procedures, the theoretical basis of these measures and hypotheses are elaborated to support the model building. After that, the non-response bias test, the common method bias specification and the reliability test are used to confirm the validity of the questionnaire data. This is followed by the model results and conclusions for this section.

6.4.2 Conceptual framework

Figure 6.1 Conceptual model: effects of cognitive and behavioural factors on investors' investment income

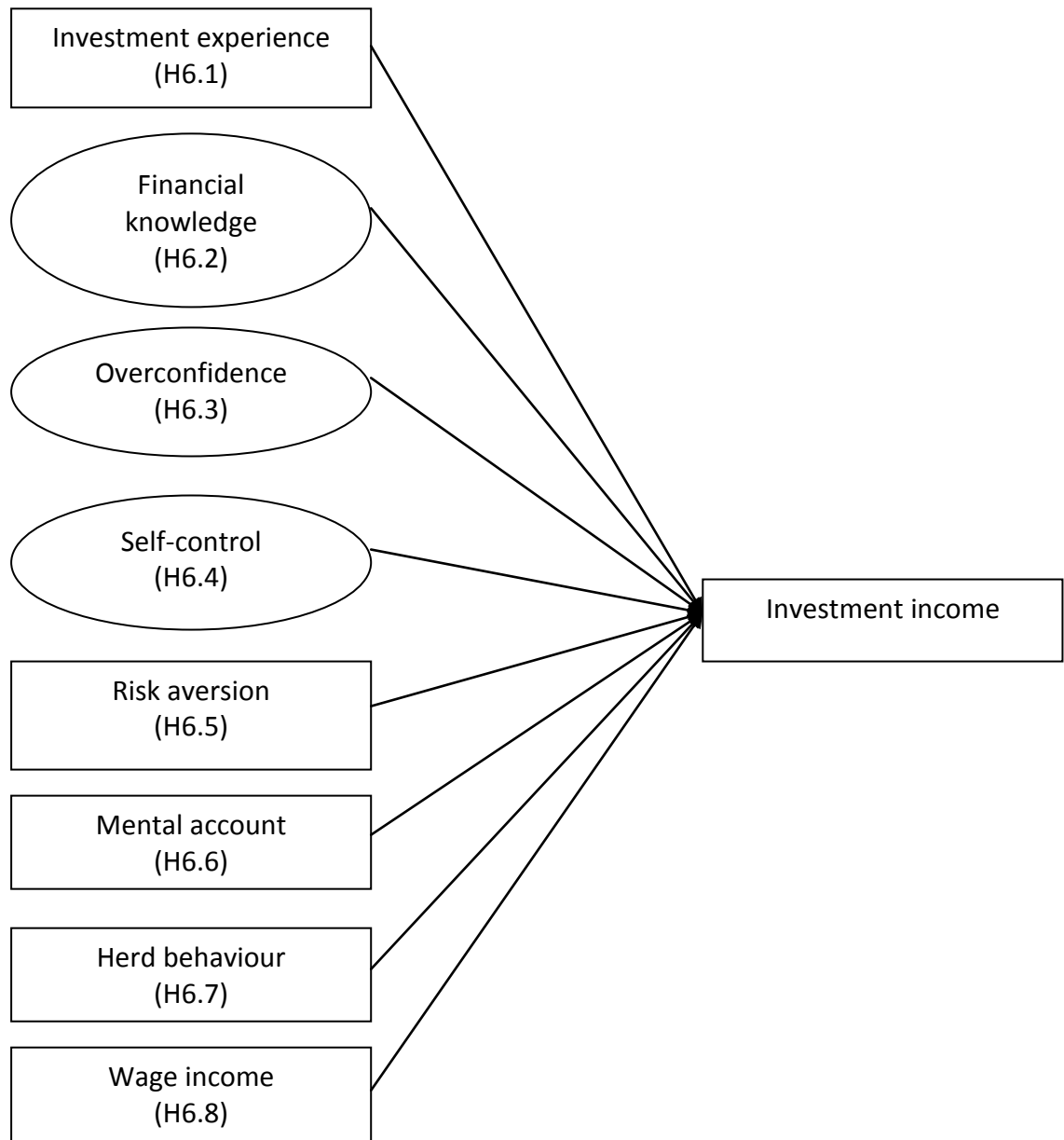


Figure 6.1 shows the construction of the conceptual framework used in this section.

The conceptual model illustrates the relationships between behavioural factors and investors' investment income, using eight independent variables and one dependent variable. Each independent variable has its own measure in the questionnaire. The

design of the corresponding measures is on the basis of the previous studies in the field of behavioural finance.

The theoretical foundation and research development of behavioural finance have been introduced in Chapters 1 and 2. This section concentrates on further exploration of each of the behavioural variables used in the model, in order to propose Hypotheses 6.1 to 6.8. The impact of investment experience, financial knowledge and wage income on investment income is expected to be significantly positive, whereas the effects of the behavioural factors used, namely overconfidence, self-control, risk aversion, mental account and herd behaviour, are expected to be significantly negative. Variables used in the model are illustrated in Figure 6.1, and they will be discussed individually in following sections.

6.4.3 Measures and hypotheses

6.4.3.1 Investment experience

The number of years that the individual investor had held the stock market account was used in the questionnaire to measure investing experience. The longer the account had been held, the more experienced the individual investor is (Chen et al., 2004). The length of account holding from zero to more than 15 years was categorised into six options: 'I have never invested', 'up to 1 year', '1 to 3 years', '4 to 9 years', '10 to 15 years' and 'more than 15 years' (Dorn and Huberman, 2005).

To estimate the effects of investor experience on investors' investment income, Hypothesis 6.1 posits that:

H6.1: More investor experience results in significant and higher investors' investment income.

6.4.3.2 Financial knowledge

Financial knowledge was assessed in the questionnaire using six categories of financial instruments indicating how well the respondent could explain the instruments to his or her friend. These instruments were money market, bonds, stocks, stock market, derivatives and mutual funds. The variable was measured on a scale of 1 (don't know this item) to 5 (can explain very well). The sum of the knowledge scores across the different instruments was a measure of investors' perceived financial knowledge.

To examine the effects of the investors' financial knowledge on their investment income, Hypothesis 6.2 posits that:

H6.2: Better investors' financial knowledge results in significant and higher investors' investment income.

6.4.3.3 Overconfidence

The overconfidence effect is a bias in which people's subjective confidence in their judgement is reliably greater than their objective accuracy, especially when the level of confidence is relatively high (Pallier et al., 2002). The variable overconfidence was measured by the combination of three drivers, by examining the extent to which respondents agreed, on a four-point scale from 1 (Disagree) to 4 (Agree). These three statements are: (1) I am substantially better informed than the average investor; (2) my past investment successes were, above all, due to my specific skills; and (3) my instinct has often helped me to make financially successful investments (Dorn and Huberman, 2005; Lease et al., 1974).

To estimate the effects of over-confidence on investors' investment income, Hypothesis 6.3 posits that:

H6.3: The behavioural factor overconfidence results in significant and lower investors' investment income.

6.4.3.4 Self-control

Self-control refers to an ability to control one's desire and emotion (Thaler and Shefrin, 1981). The variable self-control was measured by the combination of four indicators, by evaluating the extent to which the participants agreed, on a four-point scale from 1 (Disagree) to 4 (Agree). The three statements indicating self-control are: (1) When I make plans, I am certain that they will work out; (2) I always know the status of my personal finances; (3) I am in control of my personal finances; and (4) I control and am fully responsible for the results of my investment decisions (Dorn and Huberman, 2005).

To examine the impact of self-control on investors' investment income, Hypothesis 6.4 posits that:

H6.4: The behavioural factor self-control results in significant and lower investors' investment income.

6.4.3.5 Risk aversion

Risk aversion refers to a kind of human behaviour whereby people attempt to reduce uncertainty when they are exposed to that uncertainty; that is, people who start from a position of certainty are unwilling to take a bet which is 'actuarially fair' (Arrow, 1971, p.90). The variable risk aversion was measured by examining the extent to which respondents agreed with a statement, on a four-point scale from 1 (Disagree) to 4 (Agree). This statement was 'I am not at all willing to bear high risk in exchange for high expected returns' (Dorn and Huberman, 2005).

To estimate the effects of risk aversion on investors' investment income, Hypothesis 6.5 posits that:

H6.5: The behavioural factor risk aversion results in significant and lower investors' investment income.

6.4.3.6 Mental account

Mental account was proposed by Shefrin and Statman (2000) in their exploration of behavioural portfolio theory. In this theory, behavioural portfolio theory-single account (BPT-SA) referred to investors who integrated their portfolios into a single mental account, whereas behavioural portfolio theory-multiple account (BPT-MA) referred to investors who segregated their portfolios into several different mental accounts (Shefrin and Statman, 2000). The variable mental account was measured by one question: 'Do you have different aspirations for securities returns and then put different securities into various categories (mental account)'. This question is followed by three choices: (1) no; (2) it depends; and (3) yes.

To estimate the effects of mental account on investors' investment income,

Hypothesis 6.6 posits that:

H6.6: The behavioural factor mental account results in significant and lower investors' investment income.

6.4.3.7 Herd behaviour

Herd behaviour in humans refers to the phenomenon of a large number of people taking actions in the same way at the same time (Brunnermeier, 2001). The variable herd behaviour was measured by evaluating the extent to which the participants agreed with the statement: 'Many people are showing a great deal of excitement and optimism about the prospects for the Shenzhen Stock Market, and I must be careful

not to be influenced by them.’ This is followed by three choices: (1) agree; (2) neither agree nor disagree; and (3) disagree (Shiller, 2000b).

To examine the impact of herd behaviour on investors’ investment income, Hypothesis 6.7 posits that:

H6.7: The behavioural factor herd behaviour results in significant and less investors’ investment income.

6.4.3.8 Wage income

Wage income does not in fact belong to defined behavioural factors. However, the reason that this conceptual model involves the investors’ wage income is that in China the funds which individual investors put on the stock market are mainly derived from household savings and wage income. A survey conducted by China Securities Investor Protection Fund Company in January 2012 reported that 58.47% of the respondents invested using household savings and that 36.33% of the respondents invested using wage income (Liao, 2012). Household savings is a more sensitive topic than wage income, and in the process of the pilot study (Chapter 3) some respondents indicated that they did not wish to answer this question. Therefore only wage income was applied to this model.

The amount of wage income from zero to more than 200,000 RMB was categorised into six options: ‘no income’, ‘up to 32,000’, ‘32,000 to 58,000’, ‘58,000 to 100,000’, ‘100,00 to 150,000’, ‘150,000 to 200,000’ and ‘greater than 200,000’. The reason for taking 32,000 as the starting point is that, according to a report published by the National Bureau of Statistics of China in 2009, this amount was the average wage income of urban residents who worked in non-private-sector departments (Ji, 2010).

To estimate the effects of wage income on investors' investment income, Hypothesis 6.8 posits that:

H6.8: Higher wage income results in significant and higher investors' investment income.

6.4.4 Results

6.4.4.1 Non-response bias

The first step in this study in confirming the validity of the data was to undertake the t-test as a non-response bias test for the two independent samples. Non-response bias means that 'if persons who respond differ substantially from those who do not, the results do not directly allow one to say how the entire sample would have responded' (Armstrong and Overton, 1977, p.396).

The usual approach is to compare early and late respondents for two independent samples (Armstrong and Overton, 1977). However, the paper questionnaires used in this study were distributed to respondents in the same period and the questionnaires were not marked by date, so it was difficult to define early or late respondents.

Therefore, all valid questionnaires were divided into two major categories according to investor account location: respondents living in first-tier cities (n=99) and respondents living in other cities (n=94). The results show that significant differences occur for two variables: financial knowledge and overconfidence (Table 6.7).

Apart from the test above, another test was also undertaken for the two groups according to the questionnaire format: online questionnaire respondents (n=45) and paper questionnaire respondents (n=148) (Table 6.8). The results show that almost half the variables used in the model do not pass the non-response bias test. The fact that the data do not pass the non-response bias test indicates that the two groups of

the survey data have significant differences. Therefore, the model for the effects of cognitive and behavioural factors on investment income only employs the data from the 148 paper questionnaire respondents.

Table 6.7 T-test for non-response bias (respondents in first-tier cities vs respondents in other cities) for effects of cognitive and behavioural factors on investment income

	$X_{\text{firsttierrespondents}}$	$X_{\text{otherrespondents}}$	df	t	p
Experience	3.0606	3.3085	191	-1.826	.069
Knowledge	21.5758	19.5745	191	2.611	.010
Overconfidence	8.2323	7.3723	191	2.298	.023
Self-control	14.2222	14.2766	191	-.173	.863
Risk aversion	2.5253	2.6702	191	-.807	.421
Mental account	2.3737	2.1915	191	1.626	.106
Herd behaviour	1.5354	1.4681	191	.645	.519
Wage income	3.3333	3.5957	191	-1.429	.155
Investment income	1.9394	1.9787	191	-.219	.827

Table 6.8 T-test for non-response bias (online questionnaire respondents vs paper questionnaire respondents) for effects of cognitive and behavioural factors on investment income

	$X_{\text{onlinerrespondents}}$	$X_{\text{paperrespondents}}$	df	t	p
Experience	3.5111	3.0811	191	2.707	.007
Knowledge	24.4444	19.4324	191	5.913	.000
Overconfidence	7.9111	7.7838	191	.284	.777
Self-control	14.1333	14.2838	191	-.404	.687
Risk aversion	2.5111	2.6216	191	-.520	.604
Mental account	2.2667	2.2905	191	-.179	.858
Herd behaviour	1.4222	1.5270	191	-.851	.396
Wage income	4.2889	3.2095	191	5.297	.000
Investment income	1.6222	2.0608	191	-2.087	.038

6.4.4.2 Common method bias

Podsakoff et al. (2003, p.879) pointed out that most researchers found that common method variance ('the variance is attributable to the measurement method rather than to the constructs the measures represent') is a problem in behavioural research (Bagozzi and Yi, 1991). The common method bias is caused by the fact that there is potential for artificial covariance between the results of both predictor and criterion

variables due to a common informant (Campbell and Fiske, 1959). Several measures were undertaken in the design of the survey to reduce the likelihood of common method bias.

Firstly, the predictor and criterion variables in this study were derived from different sources. The scales, multiple choice questions and demographic data collection were based on a combination of various research sources conducted by other scholars.

Secondly, there was a reminder letter in front of the questionnaire, to ask the respondents to provide truthful answers and also ensure them of the anonymity of all responses. Last but not least, before formally conducting the survey, the questionnaires were sent to two academics who have an international background and one investor in China. Their reviews of the questionnaires confirmed that the expression of all items was clear and indicated intended meanings intelligibly.

Furthermore, their reviews also verified that the translation of the questionnaire from English to Chinese was appropriate. Then the questionnaire was revised according to their suggestions. The combination of the three measures above supports the proposition that common method bias is not present in the data.

In addition, a single-method factor approach can be used to further assess the potential for common method bias. This approach involves loading all items from all of the constructs in the model into a factor analysis to determine whether most of the variance can be explained by one general factor. The items for which the factor loading was less than 0.40 were removed from the model. Statistics in Table 6.9 show that there was no difference among the variables.

6.4.4.3 Reliability test

The 'reality' of the measures was based on the value of Cronbach's alpha. Cronbach's alpha is the criterion for evaluating the reliability of the different categories. As a general rule a coefficient greater than or equal to 0.7 is considered acceptable and a solid construction of reliability (Al-Tamimi and Emirates, 2006). As shown in Table 6.9, the Cronbach's alpha of the three latent variables financial knowledge, overconfidence and self-control was 0.809, 0.782 and 0.764, respectively. Therefore, the variables used in this model achieved the criteria.

6.4.4.4 CFA: measurement model

Factor analysis is used to find a small set of latent variables which can account for the covariance among a large set of observed variables. In this section, both exploratory factor analysis (EFA) and CFA are adopted. EFA imposes substantive constraints on the data and there are no restrictions on the styles of the relationships between latent variables and observed variables; thus EFA is data driven. CFA on the other hand is theory or hypothesis driven, since with CFA it is possible to place meaningful constraints on the factor model, and CFA allows researchers to examine hypotheses in regard to a particular factor structure (Albright and Park, 2009).

EFA was initially applied to identify poorly fitting measures; thus two items were removed from the scales. These two items, which are indicated in the variable overconfidence and the variable self-control, showed a poor fit with the scale according to the factor loadings that do not exceed 0.4 (Table 6.9). After using EFA, CFA was used to implement the measurement model using maximum likelihood estimation (MLE) criteria (Albright and Park, 2009).

Table 6.9 Scales used for the CFA in this study

Variable	Items	Cronbach's alpha	Factor loading
Financial knowledge	1 knowledge of money market	0.809	0.838
	2 knowledge of bonds		0.873
	3 knowledge of stocks		0.903
	4 knowledge of stock market index		0.884
	5 knowledge of derivatives		0.733
	6 knowledge of mutual funds		0.731
Over-confidence	1 I am substantially better informed than the average investor.	0.782	0.765
	2 My past investment successes were, above all, due to my specific skills.		0.589
	3 My instinct has often helped me to make financially successful investments.		n/a
Self-control	1 When I make plans, I am certain that they will work out.	0.764	0.486
	2 I always know the status of my personal finances.		0.721
	3 I am in control of my personal finances.		0.438
	4 I control and am fully responsible for the results of my investment decisions.		n/a

An examination of the construct inter-correlations (Table 6.11) shows that the inter-correlations for three groups of variables exceed 0.8, and all these three-group relationships belong to the variable financial knowledge: (1) the inter-correlation between the instrument mutual funds and derivatives (0.810); (2) the the inter-correlation between the instrument stock market and stocks (0.801); and (3) the inter-correlation between the instrument stocks and bonds (0.822). Apart from these three

groups, the highest inter-correlation is 0.785 between the instrument bond and money markets, not exceeding 0.8. As shown in Table 6.11, average variance extracted (AVE) is calculated for each of the inter-construct correlations. None of the inter-correlations exceeds the AVE figure calculated, which means that discriminant validity is achieved in the model.

Table 6.10 shows the goodness-of-fit indices for the measurement model used in this section and Figure 6.2 illustrates the original CFA model produced by AMOS 20. Table 6.10 shows that all indicators pass the related criteria except AGFI (=0.899), which indicates that the model fits the data reasonably well. Because the initial model did not present satisfactory goodness-of-fit, correlations were adopted between error terms for both independent and dependent variables respectively. All the adjustments were conducted according to 'modification indices' by AMOS 20.

Table 6.10 Fit indices for CFA

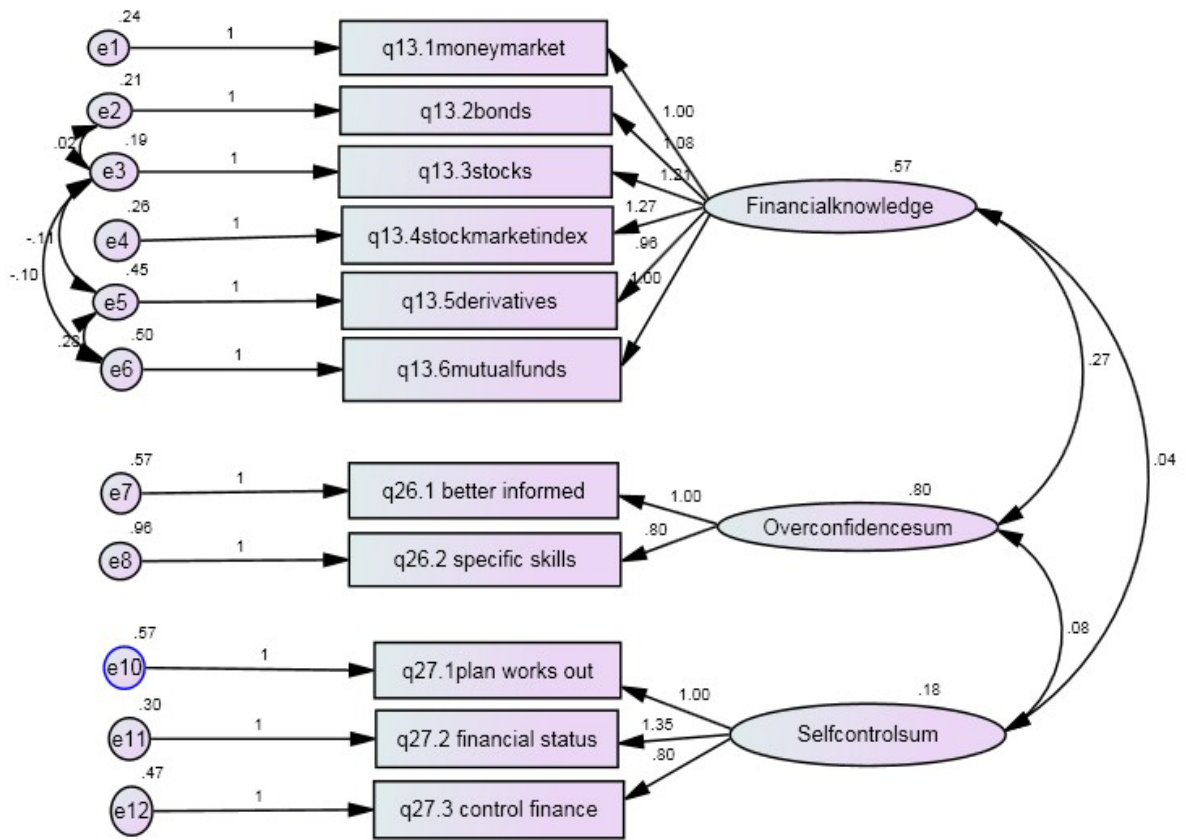
	χ^2	df	Probability level	NC value	RMSEA	GFI	AGFI	TLI	CFI
CFA	50.978	37	0.063	1.38	0.051	0.943	0.899	0.975	0.983

Notes: CFA= Confirmatory factor analysis; NC value= χ^2 /degree of freedom; RMSEA= Root mean square error of approximation; GFI= Goodness of fit index; AGFI= Adjusted goodness of fit index; TLI= Tucker Lewis index; CFI= Comparative fit indices.

Table 6.11 Construct correlations, means, standard deviations and results of average variance extracted

	Wagein come	Herdbe haviour	Mentala ccount	Riskave rsion	Investin gtime	Investm entinc ome	Control 1	Contr ol3	Contr ol2	Confi dence 1	Confi dence 2	Know ledge 6	Know ledge 5	Knowle dge4	Knowle dge3	Know ledge 2	Know ledge 1
Wageincome	1.000																
Herdbehaviour	0.198	1.000															
Mentalaccount	0.129	-0.115	1.000														
Riskaversion	0.003	0.004	-0.092	1.000													
Investingtime	0.136	-0.102	0.140	-0.003	1.000												
Investment Income	-0.029	0.078	-0.137	0.092	0.071	1.000											
Control1	0.178	0.080	0.135	0.072	0.051	0.015	1.000										
Control3	0.053	0.006	0.025	-0.022	-0.097	-0.148	0.233	1.000									
Control2	0.111	0.103	0.081	0.069	-0.019	-0.016	0.342	0.317	1.000								
Confidence1	-0.083	-0.114	0.180	0.064	0.212	0.013	0.081	-0.013	0.161	1.000							
Confidence2	-0.130	-0.128	0.184	0.074	0.149	-0.011	0.146	-.0022	0.053	0.451	1.000						
Knoeledge6	-0.147	-0.008	0.130	-0.060	0.158	0.136	-0.081	.0054	0.014	0.228	0.179	1.000					
Knowledge5	-0.133	-0.054	0.077	-0.116	0.099	0.120	0.000	.0091	0.043	0.209	0.213	0.810	1.000				
Knowledge4	-0.072	-0.009	0.165	-0.125	0.229	0.110	0.062	.0052	0.074	0.293	0.242	0.670	0.670	1.000			
Knowledge3	-0.057	0.056	0.086	-0.059	0.139	0.101	-0.055	.0049	0.111	0.287	0.210	0.562	0.546	0.801	1.000		
Knowledge2	-0.042	0.077	0.050	-0.023	0.099	0.100	0.082	.0037	0.113	0.216	0.217	0.595	0.609	0.754	0.822	1.000	
Knowledge1	0.005	-0.009	0.097	-0.083	0.170	0.109	0.065	0.017	0.129	0.260	0.169	0.635	0.623	0.714	0.740	0.785	1.000
AVE								0.5687			0.6319				0.9295		
Mean	4.2889	1.4222	2.2667	2.5111	3.5111	1.6222		14.1333			7.9111				24.4444		
Std. Deviation	1.12639	0.72324	0.79328	1.28521	0.95129	1.23016		2.13822			2.58604				5.14439		

Figure 6.2 Confirmatory factor analysis



6.4.4.5 Structural model

Table 6.12 Fit indices for the structural model

	χ^2	df	Probability level	NC value	RMSEA	GFI	AGFI	TLI	CFI
Structural Model	112.139	104	0.276	1.08	0.023	0.919	0.880	0.988	0.990

Notes: CFA= Confirmatory factor analysis; NC value= χ^2 /degree of freedom; RMSEA= Root mean square error of approximation; GFI= Goodness of fit index; AGFI= Adjusted goodness of fit index; TLI= Tucker Lewis index; CFI= Comparative fit indices.

Table 6.12 shows the goodness-of-fit indices for the structural model used in this section: all indicators pass the related criteria except AGFI (=0.880), which indicates that the model fits the data reasonably well. Besides the three latent variables in the measurement model, the structural model involved the other observed variables in the analysis. Seven independent variables and one dependent variable were used in the

model to estimate the casual relationships between behavioural factors and investors' investment income. Figure 6.3 illustrates the original structural model produced by AMOS 20.

Figure 6.3 Structural model

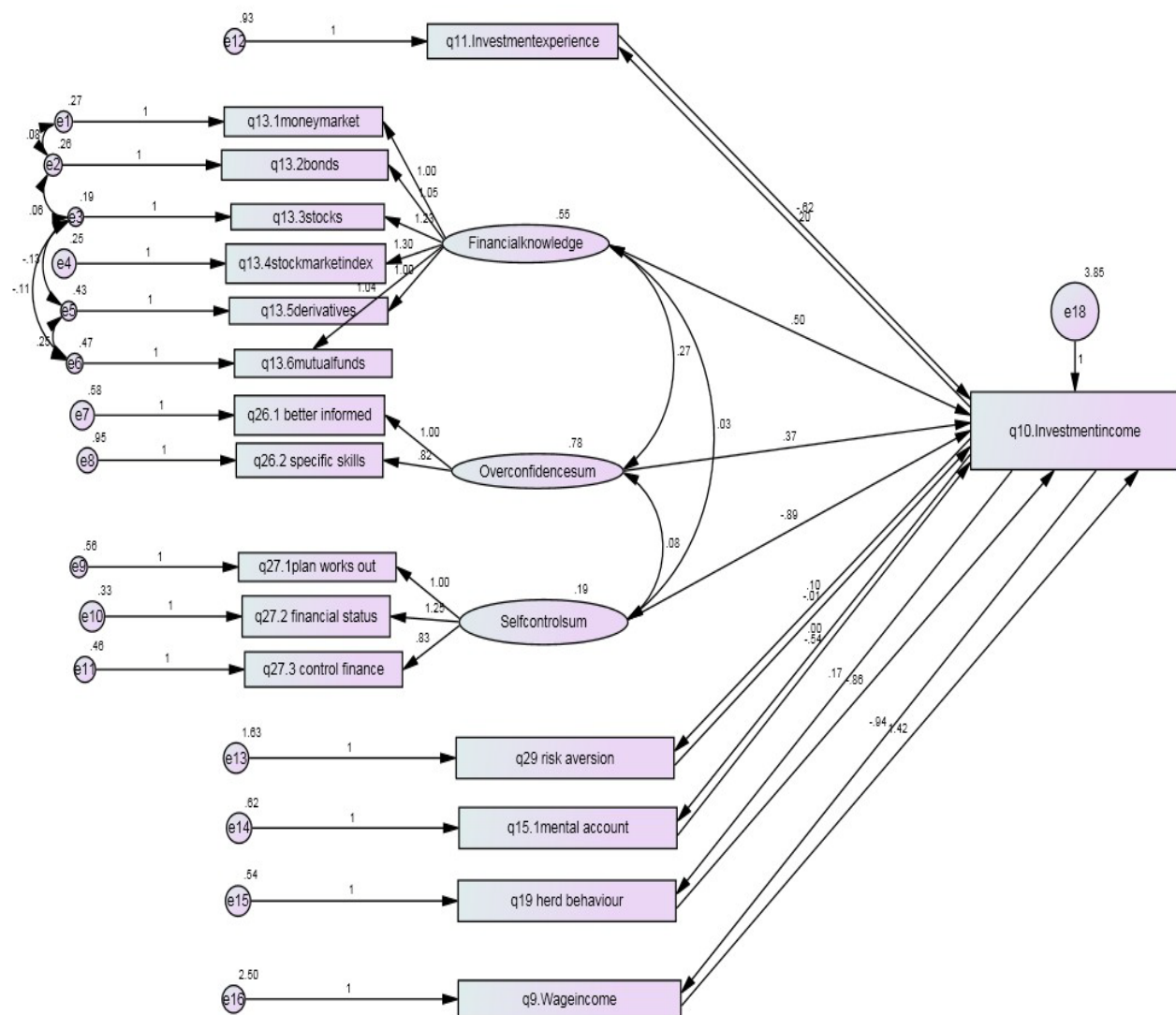


Table 6.13 Results of the structural model

Hypothesis		β	SE	P
H6.1	investment experience $\rightarrow$ (+) income	-0.476	0.259	0.017**
H6.2	financial knowledge $\rightarrow$ (+) income	0.301	0.501	0.092*
H6.3	overconfidence $\rightarrow$ (+) income	0.264	0.368	0.222
H6.4	self-control $\rightarrow$ (+) income	-0.310	-0.888	0.133
H6.5	risk aversion $\rightarrow$ (+) income	-0.010	-0.009	0.955
H6.6	mental account $\rightarrow$ (+) income	-0.347	-0.541	0.050**
H6.7	herd behaviour $\rightarrow$ (+) income	-0.506	-0.864	0.013**
H6.8	wage income $\rightarrow$ (+) income	1.298	0.652	0.030**

Note: *Significant at the 0.10 level; **Significant at the 0.05 level; *** Significant at the 0.01 level

The coefficients of five variables are found to be significant, either positive or negative.

The results show no support for research Hypotheses H6.3, H6.4 and H6.5, so the effects of overconfidence, self-control and risk aversion on investors' investment income were found to be not significant (Table 6.13).

From Table 6.20 several findings can be summarised as follows: firstly, the impact of investment experience is negative, thus this result is not consistent with the research proposition H6.1. More specifically, for every increase of 1.0 in investors' investment income, there is a decrease of 0.476 in investment experience. Secondly, significant support at the 0.10 level is found for H6.2, which means that investors' financial knowledge has significant and positive impact on their investment income. For every increase of 1.0 in investors' investment income, there is an increase of 0.301 in financial knowledge. Thirdly, the causal relationship between mental account and investors' investment income is significant at the 0.05 level, and it is negative, which means that the influence of mental account had significant and negative impact on their investment income. More specifically, for every increase of 1.0 in investors' investment income, there is a decrease of 0.347 in mental account (H6.6). Fourthly, herd behaviour has significant and negative effects on investors' investment income.

For every increase of 1.0 in investors' investment income, there is a decrease of 0.506 in herd behaviour (H6.7). Last but not least, significant support at the 0.05 level is found for H6.8. For every increase of 1.0 in investors' investment income, there is an increase of 1.298 in their wage income. That means higher wage income results in significant and higher investors' investment income.¹⁶

6.4.5 Conclusions

This part has explored the causal relationships between behavioural biases and investors' investment income. The definitions and studies related to the behavioural factors used in this section have been discussed in Chapter 2. Hypotheses 6.1 to 6.18 were firstly developed, and then non-response bias, common method bias and reliability test were conducted to confirm the validity of the data. Both measurement and structural models were used in the analysis. The empirical results showed that the financial knowledge that individual investors mastered and the amount of investors' wage income had significant and positive effects on investors' investment income. The behavioural biases, including mental account and herd behaviour, had significant and negative impact on investors' investment income.

6.5 Discussion and conclusions

On the basis of the discussions of macro-economic and firm-level contexts in Chapters 4 and 5 respectively, this chapter has analysed the behaviour of individual investors on the SZSE based on survey data. Chapter 4 showed that non-rational behaviour was suggested by the unstable relationship between SZSE volatility and macro-economic activity. Consequently, the nature of that non-rational behaviour was explored through

¹⁶ Further discussion of related findings will be conducted in Chapter 7.

interviews with senior executives in the five target companies (Chapter 5). This chapter also investigated the non-rational behaviour of individual investors on the SZSE.

This chapter first demonstrated the method used in this study, namely SEM procedures, including the steps in SEM, justifications for using SEM, as well as its advantages and limitations. Second, questionnaire development, population and sample frame, data gathering and participants' profiles were discussed. Finally, the causal relationships between behavioural factors and investors' investment income were analysed, using both measurement and structural models. One interesting finding was that investment experience had significant and negative impact on investors' investment income, which was inconsistent with the research proposition (H6.1). Unlike the influence of investment experience, both the financial knowledge that individual investors gained and the amount of investors' wage income had significant and positive effects on investors' investment income. For the behavioural biases, both mental account and herd behaviour were shown to have significant and negative impact on investors' investment income.

Complementary discussions covering several aspects derived from the questionnaires, as well as more specific results in this chapter combined with the findings obtained from Chapters 4 and 5 will be discussed in Chapter 7.

Chapter 7 Further discussion and conclusions

7.1 Introduction

This thesis has examined the effects of behavioural factors on investors' investment income (Chapter 6), incorporating both macro-economic (Chapter 4) and firm-level (Chapter 5) contexts for investors in the case of the Shenzhen Stock Exchange (SZSE). This chapter provides integrated interpretations of the results from Chapters 4, 5 and 6. In addition, it discusses particular aspects of investors' decision framework and investment strategies: the factors influencing investors' decisions and investors' viewpoints on the current situation of the SZSE. A discussion of the contributions made to knowledge, limitations of the study and directions for further research are also demonstrated.

7.2 Key findings

7.2.1 Findings of the macro-economic environment for investors

In many developed countries as well as in several emerging markets, the previous literature established the correlation between macro-economy and stock market volatility (Fama, 1990; Mukherjee and Naka, 1995; Bilson et al., 2001; Ibrahim, 1999; Gjerde and Saettem, 1999). In China, however, researchers have held two viewpoints. Some researchers stated that not only is the stable long-term relationship between the stock market and macro-economic variables stable, but also that there is a correlation over the short-term fluctuations (Jing and Yu, 2001; Zhang and Wang, 2000; Wang and Xu, 2001; Shang and Li, 2002). Other researchers have argued that the correlation between China's stock market volatility and economic activity was weak, even showing the status of deviation (Jin, 2011; Wang, 2000; Huang, 2004; Yan et al., 2004). The results of this study show significant support for the latter viewpoint.

In the case of the SZSE, only two groups of long-term cointegration relationships could be found: (1) stock exchange index and exchange rates; and (2) stock exchange index and interest rates, using the Engle-Granger two-step approach (EG). However, a large degree of instability did exist over the short term, as evidenced by the results of the error-correction models (ECM) (Chapter 4).

Through examination for the cointegration relationship for more than two variables using the Johansen and Juselius procedure (JJ), similar results were found (Chapter 4). Although there was a long-run equilibrium relationship between the stock exchange index and a series of macro-economic indicators (exchange rates, state foreign exchange reserves, interest rates, inter-bank weighted average interest rate and CPI), this relationship had large fluctuations over the short term.

To summarise, the correlation between stock market fluctuations and macro-economic conditions was found to be neither significant nor stable. As a result, it is difficult for investors to make investment decisions based on the status of the macro economy in the case of the SZSE.

7.2.2 Findings of the firm's efforts to influence investor behaviour

The firm's effects on investor behaviour were analysed from three perspectives: the social context for listed companies, internal biases existing in companies (such as agency problems and authoritarian management style), and the relationship between investor relations (IR) function and investor behaviour (Chapter 5). Senior executives provided a fresh perspective for explaining the situation in China, relative to studies in other countries.

As argued in previous studies, governments have become a crucial mover in regulating corporate operations in several developed countries (Coglianese et al., 2004; Moon,

2004). In China, newly listed companies which recently emerged from private companies were more sensitive to institutional change; at the same time, they also relied on protection from relevant governments (Che and Qian, 1998). Based on evidence provided in interviews with senior executives in target companies, it was clear that local governments did give full support for the development of emerging listed companies; however, they did not have effective regulation to control the nonstandard behaviours of listed companies. As a result, the first major finding, related to social context and governmental regulations for listed companies, is summarised as follows:

Finding 1: Governments play an important role in corporate affairs, regulating the development of companies. In the case of the SZSE, the social context for the newly listed companies has two contradictory aspects: on the one hand, local governments give full support to the growth of emerging companies and on the other hand, the relevant authorities interfere with corporate affairs in order to protect the interests of small investors. However, in reality there is no social penalty for not providing punctual and comprehensive information to investors during the transition period of newly listed companies.

Second, issues relating to corporate governance were included in the analysis. Previous studies showed that there were internal biases in corporate operations, including different types of agency problems caused by managerial behaviour (Shefrin, 2001; Morck and Yeung, 2010). In particular, irrational behaviour could occur in boardroom deliberations, partly because of managers' overconfidence and over-optimistic attitudes (Scharfstein and Stein, 1990; Malmendier and Tate, 2005b). According to the

fieldwork interview data analysed in this research, similar agency problems were found in the newly listed companies on the SZSE.

To summarise, the finding in relation to internal biases is as follows:

Finding 2: In the context of China, an imperfect mechanism was found in the five interviewed companies listed on the SZSE. Furthermore, their authoritarian management style remained in evidence after listing. This kind of imperfect mechanism and management style may diminish investors' profits.

Third and finally, the relationship between investor relations (IR) function and investor behaviour was investigated. In the West, relevant research has been conducted since the 1990s. Results showed that companies with effective IR units could materially enhance company values; furthermore, an IR unit could have a significant positive impact on the firm's interactions with investors (Farraghe et al., 1994; Marston and Straker, 2001; Laskin, 2007). However, in China, according to the interviews with senior executives, IR function did not play an important role in publicising effective information. At the same time, senior executives expressed the view that Chinese investors used relevant information to obtain speculative income. Therefore, the corresponding finding is summarised as follows:

Finding 3: In the West, an effective IR function plays an important role in the firm's interaction with other stakeholders; however, in newly listed companies in China, IR function is still a relatively insignificant area, even diminishing the efficacy of the transmission of information to investors. As a result, investors cannot obtain timely and comprehensive information from listed companies. On the other hand, the perspective of senior executives was that Chinese investors were prone to profiteering.

In sum, the firm-level influences on investors' behaviour were complex. On the one hand, there was no effective social penalty for not providing punctual and complete information to investors, and newly listed companies had their own imperfections and internal problems. On the other hand, from the perspective of senior executives, a number of Chinese investors were profiteering in their stock market investments.

7.2.3 Findings of micro-level influences on investor behaviour

The analysis of micro-level influences on investors' investment income showed several significant findings. First, consistent with Hypothesis 6.1 (Chapter 6), investment experience was found to have a significantly negative effect on investors' investment income. This result is similar to findings of Chen et al. (2004). They argued that more experienced investors were more inclined to make trading mistakes, with the result that investor sophistication did not improve trading performance.

Second, financial knowledge gained by individual investors and the amount of investors' wage income had significant and positive effects on investors' investment income. As discussed in Chapter 6, the funds which individual investors put on the stock market were mainly derived from household savings and wage income (Liao, 2012). As a result, the related finding in this study showed that investors' wage income did affect their investment income.

Last but not least, two behavioural factors, namely mental account and herd behaviour, had significant negative effects on investors' investment income. Investors with 'mental account' are those who segregated their portfolios into different categories because of various expectations, risk attitudes or diversification needs (Chapter 6). The finding in relation to mental account in this study confirms the findings of Kumar (2007) and Ivkovic et al. (2008). Kumar (2007) argued that diversification choices of individual

investors significantly influenced stock returns: his empirical results showed that the portfolio of stocks of the least diversified individual investor earned higher returns than the portfolio containing stocks with the most diversified individual investor. Similarly, Ivkovic et al. (2008) found that stock investments made by households that chose to concentrate their accounts in a few stocks outperformed those made by households with more diversified accounts. In examining herd behaviour, few studies referred to the relationship between individual investors' herd behaviour and their investment income. However, Bikhchandani and Sharma (2000, pp.279-280) noted that some observers showed concern that herding by market participants could exacerbate volatility, destabilise markets and increase the fragility of the financial system. Furthermore, Shiller (2000a) argued that individual investors might exhibit herd behaviour when they took the judgements of others into account, partly because of the information cascade.

The following sections focus on findings in relation to specific aspects of investors' decision framework and investment strategies: factors influencing investors' decisions, investors' expectations, future returns, opinions about the current situation of the SZSE, and risk and return on the SZSE. These findings are based on the survey data (Chapter 6) and the analyses of both macro-economic and firm-level contexts (Chapters 4 and 5).

7.2.3.1 Factors that influence individual investor behaviour most and least

Table 7.1 shows the frequency distribution of the first 10 variables that significantly influence the SZSE individual investor behaviour (Appendix H: 'follow-up information' in the questionnaire). The three most significant factors influencing individual investors are national policy, firm reputation and firm management, followed by three further

variables: firm status, price-earning ratio and macro-economic indicators (Table 7.1).

Both company situation (frequency 85 of firm reputation, 75 of firm management and 73 of firm status) and macro-economic factors (frequency 85 of national policy, 64 of macro-economic indicators and 58 of index movements in China) have considerable impact on individual investor behaviour.

Table 7.1 Frequency distribution of variables that always influence SZSE individual investor behaviour

Variable	Frequency	Valid %
1.2 national policy	85	44.3
3.1 firm reputation	85	44.3
3.3 firm management	75	39.1
3.2 firm status	73	38.0
4.3 price-earnings ratio	70	36.5
1.3 macro-economic indicators	64	33.3
1.4 index movements in China	58	30.2
4.2 share price affordability	52	27.1
1.1 financial coverage	50	26.0
2.1 company financial statement	50	26.0

Note: the numbers of these variables are based on their categories in the 'follow-up information' in the questionnaire in Appendix H.

The analysis leading to these findings was based on questions about the impact on individual investor behaviour of six groups of factors: (1) neutral information; (2) company accounting information; (3) self-image/firm-image coincidence; (4) company classic/traditional investment criterion; (5) advocate recommendation; and (6) personal financial needs.

This result also explains Chapters 4 and 5 which elaborated both firm-level and macro-economic contexts for the individual investors on the SZSE. The analysis in Chapter 4 revealed a contradiction in investors' decisions, which meant that the individual investors relied on the fluctuations in macro-economic indicators when they made judgements on investments. However, the relationship between stock exchange

volatility and macro-economic activity is relatively weak (section 7.2.1). Thus, the basis investor judgement is not reliable or practical.

Using the same data, Table 7.2 shows the 10 factors that rarely influence individual investor behaviour on the SZSE. The top three factors that rarely influence individual investor behaviour are information from investment advisory services, company prospectuses and tax consequences, followed by three further variables: stock broker's recommendations, valuation techniques and diversification. It is interesting that the accounting information category, including company prospectuses, valuation techniques and expected earnings, are factors that rarely influence individual investor behaviour, despite the fact that these variables are the traditional approaches to making an evaluation of stocks (Nagy and Obenberger, 1994). This result is confirmed by the analysis of the data from interviews with senior executives in listed companies (Chapter 5). Some senior executives indicated that individual investors only focused on profits rather than evaluating the stocks by traditional techniques (section 7.2.2).

Table 7.2 Frequency distribution of variables that rarely influence SZSE individual investor behaviour

Variable	Frequency	Valid %
1.6 advisory services	72	37.5
2.3 company prospectuses	58	30.2
4.4 tax consequences	50	26.0
5.1 stock brokers' recommendations	50	26.0
2.4 valuation techniques	48	25.0
6.4 diversification needs	42	21.9
4.5 risk minimisation	36	18.8
5.2 friends' recommendations	36	18.8
1.5 index movements in US	28	14.6
2.5 expected earnings	28	14.6

Note: the numbers of these variables are based on their categories in the 'follow-up information' in the questionnaire in Appendix H.

7.2.3.2 Investors' expectations

Table 7.3 Analysis of responses concerning investor expectations

Investor expectations about SZSE index					
Question		Too low	Too high	About right	Not sure
When the SZSE index reached a <u>high</u> point of 19,600.03 on 12 October, 2007, what did you think of stock prices compared to a true fundamental value or sensible investment value?		6.2%	77.2%	3.6%	13.0%
When the SZSE index hit a <u>low</u> point of 5,577.23 on 28 October, 2008, what did you think of stock prices compared to a true fundamental value or sensible investment value?		42.2%	11.9%	20.7%	25.4%
Investor expectations about stock prices and annual dividends					
Question	Increase substantially	Increase moderately	Remain the same	Decrease moderately	Decrease substantially
Which one of the following statements best describes the way you expect the market price of the stock you preferred to behave in the foreseeable future?	18.1%	63.2%	8.8%	6.7%	3.1%
Which one of the following statements best describes the way you expect the regular annual dividend per share of the stock you preferred to behave in the foreseeable future?	12.4%	71.5%	13.0%	2.6%	0.5%
Question	≤1	About 2	About 3	About 4	≥5
In your thinking about the future behaviour of the market price and regular annual dividend per share of the stock you preferred in the foreseeable future, roughly how far in the future are you looking?	73.6%	16.1%	6.7%	0	3.7%

Source: SZSE Investment Survey

In the first group of questions in the questionnaire, respondents were asked to indicate their expectations about stock prices, by considering whether stock prices were too low, too high or about right compared to the rational value at a certain point of time. Relevant questions were derived from Shiller's paper in order to explore individual investors' expectations about the movement in the SZSE index (Shiller,

2000b). As demonstrated by the responses to the survey, a majority (77.2%) of the respondents thought the stock prices were too high when the SZSE index reached a high point of 19,600, whereas 6.2% of the participants who had high expectations believed the stock prices were still too low. Of the respondents, 42.2% thought the stock prices were too low when the SZSE index hit a low point of 5,577; at the same time, 11.9% of the participants who had low expectations felt the stock prices were still too high.

In the second group of questions, respondents were asked to indicate their expectations about prices and annual dividends in the individual's 'foreseeable future' for the stocks. Relevant questions were derived from Bart and Masse's paper, in order to explore individual investors' expectations about annual dividends in the Chinese context (Bart and Masse, 1981). More than half the respondents expected the stock prices and annual dividend per share would increase moderately. Meanwhile, the majority argued that the length of this 'foreseeable future' was less than one year. Only 3.7% of the respondents made their 'foreseeable future' greater than five years (Table 7.3).

7.2.3.3 Future returns

In this part of the questionnaire, participants were asked whether they had an opinion about future stock returns and whether this opinion influenced their investment choices or not (Table 7.4). Relevant questions were derived from Benartzi and Thaler's paper in order to explore individual investors' perceptions of their stock returns in the Chinese context (Benartzi and Thaler, 2002). Of the respondents, 53 indicated that they had no opinion about future stock returns; the remaining 140 participants answered all three questions.

Table 7.4 Investors' opinions about future returns

Question	No	It will be much lower than it has been in the past 20 years.	It will be somewhat lower than it has been in the past 20 years.	It will be about the same as it has been in the past 20 years.	It will be somewhat higher than it has been in the past 20 years.	It will be much higher than it has been in the past 20 years.
Do you have an opinion about the future returns on the Shenzhen stock market over the next 10 years?	27.5%	8.8%	17.6%	17.6%	22.3%	6.2%
Question	Not at all confident	A little confident	Somewhat confident	Confident	Very confident	
How confident are you in your answer to the previous question?	0	23.8%	22.8%	18.1%	8.3%	
Question	Not at all	A little	Somewhat	Average	A lot	
Has your opinion about the future returns on the stock market influenced your investment choices?	9.8%	25.4%	16.1%	17.1%	4.7%	

Source: SZSE Investment Survey

Participants were first asked whether they thought returns in the next 10 years would be higher or lower than those they had experienced over the past 20 years. Nearly half the respondents were bullish: 26.4% believed that returns on the stock market in the next 10 years would be lower than in the past 20 years, whereas 46.1% of the respondents expected returns would be higher in the next 10 years. Nevertheless, few (8.3%) respondents were very confident in their forecasts, and over half the respondents indicated that their forecasts only had a limited impact, even any impact, on their investment choices.

7.2.3.4 Investors' viewpoints on the current situation of the stock market in China

This topic in the questionnaire investigated the individual investors' perceptions of and attitudes toward the current situation of the Chinese stock market. Relevant

statements originated from surveys in previous studies of investor behaviour, and a few questions were revised for the Chinese context (Lease et al., 1974; Shiller, 2000b).

Table 7.5 presents the data on investors' subjective evaluation of their market environment, as well as their self-defined personal role under that circumstance.

Seven propositions were evaluated on a four-point scale from 1 (Disagree) to 4 (Agree).

Table 7.5 Investors' opinions about the situation of the Chinese stock market

Question	Agree (%)	Disagree (%)	Score	Std. D.
The individual investors who manage their own portfolio of stocks are likely to fare better financially than the investors who put their money into mutual funds.	43.5	9.8	3.1658	0.93735
The individual investor tends to be a more important force in the financial markets than the institutional investor.	21.2	48.7	2.2073	1.25356
A relatively small group of investors are making money consistently on the basis of 'insider information'.	59.6	7.8	3.3731	0.91612
The China Securities Regulatory Commission affords ample protection for the small investor.	14.0	54.9	1.9896	1.17256
Security prices are predictable in the long run on the Shenzhen stock market.	28.5	32.1	2.5337	1.21199
The individual investor who regularly trades securities is likely to fare better financially than the individual who holds out for the long run.	35.2	21.2	2.8601	1.12088
Although I expect a substantial rise in stock prices in the Shenzhen stock market ultimately, I advise being less invested in stocks for the time being because I think that prices are likely to drop for a while.	76.2	4.1	3.6632	0.71118

Source: SZSE Investment Survey

The rating suggested the following findings: first, most respondents felt that they would sacrifice a fair portion of the pleasure of investing if they let institutions administer their funds, since respondents were optimistic that their portfolio selections could outperform those of institutions over time. They admitted, however, that institutional investors were still a more important force than individuals in the financial market. Second, more than half the respondents believed that some people were gaining an investment advantage by obtaining crucial information early.

Third, more than half the respondents did not think that the China Securities Regulatory Commission afforded sufficient protection for small investors. This result was inconsistent with the data obtained from face-to-face interviews with senior executives (Chapter 5). Senior executives held the view that Chinese individual investors were well protected. Last but not least, although most respondents expected a substantial rise in stock prices in the SZSE, they did not think that stock prices were predictable in the long run, and they believed that prices might even drop for a while in the short term.

7.2.3.5 Risk and return

The six propositions in Table 7.6 relate to investors' attitudes to the relationship between risk and return, evaluated on a four-point scale from 1 (Disagree) to 4 (Agree). Propositions derived from De Bondt's paper investigated individual investors' perceptions of risk and return (De Bondt, 1998). Table 7.6 lists average scores and corresponding standard deviations (Std. D.). The table also presents the percentage of subjects who agreed or disagreed with the statement. Findings can be summarised as follows: (1) more than half the participants did not think they had to expose themselves to substantial risk in order to obtain the worthwhile portfolio profits they thought were attainable; (2) nearly half the respondents accepted notions of risk that depended on the covariability of returns with the market index; and (3) the majority of respondents held the point of view that the combination of a small number of familiar firms might be a more effective management pattern than diversification.

Table 7.6 Risk and return

Question	Agree (%)	Disagree (%)	Score	Std. D.
To make money, an investor must be prepared to take substantial risks.	10.4	61.7	1.8446	1.12578
Investing in stocks is like buying lottery tickets. Luck is everything and investment skill plays no meaning role.	11.4	49.2	2.0518	1.12611
Because most investors do not like risk, risky stocks sell at lower market prices.	22.8	25.9	2.5751	1.10670
The risk of a stock depends on whether its price typically moves with or against the market.	46.6	12.4	3.1244	1.02321
I would rather have in my stock portfolio just a few companies that I know well than many companies that I know little about.	65.3	5.7	3.4974	0.82364
If you do not do your homework (e.g., follow the financial news, learn about the company, etc.) I doubt that you will achieve much investment success.	67.9	5.7	3.5285	0.81679

Source: SZSE Investment Survey

In sum, on the basis of sections 7.2.3.1 to 7.2.3.5, the statistics produced several competing findings. First, although nearly half the respondents were bullish, expecting a substantial rise in stock prices in the SZSE, they did not think stock prices were predictable in the long run. Second, more than half the participants did not think the China Securities Regulatory Commission afforded sufficient protection for small investors, which was inconsistent with the information obtained from the face-to-face interviews with senior executives (Chapter 5). Senior executives believed that Chinese individual investors were well protected. Last, most respondents felt that they would sacrifice a fair portion of the pleasure of investing if they let institutions administer their funds, since they (the respondents) were optimistic that their portfolio selections could outperform those of institutions over time. However, they admitted that the institutional investor was still a more important force in the financial market. Moreover, more than half the participants did not think they had to expose themselves to substantial risks in order to obtain the worthwhile portfolio profits that they thought were attainable.

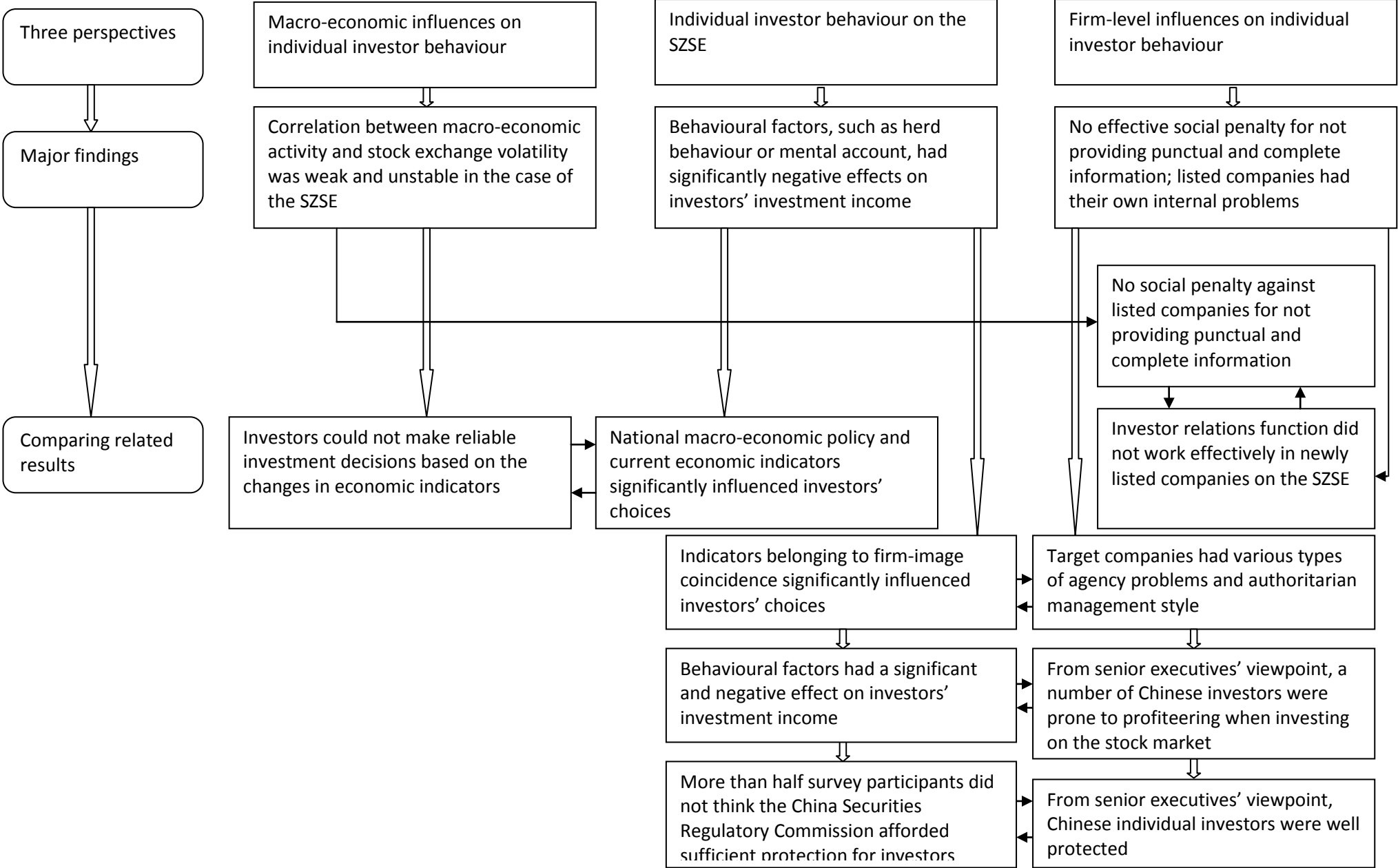
7.3 Conclusions

7.3.1 Contribution of findings in addressing the research questions

In conclusion, the investigation of investor behaviour showed different results from the three perspectives (Figure 7.1). The data on macro-economic environment showed that investors could not make reliable decisions based on macro-economic information, although macro-economic indicators were an important reference for individual investors. Firm-level influences on investor behaviour also showed mixed results. Newly listed companies on the SZSE had their own internal problems, such as agency problems and an authoritarian management style. Furthermore, IR functions did not operate efficiently.

For individual investors, behavioural factors as well as investment experience had a significant and negative impact on investors' investment income. On the other hand, investors' perceived financial knowledge and wage income had a significant positive effect on investment income. As a result, individual investors could make relatively reliable investment decisions based on relevant financial knowledge. Investors' wage income was also an important foundation for obtaining larger portfolio returns on the stock market.

Figure 7.1 Overall framework of relevant findings incorporating the three perspectives: macro-economic, firm and individual investor influences

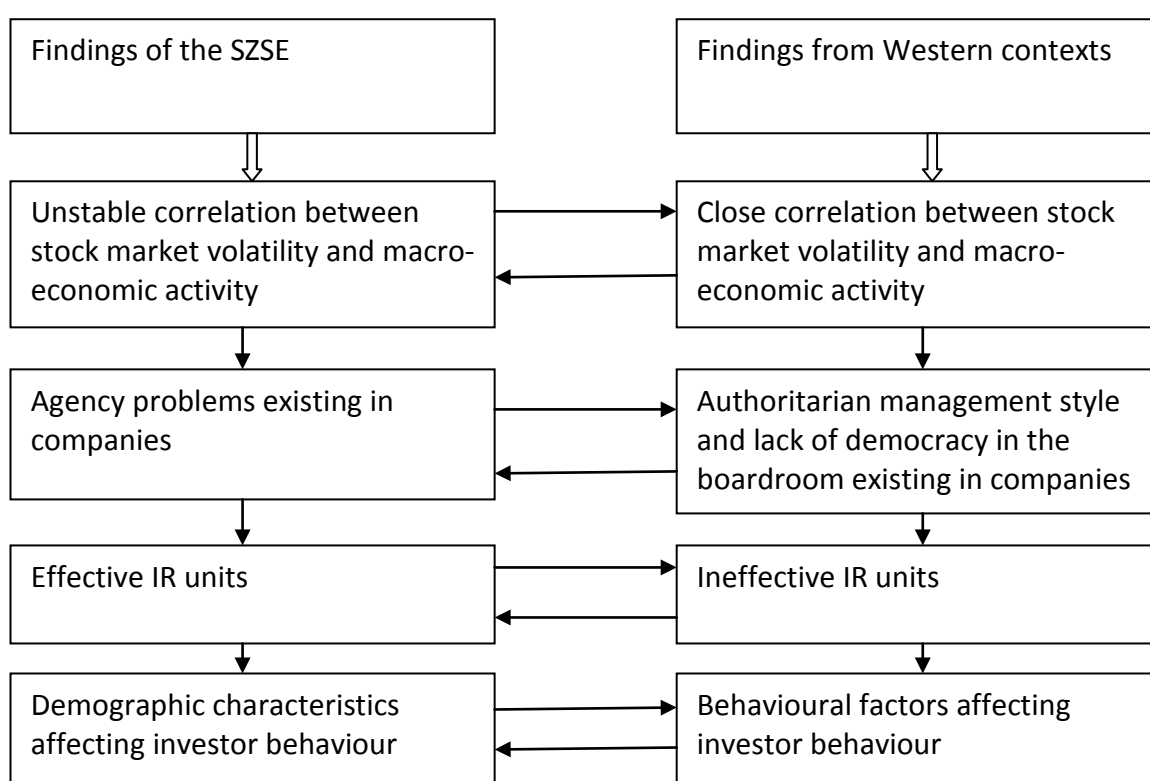


7.3.2 Comparing findings on the SZSE with findings from Western contexts

When compared to Western contexts, the findings on the SZSE differed (Figure 7.2).

First, the correlation between stock market fluctuations and macro-economic indicators was found to be stable and closely related, such as in the US, the UK and Japan; however, in the case of the SZSE, the relationship between stock market volatility and macro-economic indicators was unstable, especially over the short term.

Figure 7.2 Comparison of findings for the SZSE with findings from Western contexts



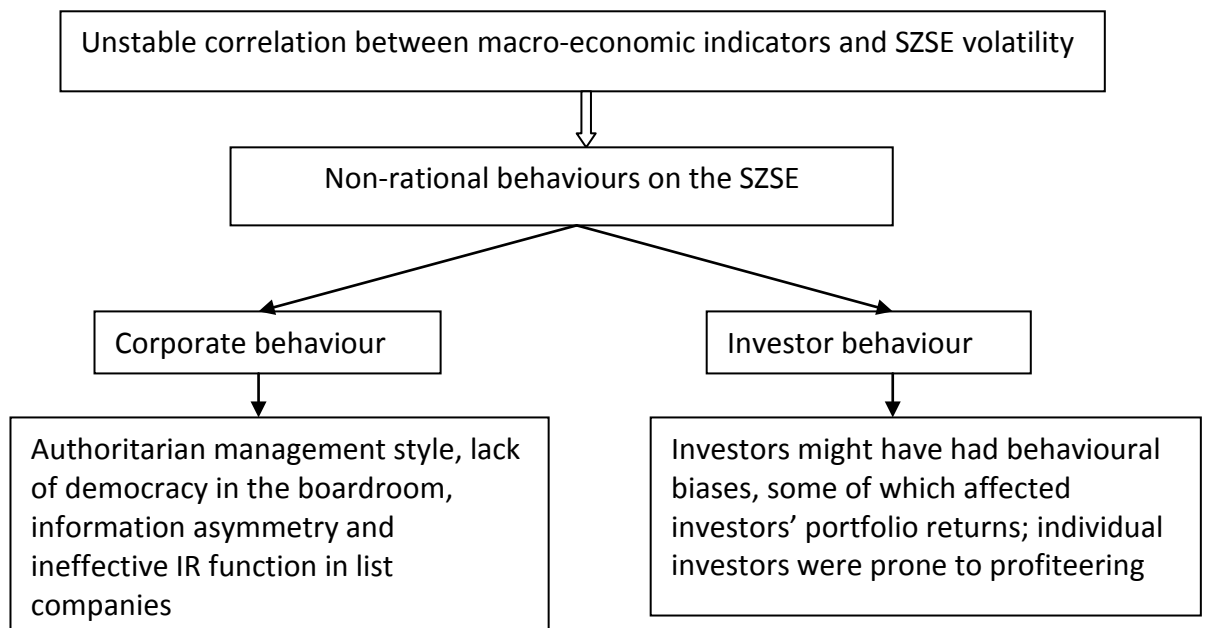
Second, there were agency problems in companies in both Western countries and the SZSE context. However, in the case of newly listed companies on the SZSE, an authoritarian management style and lack of democracy in the boardroom were core issues. In addition, company IR units in Western countries have been working effectively, however, IR units in companies on the SZSE have not played an important role in improving the efficacy of the transmission of information.

Last but not least, research findings on investor behaviour on Western stock markets showed that demographic characteristics, such as age, education and gender, affected individuals' investment income, as well as behavioural factors, such as risk aversion and overconfidence. However, in the case of the SZSE, the influence of risk aversion, self-control and overconfidence on investors' investment income was not significant. By contrast, in this study, mental account, herd behaviour and perceived financial knowledge of investors were found to significantly affect investors' investment income.

7.3.3 Irrationality on the SZSE analysed from three perspectives

Irrationally on the SZSE has been analysed from three perspectives: macro-economic, firm level and individual investors (Figure 7.3). The unstable correlation between macro-economic activity and SZSE volatility implied that there were non-rational behaviours on the SZSE.

Figure 7.3 Irrationality on the Shenzhen Stock Exchange



It was possible to explore these non-rational behaviours through corporate and investor behaviour. Through the interviews with senior executives in listed companies, a series of non-rational behaviours were found, such as authoritarian management style and information asymmetry. Based on the analysis of investor behaviour, it was found that individual investors might have had behavioural biases during the investment process, some of which affected their portfolio returns.

One interesting unexpected result was that investment experience had a significantly negative effect on investors' investment income. One hypothesis that explains this inverse relationship between experience and investment income is that the SZSE is a new market, and the firms chosen to be listed on the market by the Chinese government are those likely to be most profitable. Over time, as more firms are listed, investment income declines as less profitable firms are listed. Hence, the most experienced investors' returns decline. In a mature and deep market, this effect of initial public offering (IPO) is absent. In other words, the anomalous relationship between investment income and experience is a structural artefact of the SZSE and China's state of development.

7.4 Theoretical implications

Several implications for theory emerge from this study. First, compared to previous research, this study explains investor behaviour from three perspectives, incorporating both macro-economic and firm-level contexts for individual investors on the SZSE. It provides a new perspective to investigate the factors influencing investors' investment income. Results showed that the macro-economic environment and firm-level factors did influence investors' decisions and investment strategies in various ways. Although the correlation between stock market volatility and changes in macro-economic

indicators was not stable, and listed companies had different types of problems, these two factors were still the crucial reference for investors when investing on the stock market. As a result, combining the analysis of investor behaviour with both macro-economic and firm-level discussions is a new approach to help explain investor behaviour.

Second, this study focuses on investor behaviour in the East Asian context, specifically the SZSE in China between 2001 and 2010. Compared to stock markets in other countries the Chinese stock market, which was still immature, had its own characteristics. As a result, individual investors on the SZSE faced a unique investment environment, which might affect their behaviour. For example, individual investors had a dominant position in the Chinese stock market compared to institutional investors. Thus, investigating individual investor behaviour is also a new angle for exploring the situation of stock markets in the East Asian contexts.

Third, as discussed in the previous literature, objective factors, such as demographic information, did have an influence on investors' portfolio returns (Cohn et al., 1975; Blume and Friend, 1978; Warren et al., 1990; Chen et al., 2004). The results in this study have shown that investment experience, behavioural factors, financial knowledge of investors and investors' wage income also had significant effects on investment returns, either negative or positive.

7.5 Implications for practice

The findings of this study have a number of implications for individual investors, listed companies, related governments and institutional investors. First, behavioural factors, such as mental account and herd behaviour, had a negative effect on investors' investment income. Investors' financial knowledge and wage income were found to

have a significant and positive effect on investors' investment returns. Therefore, based on the survey data, a high level of financial knowledge and a higher wage income can lead to higher investment income for investors. At the same time, based on the views of senior executives, it is advisable for individual investors to overcome profiteering when investing on the stock market.

Second, the analysis of interviews with senior executives in the five target companies on the SZSE showed that newly listed companies had their internal biases as well as ineffective IR units. Thus, listed companies need more democracy in their boardrooms, as well as establishing a more balanced rewards and punishment system. In addition, since current corporate governance practices in China had a number of limitations, incorporating Western governance practices would be helpful to Chinese companies to develop soundly (Basu et al., 2007b). Furthermore, improving the efficiency of IR units will lead to better interaction with outside stakeholders, especially individual investors.

Third, based on the interviews, there was no efficient social penalty against listed companies for not providing punctual and accurate information during the transition period. Government authorities adopted a liberal policy, not introducing relevant rules or taking effective punitive measures. Furthermore, from investors' viewpoints, the China Securities Regulatory Commission did not offer enough protection for small investors. Thus, if related regulators and local governments have more efficacious specifications and took more efficient measures to regulate newly listed companies, corporate behaviour may be appropriately constrained. This is needed to provide a more healthy investment environment for small investors in the Chinese stock market.

7.6 Limitations of the study

As with most studies, this one contains a number of limitations. First, the analysis of individual investor behaviour using survey data employed a series of measures to represent behavioural factors derived from different studies. Several behavioural factors, such as overconfidence and self-control, used multiple measurement scales. However, for some factors, such as mental account and herd behaviour, only a single reliable scale was used. Similar studies in this area have used the same approach (De Bondt, 1998; Shiller, 2000b; Dorn and Huberman, 2005; Durand et al., 2008; Chen et al., 2004). In future research, more comprehensive and reliable measurement scales could be employed.

Second, both printed and online questionnaires were mainly distributed in Beijing and Shandong province. Although the printed questionnaires were completed by respondents from different cities, other potential respondents were not included. Similarly, target companies were located in Shandong province, so the situation of other potential newly listed companies on the SZSE was not investigated. Furthermore, interviewees in the target companies were senior executives, and most of the senior executives had more than one designation, thus, other potential interviewees were not included.¹⁷

Third, this study was conducted only in the context of the SZSE. Survey respondents were investing on the SZSE and interviewed companies were all listed on the SZSE. This limits the applicability of findings to broader contexts.

¹⁷ This is a common phenomenon in newly listed companies on the SZSE. For example, the securities consultant who is responsible for IR units is also the deputy general manager in the company.

Last, because this study was mainly concerned with the application of behavioural finance theory, using survey and interviews, the macro-economic analysis using the cointegration approach to investigate the relationship between stock market volatility and macro-economic indicators did not employ further analyses for a vector autoregressive model (VAR), including stability condition checks, impulse responses and variance decomposition analyses. This is an approach (not employing a VAR or further analyses) taken in similar studies (Liljeblom and Stenius, 1997; Kwon and Shin, 1999; Yan et al., 2004; Liu and Shrestha, 2008; Jin, 2011).

7.7 Directions for further research

This study has uncovered a number of areas that can be investigated in further research, using other approaches and elaborating interesting findings. First, as discussed in Chapter 6, the investigation of individual investor behaviour adopted a survey approach, consisting of both printed and online questionnaires. Further research is necessary to explore investor behaviour using in-depth interviews. Face-to-face interviews could test the model results, as well as obtaining more personal emotional and personal stories about individual motivations and experience from investors.

Second, the examination of investor behaviour in this study focused on the case of the SZSE. The SZSE in China's context had its own particular characteristics. Further investigation of investor behaviour could pay attention to the stock market in other East Asian countries. Comparative studies among different stock markets in an Eastern context could also be a productive research direction.

Third, the analysis of effects of behaviour on investors' investment income employed a series of behavioural biases that investors might have during the investment process,

such as overconfidence and herd behaviour. Further research into individual investor behaviour could involve behavioural factors that are not measured in this study, such as availability heuristics, frame dependence and representative heuristics.

Finally, this study combined both the macro-economic environment and firm-level context with the analysis of individual investor behaviour. The circumstances of the Chinese economy and the views of senior executives in newly listed companies provided different angles for understanding individual investor behaviour on the SZSE. Further investigation of these views from the perspective of institutional analysts could be a useful research direction, particularly a focus on the relationship between institutional analysts and individual investors. In addition, the circumstances of the Chinese stock market and the behaviour of the Chinese government from the perspective of institutional analysts may be different from the data obtained from senior executives in the listed companies or individual investors.

7.8 Conclusions

This study has investigated individual investor behaviour on the SZSE, especially exploring effects of behavioural factors on investors' investment income. In addition, the examination of contexts for investors, namely the macro-economic environment and firm-level context, were also included in the discussion to help explain the investor behaviour on the SZSE.

First, to demonstrate the macro-economic context for individual investors on the SZSE, this study adopted two modelling techniques in terms of cointegration analysis, namely the EG model and the JJ, examining the relationship between macro-economic variables and stock market volatility. Second, to examine the firm-level context for individual investors, a series of interviews were conducted with senior executives from

five major companies listed on the SZSE. Last, this study used the survey approach to explore individual investor behaviour on the SZSE. A total of 193 usable questionnaires were applied to the analysis. The structural equation modelling (SEM) procedure was used to analyse the survey data.

Related results have shown that the correlation between stock market volatility and macro-economic indicators was found to be relatively weak in the case of the SZSE, thus, it was difficult for investors to make decisions based on macro-economic conditions, although macro-economic indicators were found to significantly influence investors' choices. There were agency problems and an authoritarian management style in newly listed companies and furthermore, IR functions did not operate effectively, thus, investors could not obtain timely and comprehensive information. A series of behavioural factors, such as mental account and herd behaviour had significant effects on investors' investment income. On the other hand, influences of financial knowledge of investors and investors' wage income were positively related to investors' investment income.

Appendix list

Appendix A Data of Shenzhen Stock Exchange Manufacturing Indices and a set of macro-economic variables, 2001-2010

Variable	SZSE Manufa- cturing Index	Exchange Rates	Short- term Interest Rates	CPI	PPI	Industrial Production Growth Rates	Money Supply 1 (million Yuan)	The Inter-bank Weighted Average Interest Rates	State Foreign Exchange Reserves (million US dollars)
Year									
2001-07-31	566.33	8.2767	0.0225	101.5	98.7	0.081	5350280	2.47	184492
2001-08-31	548.61	8.2767	0.0225	101	98	0.081	5580892	2.42	190053
2001-09-30	508.31	8.2769	0.0225	99.9	97.1	0.095	5682311	2.39	195764
2001-10-31	485.51	8.2768	0.0225	100.2	96.9	0.088	5611490	2.35	203029
2001-11-30	504.72	8.2774	0.0225	99.7	96.3	0.079	5657956	2.34	208315
2001-12-31	476.11	8.2766	0.0225	99.7	96	0.087	5987159	2.39	212165
2002-01-31	418.43	8.2765	0.0225	99	95.8	0.186	6057606	2.37	217400
2002-02-28	433.28	8.2766	0.0198	100	95.8	0.027	5870287	2.27	223531
2002-03-31	462.44	8.2774	0.0198	99.2	96	0.109	5947483	2.22	227605
2002-04-30	483.24	8.277	0.0198	98.7	96.9	0.121	6046131	2.16	233824
2002-05-31	445.11	8.2766	0.0198	98.9	97.37	0.129	6124686	2.12	238473
2002-06-30	500.64	8.2771	0.0198	99.2	97.5	0.124	6314400	2.04	242760
2002-07-31	484.52	8.2766	0.0198	99.1	97.7	0.128	6348778	2.02	246534
2002-08-31	487.24	8.2767	0.0198	99.3	98.3	0.127	6486883	2.03	253096
2002-09-30	458.77	8.2771	0.0198	99.3	98.6	0.138	6679976	2.12	258623
2002-10-31	437.05	8.2771	0.0198	99.2	99	0.142	6710025	2.12	265539
2002-11-30	408.33	8.2772	0.0198	99.3	99.6	0.145	6799278	2.11	274625
2002-12-31	389.08	8.2773	0.0198	99.6	100.4	0.149	7088179	2.23	286407
2003-01-31	424.29	8.2766	0.0198	100.4	102.4	0.148	7240566	2.16	304457
2003-02-28	429.82	8.2774	0.0198	100.2	104	0.198	6975664	2.13	308252
2003-03-31	422.34	8.2771	0.0198	100.9	104.6	0.169	7143882	2.06	316009
2003-04-30	422.54	8.2771	0.0198	101	103.6	0.149	7132124	1.98	326991
2003-05-31	441.18	8.277	0.0198	100.7	102	0.137	7277784	2.02	340061
2003-06-30	406.61	8.2774	0.0198	100.3	101.3	0.169	7592323	2.11	346476
2003-07-31	397.85	8.2773	0.0198	100.5	101.4	0.165	7615277	2.15	356486
2003-08-31	387.87	8.2771	0.0198	100.9	101.4	0.171	7703298	2.19	364734
2003-09-30	372.45	8.277	0.0198	101.1	101.4	0.163	7916388	2.69	383863
2003-10-31	367	8.2767	0.0198	101.8	101.2	0.172	8026710	2.86	400992
2003-11-30	374.19	8.2772	0.0198	103	101.9	0.179	8081493	2.51	420361
2003-12-31	384.07	8.2767	0.0198	103.2	103	0.181	8411857	2.17	403251
2004-01-31	409.48	8.277	0.0198	103.2	103.5	0.072	8380590	2.38	415720
2004-02-29	446.94	8.277	0.0198	102.1	103.5	0.232	8355643	2.24	426640
2004-03-31	461.3	8.2771	0.0198	103	103.9	0.194	8581557	2.07	439820
2004-04-30	409.16	8.2769	0.0198	103.8	105	0.191	8560364	2.27	449017
2004-05-31	398.88	8.2769	0.0198	104.4	105.7	0.175	8678037	2.21	458560
2004-06-30	353.27	8.2766	0.0198	105	106.4	0.162	8862714	2.4	470639
2004-07-31	348.86	8.2769	0.0198	105.3	106.4	0.155	8798223	2.33	482982
2004-08-31	331.71	8.2767	0.0198	105.3	106.8	0.159	8912533	2.34	496169
2004-09-30	356.05	8.2766	0.0198	105.2	107.9	0.161	9043905	2.3	514538
2004-10-31	330.28	8.2765	0.0225	104.3	108.4	0.157	9078248	2.24	542443
2004-11-30	336.86	8.2765	0.0225	102.8	108.1	0.148	9238713	2.22	573882
2004-12-31	311.64	8.2765	0.0225	102.4	107.1	0.144	9597082	2.07	609932
2005-01-31	294.02	8.2765	0.0225	101.9	105.8	0.209	9707903	2.07	623646
2005-02-28	326.4	8.2765	0.0225	103.9	105.38	0.076	9281495	2.31	642610
2005-03-31	295.3	8.2765	0.0225	102.7	105.6	0.151	9474319	1.98	659144
2005-04-30	280.86	8.2765	0.0225	101.8	105.78	0.16	9459372	1.67	670774

2005-05-31	259.81	8.2765	0.0225	101.8	105.9	0.166	9580201	1.55	691012
2005-06-30	257.25	8.2765	0.0225	101.6	105.2	0.168	9860125	1.4	710973
2005-07-31	247.97	8.108	0.0225	101.8	105.19	0.161	9767410	1.44	732733
2005-08-31	273.68	8.0973	0.0225	101.3	105.3	0.16	9937770	1.45	753209
2005-09-30	277.39	8.093	0.0225	100.9	104.5	0.165	10096400	1.51	769004
2005-10-31	262.12	8.084	0.0225	101.2	104	0.161	10175198	1.4	784902
2005-11-30	263.08	8.0796	0.0225	101.3	103.2	0.166	10412578	1.5	794223
2005-12-31	273.12	8.0702	0.0225	101.6	103.2	0.165	10727857	1.72	818872
2006-01-31	302.67	8.0608	0.0225	101.9	103.05	0.126	10725068	1.88	845180
2006-02-28	311.58	8.0415	0.0225	100.9	103.01	0.201	10435708	1.58	853672
2006-03-31	320.34	8.017	0.0225	100.8	102.49	0.178	10673708	1.66	875070
2006-04-30	357.88	8.0165	0.0225	101.2	101.87	0.166	10638911	1.83	895040
2006-05-31	424.91	8.0188	0.0225	101.4	102.43	0.179	10921922	1.76	925020
2006-06-30	444.31	7.9956	0.0225	101.5	103.52	0.195	11234236	2.08	941115
2006-07-31	416.88	7.9732	0.0225	101	103.58	0.167	11265300	2.31	954550
2006-08-31	426.53	7.9585	0.0225	101.3	103.4	0.157	11484567	2.4	972039
2006-09-30	442.45	7.9087	0.0225	101.5	103.5	0.161	11681410	2.32	987928
2006-10-31	455.22	7.8792	0.0252	101.4	102.98	0.147	11835996	2.4	1009630
2006-11-30	496.19	7.8436	0.0252	101.9	102.8	0.149	12164500	3.05	1038750
2006-12-31	555.21	7.8087	0.0252	102.8	103.1	0.147	12602805	2.25	1066340
2007-01-31	670.95	7.7776	0.0252	102.2	103.3	0.137	12848406	1.86	1104690
2007-02-28	756.38	7.7409	0.0252	102.7	102.6	0.126	12625808	2.67	1157370
2007-03-31	845.34	7.7342	0.0279	103.3	102.7	0.176	12788131	1.74	1202030
2007-04-30	1091.52	7.7055	0.0279	103	102.9	0.174	12767833	2.82	1246566
2007-05-31	1197.7	7.6506	0.0306	103.4	102.8	0.181	13027580	2.01	1292671
2007-06-30	1094.96	7.6155	0.0306	104.4	102.5	0.194	13584740	2.39	1332625
2007-07-31	1281.4	7.5737	0.0333	105.6	102.4	0.18	13623743	2.33	1385200
2007-08-31	1455.72	7.5607	0.036	106.5	102.6	0.175	14099321	2	1408640
2007-09-30	1555.77	7.5108	0.0414	106.2	102.7	0.189	14259157	3.36	1433610
2007-10-31	1458.03	7.4692	0.0414	106.5	103.2	0.179	14464933	3.03	1454898
2007-11-30	1244.83	7.3997	0.0414	106.9	104.6	0.173	14800982	2.28	1496906
2007-12-31	1500.79	7.3046	0.0414	106.5	105.4	0.174	15251917	2.09	1528249
2008-01-31	1367.79	7.1853	0.0414	107.1	106.1	0.164	15487259	2.32	1589810
2008-02-29	1458.48	7.1058	0.0414	108.7	106.6	0.154	15017788	2.65	1647134
2008-03-31	1135.2	7.019	0.0414	108.3	107.95	0.178	15086747	2	1682177
2008-04-30	1139.27	7.0002	0.0414	108.5	108.12	0.157	15168141	2.59	1756655
2008-05-31	1089.14	6.9472	0.0414	107.7	108.2	0.16	15334475	2.83	1796961
2008-06-30	828.33	6.8591	0.0414	107.1	108.84	0.16	15482015	3.07	1808800
2008-07-31	870.78	6.8388	0.0414	106.3	110.03	0.147	15499244	2.69	1845164
2008-08-31	697.72	6.8345	0.0414	104.9	110.1	0.128	15688992	2.81	1884153
2008-09-30	647.67	6.8183	0.0414	104.6	109.13	0.114	15574897	2.88	1905585
2008-10-31	500.74	6.8258	0.036	104	106.6	0.082	15719436	2.7	1879688
2008-11-30	572.71	6.8349	0.0252	102.4	101.99	0.054	15782663	2.3	1884717
2008-12-31	584.6	6.8346	0.0225	101.2	98.9	0.057	16621713	1.24	1946030
2009-01-31	641.73	6.8382	0.0531	101	96.65	0.084	16521434	0.9	1913456
2009-02-29	692.39	6.8357	0.0531	98.4	95.5	0.11	16614960	0.87	1912066
2009-03-31	818.41	6.8341	0.0531	98.8	94	0.083	17654113	0.84	1953741
2009-04-30	861.38	6.8312	0.0531	98.5	93.4	0.073	17821357	0.86	2008880
2009-05-31	900.67	6.8245	0.0531	98.6	92.8	0.089	18202558	0.85	2089491
2009-06-30	961.85	6.8332	0.0531	98.3	92.2	0.107	19313815	0.91	2131606
2009-07-31	1132.15	6.832	0.0531	98.2	91.8	0.108	19588927	1.32	2174618
2009-08-31	937.9	6.8322	0.0531	98.8	92.1	0.123	20039483	1.21	2210827
2009-09-30	972.62	6.8289	0.0531	99.2	93	0.139	20170814	1.27	2272595
2009-10-31	1081.08	6.8275	0.0531	99.5	94.2	0.161	20754574	1.3	2328272

2009-11-30	1228.24	6.8274	0.0531	100.6	97.9	0.192	21249318	1.25	2388788
2009-12-31	1261.26	6.8279	0.0531	101.9	101.7	0.185	22000151	1.25	2399152
2010-01-31	1181.9	6.8273	0.0531	101.5	104.32	0.157	22958898	1.16	2415221.07
2010-02-29	1233.82	6.827	0.0531	102.7	105.39	0.128	22428695	1.52	2424590.67
2010-03-31	1268.38	6.8264	0.0531	102.4	105.91	0.181	22939793	1.4	2447083.65
2010-04-30	1188.45	6.8262	0.0531	102.8	106.81	0.178	23390976	1.34	2490511.7
2010-05-31	1119.6	6.8274	0.0531	103.1	107.13	0.165	23649788	1.67	2439505.78
2010-06-30	1016.76	6.8165	0.0531	102.9	106.41	0.137	24058000	2.31	2454274.8
2010-07-31	1157.58	6.7775	0.0531	103.3	104.84	0.134	24066407	1.67	2538893.95
2010-08-31	1266.16	6.7901	0.0531	103.5	104.3	0.139	24434064	1.62	2547837.71
2010-09-30	1280.73	6.7462	0.0531	103.6	104.3	0.133	24382190	1.9	2648303
2010-10-31	1422.72	6.6732	0.0556	104.4	105	0.131	25331317	1.68	2760899
2010-11-30	1455.61	6.6558	0.0556	105.1	106.1	0.133	25942032	1.76	2767809
2010-12-31	1426.72	6.6515	0.0581	104.6	105.9	0.135	26662150	2.92	2847338

Appendix B Question list of interviews with senior executives in listed companies on the SZSE

Group 1: Questions relating to personal backgrounds, ambiance and context

Could you please tell me about your general education background?

Group 2: Questions relating to discipline-specific issues

Q1: How would you describe the “mission statement” of your company? Do you think it is crucial for good corporate governance? If so, why?

Q2: Does management in the company limit it self to a clearly defined core business? Do you think well defined power and responsibility are important in the company? If so, why?

Q3: Over the past five years, if there was some controversy over the acquisition and/or financing new project, how would the company management have dealt with that? Could you please give me an example?

Q4: Does the company’s annual report include a section devoted to the company’s performance in complementing corporate governance principles? If yes, what do you think of the necessity of that? If no, does the company plan to add this section the annual report and why?

Group 3: Questions relating to company transparency

Q1: Are information, decisions and other announcements updated promptly on the company’s English language website? Do you think it is necessary and significant to have an English language website for the development of the company? If so, why?

Q2: Does the management disclose 3- or 5- year return on assets (ROA) or rate of return on common stockholders’ equity (ROE) target? What do you think of the significance of this kind of information disclosure for the development of the company?

Q3: Does the company publish its Annual Report within 4 months of the end of the financial year? If not, how long after the end of the financial year does the company publish its Annual Report? What do you think of this time span?

Q4: Do you think the company consistently discloses major and market sensitive information punctually? What is your opinion about the clarity and informativeness of the reports?

Q5: Do analysts have good access to senior management in this company? (Good access hereby implies accessibility soon after results are announced and timely meetings where analysts are given all relevant information and are not misled.) If not, what are your main concerns about the information accessibility of analysts?

Group 4: Questions relating to company responsibility

Q1: If the Board/senior management have made a decision in recent years seen to benefit them at the expense of shareholders, would the company promptly correct such behaviour? If so, why? Does the company have related rules?

Q2: What kinds of mechanism does the company have to carry out punishment of the executive/management committee in the event of mismanagement?

Q3: How often are board meetings held every year? What do you think of the time span?

Q4: What is your opinion about the board size in your company? Is it effective and efficient? Is there anything that could be improved?

Group 5: Questions relating to investor relations

Q1: Does your company have a formal IR policy or written description stating the objectives and responsibilities of the investor relations function?

Q2: Over the past five years, were you involved in communications with investors? If you were involved, were the communications handled by a separate investor relations department?

Q3: Could you please define the role of investor relations within the structure of your company?

Q4: What do you think should be the essential pre-requisite for the investment relations communicator?

Q5: How long has investor relations been developed within your company?

Q6: Does the company keep a record of proceedings of meetings with analysts? Does the company keep a record of the content of telephone conversations with analysts?

Q7: Does your company prohibit or restrict communication with sell-side analysts, buy-side analysts and/or fund managers?

Q8: How many kinds of following measures has the company taken to process Investor Relations program?

	Measures taken to process investor relations program	Yes	No
1	explaining the business and its environment		
2	emphasizing future prospects rather than historical performance		
3	focusing on strategies and opportunities for long-term rather than near-term performance		
4	avoiding the creation of over-expectations		
5	facing adverse news openly and honestly		
6	being proactive rather than reactive		
7	providing analysts with access to top management		
8	including the director of investor relations in top management		
9	employing an investor relations staff that understands the common stock valuation process.		

Group 6: Questions relating to social awareness and environment

Q1: How does the company improve the implementation of equal employment policy?

Q2: Do you think that the company should adhere to specified industry guidelines on sourcing of materials? If so, how and why?

Q3: What kinds of measures does the company take to improve environmental consciousness?

Q4: How do you think of the role of related government for the relationship between listed companies and investors? Do you think the China Securities Regulatory Commission affords ample protection for the listed companies? Do you think the local government has taken the following measures to support the development of listed companies?

	Measures taken by local government	Yes	No
1	help promote the business case and celebrate business achievements		
2	support partnership and business participation in key priorities - including through co-funding, fiscal incentives and brokering new partnerships		
3	ensure Government business services provide helpful advice and signpost other resources		
4	encourage consensus on China and international codes of practice;		
5	promote effective frameworks for reporting and product labelling		

Appendix C Process of data gathering

Company KK

The first interview was conducted in the company I called KK. The weather was quite sunny that day. I stayed at the company from 10am to 4pm, and the interviews went smoothly, partly because I had known the three top management executives in KK before interviews were conducted. They also knew what I was doing in Australia. As a result, they trusted me. They were not suspicious of my purpose and what I was asking about. I was relaxed during the day in KK. We had lunch together and talked about my research project and social life in Australia. They were interested in that. On the whole, the process was enjoyable.

Company OMH

OMH was the second company I visited. OMH is located on the outskirts of Qingdao city, requiring one and a half hours drive. I had an appointment with Tai,¹⁸ deputy general manager and chief financial officer. I arrived there at 12:50pm, and the interview lasted for about one hour. He seemed busy at the time, so the whole discussion was hurried. Furthermore, Tai was a serious man, and I was a little nervous during the interview, so the content of the meeting was not as fertile as I hoped. It seemed Tai did not like to talk much about the company, being cautious and careful. He was serious during the interviews, and sometimes tried to avoid sensitive points. I only had the chance to interview one executive in this company, because I did not have access to other senior executives, but he answered all aspects of the questions that I would like to ask. Tai as deputy general manager and chief financial officer was not very familiar with the issues related to the IR function in the company. Therefore, the replies for the group related to IR were brief, so that the data was not as detailed as it could have been. In fact, I lost patience at the end of the interview, because almost all Tai's replies were brief; and secondly, he appeared reluctant to answer the questions.

Company DGT

The third company covered was DGT. I made an appointment with Liu, deputy general manager and secretary of the board in DGT Ltd. We planned to meet at 10am, however, he gave me a call around 9am and told me he was busy until noon, so I intended to go to the company in the afternoon. Around

¹⁸ As mentioned before, all interviewees are given pseudonyms in this thesis.

12 o'clock, he gave me a call and said he was going out and had a meeting with someone else at 3pm, so I waited for him until 4pm. Then I sent him a message and asked him if he still had time to be interviewed on that day, but he did not reply. I waited till 6pm, and gave him a call. He said he would have dinner out and probably would have time around 9pm. Then I went shopping around the restaurant he was in, and waited for him. At last, we had a meeting lasting for one hour and a half at 9:30pm in a coffee shop. Although the process before the meeting was tough, the meeting itself was enjoyable. I found the meeting with Liu extremely valuable. Probably because we were of a similar age, we could talk like friends, although we did not know each other beforehand. Liu was a relatively young executive in the listed company; he spoke energetically, passionately and directly. He referred to some sensitive issues which had not been raised during the interviews with previous two companies. Overall, this interview was quite valuable for further analysis.

Company CNM

The next company I called on was CNM. I had an appointment with Zheng, the securities consultant and chairman of board of supervisors in CNM. We met at 9am in the company's building. The interview continued for about one hour. All his answers were relatively official and reluctant, and he always talked about the answer before thinking for a while. The content of this interview was superficial and not very helpful for my analysis.

Company PHQ

The last company was PHQ. Bin, almost 33 years old, was chief financial officer, secretary of the board and deputy general manager in PHQ. The company was located far from the urban district, so we met in a coffee shop in a five-star restaurant in the city on a Sunday afternoon. The meeting lasted for about three hours. He talked about the aspects of corporate governance and investor relations, central aspects to my research. I enjoyed the meeting with Bin. He was polite, always talking with a smile. Although our meeting occupied much of his weekend, he was patient and answered each question in as much detail as possible. What can be seen from the interview process is that face-to-face communication is prone to being affected by emotion and atmosphere, so the interview method is relatively subjective.

Appendix D Ethics approval for interview fieldwork in China¹⁹

UNSW@ADFA
CANBERRA • AUSTRALIA
Research and Research Training Office

UNSW@ADFA Human Research Ethics Advisory Panel

Thursday, 21 April 2011

Miss Jiaqi Sun
School of Business

Re: *"Irrational Exuberance" on Shenzhen Stock Market, 1991-2008*

Reference Number: A-11-12
Sun, Jiaqi; Manger, Gary

At its meeting of 6 April 2011 the UNSW Canberra Human Research Ethics Advisory Panel was satisfied that this project is of minimal ethical impact and meets the requirements as set out in the National Statement on Ethical Conduct in Human Research*. Having taken into account the advice of the Panel, the Deputy Vice-Chancellor (Research) has approved the project to proceed.

Your Head of School/Unit/Centre will be informed of this decision. This approval is valid for 12 months from the date of the meeting.

Yours sincerely



Dr Stephen Coleman
Convenor
UNSW Canberra Human Research Ethics Advisory Panel

Cc:
Prof Michael Hess
School of Business

* <http://www.nhmrc.gov.au>



THE UNIVERSITY OF NEW SOUTH WALES
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Circos Provider Number: 00100G

¹⁹ The title of this thesis was revised in the third year of the PhD study. The initial title was 'Irrational exuberance on the Shenzhen Stock Market, 1991-2008' as shown on the ethics approval letter.

Appendix E Standard consent form for interview fieldwork in China (English version)



Approval No:

THE UNIVERSITY OF NEW SOUTH WALES

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

“Irrational Exuberance” on Shenzhen Stock Market, 1991 – 2008

You are invited to participate in a study of the relationship between listed companies and investors on the Shenzhen stock market. We hope to learn the corporate governance in the listed companies and the how the investor relations implements in the listed companies. You were selected as a possible participant in this study because you are the management staff in the listed companies.

If you decide to participate, I will ask you to provide a verbal consent statement which I will record and then ask you a series of questions about the corporate governance in your company and the function of investor relations in your company. The interview is expected to take around 60 minutes and you may decline to answer any questions and/or withdraw from participation at any time. If you agree, this interview will be recorded to ensure the discussion is reported accurately. However, if you do not agree, I will just take notes of the whole process. After transcribing the recordings, recordings will be destroyed to help ensure the privacy of the participants.

Participation in the survey is entirely voluntary; there is no obligation to take part in the survey, and if you choose not to participate, there will be no detriment to you. We cannot and do not guarantee or promise that you will receive any benefits from this survey.

Any information that is obtained in connection with this survey will be disclosed only with your permission, except as required by law. If you give me your permission by participating in this research, I plan to analyse the results in my PhD thesis. The results may also be presented at a conference or in a scientific publication, but in any publication, information will be provided in such a way that you cannot be identified.

Complaints may be directed to Dr Stephen Coleman; Convenor, Human Research Ethics Advisory Panel, UNSW@ADFA, CANBERRA 2600 (phone (02) 6268-8812, fax (02) 6268-8899, email s.coleman@adfa.edu.au). Any complaint you make will be investigated promptly and you will be informed of the outcome.

If you need feedback at the completion of the study, a summary of the research findings will be sent to you.

Your decision whether or not to participate will not prejudice your future relations with the University of New South Wales. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

If you have any questions, please feel free to ask us. If you have any additional questions later, I will be happy to answer them. Contact details for the investigator are:

Jiaqi Sun, PhD student
School of Business
UNSW@ADFA
CANBERRA, ACT, 2600
Telephone: 02 6268 8668
Email: Jiaqi.Sun@student.adfa.edu.au

You will be given a copy of this form to keep.

THE UNIVERSITY OF NEW SOUTH WALES

**PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM
(continued)**

“Irrational Exuberance” on Shenzhen Stock Market, 1991 - 2008

You are making a decision whether or not to participate. Your signature indicates that, having read the information provided above, you have decided to participate.

.....

Signature of Research Participant

.....

Signature of Witness

.....

(Please PRINT name)

.....

(Please PRINT name)

.....

Date

.....

Nature of Witness

REVOCATION OF CONSENT

“Irrational Exuberance” on Shenzhen Stock Market, 1991 – 2008

I hereby wish to **WITHDRAW** my consent to participate in the research proposal described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with The University of New South Wales.

.....

Signature

.....

Date

.....

Please PRINT Name

The section for Revocation of Consent should be forwarded to:

Jiaqi Sun, PhD student

School of Business
UNSW@ADFA
CANBERRA, ACT, 2600
Telephone: 02 6268 8668
Email: Jiaqi.Sun@student.adfa.edu.au

Appendix F Standard consent form for interview fieldwork in China (Chinese version)



Approval No.

新南威尔士大学

参与者信息声明和同意书

深圳股票市场上市公司管理层访问

特邀你参加关于深圳股票市场上市公司与投资者关系的研究。我们希望了解上市公司的运营治理概况，以及投资者关系在上市公司中的实施与发展。之所以选择您参加这次访问，是因为您是深圳股票市场新兴的上市公司的管理层代表，对您的访问会对调查结果有重大贡献。

如果您同意参与，开始谈话之前，我会征得您的口头同意对我们的谈话进行录音。谈话过程中我会询问一系列的问题，包括本公司的运营治理概况，已经公司中的投资者关系这一平台的发展情况。谈话将会持续 60 分钟左右，您可以拒绝回答任何问题或者在任何时间中途退出。

此参与完全是自愿的。您没有义务参与此项调查。而且，如果您选择不参与，对您及您的公司的经营不会产生任何不利影响。同时，我们不能保证或承诺您能从此调查中获得任何收益。

此调查的任何信息只会在您的允许下公开，法律规定的除外。如果您同意签署此文件，我会把研究结果写在我的博士生论文里面。同时，研究结果可能会在国际会议上陈述或者在公共刊物上发表，但是，在未经过您同意的情况下，我保证您的身份不会被识别。

如果有任何不满，您可以投诉至：

Dr Stephen Coleman; Convenor, Human Research Ethics Advisory Panel, UNSW@ADFA, CANBERRA 2600

电话：(02) 6268-8812

传真：(02) 6268-8899

邮箱: s.coleman@adfa.edu.au

您的任何投诉将会被尽快处理，并尽快给予答复。

如您需要研究结果的反馈，我会在研究结束之后将研究小结寄给您。

您是否参与此调查不会影响到您与新南威尔士大学未来的关系。如果您决定参加，在此过程中您可以自由撤回同意书，在任何时候中途退出，不会遭受任何偏见。

如有任何问题，请随时保持联系，我会尽量给予解答。调查者详细联系方式如下：

Jiaqi Sun, PhD student
School of Business
UNSW@ADFA
CANBERRA, ACT, 2600
Telephone: 02 6268 8668
Email: Jiaqi.Sun@student.adfa.edu.au

此表将会给您备附复印件。

新南威尔士大学

参与者信息声明和同意书（续）

深圳股票市场上市公司管理层访问

您有权利决定是否参与。如果您签字，说明您已经阅读了上述信息，并且决定参与此研究。

参与者 签字：

见证人签字：

.....

.....

日期：

见证人类型：

.....

.....

同意撤销书

深圳股票市场上市公司管理层访问

我同意撤销参与上述研究，我理解此撤销的决定不会破坏我与新南威尔士大学的关系。

签字：

日期：

.....

.....

请将同意撤销书寄到如下地址：

The section for Revocation of Consent should be forwarded to:

Jiaqi Sun, PhD student

School of Business

UNSW@ADFA

CANBERRA, ACT, 2600

Telephone: 02 6268 8668

Email: Jiaqi.Sun@student.adfa.edu.au

Appendix G General themes related to corporate governance uncovered in the main analysis

Besides the three main themes discussed in the main analysis in this chapter, several general aspects of corporate governance that were not disclosed in the main analysis were extracted from the interviews are summarised in Table A5.1, including specific points pertaining to the categories of discipline, transparency, responsibility and social awareness.

The five companies had some points in common, in the fields of annual report publishing, punishment mechanism, equal employment policy, sourcing of materials and environmental consciousness.

Regardless of how the companies actually carried out their duties, they at least they had related clear rules or plans. However, for some specific issues, executives from different companies had their own understanding.

Firstly, depending on the various main businesses the companies conducted, every company had its own distinctive strategy and culture. For instance, OMH was a spare parts supplier for state-owned enterprises. The core strategy was innovation with the culture of ‘never-ending challenges through our own efforts’:

The manufacturing market is extremely competitive in China, so we only can improve competitiveness by relying on two approaches: lower cost and innovative techniques. (Tai, OMH)

By contrast, the most crucial strategy for KK of which main business was candle and glass manufacture was vertical integration, rather than horizontal integration by 2011. The financial officer of KK, Cui, also talked about the company culture in a frank way:

Most of the emerging listed companies on the Shenzhen stock exchange are developed from private enterprises, with KK company typical. As a result, corporate culture is very centralised, strong and aggressive, different from state-owned enterprises. The chairman of the board believes that because he is strong, the impossible can become possible. (Cui, KK)

It can be seen that companies set up their strategies in the light of the different situations and competition environment. Moreover, company culture was not formed in one day, and it generally developed in a close relationship with the process of company building.

Another difference is in relation to information disclosure. Some companies, such as KK and OMH, disclosed the related information punctually, even referring to some sensitive news. However, the other

three companies chose to withhold the sensitive information for reasons of commercial confidentiality and market competition. Overall, emerging listed companies on SZSE complied with the rules of supervision departments. In the meantime, they kept their own characteristics and approaches to compete with other firms in their industry.

Table A5.1 Overview of specific points in relation to corporate governance

Question Category	Specific points	KK	OMH	DGT	CNM	PHQ
Discipline	Mission statement <i>(Strategy and Culture)</i>	vertical integration	innovation	to be the leader in the field of power equipment manufacturing	use information technology to transform traditional industry	to be the leader in the soft-bag industry
		centralised, strong and aggressive;	never-ending challenges through their own efforts	innovation, belief, study, action and responsibility	humane culture: employees' feelings	more training opportunities than common employees
Transparency	Time to publish annual report	March or April	within four months of the end of financial year	three months after the end of financial year	within four months of the end of financial year	within two months after the end of financial year
	Disclosure of major and market sensitive information	punctual disclosure	consistent disclosure	limited disclosure because of market competition	comply with related rules: disclose the information as required	withhold sensitive information due to the consideration for commercial confidentiality
Responsibility	Punishment mechanism	performance appraisal, but more punishments than rewards	performance appraisal, which is linked to annual salary	management performance, but no big difference	performance evaluation: more rewards than punishments	no relevant mechanism
	Frequency of compulsory board meetings every year	four times	every six months	four times	not necessary	held as needed, at least once a year
	Board size	seven directors, including three independent directors	eight directors, three from China, two from Japan and three independent directors	nine directors: four inside, two outside and three independent directors	nine directors: three inside, two outside and four independent directors	11 directors: one internal, six external and four independent directors
Social awareness	Equal employment policy	no gender discrimination ; education degree is not a determining factor	decided by the nature of work; related certificates are necessary	hard requirements: bachelor degree; gender limitations due to distinct types of jobs	special requirements depend on work division	no gender discrimination ; relevant working experience is needed

<i>Sourcing of materials</i>	adhere to specified industry guidelines	spare parts come with export market certificate	no standards and environmental requirements: decided by themselves	depends on the design or customer requirements	adhere to specified industry guidelines, especially in pharmaceutical industry
<i>Environmental consciousness</i>	healthy working environment and proper waste recovery	control noise	environmental certification; occupational health system	production security sector in charge of labour and social security as well as safety management	no pollution; clean working environment

Appendix H Survey of individual investor behaviour on the Shenzhen Stock Exchange

This questionnaire for individual investors includes four parts: personal information, investment experience and basic financial knowledge, individual investors' decision frameworks and investment strategies, and attitudes of individual investors.

Part 1 Personal Information

Kindly answer a few questions regarding yourself!

1. Your sex?

- ☐ Female ☐ Male

2. Your age (in years)?

- ☐ ≤ 25 ☐ 26-35 ☐ 36-49 ☐ 50-59 ☐ ≥ 60

3. Marital status?

- ☐ Single ☐ Married ☐ Divorced ☐ Widowed

4. Do you have dependent children?

- ☐ Yes ☐ No

5. Do you live with your parents?

- ☐ Yes ☐ No

6. What is your current employment status?

- ☐ Responsible members of state organs, party and mass organizations, enterprises, and institutions
- ☐ Professional and technical personnel
- ☐ Clerical (such as secretary) and related personnel
- ☐ Commercial and service personnel
- ☐ Agriculture, forestry, animal husbandry, fisheries and water conservancy production personnel
- ☐ Production and transport equipment operators, and related workers
- ☐ Soldiers
- ☐ Retired or unemployed
- ☐ Other: _____ (please specify)

7. What is your level of education?

- ☐ Uneducated
- ☐ The following secondary and secondary education
- ☐ College and technical school degree
- ☐ University degree
- ☐ Graduate degree and above

8. Which city that belongs to the following categories are you living in?

- ☐ First-tier cities (e.g.: Beijing, Shanghai, Guangzhou;)
- ☐ Second-tier cities (e.g.: Jinan, Qingdao, Taiyuan;)
- ☐ Third-tier cities (e.g.: Weifang, Zibo, Zaozhuang;)
- ☐ Others

9. What is your average gross annual income?

- ☐ No income
- ☐ Up to RMB 32,000
- ☐ RMB 32,000 to RMB 58,000
- ☐ RMB 58,000 to RMB 100,000
- ☐ RMB 100,000 to RMB 150,000
- ☐ RMB 150,000 to RMB 200,000
- ☐ Greater than RMB 200,000

10. What is your average gross annual stock market investment income?

- ☐ Deficit
- ☐ No income
- ☐ Up to RMB 32,000
- ☐ RMB 32,000 to RMB 58,000
- ☐ RMB 58,000 to RMB 100,000
- ☐ RMB 100,000 to RMB 150,000
- ☐ RMB 150,000 to RMB 200,000
- ☐ Greater than RMB 200,000

Part 2 Investment Experience and Basic Financial Knowledge

1. How long have you been investing?

- ☐ I have never invested
- ☐ Up to 1 year
- ☐ 1 to 3 years
- ☐ 4 to 9 years
- ☐ 10 to 15 years
- ☐ More than 15 years

2. In which period did you start to invest on the Shenzhen stock market?

- ☐ December, 1990-July, 1996
- ☐ August, 1996-June, 2001
- ☐ July, 2001-July, 2005
- ☐ August, 2005-December, 2008
- ☐ After 2008

3. Your financial securities knowledge

Imagine that a friend asks you about different financial assets. How well can you explain them to him or her? (Tick **V** in the box for the option you choose)

<i>Categories</i>	<i>Can Explain Very Well</i>	<i>Can Explain Partially</i>	<i>Cannot Explain Well</i>	<i>Cannot Explain At All</i>	<i>Don't Know this item</i>

Money market					
Bonds					
Stocks					
Stock market index					
Derivatives					
Mutual funds					

Part 3 Individual Investors' Decision Frameworks and Investment Strategies

1. Which of the following approaches do you most frequently take in evaluating securities and/or reaching investment decisions? (Tick as many as apply to you)

- ☐ I analyse fundamental factors (such as general business conditions, industry outlook, earnings, dividends, quality of management, etc.)
- ☐ I analyse technical market factors (such as stock price movements, supply vs. demand, amount of odd-lot trading, resistance levels, short interest, charts, etc.)
- ☐ I combine fundamental and technical approaches above
- ☐ I rely primarily on brokerage firm or company executive for recommendations.
- ☐ I rely primarily on investment newsletters or financial advisors' advice.
- ☐ I seek Advice from friends, relatives and colleagues
- ☐ I rely on A "gut feeling" or sentiment that some stocks will outform the previous ones
- ☐ Other reasons for investing
_____ (please specify)

2. Do you have different aspirations for security returns and then put different securities into various categories (mental accounts)?

- ☐ Yes ☐ It depends ☐ No

3. If you divided your present securities portfolio into just two categories, (1) fixed-income securities and (2) capital appreciation securities, into which category of allocation would they belong?

- ☐ Mostly (1) ☐ Mostly (2) ☐ Equal allocation

4. In how many different corporations do you currently own stock?

- ☐ None
- ☐ 1 or 2
- ☐ 3 to 5
- ☐ 6 to 9
- ☐ 10 to 15

☐ More than 15

5. Are you satisfied with your current portfolio?

☐ Yes ☐ Not sure ☐ No

6. If you are considering whether you should change your current portfolio or not, which of the following do you use as the standard against which to compare your current portfolio performance? (Tick as many as apply to you)

- ☐ Stock exchange indexes
- ☐ Mutual funds performance
- ☐ Peer group portfolio performance
- ☐ Your own personal standards
- ☐ Interest rate on saving accounts
- ☐ Other _____ (please specify)

7. Many people are showing a great deal of excitement and optimism about the prospects for the Shenzhen stock market, and I must be careful not to be influenced by them. (Tick the box that represents your viewpoint)

☐ Agree ☐ Neither agree nor disagree ☐ Disagree

8. In how many mutual funds do you currently own shares?

☐ None ☐ 1 to 4 ☐ More than 4

9. Approximately how many hours do you spend per month in investment analysis?

☐ Less than 3 hours ☐ 4 to 10 hours ☐ 11 to 30 hours ☐ more than 30 hours

10. When the Shenzhen stock exchange index reached a high point of 19600.03 on October 12, 2007, what did you think of stock prices as compared to a true fundamental value or sensible investment value?

☐ Too low ☐ Too high ☐ About right ☐ Not sure

11. When the Shenzhen stock exchange index hit a low point of 5577.23 on October 28, 2008, what did you think of stock prices as compared to a true fundamental value or sensible investment value?

☐ Too low ☐ Too high ☐ About right ☐ Not sure

12. If the Shenzhen stock exchange index dropped 3% tomorrow, you would guess that the day after tomorrow the Shenzhen stock exchange would

- ☐ Increase (by percent: ____)
- ☐ Decrease (by percent: ____)
- ☐ Stay the same
- ☐ Not sure

13. If the Shenzhen stock exchange index dropped by 25% over the next six months, then you would guess that within the succeeding six months the Shenzhen stock exchange index would

- ☐ Increase (by percent: ____)
- ☐ Decrease (by percent: ____)
- ☐ Stay the same
- ☐ Not sure

14. Which one of the following statements best describes the way you expect the market price of the stock you preferred to behave in the foreseeable future?

- ☐ Increase substantially
- ☐ Increase moderately
- ☐ Remain approximately the same
- ☐ Decrease moderately
- ☐ Decrease substantially

15. Which one of the following statements best describes the way you expect the regular annual dividend per share of the stock you preferred to behave in the foreseeable future?

- ☐ Increase substantially
- ☐ Increase moderately
- ☐ Remain approximately the same
- ☐ Decrease moderately
- ☐ Decrease substantially

16. In your thinking about the future behaviour of the market price and regular annual dividend per share of the stock you preferred in the foreseeable future, roughly how far in the future are you looking?

- ☐ Less than one year
- ☐ About one year
- ☐ About two years
- ☐ About three years
- ☐ About four years
- ☐ About five years
- ☐ More than five years

17. Do you have an opinion about the future returns on the Shenzhen stock market over the next ten years?

- ☐ No. (If you check this answer you may skip Question 18&19.)
- ☐ Yes. It will be much lower than it has been in the past 20 years.
- ☐ Yes. It will be somewhat lower than it has been in the past 20 years.
- ☐ Yes. It will be about the same as it has been in the past 20 years.
- ☐ Yes. It will be somewhat higher than it has been in the past 20 years.
- ☐ Yes. It will be much higher than it has been in the past 20 years.

18. How confident are you in your answer to the previous question?

- ☐ Not at all confident
- ☐ A little confident
- ☐ Somewhat confident
- ☐ Confident
- ☐ Very confident

19. Has your opinion about the future returns on the stock market influenced your investment choices?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Average
- ☐ A lot

Part 4 Attitudes of Individual Investors

1. Do you agree with the following propositions?

(Tick ✓ in the box for the option you choose)

<i>Propositions</i>	<i>Agree</i>	<i>Neutral (both agree +disagree)</i>	<i>Not Sure</i>	<i>Disagree</i>
I am substantially better informed than the average investor.				
My past investment successes were, above all, due to my specific skills.				
My instinct has often helped me to make financially successful investments				
When I make plans, I am certain that they will work out.				
I always know the status of my personal finances.				
I am in control of my personal finances.				
I control and am fully responsible for the results of my investment decisions.				
The individual investors who manage their own portfolio of stocks are likely to fare better financially than the investors who put their money into mutual funds.				
The individual investor tends to be a more important force in the financial markets than the institutional investor.				
A relatively small group of investors are making money consistently on the basis of 'insider information'.				
The China Securities Regulatory Commission affords ample protection for the small investor.				
Security prices are predictable in the long run on the Shenzhen stock market.				
Although I expect a substantial rise in stock prices in the Shenzhen stock market ultimately, I advise being less invested in stocks for the time being because I think that prices are likely to drop for a while.				
The individual investor who regularly trades securities is likely to fare better financially than the individual who holds out for the long run.				

I am not at all willing to bear high risk in exchange for high expected returns.				
To make money, an investor must be prepared to take substantial risks.				
Investing in stocks is like buying lottery tickets. Luck is everything and investment skill plays no meaning role.				
Because most investors do not like risk, risky stocks sell at lower market prices.				
The risk of a stock depends on whether its price typically moves with or against the market.				
I would rather have in my stock portfolio just a few companies that I know well than many companies that I know little about.				
If you do not do your homework (e.g., follow the financial news, learn about the company, etc.) I doubt that you will achieve much investment success.				

2. Risks are the perceived differently by different people. How risky do you judge the asset categories listed below?

(Tick ✓ in the box for the option you choose)

<i>Asset Category</i>	<i>Safe</i>	<i>Unsure</i>	<i>Risky</i>	<i>High Risk</i>	<i>Extreme Risk</i>
Money market					
Bonds					
Mutual funds					
Stocks					
Futures					

Follow-up Information:

This section explores factors influencing individual investors' behaviours on the Shenzhen stock market. It includes six categories: neutral information, accounting information, self-image/firm-image coincidence, classic/traditional investment criterion, advocate recommendation and personal financial needs.

The factors below may influence your decision-making. Please rate each of them in terms of their **influence frequency** on you, where: 4 = Always influences you; 3 = Generally influences you; 2 = Occasionally influences you; 1 = Rarely influences you.

(Tick ✓ in the box for the option you choose for each factor)

Part 1: Neutral Information

<i>Key Variables</i>	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Financial press coverage				
National macroeconomic policy				
Current economic				

indicators				
Recent index movements in China				
Recent index movements in United States				
Information from investment advisory services				

Part 2: Accounting Information

Key Variables	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Financial statements				
Annual reports				
Prospectuses				
Valuation techniques				
Expected earnings				

Part 3: Self-Image/Firm-Image Coincidence

Key Variables	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Firm reputation				
Firm status				
Firm's management				
Feelings about products/services				
Past performance of firm's stock				

Part 4: Classic/Traditional Investment Criterion

Key Variables	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Expected dividends				
Share price affordability				
Price-earnings ratio				
Tax consequences				
Risk minimization				

Part 5: Advocate Recommendation

<i>Key Variables (Recommendations from:)</i>	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Stock brokers				
Friends/Co-workers				

Part 6: Personal Financial Needs

<i>Key Variables</i>	<i>Always influences you</i>	<i>Generally influences you</i>	<i>Occasionally influences you</i>	<i>Rarely influences you</i>
Past performance of your stock portfolio				
Competing financial needs				
Time before funds are needed				
Diversification needs				

You are welcome to provide your Email address! If you need feedback at the completion of the study, a summary of the research findings will be sent to you.

Email:

Please specify which city you are living in:

Thanks for your cooperation!

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Research and Research Training Office

COPY

UNSW@ADFA Human Research Ethics Advisory Panel

16 December 2010

Dr Gary Manger
School of Business

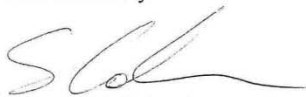
Re: "Irrational exhuberance" on Shenzen stockmarket, 1991-2008

Reference Number: A-10-46.
Jiaqi Sun, Gary Manger

At its meeting of 3 November 2010 the UNSW@ADFA Human Research Ethics Advisory Panel was satisfied that this project is of minimal ethical impact and meets the requirements as set out in the National Statement on Ethical Conduct in Human Research*. Having taken into account the advice of the Panel, the Deputy Vice-Chancellor (Research) has approved the project to proceed.

Your Head of School/Unit/Centre will be informed of this decision. This approval is valid for 12 months from the date of the meeting.

Yours sincerely



.....
Dr Stephen Coleman
Convenor
UNSW@ADFA Human Research Ethics Advisory Panel

Cc:
Prof Michael Hess
School of Business

* <http://www.nhmrc.gov.au>



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Cricos Provider Number: 00100C

²⁰ The title of this thesis was revised in the third year of the PhD study. The initial title was 'Irrational exuberance on the Shenzhen Stock Market, 1991-2008' as shown on the ethics approval letter.

Appendix J Standard consent form for individual investors in China (English version)



Approval No:

THE UNIVERSITY OF NEW SOUTH WALES

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

“Irrational Exuberance” on Shenzhen Stock Market, 1991 – 2008

You are invited to participate in a study of individual investor behaviour on the Shenzhen stock market. We hope to learn individual investors’ decision frameworks, investment strategies and attitudes, as well as the factors influencing individual investors on the Shenzhen stock market in China. You were selected as a possible participant in this study because you may have the investment experience on the Shenzhen stock market from 1991 to 2008.

If you decide to participate, we will ask you to fill in the following questionnaire, and answer the questions about personal information, investment experience and basic financial knowledge, as well as investment behaviour. The whole process may take you around 10 minutes.

Participation in the survey is entirely voluntary; there is no obligation to take part in the survey, and if you choose not to participate, there will be no detriment to you. We cannot and do not guarantee or promise that you will receive any benefits from this survey.

Any information that is obtained in connection with this survey will be disclosed only with your permission, except as required by law. If you give me your permission by participating in this research, I plan to analyse the results in my PhD thesis. Also the results may be presented at a conference or in a scientific publication, but in any publication, information will be provided in such a way that you cannot be identified.

Complaints may be directed to Dr Stephen Coleman; Convenor, Human Research Ethics Advisory Panel, UNSW@ADFA, CANBERRA 2600 (phone (02) 6268-8812, fax (02) 6268-8899, email s.coleman@adfa.edu.au). Any complaint you make will be investigated promptly and you will be informed of the outcome.

If you need feedback at the completion of the study, a summary of the research findings will be sent to you.

Completion and return of this survey indicates your consent to participate in the research. Since it will be impossible to identify any particular person’s survey after the survey’s have been returned, it is not possible for you to withdraw from the research after returning the survey. This should be borne in mind when making your decision about participation. Your decision whether or not to participate will not prejudice your future relations with the University of New South Wales.

If you have any questions, please feel free to ask us. If you have any additional questions later, I will be happy to answer them. Contact details for the investigator are:

Jiaqi Sun, PhD student

School of Business

UNSW@ADFA

CANBERRA, ACT, 2600

Telephone: 02 6268 8668

Email: Jiaqi.Sun@student.adfa.edu.au

You will be given a copy of this form to keep.

Appendix K Standard consent form for individual investors in China (Chinese version)



Approval No:

新南威尔士大学

参与者信息声明和同意书

深圳股票市场的“非理性繁荣”， 1991-2008

特邀您参加关于深圳股票市场个体投资者行为选择的问卷调查。我们希望了解个体投资者的决策框架，投资策略和态度，以及影响个体投资者投资决策的因素。之所以选您参与此次调查，是因为您可能于1991至2008年间在深圳股票市场有过投资经历。

如果您决定参与此次问卷调查，我们将邀请您填写接下来的调查问卷，回答有关个人信息，投资经历和基础金融知识，以及投资行为等相关的问题。整个过程大约花费您10分钟的时间。

此参与完全是自愿的。您没有义务参与此项调查。而且，如果您选择不参与，对您不会产生任何不利影响。同时，我们不能保证或承诺您能从此调查中获得任何收益。

此调查的任何信息只会在您的允许下公开，法律规定的除外。如果您同意签署此文件，我会把研究结果写在我的博士论文里面。同时，研究结果可能会在国际会议上陈述或者在公共刊物上发表，但是，在未经过您同意的情况下，我保证您的身份不会被识别。

如果有任何不满，您可以投诉至：

Dr Stephen Coleman; Convenor, Human Research Ethics Advisory Panel, UNSW@ADFA, CANBERRA 2600

电话：(02) 6268-8812

传真：(02) 6268-8899

邮箱：s.coleman@adfa.edu.au

您的任何投诉将会被尽快处理，并尽快给予答复。

如您需要研究结果的反馈，我会在研究结束之后将研究小结寄给您。如果不介意，请在问卷调查的最后留下您的邮箱地址。

填写并提交问卷意味着您同意参与此次研究。因为在所有调查问卷被收回后，不可能识别任何被调查者的身份，所以在您填写完并提交问卷后，问卷是不可以被撤回的。您是否参与此调查不会影响到您与新南威尔士大学未来的关系。如有任何问题，请随时保持联系，我会尽量给予解答。

调查者详细联系方式如下：

Jiaqi Sun, PhD student

School of Business

UNSW@ADFA

CANBERRA, ACT, 2600

Telephone: 02 6268 8668

Email: Jiaqi.Sun@student.adfa.edu.au

此表将会给您备附复印件。

Reference list

- ABDALLA, I. S. & MURINDE, V. 1997. Exchange Rate and Stock Price Interactions in Emerging Financial Markets: Evidence on India, Korea, Pakistan and the Philippines. *Applied Financial Economics*, 7, 25-35.
- AGGARWAL, R. 1981. Exchange Rates and Stock Prices: A Study of the Us Capital Markets under Floating Exchange Rates. *Akron Business and Economic Review*, 12, 7-12.
- AL-TAMIMI, H. & EMIRATES, U. 2006. Factors Influencing Individual Investor Behavior: An Empirical Study of the UAE Financial Markets. *Business Review*, 5, 225.
- ALAGIDEDE, P., PANAGIOTIDIS, T. & ZHANG, X. 2011. Causal Relationship between Stock Prices and Exchange Rates. *The Journal of International Trade & Economic Development*, 20, 67-86.
- ALBRIGHT, J. J. & PARK, H. M. 2009. Confirmatory Factor Analysis Using Amos, Lisrel, Mplus, Sas/Stat Calis. *The Trustees of Indiana University*, 1, 1-85.
- ANAND, M. 2002. Corporate Finance Practices in India: A Survey. *Vikalpa*, 27, 29-56.
- ANDREOU, E., DESIANO, R. & SENSIER, M. 2001. The Behaviour of Stock Returns and Interest Rates over the Business Cycle in the Us and Uk. *Applied Economics Letters*, 8, 233-238.
- ANGHELACHE, C., GHEORGHE, M., ALEXANDRU, M., POCAN, I. M. & PAUNESCU, C. 2012. Some Aspects Regarding the Basic Index Number Theory. *Romanian Statistical Review Supplement*, 60, 49-52.
- ANGLIM, J. 2007. *Structural Equation Modelling, 325-711 Research Methods* [Online]. <http://jeromyanglim.googlepages.com/>. Available: <http://web.psych.unimelb.edu.au/jkanglim/IntroductiontoSEM.pdf> [Accessed October 19 2012].
- ARAGON-CORREA, J. A. & RUBIO-LÓPEZ, E. A. 2007. Proactive Corporate Environmental Strategies: Myths and Misunderstandings. *Long Range Planning*, 40, 357-381.
- ARBUCKLE, J. L. 2011. Ibm Spss Amos 20 User's Guide. *Amos Development Corporation, SPSS Inc.*
- ARMSTRONG, J. & OVERTON, T. 1977. Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research*, 14, PP.396-402.
- ARROW, K. J. (ed.) 1971. *The Theory of Risk Aversion*, Essays in the theory of risk-bearing: Markham Publishing Co., Chicago.
- BAGOZZI, R. P. & YI, Y. 1988. On the Evaluation of Structural Equation Models. *Journal of the Academy of Marketing Science*, 16, 74-94.
- BAGOZZI, R. P. & YI, Y. 1991. Multitrait-Multimethod Matrices in Consumer Research. *Journal of Consumer Research*, 426-439.
- BAHMANI-OSKOOEE, M. & SOHRABIAN, A. 1992. Stock Prices and the Effective Exchange Rate of the Dollar. *Applied Economics*, 24, 459-464.
- BAKER, H. K., HARGROVE, M. B. & HASLEM, J. A. 1977. An Empirical Analysis of the Risk-Return Preferences of Individual Investors. *Journal of Financial and Quantitative Analysis*, 12, 377-389.
- BAKER, H. K. & HASLEM, J. A. 1974. Toward the Development of Client-Specified Valuation Models. *Journal of Finance*, 29, 1255-63.
- BAKER, M. & WURGLER, J. 2002. Market Timing and Capital Structure. *The Journal of Finance*, 57, 1-32.

- BALL, R. 1978. Anomalies in Relationships between Securities' Yields and Yield-Surrogates. *Journal of Financial Economics*, 6, 103-126.
- BANERJEE, A., DOLADO, J. & MESTRE, R. 2001. Error-Correction Mechanism Tests for Cointegration in a Single-Equation Framework. *Journal of Time Series Analysis*, 19, 267-283.
- BARBER, B. M. & ODEAN, T. 2001. Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment. *The Quarterly Journal of Economics*, 116, 261-292.
- BARNEWALL, M. M. G. 1987. Psychological Characteristics of the Individual Investor. *ICFA Continuing Education Series*, 2, 62-71.
- BART, J. & MASSE, I. 1981. Divergence of Opinion and Risk. *Journal of Financial and Quantitative Analysis*, 16, 23-34.
- BASU, P., HICKS, J. & SAPPEY, R. B. 2007a. How Can Australia Benefit from China's Economic Reforms? *Engagement and Change: Exploring Management, Economic, and Finance Implications of a Globalising Environment*, 25.
- BASU, P. K., HICKS, J. & SAPPEY, R. B. 2007b. Can We Do Business? A Study of the Attitudes of Chinese and Australian Business Students. *Australasian Accounting Business and Finance Journal*, 1, 3.
- BATHALA, C. T., MOON, K. P. & RAO, R. P. 1994. Managerial Ownership, Debt Policy, and the Impact of Institutional Holdings: An Agency Perspective. *Financial Management*, 23, 38-50.
- BAUMGARTNER, H. & HOMBURG, C. 1996. Applications of Structural Equation Modeling in Marketing and Consumer Research: A Review. *International Journal of Research in Marketing*, 13, 139-161.
- BEAUDRY, P. & PORTIER, F. 2004. *Stock Prices, News and Economic Fluctuations*. Cambridge: National Bureau of Economic Research.
- BENARTZI, S. & THALER, R. 2002. How Much Is Investor Autonomy Worth? *Journal of Finance*, 57, 1593-1616.
- BENTLER, P. M. & CHOU, C. P. 1987. Practical Issues in Structural Modeling. *Sociological Methods & Research*, 16, 78-117.
- BENTLER, P. M. & YUAN, K. H. 1999. Structural Equation Modeling with Small Samples: Test Statistics. *Multivariate Behavioral Research*, 34, 181-197.
- BERLE, A. A. & MEANS, G. C. 1932. *The Modern Corporation and Private Property*, Transaction Publisher, New Brunswick, New Jersey.
- BI, T. 2007. Analysis of Fdi, Economic Growth and Foreign Trade in Shandong Province Based on Cointegration Approach and Var Model. *Shandong Economy*, 7, 136-139.
- BIKHCHANDANI, S., HIRSHLEIFER, D. & WELCH, I. 1992. A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades. *Journal of Political Economy*, 100, 992.
- BIKHCHANDANI, S. & SHARMA, S. 2000. Herd Behavior in Financial Markets. *IMF Staff Papers*, 279-310.
- BILSON, C. M., BRAILSFORD, T. J. & HOOPER, V. J. 2001. Selecting Macroeconomic Variables as Explanatory Factors of Emerging Stock Market Returns. *Pacific-Basin Finance Journal*, 9, 401-426.
- BLACK, A. J., MAO, B. & MCMILLAN, D. G. 2009. The Value Premium and Economic Activity: Long-Run Evidence from the United States. *Journal of Asset Management*, 10, 305-317.

- BLACK, F. 1986. Noise. *Journal of Finance*, 41, 529-43.
- BLACK, F., JENSEN, M. & SCHOLES, M. 1972. The Capital Asset Pricing Model: Some Empirical Tests. *Studies in the Theory of Capital Markets*, 81, 79-121.
- BLAKE, D. 1996. Efficiency, Risk Aversion and Portfolio Insurance: An Analysis of Financial Asset Portfolios Held by Investors in the United Kingdom. *The Economic Journal*, 1175-1192.
- BLUME, M. & FRIEND, I. 1978. *The Changing Role of the Individual Investor*, John Wiley & Sons.
- BRAV, A. & HEATON, J. B. 2002. Competing Theories of Financial Anomalies. *Review of Financial Studies*, 15, 575-606.
- BREALEY, R., MYERS, S. & ALLEN, F. 2008. *Principles of Corporate Finance*, McGraw Hill, Boston.
- BROUNEN, D., DE JONG, A. & KOEDIJK, K. 2004. Corporate Finance in Europe Confronting Theory with Practice. In: EFA 2004 Maastricht Meetings Paper, 2004.
- BROWN, B. 1997. Part IV: How Do Reputations Affect Corporate Performance?: Stock Market Valuation of Reputation for Corporate Social Performance. *Corporate Reputation Review*, 1, 76-80.
- BRUNNERMEIER, M. 2001. *Asset Pricing under Asymmetric Information: Bubbles, Crashes, Technical Analysis, and Herding*, Oxford University Press, USA.
- BUSHEE, B. & MILLER, G. 2005. *Investor Relations, Firm Visibility, and Investor Following (August 2007)*. Available at SSRN: <http://ssrn.com/abstract=643223> or <http://dx.doi.org/10.2139/ssrn.643223> [Accessed February 13 2013]
- BUYSSE, K. & VERBEKE, A. 2002. Proactive Environmental Strategies: A Stakeholder Management Perspective. *Strategic Management Journal*, 24, 453-470.
- BYRNE, B. 2001. *Structural Equation Modeling with Amos: Basic Concepts, Applications, and Programming*. , Lawrence Erlbaum Associates, Mahwah, NJ.
- CAMPBELL, D. T. & FISKE, D. W. 1959. Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin*, 56, 81.
- CHANCE, D. M. & LANE, W. R. 1980. A Re-Examination of Interest Rate Sensitivity in the Common Stocks of Financial Institutions. *Journal of Financial Research*, 3, 49-55.
- CHAUVET, M. 1999. Stock Market Fluctuations and the Business Cycle. *Journal of Economic and Social Measurement*, 25, 235-258.
- CHE, J. & QIAN, Y. 1998. Institutional Environment, Community Government, and Corporate Governance: Understanding China's Township-Village Enterprises1. *Journal of Law, Economics, and Organization*, 14, 1-23.
- CHEN, B., LI, X. & DU, Y. 2002. *Survey Report of Individual Investors in the Chinese Stock Market*. Securities Times: Shenzhen Stock Exchange.
- CHEN, G. M., KIM, K. A., NOFSINGER, J. R. & RUI, O. M. 2004. Behavior and Performance of Emerging Market Investors: Evidence from China. *Unpublished Washington State University Working Paper (January)*.
- CHEN, X. 2003. *A Survey of Behavioural Finance: Theory and Application* [Online]. Nanjing Agricultural University: Docin Website. Available: <http://www.docin.com/p-341706206.html> [Accessed February 26 2013].
- CHINA'S CENTRAL GOVERNMENT 1999. Decision on the Reform of State-Owned Enterprises and the Development of Several Major Issues. In: THE 15TH

- COMMUNIST PARTY OF CHINA FOURTH PLENARY SESSION (ed.). China's Central Government.
- CHIRAS, D. P. & MANASTER, S. 1978. The Information Content of Option Prices and a Test of Market Efficiency. *Journal of Financial Economics*, 6, 213-234.
- CLARK-MURPHY, M. & SOUTAR, G. 2004. What Individual Investors Value: Some Australian Evidence* 1. *Journal of Economic Psychology*, 25, 539-555.
- COGLIANESE, C., KEATING, E. K., MICHAEL, M. L. & HEALEY, T. J. 2004. The Role of Government in Corporate Governance. *Journal of Law & Business*, 1, 219.
- COHN, R., LEWELLEN, W., LEASE, R. & SCHLARBAUM, G. 1975. Individual Investor Risk Aversion and Investment Portfolio Composition. *Journal of finance*, 30, 605-620.
- CONG, R. G., WEI, Y. M., JIAO, J. L. & FAN, Y. 2008. Relationships between Oil Price Shocks and Stock Market: An Empirical Analysis from China. *Energy Policy*, 36, 3544-3553.
- CONOVER, C. M., JENSEN, G. R., JOHNSON, R. R. & MERCER, J. M. 2005. Is Fed Policy Still Relevant for Investors? *Financial Analysts Journal*, 70-79.
- COX, J. & LAMBERT, J. 2009. *Microsoft® Office Word 2007 Step by Step*, Microsoft Press.
- CROWDER, W. J. 2006. The Interaction of Monetary Policy and Stock Returns. *Journal of Financial Research*, 29, 523-535.
- CUI, L. 2013. *Migration Trends - Population Distribution in China* [Online].
<http://www.china-un.org/chn/hyyfy/t1036827.htm>: Permanent Mission of the People's Republic of China to the UN. [Accessed June 3 2013].
- CUNNINGHAM, L. 2002. Behavioral Finance and Investor Governance. *Washington & Lee Law Review*, 59, 767.
- CUTTANCE, P. & ECOB, R. 2009. *Structural Modeling by Example: Applications in Educational, Sociological, and Behavioral Research*, Cambridge University Press.
- DARRAT, A. & DICKENS, R. 1999. On the Interrelationships among Real, Monetary, and Financial Variables. *Applied Financial Economics*, 9, 289-293.
- DE BONDT, W. & THALER, R. 1985. Does the Stock Market Overreact? *The Journal of Finance*, 40, 793-805.
- DE BONDT, W. F. M. 1998. A Portrait of the Individual Investor. *European Economic Review*, 42, 831-844.
- DE BONDT, W. & THALER, R. 1994. Financial Decision-Making in Markets and Firms: A Behavioral Perspective. *NBER working paper*.
- DESTEFANO, M. 2004. Stock Returns and the Business Cycle. *Financial Review*, 39, 527-547.
- DICKEY, D. A. & FULLER, W. A. 1981. Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica: Journal of the Econometric Society*, 74, 1057-1072.
- DOLPHIN, R. R. 2004. The Strategic Role of Investor Relations. *Corporate Communications: An International Journal*, 9, 25-42.
- DOMIAN, D. L., GILSTER, J. E. & LOUTON, D. A. 1996. Expected Inflation, Interest Rates, and Stock Returns. *The Financial Review*, 31, 809-30.
- DONG, S. 2009. State Share Switched is a Project Supported by Common People. *Securities Daily*.
- DORN, D. & HUBERMAN, G. 2005. Talk and Action: What Individual Investors Say and What They Do. *Review of Finance*, 9, 437.

- DURAND, R. B., NEWBY, R. & SANGHANI, J. 2008. An Intimate Portrait of the Individual Investor. *Journal of Behavioral Finance*, 9, 193-208.
- DURHAM, J. B. 2003. Monetary Policy and Stock Price Returns. *Financial Analysts Journal*, 26-35.
- EDMONDS, W. A. & KENNEDY, T. D. 2012. *An Applied Reference Guide to Research Designs: Quantitative, Qualitative, and Mixed Methods*, SAGE Publications.
- EHRlich, D., GUTTMAN, I., SCHONBACH, P. & MILLS, J. 1957. Postdecision Exposure to Relevant Information. *Journal of Abnormal and Social Psychology*, 54, 98-102.
- EISENHARDT, K. M. 1989. Agency Theory: An Assessment and Review. *Academy of Management Review*, 14, 57-74.
- ENGLE, R. & GRANGER, C. 1987. Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica: Journal of the Econometric Society*, 55, 251-276.
- EVIEWS 7 STUDENT VERSION. 2012. *Eviews 7 Student Version for Windows and Mac* [Online]. <http://www.ihsmarketplace.com/EViews-Student-Version-Windows-Mac/dp/B00BJN4KGM>. [Accessed 2012].
- FAFF, R. W., HODGSON, A. & KREMMER, M. L. 2005. An Investigation of the Impact of Interest Rates and Interest Rate Volatility on Australian Financial Sector Stock Return Distributions. *Journal of Business Finance & Accounting*, 32, 1001-1031.
- FAMA, E. & MACBETH, J. 1973. Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy*, 81.
- FAMA, E. F. 1981. Stock Returns, Real Activity, Inflation, and Money. *The American economic review*, 545-565.
- FAMA, E. F. 1990. Stock Returns, Expected Returns, and Real Activity. *Journal of Finance*, 45, 1089-1108.
- FAMA, E. F. & FRENCH, K. R. 1989. Business Conditions and Expected Returns on Stocks and Bonds. *Journal of Financial Economics*, 25, 23-49.
- FAMA, E. F. & SCHWERT, G. W. 1977. Asset Returns and Inflation. *Journal of Financial Economics*, 5, 115-146.
- FAN, D. K. & SO, R. W. 2000. A Survey on Capital Structure Decisions of Hong Kong Firms. *Review of Pacific Basin Financial Markets and Policies*, 3, 347-365.
- FARRAGHE, E., KLEIMAN, R. & BAZAZ, M. 1994. Do Investor Relations Make a Difference? *The Quarterly Review of Economics and Finance*, 34, 403-412.
- FERSON, W. E. & HARVEY, C. R. 1994. Sources of Risk and Expected Returns in Global Equity Markets. *Journal of Banking & Finance*, 18, 775-803.
- FISCHHOFF, B., SLOVIC, P. & LICHTENSTEIN, S. 1977. Knowing with Certainty: The Appropriateness of Extreme Confidence. *Journal of Experimental Psychology*, 3, 552-564.
- FRANCK, P. & YOUNG, A. 1972. Stock Price Reaction of Multinational Firms to Exchange Realignments. *Financial Management*, 1, 66-73.
- FREEMAN, P. K. 1994. Integrating Environmental Risk into Corporate Strategy. *Risk Management*, 41, 58-58.
- FREEMAN, R. E. 1984. *Strategic Management: A Stakeholder Approach*, Pitman, Boston.
- FRIEDMAN, B. M. 1979. Optimal Expectations and the Extreme Information Assumptions of 'Rational Expectations' Macromodels. *Journal of Monetary Economics*, 5, 23-41.

- FRIEDMAN, M. 1988. Money and the Stock Market. *The Journal of Political Economy*, 96, 221-245.
- FRIEDMAN, M. & SAVAGE, L. 1948. The Utility Analysis of Choices Involving Risk. *The Journal of Political Economy*, 56, 279.
- FUKAČ, M. 2012. *The Engle-Granger Methodology* [Online]. http://home.cerge-ei.cz/fukac/Soubory/EG_metodologie.doc. [Accessed June 14 2012].
- GALAI, D. 1978. Empirical Tests of Boundary Conditions for CBOE Options. *Journal of Financial Economics*, 6, 187-211.
- GALDEANO-GÓMEZ, E., CÉSPEDES-LORENTE, J. & MARTÍNEZ-DEL-RÍO, J. 2008. Environmental Performance and Spillover Effects on Productivity: Evidence from Horticultural Firms. *Journal of Environmental Management*, 88, 1552-1561.
- GESKE, R. & ROLL, R. 1983. The Fiscal and Monetary Linkage between Stock Returns and Inflation. *Journal of Finance*, 38, 1-33.
- GIBBONS, M. R. & HESS, P. 1981. Day of the Week Effects and Asset Returns. *Journal of Business*, 579-596.
- GIRARDIN, E. & LIU, Z. 2003. The Chinese Stock Market: A Casino with 'Buffer Zones'? *Journal of Chinese Economic and Business Studies*, 1, 57-70.
- GJERDE, Ø. & SAETTEM, F. 1999. Causal Relations among Stock Returns and Macroeconomic Variables in a Small, Open Economy. *Journal of International Financial Markets, Institutions and Money*, 9, 61-74.
- GOLDBERG, P. K. & KNETTER, M. M. 1996. *Goods Prices and Exchange Rates: What Have We Learned?* : National Bureau of Economic Research.
- GOLOB, T. F. 2003. Structural Equation Modeling for Travel Behavior Research. *Transportation Research Part B: Methodological*, 37, 1-25.
- GRAHAM, B., DODD, D. L. F. & COTTLE, S. 1934. *Security Analysis*, McGraw-Hill New York.
- GRANGER, C. W. J. 1981. Some Properties of Time Series Data and Their Use in Econometric Model Specification. *Journal of econometrics*, 16, 121-130.
- GROSSMAN, S. J. & STIGLITZ, J. E. 1980. On the Impossibility of Informationally Efficient Markets. *The American Economic Review*, 393-408.
- HAIR, J. F., ANDERSON, R. E., TATHAM, R. L. & BLACK, W. 1998. *Multivariate Data Analysis (5th Edition Ed.)*, NJ: Prentice Hall.
- HAMBURGER, M. J. & KOCHIN, L. A. 1972. Money and Stock Prices: The Channels of Influence. *Journal of Finance*, 27, 231-49.
- HAMILTON, J. D. & LIN, G. 1996. Stock Market Volatility and the Business Cycle. *Journal of Applied Econometrics*, 11, 573-593.
- HARRISS, E. 2007. *China Trouble?* : Huinness Atkinson Funds.
- HEATON, J. 2002. Managerial Optimism and Corporate Finance. *Financial Management*, 31, 33-45.
- HENRIQUES, I. & SADORSKY, P. 1999. The Relationship between Environmental Commitment and Managerial Perceptions of Stakeholder Importance. *Academy of Management Journal*, 42, 87-99.
- HIRSHLEIFER, D. 2002. Investor Psychology and Asset Pricing. *The Journal of Finance*, 56, 1533-1597.

- HOCKERTS, K. & MOIR, L. 2004. Communicating Corporate Responsibility to Investors: The Changing Role of the Investor Relations Function. *Journal of Business Ethics*, 52, 85-98.
- HOLT, C. A. & LAURY, S. K. 2002. Risk Aversion and Incentive Effects. *The American Economic Review*, 92, 1644-1655.
- HOMA, K. E. & JAFFEE, D. M. 1971. The Supply of Money and Common Stock Prices. *Journal of Finance*, 26, 1045-66.
- HOYLE, R. H. 1995. *Structural Equation Modeling: Concepts, Issues, and Applications*, Sage Publications.
- HU, Q. & ZHANG, F. 2009. *Research on the Correlation between Macro-Economic Cycle and the Stock Market Trend*. Haitong Securities.
- HU, Y. 2011. *The Analysis of the Chart of China Stock Market in Two Decades* [Online]. http://blog.sina.com.cn/s/blog_53d06a980102du8n.html. [Accessed May 4 2013].
- HU, Z. 2002. The Composition Analysis of Institutional Investors in China. *People's Daily - People's Daily Overseas Edition*, January, 2001 [Online]. <http://finance.sina.com.cn/t/20020112/163548.html>. [Accessed April 2 2013].
- HUANG, H. 2004. China Stock Market and Macro Economy. *Macroeconomic Management* 2, 13-22.
- HUANG, X. 2011. The Pain of Individual Investors on the Chinese Stock Market in 2011. *China Daily*, December, 2011. <http://finance.people.com.cn/stock/GB/222942/16758837.html>.
- HUMPE, A. & MACMILLAN, P. 2009. Can Macroeconomic Variables Explain Long-Term Stock Market Movements? A Comparison of the Us and Japan. *Applied Financial Economics*, 19, 111-119.
- IBRAHIM, M. 1999. Macroeconomic Variables and Stock Prices in Malaysia: An Empirical Analysis. *Asian Economic Journal*, 13, 219-231.
- IVKOVIC, Z., SIALM, C. & WEISBENNER, S. 2008. Portfolio Concentration and the Performance of Individual Investors. *Journal of Financial and Quantitative Analysis*, 43, 613-656.
- JAMES, L. R., MULAİK, S. A. & BRETT, J. M. 1982. *Causal Analysis: Assumptions, Models, and Data*, Sage Publications Beverly Hills, CA.
- JEGADEESH, N. & TITMAN, S. 1993. Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance*, 48, 65-91.
- JENSEN, G. R. & JOHNSON, R. R. 1995. Discount Rate Changes and Security Returns in the Us, 1962–1991. *Journal of Banking & Finance*, 19, 79-95.
- JENSEN, G. R., JOHNSON, R. R. & BAUMAN, W. S. 1997. Federal Reserve Monetary Policy and Industry Stock Returns. *Journal of Business Finance & Accounting*, 24, 629-644.
- JENSEN, M. 1978. Some Anomalous Evidence Regarding Market Efficiency. *Journal of Financial Economics*, 6, 95-101.
- JENSEN, M. C. & MECKLING, W. H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.
- Jl, Y. 2010. *The Average Wage Income of Urban Residents Who Worked in Non-Private Departments in 2009 Was 32,736 Yuan* [Online]. Hexun News: Hexun Website

- Available: <http://news.hexun.com/2010-07-17/124280517.html> [Accessed January 25 2013].
- JIA, G. 2007. *Is the Price/Earning Ratio in the Chinese Stock Market Higher Than in the New York Stock Exchange?* [Online].
<http://business.sohu.com/20070725/n251237908.shtml>. [Accessed June 28 2012].
- JIN, J. 2011. Cointegration Analysis and Causality Test between China Stock Market and Macro-Economic Variables. *Economic Research Guide*, 5, 103-105.
- JING, Y. & YU, C. 2001. Statistical Analysis of the Correlation between the National Economy and the Stock Market *Modern Finance and Economics-Journal of Tianjin University of Finance and Economics*, 09.
- JOHANSEN, S., GRANGER, C. W. J. & MIZON, G. 1995. *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*, Cambridge Univ Press.
- JOHANSEN, S. & JUSELIOUS, K. 1990. Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.
- JONES, X. D. 2012. *The Chinese Government Has Taken Measures to Boost the Stock Market* [Online]. Economic Information http://jjckb.xinhuanet.com/2012-08/08/content_393230.htm. [Accessed October 29 2012].
- JUDGE JR, W. Q. & KRISHNAN, H. 1994. An Empirical Investigation of the Scope of a Firm's Enterprise Strategy. *Business & Society*, 33, 167-190.
- KAHNEMAN, D., KNETSCH, J. & THALER, R. 1991. Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias. *The Journal of Economic Perspectives*, 5, 193-206.
- KAHNEMAN, D., SLOVIC, P. & TVERSKY, A. 1982. *Judgment under Uncertainty: Heuristics and Biases*, Cambridge University Press.
- KAHNEMAN, D. & TVERSKY, A. 1979. Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47, 263-291.
- KAIDONIS, M. A., STOIANOFF, N. & ANDREW, J. L. 2010. *The Shifting Meaning of Sustainability. A Handbook of Corporate Governance and Social Responsibility* Farnham, England: Gower Publication.
- KAUL, G. & SEYHUN, H. N. 1990. Relative Price Variability, Real Shocks, and the Stock Market. *The Journal of Finance*, 45, 479-496.
- KIA, A. 2003. Forward-Looking Agents and Macroeconomic Determinants of the Equity Price in a Small Open Economy. *Applied Financial Economics*, 13, 37-54.
- KIM, K.-H. 2003. Dollar Exchange Rate and Stock Price: Evidence from Multivariate Cointegration and Error Correction Model. *Review of Financial Economics*, 12, 301-313.
- KLAPPER, L. F. & LOVE, I. 2004. Corporate Governance, Investor Protection, and Performance in Emerging Markets. *Journal of Corporate Finance*, 10, 703-728.
- KLEMKOSKY, R. C. & JUN, K. W. 1982. The Monetary Impact on Return Variability and Market Risk Premia. *Journal of Financial and Quantitative Analysis*, 17, 663-681.
- KLINE, R. B. 2005. *Principles and Practice of Structural Equation Modelling*, Guilford Press, New York, NY, USA.
- KOLARI, J. W., MOORMAN, T. C. & SORESCU, S. M. 2008. Foreign Exchange Risk and the Cross-Section of Stock Returns. *Journal of International Money and Finance*, 27, 1074-1097.

- KROLL, Y., LEVY, H. & RAPOPORT, A. 1988. Experimental Tests of the Separation Theorem and the Capital Asset Pricing Model. *The American Economic Review*, 500-519.
- KUMAR, A. 2007. Do the Diversification Choices of Individual Investors Influence Stock Returns? *Journal of Financial Markets*, 10, 362-390.
- KUMAR, A. 2009. Hard-to-Value Stocks, Behavioral Biases, and Informed Trading. *Journal of Financial and Quantitative Analysis*, 44, 1375-1401.
- KURZ, M. 1994. On the Structure and Diversity of Rational Beliefs. *Economic Theory*, 4, 877-900.
- KWON, C. & SHIN, T. 1999. Cointegration and Causality between Macroeconomic Variables and Stock Market Returns. *Global Finance Journal*, 10, 71-81.
- LA PORTA, R., LOPEZ-DE-SILANES, F., SHLEIFER, A. & VISHNY, R. 2000. Investor Protection and Corporate Governance* 1. *Journal of Financial Economics*, 58, 3-27.
- LASKIN, A. V. 2007. The Value of Investor Relations: A Delphi Panel Investigation. *Institute for Public Relations*, 1.
- LEASE, R., LEWELLEN, W. & SCHLARBAUM, G. 1974. The Individual Investor: Attributes and Attitudes. *Journal of Finance*, 29, 413-433.
- LEASE, R., LEWELLEN, W. & SCHLARBAUM, G. 1976. Market Segmentation: Evidence on the Individual Investor. *Financial Analysts Journal*, 32, 53-60.
- LEBARON, D., FARRELLY, G. & GULA, S. 1989. Facilitating a Dialogue on Risk: A Questionnaire Approach. *Financial Analysts Journal*, 45, 19-24.
- LEE, K. Y. 2008. Causal Relationships between Stock Returns and Inflation. *Applied Economics Letters*, 15, 125-129.
- LENTEN, L. & MOOSA, I. 2003. The Cyclical Behaviour of Nominal and Real Stock Prices: Evidence from Japan. *Journal of International Economic Studies*, 17, pp.59-70.
- LEWELLEN, W. G., LEASE, R. C. & SCHLARBAUM, G. G. 1977. Patterns of Investment Strategy and Behavior among Individual Investors. *The Journal of Business*, 50, 296-333.
- LIAN, J. 2012. The Proportion of Institutional Investors Less Than Thirty Percent in China. *Xinmin Evening News*, July, 2012.
<http://finance.eastday.com/stock/m3/20120719/u1a6717787.html>.
- LIAO, Y. 2012. *80% of the Chinese Investors on the Stock Markets Have Made a Loss, and Most of the Investors Who Had Middle-Income Did Not Have Stop-Loss Plans* [Online]. SOHO Finance: SOHU webiste Available: <http://business.sohu.com/20120302/n336447490.shtml> [Accessed January 23 2013].
- LICHTENSTEIN, S., FISCHHOFF, B. & PHILLIPS, L. D. 1981. *Calibration of Probabilities: The State of the Art to 1980*. <http://www.dtic.mil/dtic/>: Defense Technical Information Center document.
- LILJEBLOM, E. & STENIUS, M. 1997. Macroeconomic Volatility and Stock Market Volatility: Empirical Evidence on Finnish Data. *Applied Financial Economics*, 7, 419-426.
- LIN, J. Y., CAI, F. & LI, Z. 1998. Competition, Policy Burdens, and State-Owned Enterprise Reform. *The American economic review*, 88, 422-427.

- LINTNER, J. 1965. The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *The Review of Economics and Statistics*, 47, 13-37.
- LIU, L. 2001. Understanding of Seasonal Adjustment of Time Series in Western Countries. *Statistical Research*, 12, 60-61.
- LIU, M. & SHRESTHA, K. 2008. Analysis of the Long-Term Relationship between Macro-Economic Variables and the Chinese Stock Market Using Heteroscedastic Cointegration. *Managerial Finance*, 34, 744-755.
- LOBO, B. J. 2000. Asymmetric Effects of Interest Rate Changes on Stock Prices. *The Financial Review*, 35, 125-43.
- LUINTEL, K. B. & PAUDYAL, K. 2006. Are Common Stocks a Hedge against Inflation? *Journal of Financial Research*, 29, 1-19.
- MACCALLUM, R. C. & AUSTIN, J. T. 2000. Applications of Structural Equation Modeling in Psychological Research. *Annual Review of Psychology*, 51, 201-226.
- MACKINNON, J. G. 1990. *Critical Values for Cointegration Tests*, Department of Economics, University of California, San Diego.
- MADITINOS, D. I., ŠEVIC, Ž. & THERIOU, N. G. 2007. Investors' Behaviour in the Athens Stock Exchange (Ase). *Studies in economics and finance*, 24, 32-50.
- MALKIEL, B. G. & FAMA, E. F. 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25, 383-417.
- MALMENDIER, U. & TATE, G. 2005a. Ceo Overconfidence and Corporate Investment. *The Journal of Finance*, 60, 2661-2700.
- MALMENDIER, U. & TATE, G. 2005b. Does Overconfidence Affect Corporate Investment? Ceo Overconfidence Measures Revisited. *European Financial Management*, 11, 649-659.
- MANDELKER, G. & TANDON, K. 1985. Common Stock Returns, Real Activity, Money, and Inflation: Some International Evidence. *Journal of International Money and Finance*, 4, 267-286.
- MARKOWITZ, H. 1952. Portfolio Selection. *Journal of Finance*, 7, 77-91.
- MARSTON, C. & STRAKER, M. 2001. Investor Relations: A European Survey. *Corporate Communications*, 6, 82-93.
- MARTIN, J. D. & KEOWN, A. J. 1977. Interest Rate Sensitivity and Portfolio Risk. *Journal of Financial and Quantitative Analysis*, 12, 181-191.
- MASLOW, A. H. 1946. Problem-Centering Vs. Means-Centering in Science. *Philosophy of Science*, 13, 326-331.
- MCGUIRE, J. B., SUNDGREN, A. & SCHNEEWEIS, T. 1988. Corporate Social Responsibility and Firm Financial Performance. *Academy of Management Journal*, 31, 854-872.
- MCQUEEN, G. & ROLEY, V. 1993. Stock Prices, News, and Business Conditions. *Review of Financial Studies*, 6, 683-707.
- MCSWEENEY, E. J. & WORTHINGTON, A. C. 2008. A Comparative Analysis of Oil as a Risk Factor in Australian Industry Stock Returns, 1980-2006. *Studies in Economics and Finance*, 25, 131-145.
- MEI, J., SCHEINKMAN, J. & XIONG, W. 2005. *Speculative Trading and Stock Prices: Evidence from Chinese Ab Share Premia*. National Bureau of Economic Research.
- MERIKAS, A. A., MERIKAS, A. G., VOZIKIS, G. S. & PRASAD, D. 2011. Economic Factors and Individual Investor Behavior: The Case of the Greek Stock Exchange. *Journal of Applied Business Research (JABR)*, 20.

- MOOKERJEE, R. & YU, Q. 1997. Macroeconomic Variables and Stock Prices in a Small Open Economy: The Case of Singapore. *Pacific-Basin Finance Journal*, 5, 377-388.
- MOON, J. 2004. Government as a Driver of Corporate Social Responsibility. *ICCSR Research Paper Series*, 6-7.
- MOORE, G. H. 1975. Stock Prices and the Business Cycle*. *The Journal of Portfolio Management*, 1, 59-64.
- MOORE, G. H. 1983. *Business Cycles, Inflation, and Forecasting*, Published for the National Bureau of Economic Research by UMI.
- MORCK, R. 2004. Behavioral Finance in Corporate Governance-Independent Directors, Non-Executive Chairs, and the Importance of the Devil's Advocate. National Bureau of Economic Research Cambridge, Mass., USA.
- MORCK, R. & YEUNG, B. 2010. *Agency Problems and the Fate of Capitalism*. National Bureau of Economic Research Cambridge, Mass., USA.
- MORLEY, B. 2007. The Monetary Model of the Exchange Rate and Equities: An Ardl Bounds Testing Approach. *Applied Financial Economics*, 17, 391-397.
- MUKHERJEE, T. K. & NAKA, A. 1995. Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model. *Journal of Financial Research*, 18, 223-37.
- MURPHY, A. & SAHU, A. 2001. Empirical Evidence of a Positive Inflation Premium Being Incorporated into Stock Prices. *Atlantic Economic Journal*, 29, 177-185.
- MURPHY, K. 2000. *A Brief Introduction to Bayes' Rule* [Online]. UBC Department of Computer Science. Available: <http://www.cs.ubc.ca/~murphyk/Bayes/bayesrule.html> [Accessed February 25 2013].
- MUTAIRI, M. A. 2011. *Corporate Finance Decisions, Governance, Environmental Concerns and Performance in Emerging Markets: The Case Study of Kuwait* Doctor of Philosophy thesis, Faculty of Commerce, University of Wollongong.
- MYERS, S. & MAJLUF, N. 1984. Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have. *NBER working paper*.
- NÆS, R., SKJELTORP, J. A. & ØDEGAARD, B. A. 2011. Stock Market Liquidity and the Business Cycle. *The Journal of Finance*, 66, 139-176.
- NAGEL, R. 1999. A Survey of Experimental Guessing Games: A Study of Bounded Rationality and Learning. *Games and human behavior: Essays in honor of Amnon Rapoport*, 105-142.
- NAGY, R. & OBENBERGER, R. 1994. Factors Influencing Individual Investor Behavior. *Financial Analysts Journal*, 50, 63-68.
- NAM, S. K., PARK, K. S. & KIM, Y. K. 1998. Agenda for Capital Market Reforms in the People's Republic of China. *Study commissioned by the Asian Development Bank*.
- NASSEH, A. & STRAUSS, J. 2000. Stock Prices and Domestic and International Macroeconomic Activity: A Cointegration Approach. *The Quarterly Review of Economics and Finance*, 40, 229-245.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 1999. *China Statistical Yearbook*. <http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2000. *China Statistical Yearbook*. <http://www.stats.gov.cn/>: National Bureau of Statistics of China.

- NATIONAL BUREAU OF STATISTICS OF CHINA. 2001. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2002. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2003. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2004. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2005. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2006. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2007. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2008. *China Statistical Yearbook*.
<http://www.stats.gov.cn/>: National Bureau of Statistics of China.
- NATIONAL BUREAU OF STATISTICS OF CHINA. 2012. *China Statistical Database* [Online].
<http://www.stats.gov.cn/english/>: National Bureau of Statistics of China.
 [Accessed December 15 2012].
- NOBEL PRIZE. 2002. *The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2002* [Online]. Nobelprize.org. Available:
http://www.nobelprize.org/nobel_prizes/economics/laureates/2002/
 [Accessed 21 Feb 2013].
- ODEAN, T. 1999. Do Investors Trade Too Much? *The American Economic Review*, 89, 1279-1298.
- ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT 2004.
Organisation for Economic Co-Operation and Development Principles of Corporate Governance 2004, OECD Publishing.
- PAASCHE, H. 1874. Über Die Preisentwicklung Der Letzten Jahre Nach Den Hamburger Borsennotirungen. *Jahrbücher für Nationalökonomie und Statistik*, 12, 168-178.
- PACY SIFUNA, A. 2012. Disclose or Abstain: The Prohibition of Insider Trading on Trial. *Journal of International Banking Law and Regulation*, 27, 340-352.
- PALLIER, G., WILKINSON, R., DANTHIIR, V., KLEITMAN, S., KNEZEVIC, G., STANKOV, L. & ROBERTS, R. D. 2002. The Role of Individual Differences in the Accuracy of Confidence Judgments. *The Journal of General Psychology*, 129, 257-299.
- PANDEY, I. & BHAT, R. 1990. Significance of Financial Goals Pursued by Companies in India: Survey Findings. *Journal of Financial Management & Research-International Review of Finance*, July-December.
- PARK, R. E. 1966. Estimation with Heteroscedastic Error Terms. *Econometrica: Journal of the Econometric Society*, 888-888.
- PODSAKOFF, P. M., MACKENZIE, S. B., LEE, J. Y. & PODSAKOFF, N. P. 2003. Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88, 879.
- PUGESEK, B. H., TOMER, A. & VON EYE, A. 2003. *Structural Equation Modeling: Applications in Ecological and Evolutionary Biology*, Cambridge University Press.
- QUAYES, S. & JAMAL, A. 2008. Does Inflation Affect Stock Prices? *Applied Economics Letters*, 15, 767-769.

- RAO, H. & SIVAKUMAR, K. 1999. Institutional Sources of Boundary-Spanning Structures: The Establishment of Investor Relations Departments in the Fortune 500 Industrials. *Organization Science*, 27-42.
- RATANAPAKORN, O. & SHARMA, S. C. 2007. Dynamic Analysis between the U.S. Stock Returns and the Macroeconomic Variables. *Applied Financial Economics*, 17, 369-377.
- RESSET DATABASE. 2011. *Resset Research Database* [Online].
<http://www.resset.cn/cn/>: Beijing Gildata Resset Data Tech Co., Ltd.
- RILEY JR, W. B. & CHOW, K. V. 1992. Asset Allocation and Individual Risk Aversion. *Financial Analysts Journal*, 32-37.
- ROGALSKI, R. J. 1984. New Findings Regarding Day-of-the-Week Returns over Trading and Non-Trading Periods: A Note. *Journal of Finance*, 39, 1603-14.
- ROZEFF, M. S. & KINNEY, W. R. 1976. Capital Market Seasonality: The Case of Stock Returns. *Journal of Financial Economics*, 3, 379-402.
- SARGENT, T. J. 2011. Bounded Rationality in Macroeconomics: The Arne Ryde Memorial Lectures. *OUP Catalogue*.
- SCHARFSTEIN, D. & STEIN, J. 1990. Herd Behavior and Investment. *The American Economic Review*, 80, 465-479.
- SCHNABEL, J. A. 1985. Monetary Instability and Share-Market Risk: Canadian Evidence. *Managerial and Decision Economics*, 6, 180-182.
- SCHWERT, G. W. 1990. Stock Returns and Real Activity: A Century of Evidence. *Journal of Finance*, 45, 1237-1257.
- SHAFIR, E., DIAMOND, P. & TVERSKY, A. 1997. Money Illusion*. *Quarterly Journal of Economics*, 112, 341-374.
- SHANG, P. & LI, H. 2002. Empirical Analysis of the Cointegration Relationship between Shanghai Composite Index and Macro-Economic Indicators *Journal of Forecasting*, 4, 52-55.
- SHARPE, W. 1964. Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance*, 19, 425-442.
- SHEFRIN, H. 2001. Behavioral Corporate Finance. *Journal of Applied Corporate Finance*, 14, 113-126.
- SHEFRIN, H. 2002. *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, Oxford University Press, USA.
- SHEFRIN, H. & STATMAN, M. 1984. Explaining Investor Preference for Cash Dividends. *Journal of Financial Economics*, 13, 253-282.
- SHEFRIN, H. & STATMAN, M. 1994. Behavioral Capital Asset Pricing Theory. *The Journal of Financial and Quantitative Analysis*, 29, 323-349.
- SHEFRIN, H. & STATMAN, M. 2000. Behavioral Portfolio Theory. *Journal of Financial and Quantitative Analysis*, 35, 127-151.
- SHENZHEN STOCK EXCHANGE. 2002. *Shenzhen Stock Exchange Fact Book 2001*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2003. *Shenzhen Stock Exchange Fact Book 2002*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2004a. *The Overview of Shenzhen Stock Exchange in 2004*. <http://www.szse.cn/UpFiles/Attach/1810/2005/01/04/1307413906.doc>: Shenzhen Stock Exchange.

- SHENZHEN STOCK EXCHANGE. 2004b. *Shenzhen Stock Exchange Fact Book 2003*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2005a. *The Overview of Shenzhen Stock Exchange in 2005*. <http://www.szse.cn/UpFiles/Attach/1810/2006/01/20/0907058125.DOC>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2005b. *Shenzhen Stock Exchange Fact Book 2004*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2006a. *The Overview of Shenzhen Stock Exchange in 2006*. <http://www.szse.cn/UpFiles/Attach/1810/2007/01/04/0919031435.doc>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2006b. *Shenzhen Stock Exchange Fact Book 2005*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2007a. *The Overview of Shenzhen Stock Exchange in 2007*. <http://www.szse.cn/main/files/2007/12/29/914660178319.DOC>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2007b. *Report of Shenzhen Stock Exchange Investor Structure and Behaviour Analysis*. <http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2007c. *Shenzhen Stock Exchange Fact Book 2006*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2008a. *The Overview of Shenzhen Stock Exchange in 2008*. <http://www.szse.cn/main/files/2008/12/31/161696587001.pdf>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2008b. *Shenzhen Stock Exchange Fact Book 2007*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2009a. *The Overview of Shenzhen Stock Exchange in 2009*. <http://www.szse.cn/main/files/2010/01/06/420354612620.pdf>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2009b. *Shenzhen Stock Exchange Fact Book 2008*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2010a. *The Overview of Shenzhen Stock Exchange in 2010*. <http://www.szse.cn/main/files/2010/12/31/909503029352.pdf>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2010b. *Shenzhen Stock Exchange Fact Book 2009*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2011a. *The Overview of Shenzhen Stock Exchange in 2011*. <http://www.szse.cn/main/files/2011/12/30/379759623807.pdf>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2011b. *Shenzhen Stock Exchange Fact Book 2010*.
<http://www.szse.cn/main/>: Shenzhen Stock Exchange.
- SHENZHEN STOCK EXCHANGE. 2013. *About the Shenzhen Stock Exchange and Listing on the Shenzhen Stock Exchange* [Online]. <http://www.szse.cn/main/aboutus/>: Shenzhen Stock Exchange. [Accessed June 28 2013].
- SHILLER, R. 1987. Investor Behavior in the October 1987 Stock Market Crash: Survey Evidence. *NBER working paper*.
- SHILLER, R. 1990. Speculative Prices and Popular Models. *The Journal of Economic Perspectives*, 55-65.

- SHILLER, R. 1998. Human Behavior and the Efficiency of the Financial System. National Bureau of Economic Research Cambridge, Mass., USA.
- SHILLER, R. 2000a. *Irrational Exuberance*, Princeton University Press.
- SHILLER, R. 2000b. Measuring Bubble Expectations and Investor Confidence. *Journal of Behavioral Finance*, 1, 49-60.
- SHLEIFER, A. 2000. *Inefficient Markets: An Introduction to Behavioral Finance*, Oxford University Press, USA.
- SHLEIFER, A. & VISHNY, R. 1997. The Limits of Arbitrage. *The Journal of Finance*, 52, 35-55.
- SIEBENMORGEN, N. & WEBER, M. 2003. A Behavioral Model for Asset Allocation. *Financial Markets and Portfolio Management*, 17, 15-42.
- SOENEN, L. & JOHNSON, R. 2001. The Interrelationship between Macroeconomic Variables and Stock Prices-the Case of China. *Journal of Asia-Pacific Business*, 3, 67-81.
- STATMAN, M. 1999. Behavioral Finance: Past Battles and Future Engagements. *Financial Analysts Journal*, 55, 18-27.
- STIGLER, G. J. 1950. The Development of Utility Theory. I. *The Journal of Political Economy*, 58, 307-327.
- STONE, B. K. 1974. Systematic Interest-Rate Risk in a Two-Index Model of Returns. *Journal of Financial and Quantitative Analysis*, 9, 709-721.
- TAN, Z. 2008. *Is the Chinese Stock Market Overvalued?* Thesis for the degree of Master, Lincoln University.
- THALER, R. 1980. Toward a Positive Theory of Consumer Choice. *Journal of Economic Behavior & Organization*, 1, 39-60.
- THALER, R. 1993. *Advances in Behavioral Finance*, Russell Sage Foundation Publications.
- THALER, R. 1999. The End of Behavioral Finance. *Financial Analysts Journal*, 55, 12-17.
- THALER, R. & SHEFRIN, H. 1981. An Economic Theory of Self-Control. *The Journal of Political Economy*, 89, 392-406.
- THE PEOPLE'S BANK OF CHINA. 2013. *Statistics* [Online].
<http://www.pbc.gov.cn/publish/english/963/index.html>: The People's Bank of China. [Accessed 2012].
- TVERSKY, A. & KAHNEMAN, D. 1973. Availability: A Heuristic for Judging Frequency and Probability. *Cognitive psychology*, 5, 207-232.
- TVERSKY, A. & KAHNEMAN, D. 1974. Judgment under Uncertainty: Heuristics and Biases. *Science*, 185, 1124-1131.
- TVERSKY, A. & KAHNEMAN, D. 1981. The Framing of Decisions and the Psychology of Choice. *Science*, 211, 453-458.
- TVERSKY, A. & KAHNEMAN, D. 1991. Loss Aversion in Riskless Choice: A Reference-Dependent Model. *The Quarterly Journal of Economics*, 106, 1039-1061.
- TVERSKY, A. & KAHNEMAN, D. 1992. Advances in Prospect Theory: Cumulative Representation of Uncertainty. *Journal of risk and uncertainty*, 5, 297-323.
- U.S. SECURITIES AND EXCHANGE COMMISSION. 2013. *Ponzi Schemes – Frequently Asked Questions* [Online].
<http://www.sec.gov/answers/ponzi.htm#PonziVsPyramid>. [Accessed February 22 2013].
- ULLMAN, J. B. 2006. Structural Equation Modeling: Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, 87, 35-50.

- VAZ, J. J. 2011. *The Effect of Macroeconomic Variables on Stock Prices: Conventional Versus New Models*. Thesis for degree of Doctor of Philosophy, Monash University.Victoria.
- VAZ, J. J., ARIFF, M. & BROOKS, R. D. 2008. The Effect of Interest Rate Changes on Bank Stock Returns. *Investment Management and Financial Innovation*, 5 (4), 221-236.
- VON NEUMANN, J. & MORGENSTERN, O. 2007. *Theory of Games and Economic Behavior (Commemorative Edition)*, Princeton University Press.
- WADDOCK, S. A., BODWELL, C. & GRAVES, S. B. 2002. Responsibility: The New Business Imperative. *The Academy of Management Executive (1993-2005)*, 16, 132-148.
- WAHBA, H. 2008. Does the Market Value Corporate Environmental Responsibility? An Empirical Examination. *Corporate Social Responsibility and Environmental Management*, 15, 89-99.
- WANG, C. & CHIN, S. 2004. Profitability of Return and Volume-Based Investment Strategies in China's Stock Market. *Pacific-Basin Finance Journal*, 12, 541-564.
- WANG, D. & XU, L. 2001. Empirical Analysis of the Relationship between Macro-Economic Variables and Stock Market Index. *Journal of Nanjing College of Finance*, 3, 13-16.
- WANG, G. 2000. Transaction Mechanisms of the Chinese Stock Market and Economic Trends. *Finance & Trade Economics*, 1, 3-5.
- WANG, W. 2004. *Behavioural Finance*, University of International Business and Economics Press, Beijing.
- WARREN, W. E., STEVENS, R. E. & MCCONKEY, C. W. 1990. Using Demographic and Lifestyle Analysis to Segment Individual Investors. *Financial Analysts Journal*, 74-77.
- WATTS, R. L. 1978. Systematic 'Abnormal' returns after Quarterly Earnings Announcements. *Journal of Financial Economics*, 6, 127-150.
- WEBB, R., BECK, M. & MCKINNON, R. 2003. Problems and Limitations of Institutional Investor Participation in Corporate Governance. *Corporate Governance: An International Review*, 11, 65-73.
- WEI, D. 2009. *Definitions of M0, M1 and M2* [Online].
http://blog.sina.com.cn/s/blog_538f37cc0100bzx.html: SINA Corporation.
 [Accessed June 12 2012].
- WEINSTEIN, M. C., FINEBERG, H. V., ELSTEIN, A. S., FRAZIER, H. S., NEUHAUSER, D., NEUTRA, R. R. & MCNEIL, B. J. 1980. *Clinical Decision Analysis*, Saunders Philadelphia.
- WONGBANGPO, P. & SHARMA, S. 2002. Stock Market and Macroeconomic Fundamental Dynamic Interactions: Asean-5 Countries. *Journal of Asian Economics*, 13, 27-51.
- WOOLDRIDGE, J. M. 2009. *Introductory Econometrics: A Modern Approach*, South-Western Pub, USA.
- XI, W. 2007. *Sound Macro-Economic Situation Pushes up the Chinese Stock Market*. Zhongda Futures Research Institute.
- XIAO, F. 2003. *The Role of the Stock Market in Influencing Firm Investment in China*. University of Massachusetts at Amherst.
- YAN, Y., LI, Z. & XU, J. 2004. Cointegration Relationship between Fluctuating Indexes and Macro-Economic Factors *Statistical Research* 4, 45-48.

- YANG, J., ZHOU, Y. & WANG, Z. 2009. The Stock–Bond Correlation and Macroeconomic Conditions: One and a Half Centuries of Evidence. *Journal of Banking & Finance*, 33, 670-680.
- YANG, X. 2008. *Individual Investors Still Occupied Half the Stock Market and Securities Fund Only Account for 1/4* [Online]. Beijing Daily Available: <http://finance.sina.com.cn/stock/y/20080125/01074450317.shtml> [Accessed June 6 2012].
- YUAN, L. 2000. State Share Reduction: An Effective Way to Improve the Corporate Governance in China. *State Assets Management* 5, Beijing: State Assets Management Magazine.
- ZHANG, R. & WANG, H. 2000. Empirical Analysis of the Trend of Systematic Risk and Fluctuations in the Shanghai Stock Exchange *Journal of Financial Research*, 92-98.
- ZHAO, D. 2011. *The Reports of Central Bank and China Securities Depository and Clearing Corporation Limited Suggest the Market Entry Signal* [Online]. <http://finance.people.com.cn/stock/GB/15690834.html>: People. [Accessed October 29 2012].
- ZHAO, X. & TAO, J. 2013. *The Chinese Stock Market Has a Steady Rise This Year and the Overall Valuation Is Reasonable* [Online]. http://news.xinhuanet.com/fortune/2013-05/26/c_115912359.htm: www.news.net. [Accessed June 28 2013].
- ZHOU, S. 2010. *Development of China's Interbank Borrowing/Lending Market* [Online]. DEDECMS. Available: <http://china.findlaw.cn/falvchangshi/yinhang/tycjsc/tycjscdhy/2010/0730/27177.html#> [Accessed June 13 2012].
- ZHU, Y. 2009. Historical Review of Fifteen Years' State-Owned Shares Reduction. *Securities Daily*. Beijing.