Perceived Risk, Risk Tolerance and Trust in Debt Decisions

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Abstract

The perceived risk of stock investment, risk tolerance and trust play important roles in the stock market and in use of debt for stock investment, yet the relationship between these has received little attention. This thesis examines these direct and indirect relationships using three independent essays using structural equation modelling as the main technique. Vietnam is used as an illustrative example, as the use of informal borrowing is common. This thesis surveyed 420 Vietnamese individual investors and found the following results.

Essay One finds that the perceived risk is positively associated with borrowing sources and the use of informal debt. Leverage risk and opportunity risk also directly relate to borrowing sources. Borrowing sources is positively related to perceived risk and debt decisions. Perceived risk is a mediator between borrowing sources and informal debt, and borrowing sources act as a mediator between perceived risk and debt decisions.

The results of Essay Two show that risk tolerance has a direct relationship to the use of financial leverage, while investment horizons are related to the use of informal debt. Risk tolerance positively relates to the use of informal debt and mediates between investment horizons and debt decisions among stockbrokers.

In Essay Three, the results reveal that there is a significantly positive relationship between trust in the stock market, and trading frequency and the use of informal debt. Trust in stockbrokers and brokerage firms are directly related to the use of informal debt. Trading frequency is also positively associated with trust in the stock market and the use of financial leverage. Trust is a mediator between trading frequency and informal debt, and trading frequency acts as a mediator between trust and financial leverage.

Findings from this thesis will help provide useful insights into investors' behaviour and its impact on debt decisions for stock investment amongst individual investors, users and non-

users of informal and formal borrowing, stockbrokers and non-stockbrokers, male and female investors in the Vietnam stock market and other stock markets.

Acknowledgements

This PhD journey has assisted me in making great changes in my life. One of the biggest changes has been becoming an independent researcher. In terms of my character, I am not naturally confident enough to put my comments or arguments into my research. Through my supervisors' guidance, I have learned useful lessons and have become a more confident person. Thanks, therefore, must first go to my supervisors: Prof. Martin Young, Dr Michael Naylor, and Dr Wei-Huei Hsu.

I express myself thankfulness to the Vietnamese individual investors who took the time to answer the survey, which provided the raw data for my research. Thanks must also go to the session Chairs and comments at the conferences and the school seminars I attended. Importantly, special thanks go to my uncle for caring for my children while I have been busy working on this PhD thesis. Lastly, I would like to say, "thank you very much" to my husband, my children, my mom, my sisters, my brother, and my fellow PhD students for their encouragement and on-going support. I could not have made my PhD thesis a successful one without your support.

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Chapter 1 Overview

1.1 The importance of informal and formal debt in stock investment

The use of debt for stock investment is common and often regarded as an essential part of the growth of stock markets. This debt can be from both formal and informal borrowing sources. Formal borrowing sources include bankers, credit institutions, and brokerage firms. Informal borrowing sources encompass family (e.g. parents, brothers, sisters) and non-family (e.g. friends, colleagues, managers). Chandavarkar (1985) argues that instead of considering these two sectors as discrete financial enclaves, informal and formal financial sectors should be seen as forming a continuum, with many sub-markets within each sector, and many connections between the two.

Informal finance sources can be more accessible than the formal sector due to its type of loan transactions and flexibility of operations (e.g. Germidis, Kessler, & Meghir, 1991; Ghate, 1992). The loan transactions are personalised in the informal sector, while the loan transactions are arms-length in the formal sector. Formal loan terms are standardised, whereas informal loan terms are outside the purview of the regulations. Borrowers from informal lenders also have flexibility in terms of loan purpose, interest rate, collateral requirements, maturity periods, and debt rescheduling, whereas borrowers from formal lenders do not (Ghate, 1992).

The role of the informal debt sector increasingly plays an important role in economic development for both enterprises and individuals. At the enterprise level, informal debt exerts a strong influence on innovation performance. This debt becomes more important as new enterprises have constrained access to formal sources. Informal capital is a unique source for them in accessing financing (Wu, Si, & Wu, 2016).

The relationship between formal and informal debt changes with increased business activity, as indicated in Figure 1.1. That is, at high levels of business activity, the use of informal debt increases, while the use of formal debt decreases.

Figure 1.1: Formal debt, informal debt and innovation performance[1] of enterprises
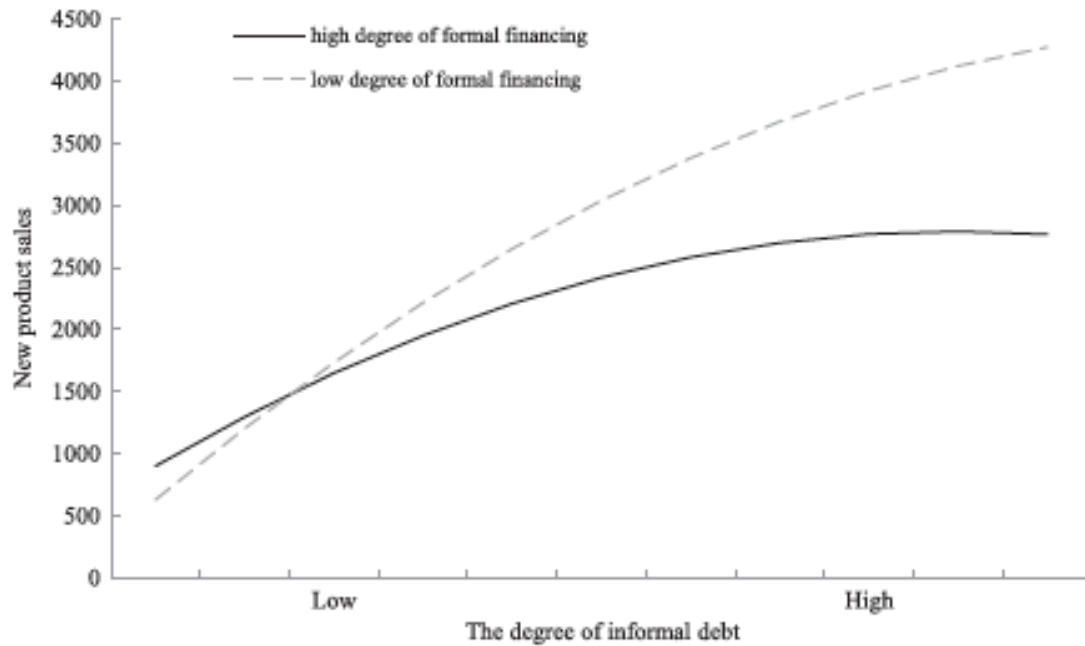
Wu et al. (2016, p. 267)

At the household level, informal debt is mostly used for production and consumption (Barslund & Tarp, 2008; Guirkinger, 2008; Mohieldin & Wright, 2000), indicating that informal debt contributes to the growth of the economy. Households use informal debt due to their limited access to formal sources. Low rates of interest, low transaction costs, and uncomplicated procedures are also the primary reasons for the use of informal debt (Barslund & Tarp, 2008; Guirkinger, 2008; Mohieldin & Wright, 2000).

Most households in developing countries have used informal debt, as shown in Figure 1.2. The informal debt levels used are around 62.5% in Madagascar (Zeller, 1994), 42.5% in Egypt

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[1] Innovation is defined as "the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order." (Van de Ven, 1986; Wu et al. 2016). Innovation performance is largely related to the new product sales (Wu et al., 2016).

(Mohieldin & Wright, 2000), 48% in Vietnam (Barslund & Tarp, 2008), 26% in Peru (Guirkinger, 2008), 19% in China (Turvey & Kong, 2010), 72% in India (Guérin, d'Espallier, & Venkatasubramanian, 2013), and 75% in Thailand (Tanomchat & Sampattavanija, 2018).

Figure 1.2: Informal debt used by households in developing countries
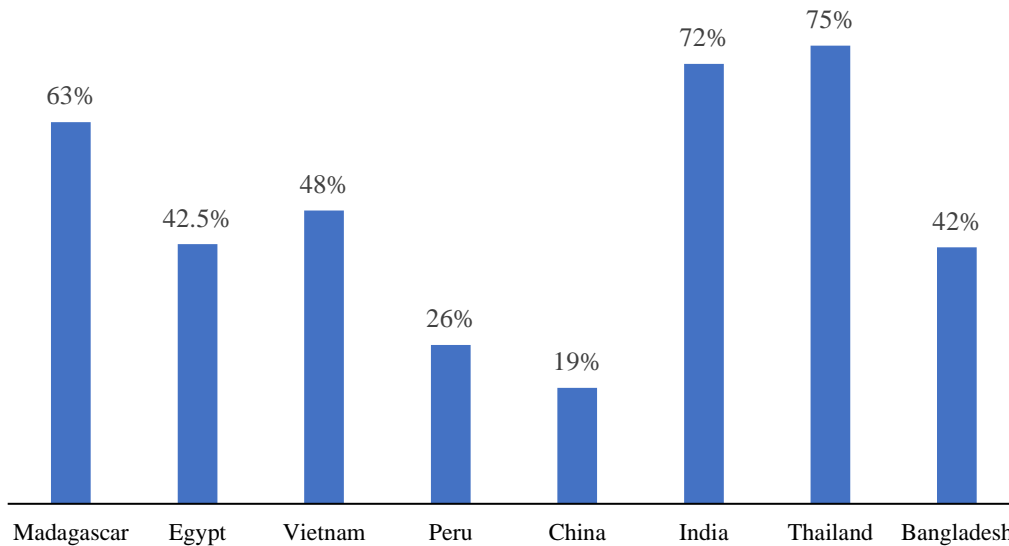
While there are numerous studies on the use of informal debt, there has been no publicised research on the use of informal debt by individual investors for stock investment to the author's knowledge. This thesis examines the use of informal debt in addition to formal debt by Vietnamese individual investors for stock investment, and that this choice can influence their investment decisions. Based on trial interviews and a pilot test of 20 individual investors, most of them (19 investors) use debt for stock investment. Among these, 9 investors use both informal and formal debt, 2 investors use only informal debt, and 8 investors use only formal debt for stock investment, as shown in Figure 1.3.

Figure 1.3: Informal and formal debt used by investors for stock investment
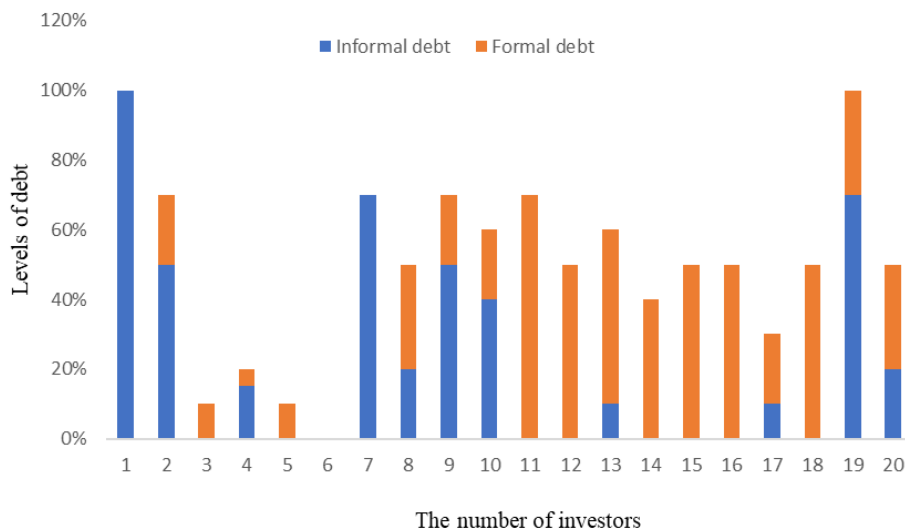
Use of debt (known as debt decisions) is a risky decision regardless of whether it is informal or formal debt because users of debt (i.e. investors) face problems personally and legally if investment outcomes result in investors being unable to cover their debt obligations. The literature finds that behavioural factors like perceived risk, risk tolerance, and trust play a vital role in decision-making under risk (e.g. Grable, 2000, 2008; Kahneman & Tversky, 1979; Stout, 2009; Zak & Knack, 2001). Based on this evidence, this thesis investigates whether the perceived risk of stock investment, risk tolerance, or trust in the stock market are key drivers of debt decisions.

1.2 Factors driving debt decisions and the primary research questions

The "perceived risk" of stock investment is defined by Peter and Tarpey Sr (1975) as the level of potential loss concerns and level of importance of this potential loss. Many finance studies, (e.g. Kahneman & Tversky, 1979; Nofsinger, 2008; Thaler & Johnson, 1990), have suggested that investors are only concerned about financial risk. However, this thesis argues that, when investing in stocks, investors may have additional risk concerns rather than just financial risk. These additional concerns are information safety (safety risk), time waste (time risk), social standing (social risk), wrong choices among stocks (choice risk), missing out on other financial

opportunities (opportunity risk), and debt problems (leverage risk) (Peter & Tarpey Sr, 1975; Hoyer et al., 2016). These concepts of perceived risk are derived from consumer theory and potentially provides valuable insights into investors' perceived risk and its relationship with debt decisions.

"Risk tolerance" is defined by Grable (2000) as the maximum amount of uncertainty that a person is willing to accept when making a decision. Risk tolerance is sometimes used to describe risk preference (e.g. Grable, 2000, 2008). Since risk tolerance affects a broad range of personal financial choices, for example, (Grable & Roszkowski, 2008), this thesis argues that risk tolerance is strongly associated with debt decisions.

"Trust" in the stock market is defined by Shapiro (2012) as the *asymmetric agency,* through which individuals or organisations (known as agents – those trusted) act on behalf of others (known as principals - trustors). In the case of A trusts B, B holds the position of trust regardless of whether A considers B trustworthy, feels confident about B, or whether B encapsulates the interest of A that B serves. B here acts with disinterestedness, full and honest disclosure, diligence, duties of care or performance that is consistent with A's expectations under the circumstances (Shapiro, 2012). This thesis argues that trust in the stock market is related to debt decisions.

This thesis, in short, argues that the perceived risk of stock investment, risk tolerance and trust in the stock market strongly relate to debt decisions, using both roles: a predictor and mediator in debt decision. The following general research questions are:

1/ What roles does the perceived risk of stock investment play in debt decisions?

2/ What roles does risk tolerance play in debt decisions?

3/ What roles does trust in the stock market play in debt decisions?

1.3 Vietnam stock market and individual investors

1.3.1 The Vietnam stock market

This thesis focuses on Vietnamese individual investors as they provide a useful example due to their distinctive characteristics, which will be discussed in Section 1.3.2. Vietnamese investors have experience of several crises since the stock market was founded in 2000. As was the case with the global financial crisis of 2007-2008, the Vietnam stock market turned into a bubble market reaching its highest point, 1100 points, in 2007 before dropping to its lowest point, 245 points, in March 2009, as shown in Figure 1.4. Over the past decade, the Vietnam stock market has rebounded sharply. The factors which have driven this recovery are a decrease in interest rates, an increase in foreign direct investment (FDI), and the growth of credit and stock prices starting from a low base. Reaching over 1000 on the VN-index, the Vietnam stock market continues to hold the top stock market spot in terms of performance in Asia (Ngo, 2018).

Figure 1.4: The VN-index performance from 2000 through 2019

1.3.2 Vietnamese individual investors

The Vietnam stock market has useful characteristics. Firstly, individual investors dominate the Vietnam stock market, making up 99% of participants. This differs from the developed markets, where institutional investors rather than individual investors are the primary participants. Most investors are young (approximately 50% age 26-35) and do not have much experience in stock investment (around 50% have less than 3 years of experience) (Trang & Khuong, 2017). For these reasons, the research on the behaviour of Vietnamese individual investors applied in this thesis is of significant interest as they are generally new to the market and are still learning.

Secondly, investors typically use high levels of financial leverage. While Vietnamese law imposes a maximum lending ratio of 1:1, in some instances, individual investors use higher levels of debt, with a leverage ratio of even up to 1:4.[2] This increases the risk of substantial losses when stock prices fall. It is almost certain, therefore, that investors have currently used financial leverage for stock investment.

Lastly, informal borrowing is common in Vietnamese culture. Many Vietnamese websites discuss issues around borrowing and give some advice on how to deal with people who ask "you" to borrow money. A list of typical borrowers is often quite wide, including acquaintances, friends, colleagues (co-workers), best friends, and relatives. [3] Informal borrowing is also a unique source for Vietnamese households as they have limited access to formal lenders (e.g. Barslund & Tarp, 2008; Nguyen, 2008; Nguyen & Berg, 2014). These

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[2] According to the website of Vnexpress (2010): http://kinhdoanh.vnexpress.net/tin-tuc/chung-khoan/thi-truong-truot-doc-vi-don-bay-tai-chinh-2705286.html

3 According to the following websites: DKN (2018): https://mb.dkn.tv/van-hoa/khi-5-loai-nguoi-nay-hoi-muon-tien-ban-se-tra-loi-ra-sao.html

Thanhnien.vn (2018): https://thanhnien.vn/doi-song/cho-nguoi-quen-muon-tien-lam-du-cach-doi-no-cung-danh-om-cuc-tuc-691567.html

characteristics will help explain why Vietnamese investors use informal debt for the stock market.

Based on these characteristics, this thesis provides useful insights into investors' behaviour and its impact on the use of formal and informal debt for stock investment in the Vietnam stock market.

1.4 Family and borrowing culture in Vietnam

1.4.1 Family culture

Vietnam is an emerging economy, being the world's most 15th populous country in the world. Vietnam has strong economic growth due to the expansion of networks and reform policies. GDP per capita has sharply increased by 123% within 10 years (2008-2018), USD 1149 (2008) compared to USD 2566 (2018), according to the data of the world bank[4]. The culture of Vietnam is one of the oldest in Southeast Asian, approximately 4000 years ago, and strongly influenced by Chinese culture (Confucian social).

In a Vietnamese family, multiple generations have been living together, including grandparents, parents, children, single aunts or uncles. Children have been in a family until they get married, regardless of what their ages are. However, married sons, especially the oldest or youngest sons (including his wife and children) have still lived with their parents because of being in charge of taking care of their parents. Grandparents can get involved in many activities, for example, nurturing their grandchildren.

Men overall have more influence on family decisions than women in a family. The older man is usually the household head, who has more influence in financial and non-financial decision-making. A family head also acts as a judge if there are quarrels between members. Women are

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[4] https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=VN

also responsible for housework and raising children. Wives often sacrifice for her husband and children, and importantly, tolerate unfair treatment to keep the family in peace.

1.4.2 Borrowing and lending money culture

"Blood is thicker than water"

Borrowing from parents is common in Vietnamese culture. Good and loyal relationships between members in a family are more important than others, which conforms to the proverb "blood is thicker than water"[5]. The elders show their care for the younger, and the younger express their respect to the seniors. They, therefore, willingly help each other when members have difficulties. The following reasons explain why parents willingly lend their children money. (i) They do this with the hope that their money may help their children solve these problems and then have better lives. (ii) Parents' money may create opportunities for their children to fulfil their dream for entrepreneurship or investment. (iii) As being household heads, lending money to children may increase their influence in a family and hold children's respect.

Cash holding preference

Eighty per cent (80%) of Vietnamese prefer using cash for daily buying and selling transactions[6], explaining why they also borrow cash from parents or friends. According to Dr Nguyen Tri Hieu - a specialist of finance - banking, cash is the main means of payment in Vietnam for three reasons.

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[5] https://www.itourvn.com/blog/traditional-vietnamese-family-values#:~:text=In%20a%20Vietnamese%20family%2C%20multiple%20generations%20are%20living,live%20with%20their%20family%20until%20they%20get%20married.

[6] https://www.tin247.com/vi-sao-nguoi-dan-viet-nam-van-thich-chi-tieu-bang-tien-mat-hon-la-thanh-toan-truc-tuyen-4-27530603.html

First, there is not any Vietnamese law on the use of non-cash payment. For payees, payment by cash is faster and safer, preventing their personal information being hacked by hackers or virus attacks online. For sellers, cash receipt may avoid the burden of taxes obligations. In practice, Vietnamese laws on bankruptcy or enterprise protection in terms of bankruptcy remain unclear and require a time-consuming process, even though they have fulfilled their tax obligations, causing a consequence that every business itself protects and survives according to their own ways.

Second, there are no official community education programs on the use of e-banking for payment, resulting in most people being uncomfortable and unfamiliar with this instrument. Currently, several workshops or seminars on the use of e-banking have been taking place. However, the focus of participants is on undergraduates or higher, meaning that students in high schools (age of 15-18) or secondary schools (age of 12-14) have no ideas about e-banking payment.

Finally, frauds in the finance-banking system and cheating payments online are common in Vietnam, becoming a serve problem without appropriate solutions because the origin of these problems emanates from false understandings of information. These causes people to lose trust in the banking system in Vietnam, and as a consequence, households are more likely to keep cash at home than in a bank.

1.5 Structure of the thesis

The structure of this thesis is based on a three-essay format. Essay one (presented in Chapter 4) examines the inter-relationships between perceived risk of stock investment, borrowing sources, and debt decisions. Essay two (presented in Chapter 5) investigates the inter-relationships between risk tolerance, investment horizons, and debt decisions. Essay three (presented in Chapter 6) examines the inter-relationships between trust in the stock market,

trading frequency, and debt decisions. These relationships are tested after controlling for six demographics; gender, age, marital status, education, income, and financial literacy. Early versions of these essays have been presented at academic conferences.[7]

The key technique for the three essays is "structural equation modelling" (SEM), utilising cross-sectional data of 420 Vietnamese individual investors. This thesis also analyses the differences in the relationship between perceived risk, risk tolerance, and trust to debt decisions between subgroups; stockbrokers and non-stockbrokers, male and female investors, and users and non-users of borrowing sources (informal and formal). Other techniques are also applied to carry out robustness checks of the findings by SEMs, including multiple regression, stepwise regression, Hayes and Preacher's approach, a t-test method, propensity score matching (PSM) method, and the instrumental variables (IVs) approach.

The remainder of this thesis is as follows. Chapter 2 presents the theoretical background of this thesis. The methodology is presented in Chapter 3. Chapter 4 serves as Essay 1, Chapter 5 as Essay 2, and Chapter 6 as Essay 3. Chapter 7 ends by presenting the conclusions, including significant findings, contributions, implications and recommendations, and suggestions for further areas of research.

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7 The early version of Study 1 (Chapter 4) of this thesis was presented at the 2nd Asia Conference on Business and Economic Studies (ACBES 2019), University of Economics Ho Chi Minh City, Vietnam, September 2019 https://acbes.ueh.edu.vn/, and at the 3rd Sydney Banking and Financial Stability Conference 2019 (SBFC 2019), University of Sydney Business School, Australia, December 2019 https://sbfc.sydney.edu.au/.

The early version of Study 2 (Chapter 5) of this thesis was presented at the 23rd International Congress on Modeling and Simulation (MODSIM2019), Modeling and Simulation Society of Australia and New Zealand Inc., Australia, December 2019 https://mssanz.org.au/modsim2019/index.html., and at the 23rd New Zealand Finance Colloquium – NZFC, Lincoln University, New Zealand, February 2019 https://nzfc.ac.nz/cfp/.

The early version of Study 3 (Chapter 6) of this thesis was presented at International Conference on Business and Finance 2019, University of Economics Ho Chi Minh City, Vietnam, August 2019 https://vietnam2019.sciencesconf.org/, and at the 24rd New Zealand Finance Colloquium – NZFC, Auckland University of Technology, New Zealand, February 2020 https://www.nzfc.ac.nz/cfp/index.html

Chapter 2 Theoretical Background

Introduction to this chapter

Behavioural decision theory includes traditional finance and behavioural finance. Scholars of behavioural finance and consumer behaviour argue the assumptions used in traditional finance. This chapter begins with the behavioural decision theory and expected utility theory (EUT). The following sections are the concept of perceived risk, investors' rationality and risk aversion, a risk-return trade-off, and trust in decision-making. This chapter ends with the behavioural finance framework and a summary.

2.1 Behavioural decision theory

Behavioural decision theory developed by Edwards (1954, 1961) focuses on a restricted range of human activity, especially how people choose between options (Hansson, 1994). Behavioural decision theory has two facets; normative and descriptive (Edwards, 1954, 1961; Hansson, 1994; Hickson & Khemka, 2014; Slovic, Fischhoff, & Lichtenstein, 1977). A normative theory provides prescriptive functions or uses decision rules to help decision-makers maximise their expected utility of outcomes. The focus of the normative theory is, therefore, on how people *should* make decisions. In contrast, the descriptive theory is a description of decision-makers' beliefs and values, and the way they incorporate these beliefs and values into their decisions. Hence, the descriptive theory focuses on how people *actually* make decisions.

In personal financial decisions, there are different perspectives among traditional finance, behavioural finance, and consumer behaviour. Traditional finance originates from normative theory, and behavioural finance and consumer behaviour are derived from descriptive theory, as shown in Figure 2.1.

Figure 2.1: Conceptual background of the thesis
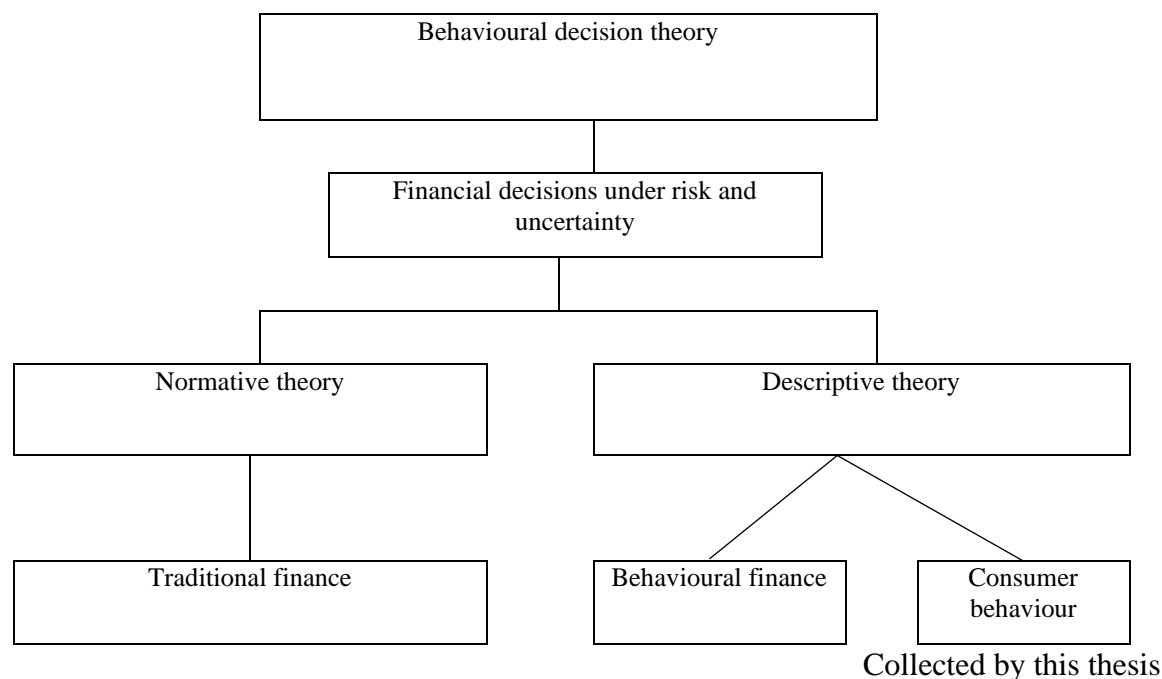
The assumptions made under the traditional finance framework have been much debated by scholars of behavioural finance and consumer behaviour. This begins with the debates on the assumptions of Expected Utility Theory (EUT) that are presented below.

2.2 Expected Utility Theory (EUT)

One of the basic concepts underlying traditional theory is expected utility theory (EUT) developed by Von Neumann and Morgenstern (1944). EUT assumes that people choose between any two alternatives based on their preferences and that these preferences are always consistent. For example, if he/she prefers A to B, A is always chosen. Noticeably, the preferences between any two choices are independent of the presence of a third option, for example, C. This means that a person always prefers A to B regardless of the existence of C. Also, if he/she prefers A to B and B to C, he/she will prefer A to C.

This assumption has been argued against by scholars of behavioural finance, where investors' preferences may change and be inconsistent over time (e.g. Grable & Roszkowski, 2008;

Kahneman & Tversky, 1979; Nofsinger, 2008; Thaler & Johnson, 1990; Weber, Blais, & Betz, 2002). Moreover, a decision maker's perception of choice may change according to the presentation of information referred to as "decision frame".

Tversky and Kahneman (1981) argue that a decision to be made is based on the "frame". "Decision frame" is described as "the decision-maker's conception of acts, outcomes, and contingencies associated with a particular choice" (Tversky & Kahneman, 1981, p. 453). In other words, it relates to how a decision-maker takes a problem into account, with "frame" referring to the description or presentation of a problem (Ackert, 2014; Shefrin, 2002).

In traditional finance, the frame is independent of behaviour or irrelevant to behaviour (known as frame independence) due to a decision-maker having consistent preferences in decision-making and information always being available (Shefrin, 2002). By contrast, scholars of behavioural finance, for example, Tversky and Kahneman (1981), debate that the frame is relevant to behaviour and affects decision-making (known as frame dependence), and that because a decision-maker has limited resources and ability, they make a decision based on both the presentation of this problem and their personal characteristics.

This thesis also argues that individual investors' preferences are inconsistent. Investors may prefer stock A to stock B at present, but B to A in the future. Likewise, between formal and informal debt for stock investment, individual investors may choose both formal and informal debt in varying proportions. Traditional finance would suggest that one would be preferred to the other and investors would only borrow from both sources if their preferred source was exhausted.

Moreover, a decision to be made should not be focused only on two alternatives. Rather, other factors should be considered; for example, personal characteristics, emotions, risk attitudes, and prior outcomes; due to their impacts on choice decisions (Grable & Roszkowski, 2008;

Kahneman & Tversky, 1979; Nofsinger, 2008; Thaler & Johnson, 1990; Weber et al., 2002). It is also essential to examine whether these additional factors dampen the impact of the preferences on choice decisions.

2.3 Perceived risk

2.3.1 Concepts of perceived risk

Scholars of both finance and consumer behaviour also have different perspectives around the concept of perceived risk. Perceived risk plays a vital role in decision-making (Bélanger & Carter, 2008; Cunningham, 1967; Weber et al., 2002). In consumer behaviour theory, Bauer (1960) defines perceived risk as "the sense that any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant" (p.24). Perceived risk is also characterised as a person's subjective feelings of certainty to act in an uncertain environment (Cunningham, 1967), or a subjective expectation of suffering a loss to pursue the desired outcome (Bélanger & Carter, 2008). In finance, perceived risk may be described as "a person's standing on the continuum from risk aversion to risk-seeking" (Weber et al., 2002, p. 264).

Perceived risk differs from actual risk. The way that risk is perceived can be more or less severe than actual risk. Established research shows that people do not always have a realistic or accurate view of actual risk (e.g. Gilbert, 2009; Schneier, 2006). For example, Gilbert (2009) argues that individuals are likely to over-react or under-react to actual risks. They worry more about anthrax (intentional action) than influenza (a natural accident) although an annual death toll of anthrax may be zero, while an annual death toll of influenza may be a half-million people. Schneier (2006) also reveals that people underestimate risks they voluntarily take, and overestimate risks they cannot control. In stock investment, perceived risk may lead to adverse results. For example, investors tend to be overly optimistic about the potential for good

performance or be excessively confident about their ability in predicting the possible good outcomes of the investments they make (e.g. Barber & Odean, 2001; Kim and Nofsinger, 2003). As a result, these optimism or overconfidence biases lead to suboptimal returns. Behavioural biases will be examined in Section 2.6.

Perceived risk also varies based on personal characteristics or a country's culture. Namely, males are more overconfident or less risk-averse than females (Barber & Odean, 2001; Weber et al., 2002). Kim and Nofsinger (2003) also find that people in Asian culture tend to be more overconfident than people in other cultures. Products in less-developed countries are perceived as riskier due to the high likelihood of poor quality (Alden, Stayman, & Hoyer, 1994).

2.3.2 Investors' perceived risk

The concept of perceived risk differs between finance and consumer behaviour frameworks. As shown in Figure 2.2, in traditional finance theory, objective risk is normally measured through beta or standard deviation, while in behavioural finance or consumer behaviour frameworks, the subjective risk is measured through investors' perspectives.

Within the finance framework, investors are seen as being only concerned about financial risk (gain or loss) when investing in stocks. This may lead to an inaccurate assessment of the perceived risk of an investment because investors miss some critical facets of the risk. Within a consumer behaviour framework, consumers are concerned with a wide variety of risk including financial risk (potential to suffer financial harm); performance risk (perform more poorly than expected); safety risk (create harm to their safety); psychological risk (harm their sense of self and, thus, create negative emotions); social risk (do harm to their social standing); and time risk (lead to loss of time).

Given that both investors and consumers make decisions under uncertainty, it could be posited that investors may, in addition to financial risk, be concerned about the other facets of risk used

in consumer theory. This thesis thus explores this and finds that, as well as financial risk, investors are concerned about additional six kinds of risk, namely information safety, social standing, investment opportunities, investment time, investment choice, and the use of leverage for investment. The findings of this thesis provide novel insights into investor behaviour.

Figure 2.2: A summary of concepts of perceived risk

Collected by this thesis
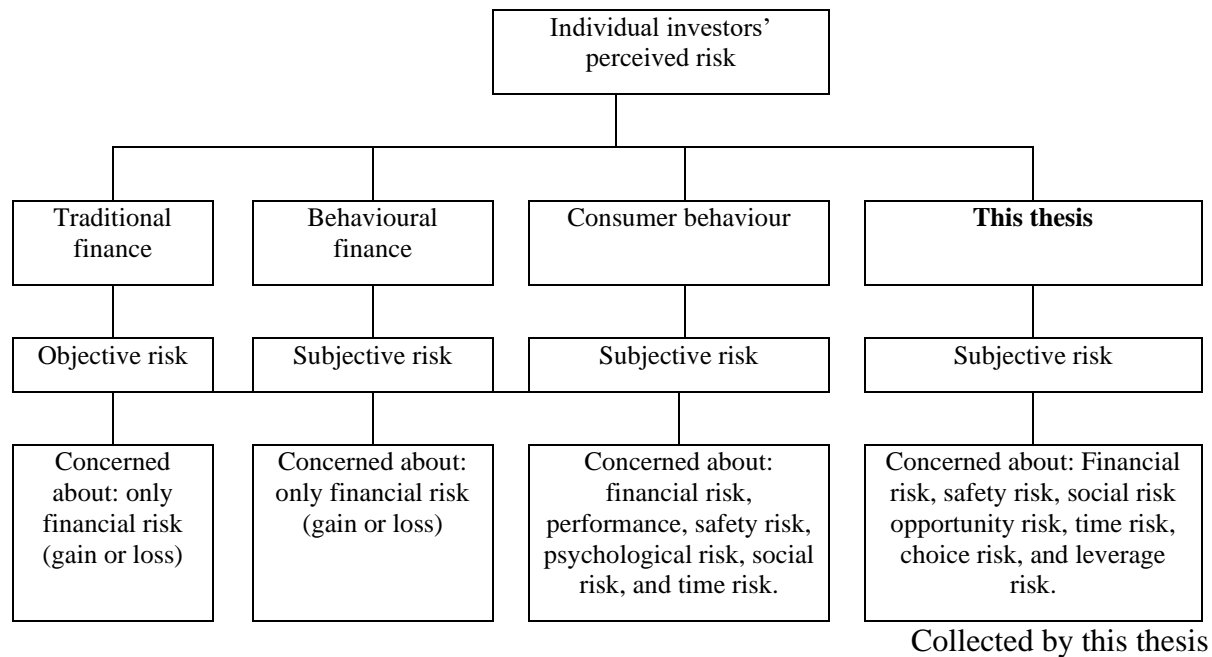
In summary, based on the consumer behaviour framework in terms of perceived risk, this thesis finds that investors are concerned with seven facets of risk, namely financial risk, safety risk, social risk, opportunity risk, time risk, choice risk, and leverage risk. These facets of risk form investors' perceived risk of stock investment.

The three fields of traditional finance, behavioural finance and consumer theory have differing perspectives of the relationship between risk and return in terms of investor behaviour. The traditional finance framework assumes that investors are always rational and risk-averse, and the relationship between risk and return is positive. These assumptions have been the focus of much debate by scholars of behavioural finance and consumer theory. These debates are presented below.

2.3.3 Investors' rationality and risk aversion

Within traditional finance framework, for example, modern portfolio theory (MPT) by Markowitz (1952) and the Capital Asset Pricing Model (CAPM) by Sharpe (1964), Lintner (1965) and Mossin (1966) assume that investors are rational and risk-averse in terms of their expected returns. This means that for a specific level of return, investors prefer a less risky portfolio to a riskier one. In general, scholars of traditional finance ignore all behavioural factors, which often play a part in human decision-making. These assumptions have been debated by scholars of behavioural finance and consumer behaviour and are outlined in Figure 2.3.

Figure 2.3: A summary of investors' behaviour in investment decision-making

Individual investors' behaviour			
Traditional finance	Behavioural finance	Consumer behaviour	**This thesis**
Rational	Irrational	Irrational	Irrational
Risk-averse always	Case 1: Risk-averse in the gains situations. Risk-seeking in the loss situations. / Case 2: Risk-averse after gains. Risk-seeking after losses / Case 3: Risk-seeking under circumstances	Most consumers are risk-taking	Investors who use debt are more risk-tolerant than those who do not

Collected by this thesis

Within the behavioural finance framework, many scholars argue that investors are not always rational because inadequate information, cognitive limitations, mental short-cuts, heuristics, or emotions can influence decision-making processes away from what may seem strictly rational, for example (Bikas, Jurevičienė, Dubinskas, & Novickytė, 2013; Bloomfield, 2010; Kahneman & Tversky, 1979; Ricciardi, 2008) . Investors are risk-averse in winning situations and risk-seeking in losing situations (Chen, Kim, Nofsinger, & Rui, 2007; Kahneman & Tversky, 1979; Rau, 2014). Importantly, investors also have a range of needs apart from maximising monetary outcomes and, thus, they may choose a course of action to satisfy these needs, e.g. loss avoidance instead of optimising the financial result (Barber & Odean, 2013; Barberis & Huang, 2001; Berkelaar & Kouwenberg, 2009; Easley & Yang, 2015; Rau, 2014).

There are three cases to assess whether investors are risk-averse or risk-taking. First, investors may be risk-seeking in winning situations and risk-averse in losing situations (Chen, Kim, Nofsinger, & Rui, 2007; Kahneman & Tversky, 1979; Rau, 2014). Investors are averse to loss (known as *loss aversion*) (e.g. Barber & Odean, 2013; Barberis & Huang, 2001; Berkelaar & Kouwenberg, 2009; Easley & Yang, 2015; Rau, 2014) and feel more pain for a loss than pleasure for gains. This leads them to hold a losing investment longer to avoid the loss and to sell a gaining investment soon because they think their profit will erode. This is referred to as a *disposition effect* (Chen, Kim, Nofsinger, & Rui, 2007; Kahneman & Tversky, 1979; Rau, 2014). These behaviours will be discussed in Section 2.5.

Second, investors may become risk-takers after gains and risk-averters after losses (Nofsinger, 2008; Ricciardi, 2008; Thaler & Johnson, 1990). Winners (who gained early) may take more risk because they think their gains are not their own money (known as a *house-money effect*). Losers (who lost early) may take less risk because they feel they will continue to be unlucky (referred to as a *risk-aversion effect*) (Nofsinger, 2008; Thaler & Johnson, 1990).

Finally, some investors may be risk-taking no matter what their prior results are. That is, either winners or losers take on more risk for the next investment. This is because losers will engage in riskier activities in an attempt to regain losses (known as the *break-even effect)* so are willing to accept a double-or-nothing toss of the coin, even when they have less than a 50% chance of winning (Kahneman & Tversky, 1979; Nofsinger, 2008). As a result, in most circumstances, investors are risk-taking, regardless of whether they have prior gains or losses.

Bauer (1960) states that consumer behaviour framework has approached buying choices from a different angle, arguing that consumers are not perfectly rational because, as human beings, consumers are often constrained from accessing data sources and limit the ability to calculate the risks involved correctly. As a result of this assumption, consumers tend to assess risk through their less than perfect judgement (Bauer, 1960; Peter & Tarpey Sr, 1975; Sedgwick & Pokorny, 2010).

Most consumers are risk-taking in the sense that they are facing many kinds of risk when buying a product (Bauer, 1960; Sedgwick & Pokorny, 2010). For example, consumers are facing safety risk where their personal information may be leaked by hackers or viruses when they buy online.

This thesis is open to the view about investors being irrational in decision-making to that found by scholars of behaviour finance and consumer behaviour (e.g. Barber & Odean, 2013; Barberis & Huang, 2001; Berkelaar & Kouwenberg, 2009; Easley & Yang, 2015; Rau, 2014; Sedgwick & Pokorny, 2010). Moreover, this thesis argues that investors who use debt for stock investment are prone to be more risk-tolerant than those who do not, no matter what kinds of debt are used (formal or informal). This is because more debt, particularly higher levels of debt means more leverage and therefore, more risk and a greater chance of insolvency if stock investments go bad.

Not only do scholars of behavioural finance and consumer behaviour debate investors' rationality and risk aversion, but they also argue the positive relationship between risk and return inherent in the models of traditional finance.

2.3.4 The trade-off between risk and returns

Models of traditional finance assume that risk-averse investors must be compensated for taking on more risk with higher expected returns, meaning a positive association between risk and return (e.g. the Capital Asset Pricing Model – CAPM).

The risk-return trade-off is briefly outlined in Figure 2.4. The behavioural framework argues that the relationship between risk and return is not always positive; instead, this relationship may be positive or negative dependent on the decision-makers' perspectives or the specific features of a product (e.g. Byrne, 2005; Diacon and Ennew, 2001; Ganzach, 2000; Shefrin, 2001; Trang and Tho, 2017).

MacGregor, Slovic, Berry, and Evensky (1999), for example, find an inverse relationship between perceived risk and perceived returns. Shefrin (2001) argues that perceived risk is negatively associated with perceived returns on account of the representativeness bias of decision-makers. Investors thus believe that stocks from companies that are well run and financially sound are representative of good stocks, leading them to expect high returns from these stocks, as well as leading them to expect a comparatively lower risk. By contrast, Trang and Tho (2017) argue that perceived risk can be positively associated with perceived returns (perceived investment performance). That is, once investors perceive their stock investment as being high risk, this investment is also perceived to have high returns. Ganzach (2000) argues that the association between perceived risk and returns can be negative or positive dependent on the characteristics of the financial product. Ganzach (2000) classifies the assets into familiar and unfamiliar. For *unfamiliar* financial assets, the risk-return relationship is inverse because

the judgments pertain to the global preference, while for the *familiar* financial assets, the risk-return association is positive because the actual values of risk and expected returns determine this trade-off.

Figure 2.4: A summary of the perspectives of the risk-return trade-off

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                    │ The relationship between risk│
                    │         and returns          │
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   │Traditional│ │Behavioural│ │   Consumer    │ │This thesis│
   │  finance  │ │  finance  │ │   behaviour   │ │           │
   └─────┬─────┘ └─────┬─────┘ └───────┬───────┘ └─────┬─────┘
   ┌───────────┐ ┌───────────┐ ┌───────────────┐ ┌───────────┐
   │A positive │ │Positive or│ │Positive or    │ │Positive   │
   │risk-return│ │negative   │ │negative risk- │ │relationship│
   │ tradeoff  │ │risk-return│ │benefit trade- │ │between    │
   │           │ │ tradeoff  │ │off            │ │risk-debt  │
   └───────────┘ └───────────┘ └───────────────┘ └───────────┘
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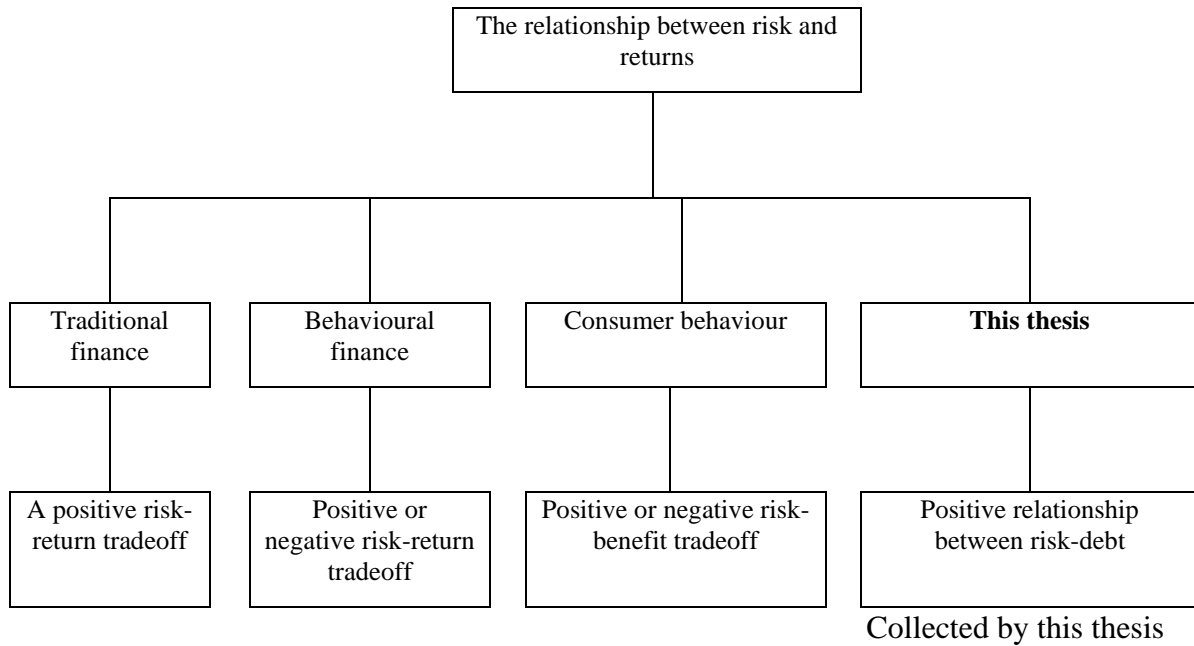
Peter and Tarpey Sr (1975) also argue that there is a negative relationship between perceived risk and perceived returns among consumers. Peter and Tarpey Sr (1975) examine three models of making decisions on brand preference. Model 1 pertains to choices of brands that minimise loss (perceived risk). Model 2 focuses on options of the brand that maximises gain (perceived return), and model 3 is where consumers select the brand that maximises net gains (net perceived returns = gain minus loss). Of those, they argue that the net perceived return model (model 3) accounts for more variance in brand preference than model 1 and 2, indicating that consumers expect both high returns and low risk. Alhakami and Slovic (1994) investigate 40 different activities and find an inverse relationship between perceived risk and perceived benefits. Diacon and Ennew (2001) argue that, for investments with below-average levels of consumer distrust (e.g. banks and building society accounts), a decrease in risk (distrust) leads

22

to an increase in perceived return (benefit), showing a negative relationship between perceived risk and returns. However, for investments with higher-than-average distrust levels (e.g., an endowment policy or personal pension), perceived risk is positively associated with the perceived return (benefit). Agarwal and Teas (2001) find that consumers' performance risk and financial risk negatively influence the perceived value of products. Byrne (2005) explores that the relationship between perceived risk and returns is positive and that the positive risk-return trade-off only occurs to experts, but not to novices.

As a result, some scholars (e.g. Byrne, 2005; Ganzach, 2000; Trang & Tho, 2017) find a positive risk-return relationship, while others (e.g., Diacon & Ennew, 2001; MacGregor et al., 1999; Shefrin, 2001) argue that the relationship between risk and return is inverse.

This thesis does not address the relationship between risk and return. Instead, it applies this positive risk-return relationship. It is a fact that using debt effectively enhances returns through leverage, and so, the link between debt levels and expected return is positive. This thesis examines the relationship between perceived risk and debt decisions and finds a positive link between perceived risk and the use of informal debt.

2.4 Trust in decision-making

2.4.1 Concepts of trust

Trust plays an important role in investor decision-making. Hardin (2006) define trust as cognitive, not as an action or choice because "our trust in another is essentially a matter of relevant knowledge about that other, in particular, knowledge of reasons the other has to be trustworthy" (p. 38). Trust pertains to an *encapsulated interest* that refers to a notion that A trusts B due to X. That is, A believes B has some reason to act in A's best interest (Cook, 2001; Hardin, 2001). Cook (2001) argues that this model does not make much sense because

A might trust B due to X, Y but not Z. Also, it is hard to say who the B is and what the X is in the relation "A trusts B to do X".

Barbalet (2009) also argues that trust is often emotional rather than cognitive or rational. The basis of trust "is the feeling of confidence in another's future actions and also confidence concerning one's judgment of another" (Barbalet, 2009, p. 375). Also, trust is non-transitive; that is, when A trusts B and B trusts C, it does not mean that A trusts C; and since trust has a central emotional factor it cannot be transitive (Barbalet, 2009). Like Barbalet (2009), Pixley (2004) states that the future is unknowable and implications of its unknowability seem terrifying. Thus, trust surrounding uncertainty enables decisions to be made.

Shapiro (2012) has a different view of trust. Shapiro conceptualises trust as the *asymmetric agency* in which individuals or organisations (known as agents – those trusted) act on behalf of others (known as principals - trustors). Shapiro argues that in a case of A trusts B, B holds the position of trust regardless of whether A considers B trustworthy, feels confident about B, or whether B encapsulates the interest of A that B serves. B here acts with disinterestedness, full and honest disclosure, diligence, duties of care, or performance that is consistent with A's expectations under the circumstances.

This thesis follows Shapiro's perspectives and investigates the extent to which investors trust their advisors, friends (who work for securities companies), brokerage firms, and stock exchanges when investing in stocks.

2.4.2 Trust in finance

Trust plays a vital role in social capital, for example, (Barbalet, 2009). Social capital is viewed as "an investment that persons make in social relationships that enhance or enrich their social resources" (Barbalet, 2009, p. 377). Trust is an essential ingredient for the success of a securities market (Stout, 2009).

Within the behavioural finance framework, for example, Stout (2009) argues that investors do not always behave in a cool, calculating, or a purely self-interested manner. Statman (2005) also states that investors are never rational and that they are not "rational expectations investors". Instead, they are "trusting investors", who readily believe that at least some people and some organisations are trustworthy (Stout, 2009, p. 5). That is, trusting investors think that trustees desist from exploiting their trust, even though they do not know what precludes this exploitation (Stout, 2009).

Trust is found to be positively associated with risk-taking behaviour, for example, stock market participation (Georgarakos & Pasini, 2011; Guiso, Sapienza, & Zingales, 2008). As with these scholars, this thesis assumes that the relationship between trust and risk-taking behaviour is positive, meaning a positive trust-debt association. Prospect theory and heuristics are the foundation of behavioural finance.

2.5 Behavioural finance framework

2.5.1 Prospect theory and its concepts

Behavioural finance is descriptive and underscores why investors make decisions (Ackert, 2014). Proponents of behavioural finance (Bikas, Jurevičienė, Dubinskas, & Novickytė, 2013; Bloomfield, 2010; Kahneman & Tversky, 1979; Ricciardi, 2008) debate that traditional models cannot delineate investors' actual behaviour, and that the assumptions about investors appear unrealistic; Investors may be irrational (not always rational) or risk-taking (not always risk-averse). They may also have inconsistent preferences, seek satisfactory choices, have opportunities to earn abnormal returns or expect high returns with low risk; For example, Kaniel, Liu, Saar, and Titman (2012) find that investors make abnormal returns throughout the periods of earnings announcements. One of the well-known theories related to behavioural finance is the prospect theory.

Prospect theory developed by (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981) highlights that people inconsistently make decisions; they are risk-averse in terms of gains, but risk-taking in terms of losses. The S-shaped value function also indicates convexity in the domain of losses and concavity in the area of gains. Importantly, the value function is steeper for losses than for gains, meaning that pain from losses is much greater than pleasure from gains. This behaviour is known as *loss aversion* (Kahneman & Tversky, 1979, p. 279); Loss aversion also shows that people who make a loss after prior gains are less loss-averse than those making a loss after previous losses.

2.5.2 Key concepts of prospect theory

As shown in Figure 2.5, the key concepts of prospect theory are the disposition effect, regret aversion, mental accounting, and self-control (Brabazon, 2000; Strahilevitz, Odean, & Barber, 2011; Waweru, Munyoki, & Uliana, 2008).

Figure 2.5: A summary of the key concepts of Prospect theory
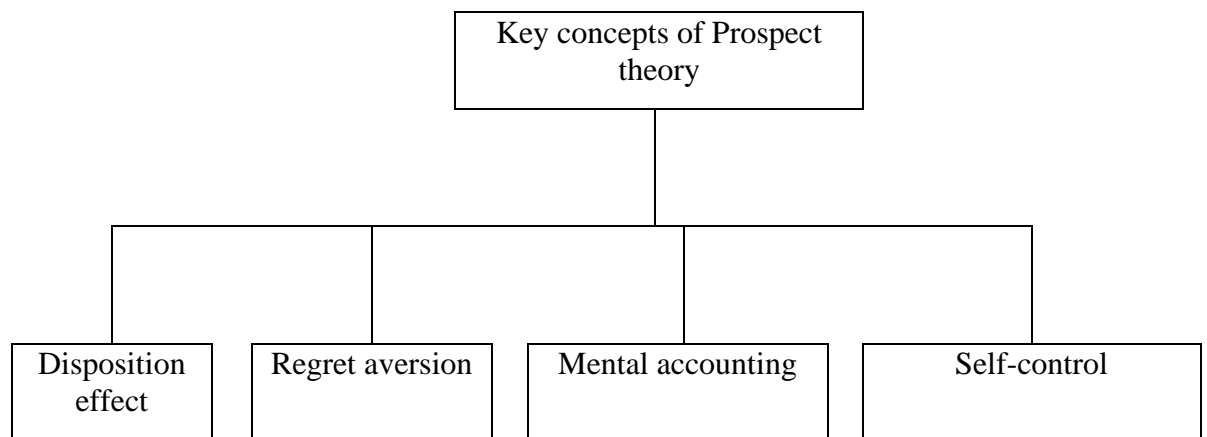
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The disposition effect defined by Shefrin & Statman (1985) as situations where investors tend to sell winning stocks (winners) too soon and hold onto losing stocks (losers) too long. Odean (1998) states that investors are reluctant to realise losses but quick to realise gains. Winning stocks sold too soon implies that these stocks continue to perform well after being sold. Losing stocks held too long suggests that these stocks continue to perform poorly, for example, (Chen,

Kim, Nofsinger, & Rui, 2007; Kahneman & Tversky, 1979; Nofsinger, 2008; Rau, 2014; Shefrin & Statman, 1985). Nofsinger (2008) states that one of the reasons to explain the disposition effect is tax issues in countries where there is a capital gains tax on equities. If stocks are sold for a profit, tax on the capital gains must be paid, thus decreasing the amount of the gain. In contrast, if stocks are sold for losses, these losses give opportunities to reduce taxes, hence decreasing the amount of the loss.

The regret aversion effect is defined as "an emotional feeling associated with the ex-post knowledge that a different past decision would have fared better than the one chosen" (Shefrin & Statman, 1985, p. 781). Regret aversion is described as a "painful cognitive and emotional state of feeling sorry for misfortunes, limitations, losses, transgressions, shortcomings or mistakes" (Landman, 1993, p. 36). Regret differs from pride: regret is the pain of realising that prior decisions become bad ones, whereas pride is the joy of realising that prior decisions become good ones. People often seek actions that bring pride for them and avoid actions that bring them regret (Nofsinger, 2008). Investors fear regret and seek pride results in the disposition effect; they sell winning stocks too soon and hold onto losing stocks too long (Chen, Kim, Nofsinger, & Rui, 2007; Kahneman & Tversky, 1979; Rau, 2014). Also, investors face greater regret about holding onto a losing stock too long than about selling a winning stock too soon (Fogel & Berry, 2006; Shefrin & Statman, 1985); As a result, regret is an element in the disposition effect because the pain associated with the realisation of loss is greater than the pride associated with the realisation of gains. The third behaviour with respect to prospect theory is mental accounting.

Mental accounting is defined as "the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities" (Thaler, 1999, p. 183). Mental accounting is also viewed as a process by which people code, classify, and evaluate outcomes by gathering their money into non-interchangeable mental accounts (Pompian,

2012a). Mental accounting provides a better understanding of the psychology of choice because "mental accounting rules are not neutral" (Thaler, 1999, p. 185). According to the expected utility theory, money is fungible, while researchers of behavioural finance contend that money is non-fungible in one mental account and is not well replaced by money in another account (Barberis, & Huang, 2001; Pompian, 2012a; Thaler, 1999); for example, money for a vacation is not a good substitute for money for bills (Pompian, 2012a). The potentially serious problem is that mental accounting may predispose investors to treat stocks in a portfolio separately, or they construct portfolios regardless of the correlations among these stocks, leading to suboptimal overall outcomes (Pompian, 2012b). Mental accounts, e.g. retirement accounts, are useful for investors who have good self-control because self-control reminds them to avoid overspending at the point of payment (Nofsinger, 2008).

Lastly, self-control is defined as "the human behavioural tendency that causes people to consume today at the expense of saving for tomorrow" (Pompian, 2012b, p. 211). Everyone is assumed to be "both a farsighted planner and a myopic doer", which leads to internal conflict as the planner suggests saving money for the future while the doer would like to consume money today (Thaler & Shefrin, 1981, p. 392). The conflict is that one is concerned with long-term goals, e.g. saving for retirement (the planner), and the other is interested in short-term satisfaction, e.g. shopping (the doer) (Barberis & Huang, 2001; Pompian, 2012b; Thaler & Shefrin, 1981). This phenomenon contradicts the traditional finance of optimal saving decision under risk, whereby income risk (uncertainty about future non-capital income) increases current saving (Barberis & Huang, 2001; Menezes & Auten, 1978). This conflict is similar to the agency conflict between the owners and managers of a firm. Both individuals and firms attempt to preclude these conflicts. People often fail to pursue their long-term goals because they prefer spending today over saving for tomorrow, or they have a strong desire and weak willpower, indicating a lack of planning or lack of self-control (Heidhues & Kőszegi, 2010;

Lusardi, 1999). Investors who are biased against self-control often prefer investing in stocks to investing in bonds, or they lack basic financial knowledge such as compounding of interest. For instance, the majority wish to have $50 immediately instead of receiving $100 in two-year time, even given the 41% annual return (Nofsinger, 2008, p. 98).

2.5.3 Heuristic and its concepts

Scholars of behavioural finance also argue that not only is a decision to be made based on the key concepts of prospect theory, but investors also make decisions based on rules of thumb, which is known as heuristics.

Simon (1978), a founder of the theory of bounded rationality, argues that people would like to make rational decisions, but they are restricted by available information and by limited ability. This means that, in many circumstances, people make decisions which are satisfactory rather than optimal. Tversky and Kahneman (1974) argue that, when faced with risky or uncertain situations, decision-makers use rules of thumb known as heuristics to solve problems. Heuristics are useful for decision-makers, attaining good outcomes (Todd & Gigerenzer, 2003), but sometimes resulting in suboptimal outcomes or systematic errors (Huberman, 2001; Tversky & Kahneman, 1974).

2.5.4 The concepts of heuristics

Five key heuristics concepts; representativeness, overconfidence, gambler's fallacy, anchoring, and availability are summarised in Figure 2.6.

Figure 2.6: A summary of the key concepts of heuristics

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                    │  Key concepts of │
                    │    heuristics    │
                    └─────────────────┘
                             │
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    │              │         │          │              │
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│ Represen-│ │  Over-   │ │Gambler's │ │Anchoring │ │Availability│
│tativeness│ │confidence│ │ fallacy  │ │          │ │          │
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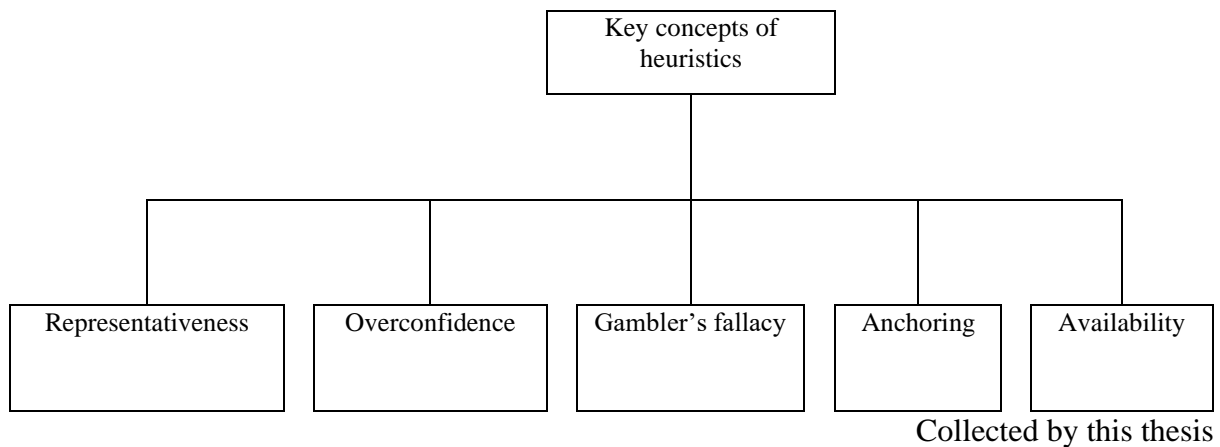
Representativeness is defined by Kahneman & Tversky (1972) as an assessment of an uncertain event by inferring from (i) the similarity of this event to its parent population and (ii) the outcomes of this event generated at random. People assess a sample according to the degree to which this sample is similar to the entire sample (standard); e.g., a librarian is assessed based on the degree to which they resemble the prototypical librarian (Gilovich, 1991). This judgement is helpful because it shares a resemblance. However, if we over-apply this judgment, we encounter difficulty because all things are not always equal; e.g., not all librarians are always the prototypical librarian (Gilovich, 1991). Moreover, people evaluate uncertain action by generating the random outcomes of this action (Kahneman & Tversky, 1972). A key feature of apparent randomness is the lack of systematic patterns; therefore, irregularity and local representativeness are considered as two general properties for randomness (Kahneman & Tversky, 1972). Irregularity indicates that an uncertain event fails to reflect the randomness. For example, consider the sequence outcomes in a fair coin flipping (heads and tails). If the outcomes are H T H T H T H T or T T H H T T H H, these outcomes are not viewed as representative of a random generating process because their order is too perfect (Kahneman & Tversky, 1972). Local representativeness assumes that small samples are representative of large samples (Kahneman & Tversky, 1972). This assumption causes people to display bias in decision-making because short-term behaviour is taken to be indicative of long-term trends.

For instance, when equity returns have been high for many years (from 1982 to 2000 in the US and Western Europe), investors believe high equity returns are common (e.g. Chen, Kim, Nofsinger, & Rui, 2007; Ritter, 2003). Investors also buy only hot shares and avoid shares with poor performance, or define good shares as the shares whose firms have good past earnings growth (e.g. Chen, Kim, Nofsinger, & Rui, 2007; De Bondt & Thaler, 1995; Phung, 2015).

Overconfidence is defined as "overestimation of one's actual performance, over-placement of one's performance relative to others, and excessive precision in one's beliefs" (Moore & Healy, 2008, p. 502). Overconfident people believe their knowledge is greater than it actually is, or their information is more precise than it is (Barber & Odean, 2001; Merkle, 2017; Odean, 1998). Overconfident investors believe their knowledge or investment skills are above average (Dorn & Huberman, 2005; Glaser & Weber, 2007; Odean, 1999). They trade excessively; importantly, men tend to be more overconfident and, consequently, are more likely to trade than women and earn lower returns than women (Barber & Odean, 2000). They also underestimate risks, overestimate expected returns, hold undiversified stock portfolios (Pompian, 2012a), and have suboptimal outcomes (Barber & Odean, 2013) or poor investment results (Pompian, 2012a). This behaviour appears difficult to correct because people find it hard to "revise self-perception of their knowledge and abilities" (Pompian, 2012a, p. 45).

Gambler's fallacy (also known as Monte Carlo fallacy or the fallacy of the maturity of chances) is defined by Lepley (1963) as the belief that, if a random event repeatedly occurs on one direction during a certain period, then the event will subsequently move repeatedly in the opposite direction in the future to ensure that randomness is evened out. The law of small numbers boasts the belief in gambler's fallacy; for example, if a fair coin has five heads in a row, people believe that tails will come up because more tails might arise to offset against a large number of heads (Barberis & Thaler, 2003). This belief is false because they have a misperception of the fairness of the law of chances, in which the probability of random events

is independent (Barberis & Thaler, 2003; Tversky & Kahneman, 1971). Investors affected by gambler's fallacy incorrectly predict a reverse trend of stock prices (Brabazon, 2000). They believe that, if shares have traded a large number of times, these shares will trade less in the next time period; if shares have not been traded for a long time, these shares will trade in this time period; if they have not earned returns for several trades, they will gain for the next trades (Luong & Ha, 2011; Ngoc, 2014; Phung, 2015).

Anchoring is defined as people relying too heavily on initial pieces of information to make subsequent decisions (Tversky & Kahneman, 1975). People often "anchor too much on the initial value" (Barberis & Thaler, 2003, p. 1068). People often take account of a reference point as the anchor, then predict the outcomes according to this adjusted anchor. Investors make decisions based on their purchase prices as reference points (Kahneman & Riepe, 1998). This phenomenon causes investors to expect changes in current stock prices to be consistent with their historical trends, and to anticipate future share prices to relate closely to the initial values (the anchor); as a result, suboptimal outcomes ensue (Brabazon, 2000; Kahneman & Riepe, 1998; Pompian, 2012a).

Finally, availability is defined as arising in situations in which "people assess the frequency of a class or the probability of an event by the ease with which instances or occurrences can be brought to mind" (Tversky & Kahneman, 1975, p. 1127). People are often biased by availability because they find it easy to recall frequent situations (Tversky & Kahneman, 1973). Pompian (2006) classified availability into four facets: (a) Retrievability, where people tend to select investments with available information; (b) categorisation, where investors attempt to categorise information that suits a specific reference; (c) the narrow range of experience, where investors select investments that match their narrow range of life experiences, the regions they live in, and the people they contact; and (d) resonance, where investors choose investments that are similar to their personality or have characteristics related to their behaviour.

Vietnamese investors are the respondents of this thesis. It is essential, therefore, to review current studies on the effect of behavioural finance on investment decisions in Vietnam.

2.6 Recent research on investors' behavioural biases in Vietnam

The literature on investor behaviour in Vietnam is small in volume. Phan and Zhou (2014) interview 20 retail investors to find that 4 behaviour biases affect investment intentions; overconfidence, excessive optimism, the psychology of risk, and herd behaviour. The results indicate 4 key investor attributes.

First, overconfidence: 60% of informants exhibit overconfidence. They strongly believe in their abilities in regard to investment regardless of their participation in any training courses on stock investment. They also believe that they have better abilities in investment than others, that they are in full control of their investment, and that their successful investment emanates from their knowledge. Interestingly, 100% of informants believe that they genuinely understand the Vietnamese stock market. Second, excessive optimism: 70% of informants reveal excessive optimism about; (a) continuing to purchase stocks, even when the market has a downward trend, (b) increasing their investment capital in the next year, and (c) that the Vietnamese stock market would rebound in the next year. Third, the psychology of risk: 45% of investors prefer a period of price fluctuations because they believe that they will earn high returns from these fluctuations. Sixty per cent of them readily hold the losing stocks longer until their prices go up and invest in firms that are familiar to them or firms that pay cash dividends. Lastly, herd behaviour: Sixty per cent of investors make decisions based on the ideas of others, the crowd, or the movements of the digital stock board.

Ngoc (2014) surveys 188 individual investors and discovers that investors are biased in decision-making. The behaviour biases include herding, overconfidence-gamblers' fallacy, and anchoring-ability biases affecting investment decisions. Ton and Dao (2014) survey 422

investors and find that excessive optimism, risk psychology, and excessive pessimism positively influence long-term investments. In contrast, overconfidence and herd behaviour negatively impact on long-term investments. Cuong and Jian (2014) survey 472 retail investors, 40.5% of which were female, and find that overconfidence, excessive optimism, the psychology of risk, and herd behaviour have a significant impact on the individuals' attitude towards investment. The authors, interestingly, do not observe higher overconfidence among male investors than among female investors. Phung (2015) conducts in-depth interviews and a survey of 220 individual investors, and finds that representativeness and over/under-reaction positively, and gambler's fallacy negatively, affected investment decisions.

Nguyen and Pham (2018) investigate the relationship between search-based sentiment and stock market reactions in the Vietnam stock market. The sentiment index is established from the Google Trends' Search Volume Index of financial and economic terms Vietnamese search from January 2011 to January 2018. The authors find that the sentiment-induced impact is mostly driven by pessimism, and optimistic investors appear to postpone investment until the market corrects. Tho, Trang, and Van Hoa (2018) construct research scales to distinguish risk avoidance, ambiguity avoidance and uncertainty avoidance and then survey 400 investors. The results show that investors are most likely to avoid; ranked in descending order; uncertainty, ambiguity and risk, and female investors are more likely to avoid these situations than men. An increase in participation in investment courses leads to a rise in avoidance of risk, ambiguity and uncertainty, and to choosing safer investments.

2.7 Summary

This chapter has examined the theoretical background of this thesis relating to finance theory and to consumer behaviour. Scholars have, however, opposing views amongst the framework of traditional finance, behavioural finance, and consumer behaviour. This thesis largely focuses

on investors' decision-making in the context of traditional finance, behavioural finance, consumer behaviour. This thesis presents current literature on investors' perceived risk, the relationship between risk and return, investors' rationality and risk aversion, the trade-off between risk and return, and investors' trust in decision-making. This thesis also focuses on prospect theory, heuristics and current research of investors' behavioural biases in Vietnam.

The main tenets of this thesis are summarised as follows. First, investors can choose both informal and formal debt for stock investment. Second, a decision to be made is affected by many facets of risk, including financial risk, safety risk, social risk opportunity risk, time risk, choice risk, and leverage risk. Third, investors who use debt are more prone to risk-tolerant than those who do not. Lastly, the relationship between risk and debt is positive.

Chapter 3 Methodology

Introduction to this chapter

Structural equation modelling (SEM) is the main method applied to this thesis because SEM is the most useful technique for examining the direct and indirect relationships of multiple variables in a model concurrently. This chapter starts with an introduction to the structural equation modelling technique. The focus of SEM is on the importance of SEM, SEM structure, estimated relationship values, measurement error, and model fit. The following sections discuss the sample size, survey process, and the robustness checks. Additional techniques employed to examine the robustness of the results by SEMs are multiple and stepwise regression, Hayes and Preacher's approach, a t-test method, the propensity score matching method, and the instrumental variables (IVs) approach. Solutions to locations selection bias and response bias are also presented in the robustness check section. This chapter also presents investors' characteristics, debt decisions, control variables, and ends with a summary.

3.1 Structural equation model (SEM)

3.1.1 The importance of SEM in testing the relationships between variables

As defined by Hair, Black, Babin, and Anderson (2014), structural equation modelling is "a family of statistical models that seek to explain the relationships among multiple variables" (p.546).

The SEM technique can examine mediating relationships between variables. "Mediating variables" are "prominent in psychological theory and research", and their role is to transmit the impact of an independent variable on a dependent variable (MacKinnon, Fairchild, & Fritz, 2007, p. 593). The mediating variable is also referred to as the mediator variable, intermediary variable, or intervening variable.

SEM is useful in testing theories that have multiple equations, with the multiple variables acting as independent and dependent variables, as shown in Figure 3.1. These theories are based on the perspectives arising from prior empirical studies, experience, and observations of actual behaviour or attitudes. In other words, an SEM model is a representation of a theory that provides a consistent and comprehensive explanation of phenomena, benefiting both academia and industry. The notable point is that SEM can be used for all kinds of variants such as nonmetric, categorical variables, and even a MONOVA model (Hair et al., 2014).

Hair et al. (2014) illustrate an example where SEM can examine the variable of satisfaction acting as both independent and dependent variables in a model including the image, satisfaction, and loyalty of customers:

> If we believe that image creates satisfaction and satisfaction creates loyalty, then satisfaction is both a dependent and an independent variable in the same theory (p.542).

SEM has two distinctive advantages compared to other techniques, such as multiple regression. First, SEM can assist researchers in testing the covariance among factors and, in particular, the factors operating as both a(n) independent and dependent variable. Second, SEM directly accommodates measurement errors in predicting the impacts of the independent variables in any particular dependence association.

MacKinnon et al. (2007) state that "mediating variables" are "prominent in psychological theory and research" (p.593). Their role is to transmit the impact of an independent variable on a dependent variable; the mediating variable also has other names such as mediator variable, intermediary variable, or intervening variable.

Figure 3.1: Structural equations modelling overview
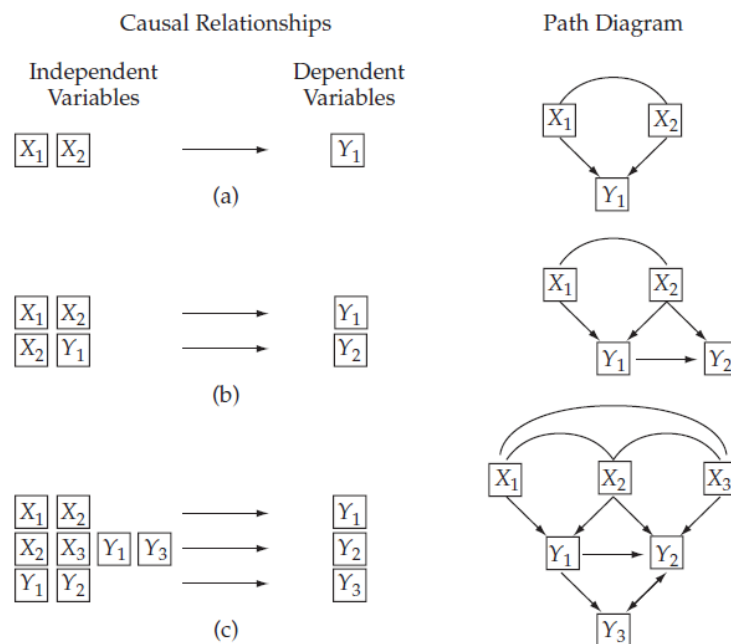
3.1.2 SEM structure

SEM overall has three advantages, for example, (Hair et al., 2014). These are; (i) an ability to estimate multiple and interrelated dependence relationships, (ii) an ability to represent unobserved concepts in these relationships and account for measurement errors in the estimation process, and (iii) an ability to define a model to explain the entire set of relationships.

SEM consists of two essential components; the measurement model, and the structural model. The former indicates how measured variables come together to represent constructs. The latter reveals how constructs are associated with each other, often with multiple dependence relationships. Note that multiple regression is not applicable in this model on account of a separate analysis in a model.

A single SEM model mostly contains both correlational (or covariance) relationships and dependence relationships among exogenous and endogenous variables. Exogenous constructs are seen as independent variables and determined by factors outside of the model. Endogenous constructs are dependent variables and affected by elements within the model.

As exhibited in Figure 3.2, an exogenous variable represents an independent variable, and an endogenous variable represents a dependent variable. A dependence relationship between two variables, e.g., constructs 1 and 2, is represented with single-headed directional arrows. Covariance relationships between construct 1 and 2 are described with two-headed arrows. Ovals or circles symbolise the latent constructs, and squares or rectangles denote the measured variables (e.g. X1 to X3). A structural equation model (SEM) can be represented visually with a path diagram.

Figure 3.2: Covariance relationships between constructs
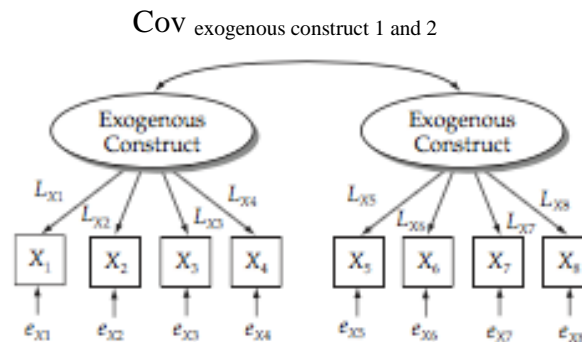
Note: Cov: covariance, X_1 to X_8: measured variables; L_{x1} to L_{x8}: coefficient between the constructs and the measured variables; e_{x1} to e_{x8}: errors.

Source: (Hair et al., 2014)

3.1.3 Estimated relationship values

SEM differs from other multivariate techniques, in which SEM is a covariance structure analysis rather than a variance analysis technique used in multiple regression. SEM can be estimated with covariances or correlations. The first example of calculating the coefficient relationship between X1, X2, and Y1 is shown below, according to Hair et al. (2014, pp. 592-593). Note that there is no mediating variable.

Based on this path diagram, the general linear regression is: $\hat{Y}_1 = BX_1 + CX_2$

Path Diagram
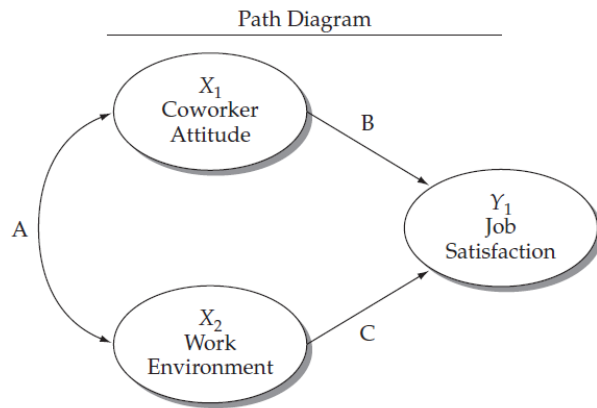
Bivariate Correlations

	X_1	X_2	Y_1
X_1	1.0		
X_2	.50	1.0	
Y_1	.60	.70	1.0

The estimated covariance matrix between X1, X2, and Y1 is indicated below:

Direct paths:	Indirect paths:	Total path:	The estimated correlation
X1->X2 = A		X1 -> X2 = A	$Corr_{X1,X2}$ = A
X1 -> Y1 = B	X1 ->X2 -> Y1 = AC	X1 -> Y1 = B + AC	$Corr_{X1,Y1}$ = B + AC
X2 -> Y1 = C	X2 -> X1-> Y1 = AB	X2 -> Y1 = C + AB	$Corr_{X2,Y1}$ = C + AB

The table of Bivariate Correlations also shows the correlation value of 0.5 for X1 and X2, 0.6

for X1 and Y1, and 0.7 for X2 and Y1. This means that:

$0.5 = A$

$0.6 = B + AC$

$0.7 = C + AB$

Substituting A = 0.5:

$0.6 = B + 0.5C$

$0.7 = C + 0.5\ B$

Solving for B and C:

$B = 0.33$

$C = 0.53$

As a consequence, the equation indicates the coefficient regression relationship between X1, X2 and Y1:

$$\widehat{Y1} = 0.33\ X1 + 0.53\ X2$$

40

The second example is illustrated for the estimated values for direct and indirect impact (Hair et al., 2014, p. 563). Note that Job Satisfaction is a mediating variable.

There are three equations. Equation 1 shows a direct impact of Supervision, Work Environment, and Co-workers on Job Satisfaction. Equation 2 indicates a direct influence of Job Satisfaction on Job Search. Equation 3 inhibits an indirect effect of Supervision, Work Environment, and Co-workers on Job Search through Job Satisfaction.

$$\hat{y}_{Job\ Satisfaction} = \beta_1\ (\text{Supervision}) + \beta_1\ (\text{Work Environment}) + \beta_1\ (\text{Co-workers}) \tag{1}$$

$$\hat{y}_{Job\ Search} = \pi_1\ (\text{Job Satisfaction}) \tag{2}$$

$$\hat{Y}_{Job\ Search} = \alpha_1\ (\text{Supervision}) + \infty_2\ (\text{Work Environment}) + \alpha_3\ (\text{Co-workers}) \tag{3}$$

First, an equation indicates a direct impact of supervision, work environment and co-workers on job satisfaction:

$$\hat{y}_{Job\ Satisfaction} = 0.065\ (\text{Supervision}) + 0.219\ (\text{Work Environment}) + 0.454\ (\text{Co-workers}) \tag{1'}$$

Second, an equation reveals a direct effect of job satisfaction on job search:

$$\hat{y}_{Job\ Search} = 0.5\ (\text{Job Satisfaction}) \tag{2'}$$

Replacing equation (1') into equation (2'), we get equation (3'), showing an impact of supervision, work environment, and co-workers on job search through job satisfaction:

$\hat{y}_{\text{Job Search}} = 0.5 \, [0.065 \, (\text{Supervision}) + 0.219 \, (\text{Work Environment}) + 0.454 \, (\text{Co-workers})]$

$\hat{y}_{\text{Job Search}} = 0.0325 \, (\text{Supervision}) + 0.1095 \, (\text{Work Environment}) + 0.227 \, (\text{Co-workers})$ (3')

3.1.4 Measurement error

One of the problems with multiple regression is that although measurement errors can emanate from many sources, there are "no direct means of correcting for known levels of measurement error for the dependent or independent variables" (Hair et al., 2014, p. 168). In contrast, SEM (or summated scales) can address measurement errors.

Measurement error is defined as the extent to which the observed values are not representative of the *true* values (Hair et al., 2014, p. 7). Measurement error is inversely related to reliability - a measure of the degree to which a set of the measured variables of a latent construct is internally consistent based on how highly interrelated the items are with each other. The greater the relationship between a construct and the measured variables, the lower the measurement errors are. The effect of measurement error can be written as:

$$\beta_{y,x} = \beta_t * \rho_x$$

where: $\beta_{y,x}$: the observed regression coefficient, β_t: the true structural coefficient, ρ_x: the reliability of the predictor variable.

SEM makes an estimate of the actual structural coefficient (β_t) rather than the observed regression coefficient ($\beta_{y,x}$). The reliability value (ρ_x) is in the range of -1 through +1, reaching ± 1 when it is perfect, meaning that there is no measurement error. If $\rho_x < |1|$, $\beta_{y,x} < \beta_t$, it is indicated that the relationships estimated with typical multivariate procedures will understate the actual links. Therefore, the coefficient regression relationship predicted by SEM exceeds those by regression techniques with single equations.

3.1.5 A model fit

SPSS, AMOS and STATA software were applied to test the direct and indirect relationship between variables. Unlike the regression analysis or other dependence techniques that seek to explain relationships in a single equation, an SEM model tests a set of relationships representing multiple relationships. As SEM focuses on the entire model, a measure of fit reflects the overall model, not any single relationship. As a result, measures of fit, e.g., R^2 for multiple regression, are not well suited for SEM. SEM uses a series of measures that describe how well a theory explains the input data. Model fit is determined by the correspondence between the observed covariance matrix and an estimated covariance matrix that results from the proposed model.

A model is assessed as fit if it fulfils the following criteria by Hair et al. (2014, p. 584), as shown in Figure 3.3. For example, Chi-square # 0, degree of freedom #0, Goodness-of-fit index (GFI), Comparative fit index (CFI), Tucker-Lewis index (TLI) >0.95, RMSEA<0.07.

Figure 3.3: Fit Indices Demonstrating Goodness-of-Fit Across Different Model Situations

No. of Stat. vars. (m)	N<250			N>250		
	m≤12	12<m<30	m≥30	m<12	12<m<30	m≥30
X^2	Insignificant p-values expected	Significant p-values even with good fit	Significant p-values expected	Insignificant p-values even with good fit	Significant p-values expected	Significant p-values expected
CFI or TLI	0.97 or better	0.95 or better	Above 0.92	0.95 or better	Above 0.92	Above 0.90
RNI	May not diagnose misspecification well	0.95 or better	Above 0.92	0.95 or better, not used with $N > 1,000$	Above 0.92, not used with $N > 1,000$	Above 0.90, not used with $N > 1,000$
SRMR	Biased upward, use other indices	0.08 or less (with CFI of 0.95 or higher	Less than 0.09 (with CFI above 0.92)	Biased upward; use other indices	0.08 or less (with CFI above 0.92)	0.08 or less (with CFI above 0.92)
RMSEA	Values < 0.08 with CFI = 0.97 or higher	Values < 0.08 with CFI of 0.95 or high	Values < 0.08 with CFI above 0.92	Values < 0.07 with CFI of 0.97 or higher	Values < 0.07 with CFI of 0.92 or higher	Values < 0.07 with CFI of 0.90 or higher

Note m = number of observed variables; N applies to a number of observations.
X^2: Chi-square, CFI: Comparative fit index, TLI: Tucker-Lewis index, RNI: Relative non-centrality index, SRMR: Standardised root mean residual, RMSEA: Root mean square error of approximation.

Source: (Hair et al., 2014)

3.2 Sample size

The sample size of this study is computed based on the following studies. First, according to Hair et al. (2014), the minimum ratio of observations to variables is 5:1, but the preferred ratio is 15:1 or 20:1 (p.177). With 10 variables in a model, the sample size required is 200 (20:1).

Second, Krejcie and Morgan (1970) propose the sample size computed via the formula:

$$s = X^2 \, NP \, (1 - P) \div d^2 \, (N - 1) + X^2 \, P \, (1 - P)$$

where:

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size); and

d = the degree of accuracy expressed as a proportion (.05).

The number of individual investors trading on the Vietnamese stock market is approximately 1.5 million (Baomoi, 2016). The sample size required is s = (3.841 x 1,500,000 x 0.5(1-0.5)/ {0.05x0.05(1,500, 000 -1) + 3.841x0.5(1-0.5) = 384 respondents.

Third, Zikmund, Babin, Carr, and Griffin (2013) recommend the sample size calculated with the formula:

$$n = \frac{Z^2_{c.l.} \, p \, q}{E^2}$$

where:

n: number of items in the sample.

$Z_{c.l.}^2$: square of the confidence level in standard error units.

p: the estimated proportion of success.

q: (q= 1-p), or estimated proportion of failures; and

E^2: square of the maximum allowance for error between the true proportion and the sample proportion, $Z_{c.l.}S_p$ squared.

At the 95% confidence level ($Z_{c.l.}^2 = 95\%$), the 85% estimated proportion of success, the sample size required is: n= $(1.96)^2$ *0.85*0.15/ $(0.035)^2$ = 400 respondents.

Overall, the sample size of this thesis (420 observation) fulfils the guidelines of these studies.

3.3 Survey process

This research was undertaken through five phases over two years (9/2017 - 9/2019), as shown in Figure 3.4.

Figure 3.4: A summary of research phases

Phase 1: Trial interviews	Phase 2: Questionnaire design	Phase 3: A pilot test	Phase 4: Ethics approval	Phase 5: Final surveys
1 month (9/2017)	11 months (10/2017 - 8/2018)	3 months (9 - 11/2018)	4 months (12/2018 - 3/2019)	5 months (4 - 8/2019)

Collected by this thesis
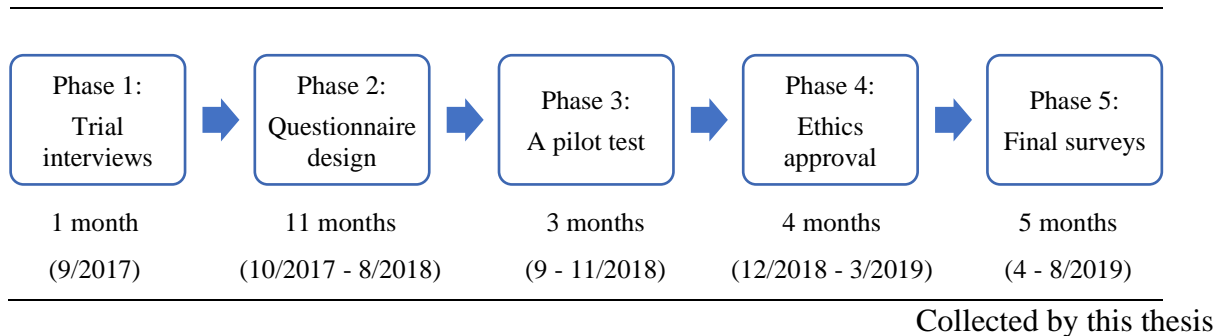
3.3.1 Trial interviews

For the first stage, this thesis conducts trial interviews with ten investors, with half having less than three years, and half having three years or more, experience. This is because the majority are young and have less than three years of investment experience, which is consistent with prior studies (e.g. Tho et al., 2018; Trang & Khuong, 2017). This phase lasts one month; September 2017. For example, investors were asked the following questions:

1/ Do you often borrow money to invest in stocks?

2/ If yes, what kinds of debt do you generally use for stock investment?

3/ Could you give me some reasons why you use this kind of debt?

4/ What facets of risk are you generally concerned with as investing in stocks?

5/ Do you often invest in stocks for the short term (less than 1 year)?

6/ Do you trust the stock market in general?

7/ Who and what do you often trust regarding stock investment?

The trial interviews aim to discover whether they often borrow money from informal lenders and formal lenders for stock investment. The reasons for the use of debt are presented in Section

3.6.3. Interviewees were found to be mainly concerned about financial loss, personal information safety due to trading online, time wastage, social standing, opportunity loss, debt problems, and making the wrong decisions. They also invest in stocks for the short term (less than one year) and highly trust the stock market in general.

3.3.2 Questionnaire design

The second stage relates to the questionnaire design. Based on the trial interviews and literature, the scales were developed, including perceived risk, borrowing sources, trust, trading frequency, risk tolerance, investment horizons, and debt decisions. This thesis also invited New Zealanders (native English speakers) to assess how understandable and straightforward the questionnaire was with the aim of ensuring the quality of questions in terms of readability and understandability. After receiving feedback from these readers, the questionnaire was translated into Vietnamese and re-examined by a senior lecturer at Massey University, whose nationality is Vietnamese. This phase spanned 11 months, from October 2017 through August 2018.

3.3.3 A pilot test

The third stage is the pilot test undertaken in Vietnam. Five Vietnamese individual investors first re-examined the questionnaire to ensure that questions were readable and understandable. Then the questionnaire was sent to 25 Vietnamese individual investors. The main feedback was that mutual funds do not apply to the Vietnam stock market. Alternatively, mutual funds should be changed to fund certificates. This phase was finished in three months, from September through November 2018.

3.3.4 Human ethics approval

The fourth stage pertains to the Human Ethics approval for the questionnaire. After corrections were made based on the feedback, the questionnaire was submitted to the Massey University

Human Ethics Committee in order to ensure the project met the University's standards on research ethics. The assessment process lasted four months (from December 2018 through March 2019). The human ethics approval was granted with notification SOB 19/07 on 21 March 2019.

3.3.5 A final survey

Finally, after receiving the ethics approval, the questionnaire was distributed to 600 individual investors through many instruments: Qualtrics Massey survey; social media, Facebook and Zalo; emails; workshops; and paper-based survey. This elicited 420 responses, being a 70% response rate. The data collection was carried out in two stages; first, the questionnaire was sent to 200 investors from which were collected 145 responses. After that, the questionnaire was distributed to a further 400 investors from which were received 275 responses. The survey process lasted 5 months. Due to the fact that participants must be individual investors, the sample should be defined as a snowball sample. Data collection was supported by friends, colleagues, acquaintances, and workshops on stock investment[8] through recommendations from brokerage firms. These brokerage firms are RongViet, Maybank, Military Bank (MB), VnDirect, Asia Commercial Bank (ACB), Sacombank, Vietcombank, and DongA Securities Corporation. The survey lasted 5 months from April through August 2019. Respondents' locations are presented in the robustness check in Sections 3.4.4 and 3.4.5.

3.4 Robustness check

This thesis applies other techniques to test the robustness of the results found by SEM models. First, alternative measures for the main variables strengthen the significant relationship by SEMs. Second, multiple regression and stepwise regression are applied to re-test the direct

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[8] The workshops of stock investment were organised by Maybank: https://maybank-kimeng.com.vn/kimengportal/

relationships, and Hayes and Preacher's approach used to re-examine the indirect relationships using SEMs. Third, a t-test and then the propensity matching score are applied to reduce the selection bias. Fourth, the instrumental variables (IVs) approach is applied to deal with the endogeneity issue. Lastly, solutions are suggested for locations and response biases. This chapter outlines the Hayes and Preacher's approach, the causality analysis in the SEM method, propensity matching score, the IVs approach, and solutions to the locations and response biases.

3.4.1 The Hayes and Preacher's approach

This approach is developed by Hayes (2017) and Hayes and Preacher (2010) to examine the direct and indirect relationships between variables. This approach is widely used and cited by many scholars of marketing. However, this approach only tests a relationship between one independent and one dependent variable in a model. This differs from the SEM technique, in which multiple independent and dependent variables can be tested in a model.

Hayes and Preacher's approach presents a cause-effect relationship with the lower-level confidence interval (LLCI) and upper-level confidence interval (ULCI). The smaller confidence intervals indicate "greater predictive accuracy" (Hair et al., 2014, p. 161). A relationship is assessed as significant ($p<0.1$) if zero is not included between LLCI and ULCI (Hair et al., 2014, p. 189). A typical model illustrated below includes an independent variable denoted as X, a mediating variable as M, and a dependent variable as Y.
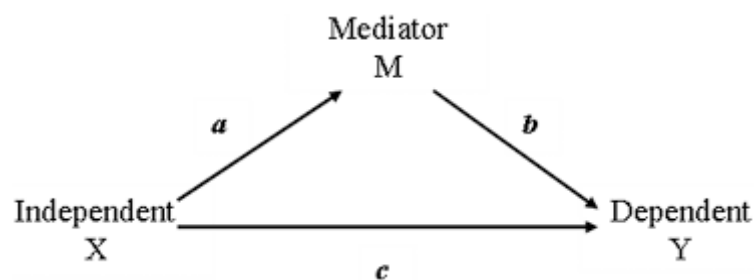
3.4.2 Causality analysis in the SEM method

Causation refers to the cause and effect between two variables, in which one variable must arise before the other and be the outcome of the other. A causal relationship can be created through strong theoretical support.

Causal research designs traditionally comprise an experiment with some controlled manipulation. SEM, however, is often used in non-experimental conditions, leading to some limitations on drawing causal inferences. It is noted that SEM alone cannot generate causality, but can make a causal relationship if it conforms to the following conditions (Hair et al., 2014; Hunt, 2002; Pearl, 1998):

(i) Covariation: As presented above, SEM can determine systematically and statistically significant covariation between constructs. Estimated paths in the structure SEM model provide evidence that covariance is present.

(ii) Sequence: A sequence in the causation of two variables indicates that one variable must occur before the other. For example, entertain the idea that many dominos are standing in a row and a ball hitting the first domino makes the other dominos fall. As a result, if this ball is the cause of this effect, the ball must hit the first domino before the others drop. An experiment or longitudinal data can provide the evidence of sequence because they can account for the time period in which events arise. However, with the cross-sectional survey, since all variables are measured at the same point in time, they cannot explain the time sequence. Consequently, theoretical arguments must be used to contend that the sequence of an impact is from one construct to another.

(iii) Nonspurious covariance: A spurious relationship refers to a connection between two factors that seem causal but is actually not. This spuriousness is affected by another factor that is not included in a model. For instance, although a correlation between ice cream consumption

and the levels of drowning is statistically significant, it is implausible to say that eating ice-cream causes drowning. Another factor may be the temperature, e.g., high temperatures cause high levels of consumption of ice-cream or more swimming. A structural relationship is deemed as nonspurious if; (i) this relationship remains significant no matter how many other constructs are added in the model, and (ii) the construct's error is independent of the causal construct (Hair et al., 2014, p. 557).

(iv) Theoretical support: SEM can test and analyse the correlations between variables but cannot decide which variable is a cause or an effect. This is because, as shown above, all factors in an SEM model are measured in the same period. Theoretical support, therefore, plays a vital role with cross-sectional data, establishing a causal ordering and a rationale for the observed covariance.

In summary, SEM can provide evidence of systematic covariation and help in understanding that a relationship is not spurious. However, SEM cannot establish a causal inference alone and can only do so if SEM meets the four conditions already mentioned.

3.4.3 T-test, propensity score matching and instrumental variable methods

Methods for dealing with problems of causal relationships suggested by scholars (e.g. Diamond & Sekhon, 2013; Ho, Imai, King, & Stuart, 2007; Papies, Ebbes, & Van Heerde, 2017) are a T-test, Propensity Score Matching (PSM), and the Instrumental Variables (IVs) approach. These methods are applied in this thesis.

A t-test is performed to determine the statistical significance of the difference in the variable's mean between the two groups. The t-test assumes a null hypothesis that the means between the two groups are equal. This thesis will use a t-test method to examine "the two samples with equal variance" of six control variables between two groups, for example, of perceived risk. If the null hypothesis is rejected, this means that the means of these control variables between the

two groups are different, possibly leading to the confounding effect in which these six control variables may influence both perceived risk and debt decisions. Thus, propensity score matching should be applied to deal with these issues.

As stated by Rosenbaum and Rubin (1983), the propensity score method plays a central role in observational studies for a causal effect. This method may reduce bias if the selection on observables assumption holds (Diamond & Sekhon, 2013). The PSM relates to creating an artificial control group by matching each treated variable with a non-treated variable that has similar characteristics. PSM matches treated factors to untreated factors based on the propensity score. In general, PSM finds similar randomisation to solve problems of selection bias that often occurs in non-experimental methods.

Endogenous problems are also a threat to inferring causal relationships (Papies et al., 2017). The standard method to solve endogeneity is to employ an instrumental variable (IV) approach. IVs are used as an explanatory variable is related to the error term. A valid instrument relates to the changes in the explanatory variable but does not relate to the dependent variable. In other words, using an IV to identify the unobserved correlation allows a researcher to explore the causal impact of a predictor on the outcome variable.[9]

3.4.4 Locations selection bias

Vietnam has four main areas; Ho Chi Minh City (HCM City) in the South, Ha Noi Capital in the North, Da Nang City in the Middle of the country, and Mekong Delta in the Western region. The respondents of this thesis live in all these areas, which will reduce sampling bias.

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[9] According to Instrumental variables estimation:
https://en.wikipedia.org/wiki/Instrumental_variables_estimation
and Statistics How to: https://www.statisticshowto.datasciencecentral.com/instrumental-variable/

As shown in Table 3.1, approximately 58% of individual investors live in Ho Chi Minh City, which is the biggest city in Vietnam, followed by Ha Noi Capital (24.1%), Da Nang City (7.1%), Mekong Delta (6.4%), and other locations (4.3%).

Respondents who are living in Ho Chi Minh City dominate the sample. This is because Ho Chi Minh City (HCM City) is the biggest city in terms of population and economy. HCM City is the economic centre of Vietnam, with a GDP per capita much higher than the country's average.[10]

Table 3.1: A summary of the survey respondents

Stages	Sent questionnaires	Received responses	Response rate %	Frequency	%	Locations
I	200	145	72.5%	86	59.3%	HCM City
				35	24.2%	Ha Noi Capital
				10	6.9%	Da Nang City
				6	4.1%	Mekong Delta
				8	5.5%	Others
				145	100%	
II	400	275	68.8%	158	57.5%	HCM City
				66	24.0%	Ha Noi Capital
				20	7.3%	Da Nang City
				21	7.6%	Mekong Delta
				10	3.6%	Others
				275	100%	
I+II	600	420	70%	244	58.1%	HCM City
				101	24.1%	Ha Noi Capital
				30	7.1%	Da Nang City
				27	6.4%	Mekong Delta
				18	4.3%	Others
Total				420	100%	

Collected by this thesis

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[10] The government aims to raise GDP per capita to US$9,800 in 2020. Details of HCM City are presented at https://indochina-properties.com/location/ho-chi-minh-city/about

As exhibited in Table 3.2, 244 respondents live in all suburbs in Ho Chi Minh City. Of these, respondents living in District 1, which is the central district of Ho Chi Minh City (HCM City), make up around 11%, followed by Tan Binh District (6.4%), Binh Thanh District and Go Vap District (5.2% each). This sample can, therefore, be seen as proxying the location of Vietnamese investors.

Table 3.2: A summary of suburbs in Ho Chi Minh City

Suburbs in HCM City	Frequency	Proportion
District 1	48	11.4%
Tan Binh District	27	6.4%
Binh Thanh District	22	5.2%
Go Vap District	22	5.2%
District 10	14	3.3%
Thu Duc District	12	2.9%
District 2	11	2.6%
District 5	11	2.6%
District 9	10	2.4%
District 7	9	2.1%
Binh Tan District	9	2.1%
District 8	8	1.9%
District 6	7	1.7%
Phu Nhuan District	7	1.7%
District 3	6	1.4%
Tan Phu District	5	1.2%
Binh Chanh District	4	1.0%
District 4	3	0.7%
District 11	3	0.7%
District 12	3	0.7%
Nha Be District	2	0.5%
Hoc Mon District	1	0.2%
Total	**244**	**100%**

<div align="right">Collected by this thesis</div>

This thesis also examines whether respondents' locations dampen the relationships of perceived risk, risk tolerance or trust to debt decisions after controlling for seven demographics; gender, age, marital status, education, income, financial literacy, and locations. This analysis is presented in Chapters 4, 5, and 6. Response bias is also a concern in this thesis because this bias may skew the results.

3.4.5 Response bias

Response bias is defined by Furnham (1986) as a tendency that respondents have to respond to the questions inaccurately or falsely. The causes of this bias are derived from the measurement process, including leading questions and social desirability (Furnham, 1986; Krumpal, 2013). Leading questions refer to problems with the wording of the questions. For example, questions are not understandable or readable, leading respondents to be confused and then answer falsely. Social desirability is defined by Krumpal (2013) as the tendency of respondents to respond to the questions in a way that will be viewed favourably by others. This bias leads to a severe problem with research related to self-reports.

To minimise the risk of response bias, first, as already presented above, this thesis designed the questionnaire carefully, then asked New Zealanders (native English speakers who neither know about economics nor finance) to examine how understandable and readable the questions are. In Vietnam, Vietnamese individual investors were also asked to re-examine the wording of the questions before the final survey was distributed.

Second, this thesis includes some questions to check respondents' consistency in responding to the questions. For example, considering questions 3, 5 and 9 below, if a respondent chooses both "9": I do not borrow money from any family sources in question 3, and I do not borrow money from any non-family sources in question 5, the respondent should write down 0% (zero) of informal borrowing in question 9 for consistency.

Question 3: Thinking about borrowing **from family sources** such as parents, a spouse, sisters, brothers, relatives, to invest in shares (you can choose more than 1 answer):

□ 1. Parents.
□ 2. Grandparents.
□ 3. Brothers/sisters.
□ 4. Parents in law.
□ 5. Brothers/sisters in law.
□ 6. Cousins/nieces/nephews.
□ 7. Husband/wife.
□ 8. Other family sources: ……….
□ 9. I do not borrow from any family sources.

Question 5: Borrowing **from non-family** sources such as friends, teachers, co-workers, … (you can choose more than 1 answer):

□ 1. Friends
□ 2. Girlfriends/boyfriends/partners
□ 3. Teachers/lecturers
□ 4. Colleagues/co-workers
□ 5. Bosses/managers
□ 6. Business partners
□ 7. Neighbours
□ 8. Other non-family sources: ……….
□ 9. I do not borrow from any non-family sources.

Question 9: Thinking about **the total money** for share investment, how would you divide this amount between the borrowing and your own money?

The total money for share investment:	%
Borrowing from informal sources (family and/or non-family)	
Borrowing from formal sources	
My equity	
Total	**100%**

This thesis also has an additional check of respondents' consistency between question 8 and 12 in relation to personal information. Namely, the income level selected in question 8 should be inconsistent with their choice of the main field of occupation.

Question 8: On average, how much income (VND) **per month** do you receive from your work?

□ 0
□ less than 10 million
□ 10 million – 50 million
□ more than 50 million – 100 million
□ more than 100 million

Question 12: What is your main field of occupation?

□ 1. Fund manager
□ 2. Broker-dealer
□ 3. Brokerage manager/director
□ 4. Financial advisor
□ 5. Banking officer
□ 6. Business owner

□ 7. CEO (Chief executive officer)
□ 8. CFO (Chief financial officer)/ Chief Accountant
□ 9. Investment officer
□ 10. Accountant
□ 11. Administrative officer/manager
□ 12. Sale/Marketing officer/manager
□ 13. Teacher/lecturer
□ 14. Other: …….

Finally, regarding an issue of non-response bias, it is, of course, impossible to access the personal information of non-participants. This thesis, consequently, cannot compare between participants and non-participants in terms of gender, age, education, etc. According to Armstrong and Overton (1977), it is best for the non-response rate to be kept under 30% of the sample. The non-response rate to the thesis questionnaire is 30%, thereby reducing the non-response bias.

3.5 Investor characteristics

This thesis presents the personal characteristics of 420 individual investors. Male investors dominate the sample, making up around 61%, as summarised in Table 3.3. Sixty-two per cent (62%) single investors compares with 38% married investors. Most investors have a university degree (around 86%), higher levels of financial literacy than the average (around 59%), and less than 5 years (about 77%) of stock investment experience. The majority of investors have income of either up to VND 10 million, or VND 10-50 million per month (up to USD 500, or USD 500-2500 per month). Over half of the investors (around 53%) invest in stocks worth between VND 200 to 500 million per year (USD 10,000-25,000 per year). These investor characteristics are arguably typical of the Vietnamese investor population and are consistent with the samples used in prior studies in Vietnam (e.g., Tho et al., 2018; Trang & Tho, 2017).

Table 3.3: Results of investor characteristics

This table shows the following predominant investor characteristics: male investors, investors aged 25-35, single investors, investors having a university degree, less than 5 years of investment experience, income between VND 10 million to 50 million (USD 500 – 2500 per month), trading frequency between 1 time per week and 3 times per month, investment amount less than 200 million (USD 10000) per year, and having higher levels of financial literacy than the average.

	Characteristics	Freq.	%		Characteristics	Freq.	%
I.	**Gender**			**VI.**	**Investment experience**		
	Male	258	61.4		< 3 years	239	56.9
	Female	162	38.6		3-5 years	86	20.5
					>5-10 years	51	12.1
II.	**Age**				> 10- 20 years	44	10.5
	<25	98	23.3	**VII.**	**Income (VND)/ month**		
	25-35	238	56.7		No income	22	5.2
	36-45	68	16.2		Up to 10 million	151	36.1
	46-55	7	1.7		10-50 million	224	53.3
	>55	9	2.1		> 50 - 100 million	17	4.0
III.	**Marital status**				> 100 million	6	1.4
	Single	259	61.7	**VIII.**	**Trading frequency**		
	Married	155	36.8		At least once a day	48	11.4
	Divorced/widow (or)	6	1.5		1 - 6 times/week	113	26.9
IV.	**Education levels:**				1-3 times/month	158	37.6
	Up to secondary school	4	1.0	**IX.**	1-2 times/quarter	55	13.1
	High school	13	3.0		1-3 times/year	20	4.8
	University	362	86.2		Less than once a year	26	6.2
	Master or more	41	9.8	**X.**	**Investment amount: VND/year**		
V.	**Financial literacy**				<200 million	263	62.6
	Mean: 9.57				200-500 million	88	21.0
	Less than Mean	164	39.0		501-1 billion	33	7.9
	More than Mean	247	58.8		>1-3 billion	21	5.0
	Not answered	9	2.1		>3 billion	15	3.6
	N	**420**	**100**		**N**	**420**	**100**

3.6 Debt decisions and reasons for this use of debt

3.6.1 Debt decisions definition

"Debt decisions" is defined as the level of debt which investors use for stock investment. This debt decision has two measures; "financial leverage", and "informal debt". For this thesis, financial leverage is defined as the credit investors obtain only through brokerage firms, while informal debt is the credit investors obtain through family and non-family sources. This definition of financial leverage is used, as it is a common term in Vietnam. Debt decisions are risky decisions no matter what kinds of debt is involved, informal or formal, because users of debt may face possible insolvency if they do not manage debt well. The following question relates to the use of informal debt (question 9 in Appendix 1 and 2).

Thinking about the total money for stock investment, how would you divide this amount between the borrowing and your own money?

The total money for stock investment:	%
Borrowing from informal sources (informal debt)	
Borrowing from formal sources (formal debt)	
My equity	
Total	100%

Financial leverage differs from formal debt. Financial leverage is the debt that investors only borrow from brokerage firms, while formal debt is borrowed from a variety of sources such as banks, credit institutions, brokerage firms, and other formal lenders. The following question pertains to financial leverage (question 10 in Appendix 1 and 2).

Supposing that a stock (a share) has the highest financial leverage in accordance with the brokerage firms' rules if you would like to buy this share, what financial leverage ratios do you often use?

☐ do not leverage

☐ less than 20%

☐ 20% to less than 30%

☐ 30% to less than 50%

☐ Use the highest lending ratio

3.6.2 Findings of debt decisions

The findings on debt decisions of the 420 respondents are presented in Table 3.4. For the use of informal debt, approximately 55% of investors use informal debt for stock investment. The rest (45%) of investors do not use informal debt for stock investment. That is, 45% of investors may use formal debt or their own equity for stock investment.

Looking at the use of formal debt, 65% of investors use formal debt for stock investment. The rest (35%) of investors do not use formal debt. This means that 35% may use informal debt or their own equity for stock investment. Looking at total debt, about 82% of investors use debt (informal or/and formal) for stock investment. Only around 18% of investors do not use any debt for stock investment. This means that 18% of them only use their own equity for stock investment.

For financial leverage, 78% of investors use leverage through brokerage firms for stock investment. It is also worth noting that on average, the debt ratio over the total money for stock investment is 38% (informal debt: 17% and formal debt: 21%).

Table 3.4: A summary of debt decisions

This table indicates that about 55% of investors use informal debt (the rest of them do not), 65% of them use formal debt (the rest of them do not). About 82% of investors use debt (informal or/and formal debt) for their stock investment. Most investors (about 78%) use financial leverage through brokerage firms. On average, 38% of debt used for a stock investment portfolio is divided into informal debt (17%) and formal debt (21%).

Debt ratios (%)	Informal debt		Formal debt		Total debt		Financial leverage		
	Freq.	%	Freq.	%	Freq.	%	Levels	Freq.	%
No debt	188	44.8	147	35.0	75	17.9	No leverage	94	22.4
Less than 50	180	42.8	208	49.5	161	38.3	Less than 20%	63	15.0
50	26	6.2	49	11.7	112	26.7	20% - < 30%	64	15.2
>50 - <100	21	5.0	10	2.4	56	13.2	30% - <50%	106	25.2
100	5	1.2	6	1.4	16	3.8	Maximum levels	93	22.1
N	420	100	420	100	420	100	N	420	100
Average debt	**17%**		**21%**		**38%**				

3.6.3 Reasons for the use of debt by investors

The thesis examined the reasons why investors use informal debt and financial leverage for stock investment, based on the investor interviews, the literature review, and anecdotes.

Investors use informal debt for stock investment, possibly because first, informal borrowing is common in Vietnamese culture. So, both borrowers and lenders may feel comfortable with this form of borrowing. Lenders feel this because they think they help their borrowers. Borrowers believe they help lenders by contributing extra income from their returns from the stock investment to informal lenders if their stock investment succeeds. Second, investors have limited access to formal lenders, and informal borrowing becomes a unique source of funds for investors. This is consistent with the findings of prior studies (e.g. Guirkinger, 2008; Mohieldin & Wright, 2000; Nguyen & Berg, 2014). Finally, investors may also feel less pressured, and may even avoid legal problems, if they cannot return the money to the informal lenders.

Investors using just financial leverage for stock investment may have sufficient access to borrowings through brokerage firms. This is in line with previous studies (e.g. Guirkinger, 2008; Mohieldin & Wright, 2000; Nguyen & Berg, 2014). Also, it is possible that people whom investors know have a low or average income will, as a result, have insufficient money to lend to investors. Investors may wish to borrow a large amount of money to invest in stocks, and only brokerage firms meet this borrowing.

3.7 Control variables

Literature finds a number of variables related to demographics have an effect on investment decisions, including gender, age, education, marital status, income, and financial literacy. Women are often more risk-averse than men (e.g. Barber & Odean, 2001; Frijns et al., 2008; Grable, 2000; Hallahan et al., 2003; Kannadhasan, 2015; Lucarelli & Brighetti, 2011; Tho et al., 2018; Yao et al., 2011). Risk-taking levels increase when age increases (Frijns et al., 2008;

Grable, 2000; Pålsson, 1996; Wang & Hanna, 1997). Single people are more likely to take risk than married people (e.g. Grable, 2000), and higher-income investors tend to take more risk (Grable, 2000; Hallahan et al., 2003; Hallahan, Faff, & McKenzie, 2004; Morin & Suarez, 1983; Riley Jr & Chow, 1992; Yao et al., 2011). Higher education levels or financial knowledge is associated with higher risk-taking behaviour (Grable, 2000; Hallahan et al., 2004; Kannadhasan, 2015; Riley Jr & Chow, 1992; Yao et al., 2011). Based on this evidence, this thesis considers these factors as control variables.

These six control variables, with the exception of financial literacy, are measured through simple questions, for example, "what is your age?" Financial literacy is measured through 16 questions as for a number of existing studies (Balloch, Nicolae, & Philip, 2014; Van Rooij, Lusardi, & Alessie, 2011). All questions are attached in Appendix 1 and 2. All of these control variables are evaluated through a t-test to deal with the possible selection bias, which is presented in the robustness checks of Chapters 4, 5, and 6.

This thesis also examines whether other demographics, such as work experience, investment experience, or investment amount, significantly affect debt decisions. The results find that most of these have no significant relationship with debt decisions. These demographic variables are, therefore, are not included in a model.

3.8 Summary

This chapter first presented the structural equation modelling (SEM) that is the primary method of this thesis. The importance of SEM is that SEM can test the direct and indirect relationships in a model concurrently and directly accommodates measurement errors in predicting the relationships between variables, while other techniques such as multiple regression or stepwise regression cannot. In terms of assessment of a model fit, R squared is the main measure to assess a model fit when using the multiple regression or stepwise regression. By contrast, SEM

uses a series of measures that describe how well a theory explains the input data. For example, Chi-square # 0, degrees of freedom #0, Tucker-Lewis index (TLI), Goodness-of-fit index (GFI), Comparative fit index (CFI) > 0.95, and Root mean square error of approximation (RMSEA) < 0.7. Second, this chapter presents details of the sample. Using the sample size of 420 respondents conforms to the criteria suggested by Hair et al. (2014), Krejcie and Morgan (1970) and Zikmund et al. (2013). Third, the thesis has 5 phases of the survey process, through trial interviews, questionnaire design, a pilot test, Human ethics approval of the questionnaire and a 5-month survey. Fourth, the robustness checks applied to test the relationships by SEMs is presented. Fifth, the personal characteristics of 420 investors are presented. Sixth, this chapter presents the reasons for the use of debt by investors, and lastly, ends with a description of the control variables.

Chapter 4 Essay One: Perceived Risk, Borrowing Sources, and Debt Decisions[11]

4.1 Introduction

The main objective of this chapter is to investigate the extent to which perceived risk directly relates to borrowing sources and debt decisions and mediates between borrowing sources and debt decisions.

The use of debt by investors to increase the rate of return is common in many countries and often regarded as an essential part of the growth of financial markets. Recent research has, however, little paid attention to investors' use of debt and what factors relate to this use of debt. Also, while there has been significant research on formal and informal debt, to the best of the author's knowledge, there has been no academic research examining the use of informal debt by individual investors for stock investment. This chapter will examine whether the perceived risk of stock investment and available borrowing sources predict the use of debt for stock investment, as well as the impact of perceived risk on the use of informal debt.

The importance of debt decisions and their definitions were presented in Chapters 1 and 3. "Debt decisions" are defined as the level of debt which investors use for stock investment. "Informal debt" is defined as the credit investors obtain through informal lenders for stock investment. "Financial leverage" is defined as the credit investors obtain only through brokerage firms for stock investment. A debt decision is a risky decision no matter what kinds

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[11] The early version of this chapter was presented at the 3rd Sydney Banking and Financial Stability Conference 2019 (SBFC 2019), University of Sydney Business School, Australia, December 2019. https://sbfc.sydney.edu.au/

The first version of this chapter (N = 145) was presented at the 2nd Asia Conference on Business and Economic Studies (ACBES 2019), University of Economics Ho Chi Minh City, Vietnam, September 2019. https://acbes.ueh.edu.vn/

of debt are utilised, informal or formal, because users of debt may face possible insolvency if they do not manage debt well.

Based on Peter and Tarpey Sr (1975), this chapter defines "perceived risk" as the subjective levels of an investor's concern about the risks of their stock investment. This is different from the actual objective risk. It is a fact that investors typically find it hard to make the right decision under risk or uncertainty because they cannot precisely predict possible outcomes (Statman, 2005). A risky decision to be made is thus often based on the judgment on how hazardous an event is (Kahneman & Tversky, 1979; Shefrin, 2002). As investment decisions are made based on perceived risk rather than objective risk, there is significant literature on risk perception.

This chapter examines risk within consumer behaviour framework and argues that, when making a buying decision, investors perceive multiple aspects of risk instead of only financial risk. This differs from both traditional and behavioural finance in which investors are assumed to be only concerned about financial gains or loss (financial risk) when making a purchase decision. This chapter introduces ideas from consumer theory and argues that investors may have additional risk concerns; such as information safety (safety risk), social standing (social risk), time waste (time risk), missing out on other opportunities (opportunity risk), wrong choices (choice risk), or debt problems (leverage risk). Taking these additional facets of risk into account provides a better understanding of investors' perceived risk and its impact on debt decisions.

The remainder of this chapter is as follows. Section 4.2 presents a literature review and hypothesis development. The methodology is described in Section 4.3. Section 4.4 outlines the main results, and Section 4.5 presents the results of additional analysis. The robustness check is in Section 4.6, and demographics are discussed in Section 4.7. Section 4.8 presents the conclusions, contributions, implications, limitations and further research.

4.2. Literature review and hypothesis development

4.2.1 Facets of perceived risk

The literature for this section was presented in Section 2.3. This chapter thus focuses only on the definition of the perceived risk of stock investment and its facets.

"Perceived risk" includes two components; uncertainty and consequences (Bauer, 1960; Cunningham, 1967), or probability of loss and importance of loss (Peter & Ryan, 1976; Peter & Tarpey Sr, 1975). Following Peter and Tarpey Sr (1975), perceived risk of stock investment is described as the level of potential loss concerns and the level of importance of this potential loss.

The exploratory investor interviews found that the perceived risk of stock investment consisted of seven facets. These facets are summarised below. Among them, four facets of risk (financial risk, safety risk, social risk, time risk) are consistent with consumer behavioural framework. Three aspects of risk; opportunity risk, choice risk, and leverage risk; were discovered through the interviews.

Financial risk	The possibility that investors make a loss in their stock investment portfolio.
Safety risk	The possibility that investors' information is leaked by hackers or attacked by viruses.
Social risk	The possibility that investors are held in low esteem by a certain group because they make a large loss in stock investment.
Time risk	The possibility that investors spend much time on stock investment and the results are not what they expect.
Opportunity risk	The possibility that investors miss out on other financial investment opportunities if they use all the money for stock investments.
Choice risk	The possibility that investors make a wrong decision on choosing stocks for their portfolio.
Leverage risk	The possibility that investors' investment returns are inadequate to cover their loan interest and principal at maturity.

The existing literature, as a result, has paid much attention to the relationship between perceived risk and returns, but little attention to the relationship between perceived risk and

debt decisions. This leads this chapter to examine this risk-debt link through the following hypotheses.

4.2.2 Hypothesis development

Traditional finance and some scholars of behaviour finance argue that the relationship between risk and return is positive (e.g. Byrne, 2005; Diacon & Ennew, 2001; Ganzach, 2000; Trang & Tho, 2017). This means that investors will only accept higher risk if they are compensated with higher expected returns. This chapter argues that a higher level of the perceived risk of stock investment equates to higher expected returns, and this may lead to the use of more borrowing sources and higher debt. This chapter thus examines the following hypotheses.

H4.1: The higher the level of the perceived risk of stock investment, the higher the number of borrowing sources used.

H4.2: The higher the level of the perceived risk of stock investment, the higher the level of informal debt used.

H4.3: The higher the level of the perceived risk of stock investment, the higher the level of financial leverage used.

Winning or losing situations are found to affect investors' risk perception. Investors are risk-averse to gain situations and risk-taking to loss situations (Kahneman & Tversky, 1979). Past outcomes also influence investors' current risk perception. Investors tend to take more risk after gains and take less risk after losses (Nofsinger, 2008; Thaler & Johnson, 1990). This chapter argues that an increase in the number of borrowing sources may cause current risk concerns about stock investment.

H4.4: The higher the number of borrowing sources, the higher the level of the perceived risk of stock investment.

Recent studies also uncover that households in developing countries borrow money from many informal and formal lenders for production and consumption (Diagne, 1999; Zeller, 1994), (Barslund & Tarp, 2008; Guirkinger, 2008; Mohieldin & Wright, 2000; Nguyen, 2008; Nguyen & Berg, 2014). This chapter argues that investors also borrow money from informal and formal lenders and that more available sources will lead to the use of higher debt.

H4.5: The higher the number of borrowing sources, the higher the level of informal debt used.

H4.6: The higher the number of borrowing sources, the higher the level of financial leverage used.

Perceived risk is found to be a mediator between perceived quality and perceived value (Sweeney, Soutar, & Johnson, 1999). Performance risk mediates between quality and value (Agarwal & Teas, 2001), meaning that performance risk can account for why a higher quality leads to a higher value for money. This chapter thus argues that perceived risk may mediate between borrowing sources and debt decisions, with the following hypotheses:

H4.7: Perceived risk of stock investment mediates between borrowing sources and informal debt.

H4.8: Perceived risk of stock investment mediates between borrowing sources and financial leverage.

This chapter also argues that perceived risk relates to borrowing sources, and borrowing sources pertain to debt decisions. This reveals that borrowing sources may mediate between perceived risk and debt decisions, with the following hypotheses:

H4.9: Borrowing sources mediates between perceived risk of stock investment and informal debt.

H4.10: Borrowing sources mediates between perceived risk of stock investment and financial leverage.

4.3 Methodology

This main methodology was outlined in Chapter 3. This chapter only presents the measures of perceived risk, borrowing sources, and debt decisions, as shown in Figure 4.1. Perceived risk is measured based on Peter and Tarpey Sr (1975)'s formula. Mitchell (1999) assesses the model of Peter and Tarpey Sr (1975) as one of the best models in comparison with other models (such as Deering & Jacoby, 1972; Dowling & Staelin, 1994; Horton, 1976; Stone & Winter, 1987). Each facet of risk is computed by multiplying the probability of loss (PL) by the importance of loss (IL). There are seven facets of risk, and the sum of these seven facets together form the overall perceived risk of stock investment (coded as PERI). Borrowing sources are described as the number of sources investors borrow money from for stock investment.

Figure 4.1: A summary of measures of perceived risk, borrowing sources and debt decisions

I. Perceived risk of stock investment

$$PERI = \sum_{i=1}^{n}(SAFR_i + SOCR_i + OPPR_i + TIMR_i + CHOIR_i + LEVR_i + FINR_i)$$

SAFR	: Safety risk; = ln (SAF_{1i} * SAF_{2i})	CHOIR	: Choice risk; = ln (CHO_{1i} * CHO_{2i})
SAF_1	: the probability of safety loss;	CHO_1	: the probability of choice loss;
SAF_2	: the importance of safety loss;	CHO_2	: the importance of choice loss;
SOCR	: Social risk; = ln (SOC_{1i} * SOC_{2i})	LEVR	: Leverage risk; = ln (LEL_{1i} * LEL_{2i})
SOC_1	: the probability of social loss;	LEL_1	: the probability of leverage loss;
SOC_2	: the importance of social loss;	LEL_2	: the importance of leverage loss;
OPPR	: Opportunity risk; = ln (OPP_{1i} * OPP_{2i})	FINR	: Financial risk; = ln (FIN_{1i} * FIN_{2i})
OPP_1	: the probability of opportunity loss;	FIN_1	: the probability of financial loss;
OPP_2	: the importance of opportunity loss;	FIN_2	: the importance of financial loss;
TIMR	: Time risk; = ln (TIM_{1i} * TIM_{2i})	PERI	: Perceived risk of stock investment;
TIM_1	: the probability of time loss;		i: i^{th} investor; n= 420.
TIM_2	: the importance of time loss;		

II. Borrowing sources

$$FINFS = \sum_{i}^{n}(INBO + FBO)$$

where:

INBO: borrowing from the informal lenders

FBO: borrowing from the formal lender

FINFS: borrowing sources;

i: i^{th} investors, n=420.

III. Debt decisions

$$INFD = \sum_{i}^{n}(INFD)_i$$

$$LEVE = \sum_{i}^{n}(LEVE)_i$$

where:

INFD: informal debt ratios (%)

LEVE: levels of financial leverage (1: no leverage to 5: maximum leverage ratios).

i: i^{th} investors, n=420.

Borrowing sources are a categorical variable with 0 as no borrowing, 1 as borrowing from one informal or formal lender, and 2 as borrowing from both informal and formal lenders. In Vietnamese culture, a family is often an extended family, including spouses, parents (in-law), single brothers or sisters (in-law), single aunts or uncles, nieces, nephews. Also, non-family

lenders involve many kinds of people as friends, colleagues, managers, neighbours. This thesis, therefore, divides informal lenders into two groups: family and non-family. This categorization helps achieve a better understanding of whom investors borrow money from for stock investment. Debt decisions and six control variables were presented in Section 3.6.

4.4 Results

The investor characteristics were presented in Section 3.5. This chapter describes investors' perceived risk, borrowing sources and debt decisions, followed by the reliability of the scale of perceived risk, the correlations between variables and the main results of this chapter.

4.4.1 Levels of perceived risk

Investors' overall perceived risk is composed of seven facets; financial risk, safety risk, social risk, time risk, opportunity risk, choice risk, and leverage risk, as revealed in Table 4.1. On average, investors are most concerned about leverage risk, followed by choice risk, safety risk, opportunity risk, social risk, and financial risk. For financial risk, most investors are highly concerned about their loss being over 10% of their equity.

Table 4.1: Description of overall perceived risk and its seven facets

This table shows investors' overall perceived risk and its facets. The majority of investors have higher levels of overall perceived risk than the average (53%). On average, investors are most concerned about leverage risk, followed by choice risk, safety risk, opportunity risk, social risk, and financial risk.

Indicators	Safety risk	Social risk	Opportunity risk	Time risk	Choice risk	Leverage risk	Financial risk	Overall perceived risk
Mean	13.80	10.75	11.93	13.12	14.20	16.21	8.69	88.71
Median	12	9	12	12	15	16	6	87
Minimum	1	1	1	1	1	1	1	22
Maximum	25	25	25	25	25	25	25	162
Standard deviation	6.46	6.46	6.00	5.91	6.06	7.20	6.24	25.89
Below mean (%)	51	60	46	54	48	61	53	53
Over mean (%)	49	40	54	46	52	39	47	47
N	420	420	420	420	420	420	420	420

Levels of perceived risk, in general, differ among groups, as indicated in Table 4.2. Users of debt have a higher level of risk concern than non-users of debt. This supports the debate of this study that investors are not always risk-averse. Besides this, non-stockbrokers are also more concerned about investment risk than stockbrokers. The risk of stock investment perceived by female investors is higher than that by male investors. This result is consistent with prior studies in which males are more risk-taking than females, for example (Barber & Odean, 2001; Frijns, Koellen, & Lehnert, 2008; Grable, 2000; Hallahan, Faff, & McKenzie, 2003; Kannadhasan, 2015; Lucarelli & Brighetti, 2011; Tho et al., 2018; Yao, Sharpe, & Wang, 2011).

Table 4.2: Perceived risk among groups

This table shows investors' overall perceived risk and its facets. Users of debt have a higher level of risk concern than non-users of debt. Besides this, non-stockbrokers and female investors are more concerned about investment risk than stockbrokers and male investors, respectively.

Perceived risk	Non-users of debt	Users of debt	Non-stock-brokers	Stock-brokers	Male investors	Female investors	All investors
Mean	15.69	16.49	16.41	16.24	16.02	16.87	16.35
Median	16.18	16.87	16.97	16.70	16.57	17.21	16.80
Minimum	7.97	5.93	5.93	6.58	5.93	6.64	5.93
Maximum	21.2	21.8	21.80	21.80	21.80	21.80	21.8
Std. dev.	0.29	0.15	0.175	0.21	2.80	0.20	2.74
N	75	345	251	169	258	162	420

Note: Std. dev.: standard deviation

4.4.2 Borrowing sources and debt decisions

Debt decisions were presented in Section 3.6.1. This chapter only presents borrowing sources that are briefly in Table 4.3. Investors have no borrowing from family (around 30%), non-family (about 44%), and formal sources (around 19%). Approximately 93% of investors borrow from at least one source. Among them, 26% of them borrow from one informal or formal source, and nearly 67% of them borrow from both informal and formal sources. Overall, the number of investors who use both informal and formal sources for stock investors

dominates the sample. The primary lenders are parents (36%), friends (34%), and brokerage firms (about 40%).

Table 4.3: A summary of the borrowing sources

Investors have no borrowing from informal sources; family (around 30%), and non-family (about 44%), and formal sources (around 19%). Remarkably, only about 7% of investors borrow neither from informal nor formal sources. That is, most investors borrow money from at least one source for stock investment. The primary lenders are parents, friends, and brokerage firms.

Family sources	Freq.	%	Non-family sources	Freq.	%	Formal sources	Freq.	%	Borrowing sources	Freq.	%
No borrowing	124	29.5	No borrowing	184	43.8	No borrowing	79	18.8	No borrowing	31	7.4
Parents (in-law)	151	36	Friends	144	34.3	Brokerage firms	163	38.8	Informal or formal	109	26.0
Husband/wife	77	18.3	Other	30	7.1	Banks	152	36.2			
Brothers /sisters (in-law)	47	11.3	Colleagues/co-workers	18	4.3	Credit institutions	13	3.1	Both informal and formal	280	66.6
Other	18	4.2	Girlfriend/boyfriend /partner	18	4.3	Other	13	3.1			
Cousins/nieces /nephews	3	0.7	Business partners	16	3.8						
			Neighbours	6	1.4						
			Bosses/managers	4	1.0						
N	420	100	N	420	100	N	420	100		420	100

4.4.3 Test of reliability

The reliability coefficients (Cronbach's alpha) of seven facets of risk are shown in Table 4.4. All Cronbach's alphas of each facet of risk are more than 0.6[12]; for example, 0.612 (choice risk), and 0.882 (leverage risk). Perceived risk has a Cronbach's alpha of 0.679, although some inter-correlation is less than 0.3. In general, each facet of risk and overall perceived risk fulfils acceptable or high internal consistency, which enables them to be variants in a model.

4.4.4 Test of correlations between variables

This study tests Pearson's correlation coefficients between variables. As shown in Table 4.5, most facets of risk variables have a positive inter-correlation at a significant level ($p<0.05$). For example, safety risk has a positive correlation with social risk, opportunity risk, time risk, choice risk, leverage risk, and perceived risk. Perceived risk positively correlates with choices among borrowing sources and informal debt.

Overall perceived risk has correlations with its seven facets at significant levels which are, ranked in descending order, time risk, leverage risk, choice risk, opportunity risk, social risk, safety risk, and financial risk.

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[12]According to Hair et al. (2014)'s guidelines, to ensure that a variable has sufficient reliability, Cronbach's alpha of each variable should exceed a threshold of 0.6. Internal consistency (the item-to-total correlations) exceeds 0.5, and the inter-item correlation exceeds 0.3.

Table 4.4: Results of the reliability of perceived risk and its facets

This table examines the reliability coefficients (Cronbach's alpha) of each facet of risk and overall perceived risk. All variables have Cronbach's alpha greater than 0.6; safety risk (0.684), social risk (0.833), opportunity risk (0.802), time risk (0.798), choice risk (0.705), leverage risk (0.861), financial risk (0.835), and perceived risk (0.629). The results show that all these variables have sufficient reliability.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's alpha if item deleted
Safety risk					**0.684**
SAF1	3.97	0.972	0.521	0.272	
SAF2	3.36	1.151	0.521	0.272	
Social risk					**0.833**
SOC1	3.14	1.118	0.714	0.510	
SOC2	3.16	1.265	0.714	0.510	
Opportunity risk					**0.802**
OPP1	3.36	0.921	0.671	0.450	
OPP2	3.39	1.047	0.671	0.450	
Time risk					**0.798**
TIM1	3.59	0.855	0.664	0.441	
TIM2	3.51	0.877	0.664	0.441	
Choice risk					**0.705**
CHO1	3.87	0.859	0.545	0.297	
CHO2	3.59	0.876	0.545	0.297	
Leverage risk					**0.861**
LEV1	4.00	1.111	0.756	0.572	
LEV2	3.88	1.139	0.756	0.572	
Financial risk					**0.835**
FIN1	2.90	1.368	0.718	0.516	
FIN2	2.68	1.226	0.718	0.516	
Perceived risk (PERI)					**0.629**
SAFR	13.8752	6.114	0.315	0.109	0.600
SOCR	14.2139	5.426	0.390	0.192	0.575
OPPR	14.0422	5.782	0.389	0.232	0.577
TIMR	13.9028	5.654	0.561	0.425	0.534
CHOIR	13.8181	5.863	0.466	0.334	0.559
LEVR	13.7318	5.715	0.376	0.202	0.580
FINR	14.4890	6.593	0.046	0.006	0.702

SAF1: probability of safety loss, SAF2: importance of safety loss, SOC1: probability of social loss, SOC2: importance of social loss, OPP1: probability of opportunity loss, OPP2: importance of opportunity loss, TIM1: probability of time loss, TIM2: importance of time loss, CHO1: probability of choice loss, CHO2: importance of choice loss, LEV1: probability of leverage loss, LEV2: importance of leverage loss, FIN1: probability of financial loss, FIN2: importance of financial loss, SAFR: safety risk, SOCR: social risk, OPPR: opportunity risk, TIMR: time risk, CHOIR: choice risk, LEVR: leverage risk, FINR: financial risk, PERI: perceived risk of stock investment.

Table 4.5: A summary of the correlations between variables

This table tests the correlation between variables. Most variables have inter-correlation at a significant level. For example, safety risk correlates with social risk, opportunity risk, time risk, choice risk, leverage risk, and perceived risk. Perceived risk also positively correlates with borrowing sources and informal debt.

	SAFR	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.SAFR	1.000																
2.SOCR	0.250**	1.000															
3.OPPR	0.203**	0.363**	1.000														
4.TIMR	0.200**	0.376**	0.481**	1.000													
5.CHOIR	0.200**	0.271**	0.307**	0.521**	1.000												
6.LEVR	0.190**	0.289**	0.237**	0.435**	0.440**	1.000											
7.FINR	0.084	0.009	-0.024	-0.002	0.056	-0.023	1.000										
8.PERI	0.458**	0.573**	0.576**	0.633**	0.578**	0.582**	0.306**	1.000									
9.FINFS	0.029	0.081	0.095	0.106*	0.052	0.217**	-0.004	0.190**	1.000								
10.GEN	0.128**	0.047	0.089	0.071	0.105*	0.116*	0.065	0.146**	0.073	1.000							
11.AGE	-0.076	-0.069	-0.069	-0.182**	-0.128**	-0.206**	0.057	-0.126**	-0.050	-0.199**	1.000						
12.MAR	-0.014	0.063	0.003	-0.086	-0.067	-0.090	0.037	-0.013	-0.023	-0.059	0.491**	1.000					
13.EDU	-0.098*	-0.106*	-0.042	-0.010	-0.038	-0.041	0.005	-0.047	-0.036	-0.105*	0.076	0.131**	1.000				
14.INC	-0.046	-0.044	-0.072	-0.101*	-0.074	-0.106*	0.089	-0.022	-0.099*	-0.193**	0.418**	0.297**	0.238**	1.000			
15.FIL	-0.117*	-0.072	0.004	0.078	0.136**	0.175**	-0.031	0.075	-0.012	-0.098*	-0.046	-0.023	0.230**	0.087	1.000		
16.INFD	0.047	0.117*	0.049	0.076	0.100*	0.112*	0.070	0.154**	0.176**	0.053	-0.114*	-0.135**	-0.011	-0.133**	-0.042	1.000	
17.LEVE	-0.075	0.016	-0.044	0.000	-0.027	0.076	-0.035	0.029	0.260**	-0.076	0.060	0.051	0.017	0.131**	0.175**	-0.071	1.000
N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed). SAFR: safety risk, SOCR: social risk, OPPR: opportunity risk, TIMR: time risk, CHOIR: choice risk, LEVR: leverage risk, FINR: financial risk, PERI: perceived risk of stock investment, FINFS: choices among borrowing sources, GEN: gender, AGE: age, MAR: marital status, EDU: education levels, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

4.4.5 Results of main SEM models and discussion

This study develops three structural equation models (SEM1, SEM2, and SEM3). SEM1 examines borrowing sources as a mediator between perceived risk and debt decisions. SEM2 examines borrowing sources a mediator between seven facets of risk and debt decisions. SEM3 tests perceived risk as a mediator between borrowing sources and debt decisions. The relationships are tested after controlling for six personal characteristics; gender, age, marital status, education, income, and financial literacy. It is noted that other demographics are also tested, including investment amount, work experience, and investment experience among investors. The results, however, find that most of these variables have no significant association with debt decisions.

The results of SEM 1 are exhibited in Figure 4.2 and Table 4.6. The results indicate a direct relationship between perceived risk and borrowing sources at 0.186 ($p<0.01$) in support of H4.1, in which the higher the level of risk concerns, the higher the number of borrowing sources used. Investors with higher concern for risk associated with stock investment prefer more borrowing sources because they then avoid dealing with a large debt amount from only one source. Alternatively, their debt amount can be divided across a number of smaller sources, and consequently, problems of repayment become less severe.

Borrowing sources is positively associated with both the use of informal debt at 0.149 ($p<0.01$) and financial leverage at 0.283 ($p<0.01$), in support of H4.5 and H4.6, respectively. The use of more borrowing sources leads to the use of higher debt (informal and financial leverage). This supports the view that investors who borrow money from many sources can effectively double-up on debt coming from both informal and formal lenders: that is, they borrow money from parents and friends first, and then continue to borrow from brokerage firms. This infers that investors with more borrowing sources are more likely to be risk-lovers and that they use higher debt in the hope of achieving higher returns.

Perceived risk also pertains to informal debt at 0.124 (*p<0.01*), supporting H4.2, in which the higher the level of risk concerns, the higher the level of informal debt being used. The result finds no significant relationship of perceived risk to financial leverage, which does not support H4.3. Overall, our finding of a positive risk-debt link adds to the literature alongside prior studies on a positive risk-return trade-off (e.g. Byrne, 2005; Diacon & Ennew, 2001; Ganzach, 2000; Trang & Tho, 2017). Investors with higher risk perception of stock investment prefer informal debt to formal debt. Two reasons account for this: first is the avoidance of legal problems. Due to parents and friends being the main informal borrowing sources, investors (borrowers) may avoid commitments of repayment to their parents or friends if they cannot return the money to them. Second is the tendency to invest small amounts in stock investment, and as a result, this borrowing is not a substantial concern to the parents and friends.

Figure 4.2: Perceived risk, borrowing sources and debt decisions (SEM1)

This figure presents a direct link of perceived risk to borrowing sources, perceived risk to informal debt, and borrowing sources to informal debt and financial leverage at a significant level (*p<0.1*). SEM1 also uncovers borrowing sources as a mediator between perceived risk and debt decisions at a significant level.
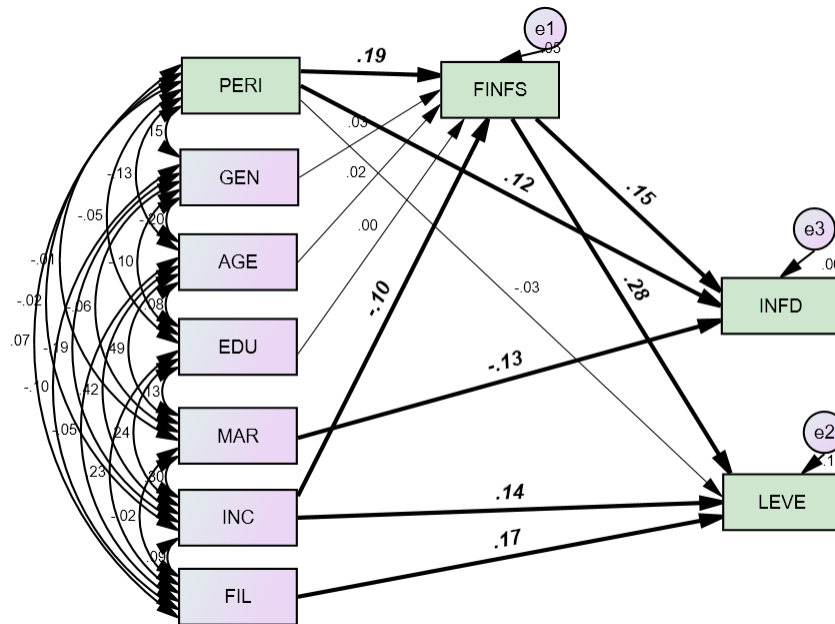
A model fit with criteria: Chi-square: 16.764, df: 12, GFI: 0.978, TLI: 0.904, CFI: 0.975, RMSEA: 0.053.
PERI: overall perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 4.6: Perceived risk, borrowing sources and debt decisions (SEM1)

This table shows a direct association of perceived risk with borrowing sources, the perceived risk with informal debt, and borrowing sources with informal debt and financial leverage at a significant level (*p<0.1*). SEM1 also uncovers borrowing sources as a mediator between perceived risk and debt decisions at a significant level.

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
I. Direct relationship								
FINFS	**<---**	**PERI**	0.042	**0.186**	0.011	3.829	**0.000*****	**H4.1**
FINFS	<---	GEN	0.039	0.031	0.063	0.616	0.538	
FINFS	<---	AGE	0.016	0.021	0.041	0.386	0.700	
FINFS	<---	EDU	-0.005	-0.003	0.076	-0.060	0.952	
FINFS	<---	INC	-0.085	-0.097	0.047	-1.789	0.074*	
INFD	**<---**	**FINFS**	0.051	**0.149**	0.017	3.092	**0.002*****	**H4.5**
INFD	**<---**	**PERI**	0.010	**0.124**	0.004	2.579	**0.010*****	**H4.2**
INFD	<---	MAR	-0.052	-0.130	0.019	-2.747	0.006***	
LEVE	<---	INC	0.120	0.143	0.039	3.106	0.002***	
LEVE	<---	FIL	0.031	0.168	0.008	3.641	0.000***	
LEVE	**<---**	**FINFS**	0.272	**0.283**	0.045	6.030	**0.000*****	**H4.6**
LEVE	<---	PERI	-0.007	-0.034	0.010	-0.722	0.470	H4.3
II. Indirect relationship								
PERI->FINFS->INFD			0.002	**0.028**			***	**H4.9**
PERI->FINFS->LELE			0.011	**0.053**			***	**H4.10**

Note: *: p<0.1, **: p<0.05, ***: p<0.01
PERI: perceived risk, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, FINFS: borrowing sources, INFD: informal debt, LEVE: financial leverage.

The results of SEM2 are presented in Figure 4.3 and Table 4.7. The findings show that opportunity risk and leverage risk have a direct association with borrowing sources at 0.107 ($p<0.05$) and 0.242 ($p<0.01$), respectively, which also supports H4.1. As a result of findings by SEM1 and SEM2, in addition to the overall perceived risk, investors are concerned about missing out on other financial investment opportunities if they use all the money for stock investments. They are also concerned about their returns being inadequate to cover their debt, leading to borrowing from more sources so as to reduce a severe debt amount from only one source.

In addition, borrowing sources relate to informal debt at 0.176 ($p<0.01$) and financial leverage at 0.260 ($p<0.01$), which supports H4.5 and H4.6. Borrowing sources are also a mediator between opportunity risk and informal debt at 0.019 ($p<0.01$), between opportunity risk and financial leverage at 0.028 ($p<0.01$), between leverage risk and informal debt at 0.042 ($p<0.01$), and between leverage risk and financial leverage at 0.063 ($p<0.01$). These results support H4.9 and H4.10. These hypotheses have already been mentioned in SEM1.

The findings of SEM3 are indicated in Figure 4.4 and Table 4.8. SEM3 finds a direct relationship of borrowing sources to perceived risk at 0.177 ($p<0.01$) in support of H4.4, in which an increase in the number of borrowing sources leads to higher risk concerns about stock investment. This result contributes to the literature alongside prior studies (e.g. Nofsinger, 2008; Thaler & Johnson, 1990) in which past outcomes affect current risk perception. Investors with more borrowing sources are more concerned about the risk of stock investment. When faced many borrowing sources, investors worry about having large borrowings from many lenders, leading them to be more aware of the risk of stocks chosen for investment.

Model SEM3 also manifests the link of perceived risk to informal debt at 0.12 ($p\leq0.01$) (H4.2), borrowing sources to informal debt at 0.15 ($p<0.01$) (H4.5), and financial leverage at 0.28 ($p<0.01$) (H4.6). These hypotheses were mentioned in SEM1 and SEM2.

The results also show that perceived risk mediates between borrowing sources and informal debt at 0.022 ($p<0.01$) in support of H4.7. The use of more borrowing sources leads to more concerns about the risk of stock investment, and more risk concerns result in the choice of informal debt for stock investment, and as a result, perceived risk links borrowing sources to informal debt decisions. In other words, the mediating role of perceived risk may explain why a higher number of borrowing sources leads to the use of higher informal debt. This result also contributes to the literature. SEM3, however, finds no significant indirect impact of borrowing sources on financial leverage through perceived risk, which does not support H4.8.

In summary, based on the main results of SEMs, as presented above, this chapter reiterates that borrowing, especially informal borrowing is part of Vietnamese culture. Investors with higher risk perception of stock investment tend to use more borrowing sources and higher informal debt, and those with more borrowing sources are more likely to use debt for stock investment.

Figure 4.3: Facets of risk, borrowing sources and debt decisions (SEM2)

This figure reveals a direct relationship of opportunity risk and leverage risk to borrowing sources and borrowing sources to informal debt and financial leverage at a significant level (*p<0.1*). In addition, borrowing sources are a mediator between opportunity risk, leverage risk, and debt decisions at a significant level.
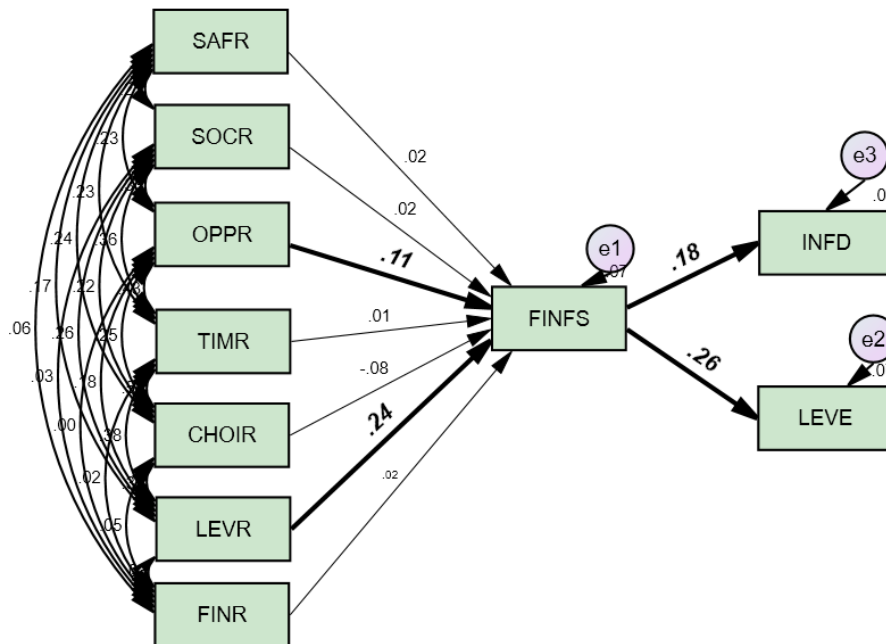
Model fit criteria: Chi-square: 22.676, df: 15, GFI: 0.990, TLI: 0.954, CFI: 0.985, RMSEA: 0.035.
SAFR: safety risk, SOCR: social risk, OPPR: opportunity risk, TIMR: time risk, CHOIR: choice risk, LEVR: leverage risk, FINR: financial risk, FINFS: borrowing sources, INFD: informal debt, LEVE: financial leverage.

Table 4.7: Facets of risk, borrowing sources and debt decisions (SEM2)

This table indicates a direct link of opportunity risk and leverage risk to borrowing sources and borrowing sources to informal debt and financial leverage at a significant level (*p<0.1*). In addition, borrowing sources are a mediator between opportunity risk, leverage risk, and debt decisions at a significant level.

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
I. Direct relationship								
FINFS	<---	SOCR	0.013	0.017	0.041	0.323	0.747	
FINFS	**<---**	**OPPR**	0.097	**0.107**	0.049	1.997	**0.046****	H4.1
FINFS	<---	TIMR	0.010	0.009	0.067	0.149	0.882	
FINFS	<---	CHOIR	-0.083	-0.078	0.061	-1.354	0.176	
FINFS	**<---**	**LEVR**	0.209	**0.242**	0.045	4.594	**0.000*****	H4.1
FINFS	<---	FINR	0.012	0.017	0.034	0.356	0.722	
FINFS	<---	SAFR	0.019	0.019	0.048	0.386	0.699	
INFD	**<---**	**FINFS**	0.060	**0.176**	0.017	3.650	**0.000*****	H4.5
LEVE	**<---**	**FINFS**	0.250	**0.260**	0.045	5.514	**0.000*****	H4.6
II. Indirect relationship								
OPPR->FINFS->INFD			0.006	**0.019**			***	H4.9
OPPR->FINFS->LEVE			0.024	**0.028**			***	H4.10
LEVR->FINFS->INFD			0.013	**0.042**			***	H4.9
LEVR->FINFS->LEVE			0.052	**0.063**			***	H4.10

Note: *: p<0.1, **: p<0.05, ***: p<0.01
SAFR: safety risk, SOCR: social risk, OPPR: opportunity risk, TIMR: time risk, CHOIR: choice risk, LEVR: leverage risk, FINR: financial risk, FINFS: borrowing sources, INFD: informal debt, LEVE: financial leverage.

Figure 4.4: Borrowing sources, perceived risk and debt decisions (SEM3)

This figure indicates that borrowing sources affect perceived risk, informal debt and financial leverage. Perceived risk also relates to informal debt at a significant level. SEM3, however, finds no significant relationship of perceived risk to financial leverage. Moreover, perceived risk significantly mediates between borrowing sources and informal debt.
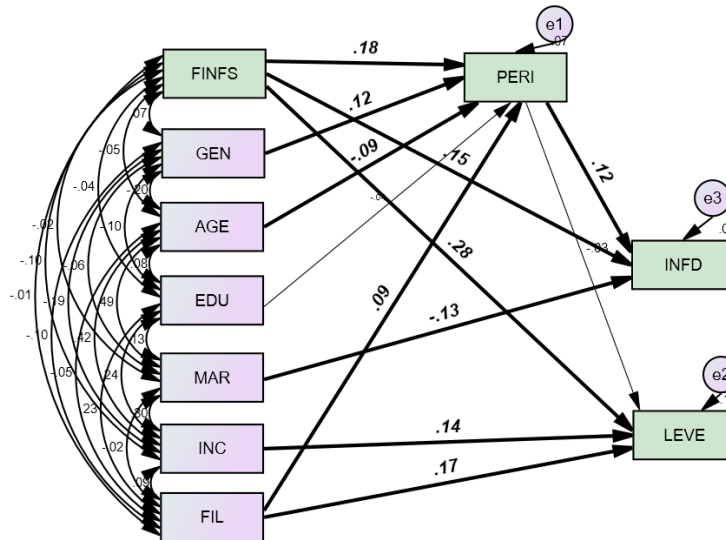
Model fit criteria: Chi-square: 14.181, df: 12, GFI: 0.993, TLI: 0.978, CFI: 0.994, RMSEA: 0.021.
FINFS: borrowing sources, PERI: perceived risk, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 4.8: Borrowing sources, perceived risk, debt decisions (SEM3)

This table reveals the direct association of borrowing sources with perceived risk as well as debt decisions. Perceived risk also pertains to informal debt at a significant level. The perceived risk significantly mediates between borrowing sources and informal debt. However, SEM3 finds no significant link of perceived risk to financial leverage.

			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
I. Direct relationship								
PERI	**<---**	**FINFS**	0.776	**0.177**	0.208	3.738	**0.000***	**H4.4**
PERI	<---	GEN	0.672	0.121	0.270	2.486	0.013**	
PERI	<---	EDU	-0.289	-0.043	0.329	-0.879	0.379	
PERI	<---	AGE	-0.289	-0.085	0.164	-1.765	0.077*	
PERI	<---	FIL	0.079	0.094	0.041	1.935	0.053*	
INFD	**<---**	**PERI**	0.010	**0.124**	0.004	2.579	**0.010**	**H4.2**
INFD	**<---**	**FINFS**	0.051	**0.149**	0.017	3.092	**0.002***	**H4.5**
INFD	<---	MAR	-0.052	-0.130	0.019	-2.747	0.006***	
LEVE	<---	INC	0.120	0.144	0.039	3.106	0.002***	
LEVE	<---	FIL	0.031	0.168	0.008	3.641	0.000***	
LEVE	<---	PERI	-0.007	-0.034	0.010	-0.722	0.470	H4.3
LEVE	**<---**	**FINFS**	0.272	**0.283**	0.045	6.030	**0.000***	**H4.6**
II. Indirect relationship								
FINFS->PERI->INFD			0.008	**0.022**			*******	**H4.7**
FINFS->PERI->LEVE			-0.005	-0.006			0.470	H4.8

Note: *: p<0.1, **: p<0.05, ***: p<0.01
FINFS: borrowing sources, PERI: perceived risk, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

4.5 Results of sub-group analysis

This chapter next examines the differences in the relationship of perceived risk to borrowing sources and debt decisions amongst sub-groups: stockbrokers and non-stockbrokers, male and female investors and users and non-users of borrowing sources. Eight models are developed. SEM4 will examine this relationship among investors who are also stockbrokers, while SEM5 will investigate this relationship among investors who are non-stockbrokers[13]. Male investors and female investors will be presented in SEM6 and SEM7, respectively. Non-users and users of borrowing sources will be tested through four models using multiple regression techniques due to the small sample. This analysis will find which group has the strongest relationship of perceived risk to debt decisions.

The first sub-group analysis is between stockbrokers (N=169) and non-stockbrokers (N=251). Figure 4.5 and Table 4.9 summarise the results as follows. Both SEM4 and SEM5 find an association of perceived risk (overall) with the use of borrowing sources at 0.24 ($p<0.01$) and 0.1 ($p<0.1$), and the use of informal debt at 0.13 ($p<0.1$) and 0.12 ($p<0.05$), respectively. Borrowing sources also relate to the use of financial leverage at 0.246 ($p<0.01$) and 0.247 ($p<0.01$), respectively. These results indicate that perceived risk predicts the use of borrowing sources and the use of informal debt, and borrowing sources pertain to the use of financial leverage among stockbrokers and non-stockbrokers.

For the relationship between borrowing sources and the use of informal debt, only SEM4 finds a link from borrowing sources to informal debt at 0.25 ($p<0.01$), while SEM5 does not. This means that borrowing sources only relate to the use of informal debt among stockbrokers.

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[13] Non-stockbrokers (N=251) include, in descending order, other jobs (25.1%), banking officers (17.9%), sales/marketing managers (14.7%), administrators (12%), investment officers (9.6%), business owners (4.8%), accountants (3.9%), teachers/lecturers (3.2%), financial advisors (3.2%), find managers (2.8%), brokerage managers (1.2%), CFOs (1.2%), and CEOs (0.4%).

Figure 4.5: Perceived risk, borrowing sources and debt decisions between stockbrokers and non-stockbrokers

This figure shows that both SEM4 and SEM5 find a link of perceived risk (overall) to borrowing sources and the use of informal debt and borrowing sources to financial leverage at a significant level. This indicates that perceived risk directly relates to borrowing sources and informal debt, and borrowing sources are associated with financial leverage among stockbrokers or non-stockbrokers. For the relationship between borrowing sources and informal debt, only SEM4 finds an association of borrowing sources with informal debt at 0.25 (*p<0.01*), while SEM5 does not. This means that borrowing sources only explain the use of informal debt among stockbrokers.

Perceived risk, borrowing sources and debt decisions among stockbrokers (SEM4) (N=169)

Perceived risk, borrowing sources and debt decisions among non-stockbrokers (SEM5) (N=251)

Model fit criteria: Chi-square: 5.234, Df: 12, GFI: 0.994, TLI: 1.160, CFI: 1.000, RMSEA: 0.000.
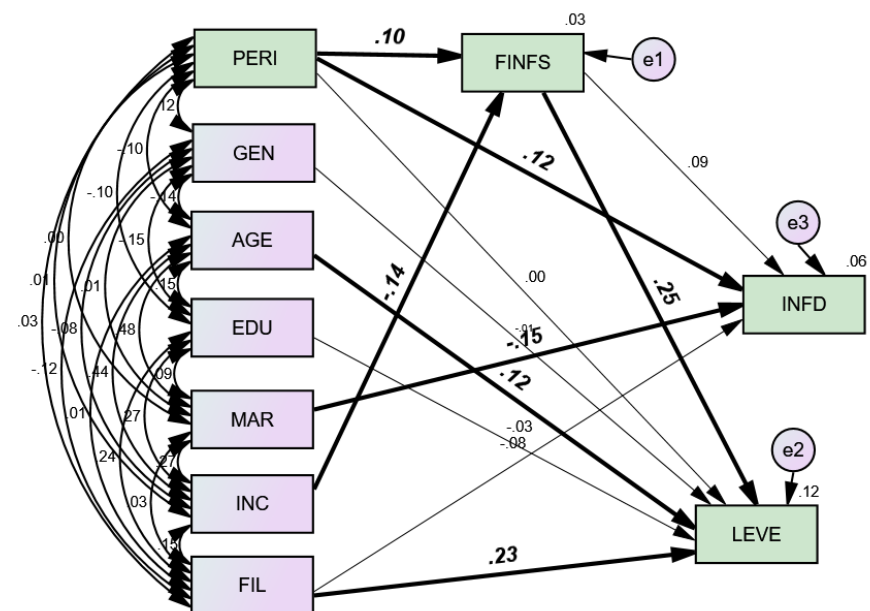
Model fit criteria: Chi-square: 14.828, Df: 12, GFI: 0.988, TLI: 0.948, CFI: 0.986, RMSEA: 0.031.

PERI: perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy,

INFD: informal debt, LEVE: financial leverage.

Table 4.9: Perceived risk, borrowing sources and debt decisions between stockbrokers and non-stockbrokers

This table presents that both SEM4 and SEM5 find a link of perceived risk (overall) to borrowing sources and the use of informal debt and borrowing sources to financial leverage at a significant level. This indicates that perceived risk directly relates to borrowing sources and informal debt, and borrowing sources are associated with financial leverage among stockbrokers and non-stockbrokers. For the relationship between borrowing sources and informal debt, only SEM4 finds an association of borrowing sources with informal debt at 0.25 (*p<0.01*), while SEM5 does not. This means that borrowing sources only explain the use of informal debt among stockbrokers.

Perceived risk, borrowing sources and debt decisions among stockbrokers (SEM4) (N=169)						Perceived risk, borrowing sources and debt decisions among non-non-stockbrokers (SEM5) (N=251)					
Direct relationships	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P	Direct relationships	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P
FINFS <--- PERI	0.053	**0.238**	0.017	3.179	**0.001*****	FINFS <--- INC	-0.116	-0.142	0.051	-2.287	0.022**
INFD <--- **FINFS**	0.063	**0.200**	0.024	2.675	**0.007*****	**FINFS** <--- **PERI**	0.023	**0.103**	0.014	1.655	**0.098***
INFD <--- **PERI**	0.009	**0.130**	0.005	1.692	**0.091***	INFD <--- FINFS	0.035	0.092	0.023	1.483	0.138
LEVE <--- PERI	-0.012	-0.062	0.016	-0.793	0.428	**INFD** <--- **PERI**	0.011	**0.122**	0.005	1.972	**0.049****
LEVE <--- FIL	0.023	0.124	0.014	1.632	0.103*	LEVE <--- PERI	-0.001	-0.005	0.014	-0.081	0.936
LEVE <--- EDU	-0.066	-0.039	0.127	-0.520	0.603	LEVE <--- FIL	0.041	0.230	0.011	3.748	0.000***
LEVE <--- **FINFS**	0.222	**0.246**	0.068	3.248	**0.001*****	INFD <--- MAR	-0.058	-0.152	0.024	-2.464	0.014**
LEVE <--- GEN	-0.168	-0.135	0.093	-1.800	0.072*	LEVE <--- AGE	0.095	0.120	0.048	1.983	0.047**
INFD <--- INC	-0.053	-0.184	0.024	-2.207	0.027**	LEVE <--- EDU	-0.038	-0.028	0.084	-0.449	0.654
INFD <--- GEN	-0.050	-0.114	0.035	-1.446	0.148	**LEVE** <--- **FINFS**	0.257	**0.247**	0.062	4.122	**0.000*****
INFD <--- AGE	-0.014	-0.058	0.022	-0.651	0.515	INFD <--- FIL	-0.005	-0.080	0.004	-1.296	0.195
INFD <--- MAR	-0.009	-0.022	0.036	-0.255	0.799	LEVE <--- GEN	-0.017	-0.015	0.072	-0.239	0.811

*: p<0.1, **: p<0.01, ***: p<0.001, PERI: perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

The second sub-group analysis is between male (N=258) and female investors (N=162). Figure 4.6 and Table 4.10 present the findings of the relationship between perceived risk, borrowing sources, and debt decisions between male and female investors. SEM6 finds a positive link of perceived risk (overall) to borrowing sources at 0.21 ($p<0.01$) and the use of informal debt at 0.2 ($p<0.01$), and a negative association of perceived risk with the use of financial leverage at -0.13 ($p<0.05$), while SEM7 does not. Both these SEMs uncover a positive connection of borrowing sources to the use of financial leverage at 0.35 ($p<0.01$) and 0.17 ($p<0.05$), respectively.

These findings indicate that perceived risk can predict the use of borrowing sources, informal debt and financial leverage among male investors. Borrowing sources can explain the use of financial leverage among male and female investors. It is worthy of note that SEM6 does find that perceived risk is negatively associated with the use of financial leverage among male investors, while both SEM1 and SEM2 do not find a significant association between perceived risk and financial leverage among all investors.

Perceived risk, in short, is positively related to the use of informal debt among investors and inversely associated with the use of financial leverage among male investors. That is, higher-risk concern investors tend to use higher informal debt and lower financial leverage. This result is plausible because, in a typical debt portfolio, the total debt is 100%, which means that if the use of informal debt increases, the use of formal debt must decrease.

Figure 4.6: Perceived risk, borrowing sources and debt decisions between male and female investors

This figure shows that SEM6 finds a positive link of perceived risk (overall) to borrowing sources and the use of informal debt, and a negative link of perceived risk to the use of financial leverage, while SEM7 does not. Both SEMs present a relationship of borrowing sources to the use of financial leverage at 0.35 (*p<0.01*) and 0.17 (*p<0.05*), respectively. These results mean that perceived risk can predict the use of borrowing sources, informal debt, and financial leverage among male investors. In contrast, only borrowing sources can explain the use of financial leverage among female investors.

Perceived risk, borrowing sources and debt decisions among male investors (SEM6) (N=258)

Perceived risk, borrowing sources and debt decisions among female investors (SEM7) (N=162)
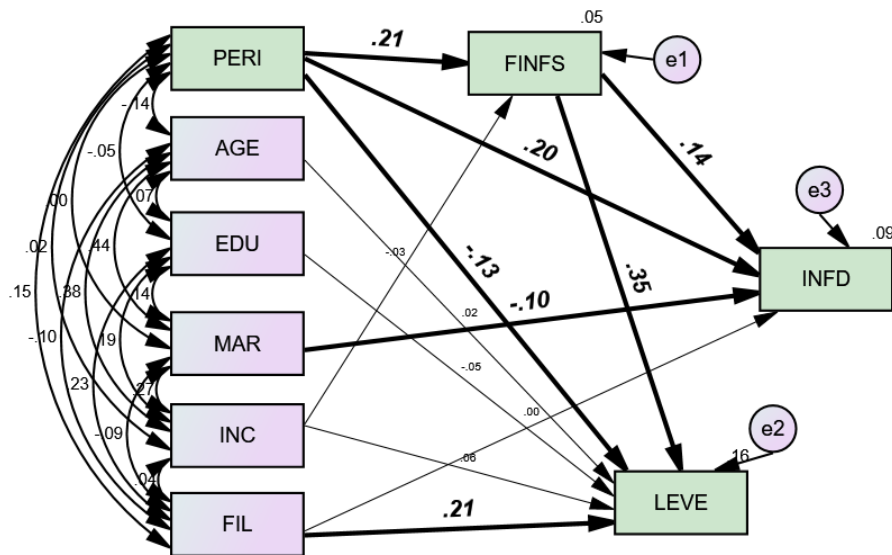
Model fit criteria: Chi-square: 4.584, Df: 9, GFI: 0.996, TLI: 1.091, CFI: 1.000, RMSEA: 0.000.
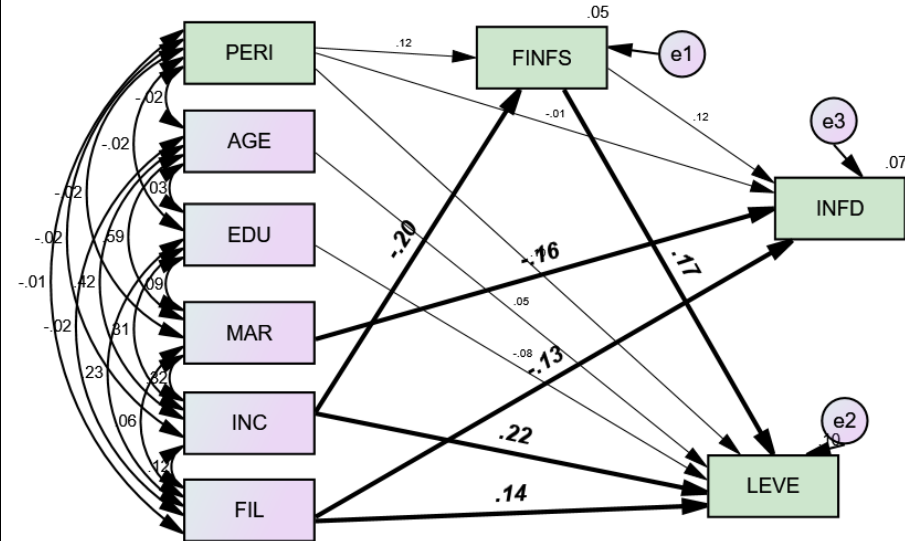
Model fit criteria: Chi-square: 6.750, Df: 9, GFI: 0.991, TLI: 1.066, CFI: 1.000, RMSEA: 0.031.

PERI: perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy,

INFD: informal debt, LEVE: financial leverage.

Table 4.10: Perceived risk, borrowing sources and debt decisions between male and female investors

This table presents that SEM6 finds a positive link of perceived risk (overall) to borrowing sources and the use of informal debt, and a negative link of perceived risk to the use of financial leverage, while SEM7 does not. Both SEMs present a relationship of borrowing sources to the use of financial leverage at 0.35 (*p<0.01*) and 0.16 (*p<0.05*), respectively. These results mean that perceived risk can predict the use of borrowing sources, informal debt, and financial leverage among male investors. In contrast, only borrowing sources can explain the use of financial leverage among female investors.

Perceived risk, borrowing sources and debt decisions among male investors (SEM6) (N=258)						Perceived risk, borrowing sources and debt decisions among female investors (SEM7) (N=162)					
Direct relationships	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P	Direct relationships	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P
FINFS <--- INC	-0.026	-0.028	0.058	-0.459	0.646	FINFS <--- PERI	0.027	0.121	0.017	1.572	0.116
FINFS <--- PERI	0.050	**0.213**	0.014	3.494	**0.000***	FINFS <--- INC	-0.156	-0.196	0.061	-2.552	0.011**
LEVE <--- FIL	0.038	0.211	0.011	3.516	0.000***	INFD <--- PERI	0.000	-0.005	0.007	-0.069	0.945
LEVE <--- EDU	-0.065	-0.049	0.079	-0.824	0.410	LEVE <--- PERI	0.025	0.103	0.018	1.371	0.170
LEVE <--- FINFS	0.311	**0.347**	0.053	5.909	**0.000***	LEVE <--- FIL	0.026	0.139	0.014	1.801	0.072*
LEVE <--- AGE	0.014	0.020	0.045	0.314	0.753	LEVE <--- EDU	-0.144	-0.076	0.153	-0.946	0.344
LEVE <--- INC	0.048	0.057	0.054	0.901	0.368	**LEVE <--- FINFS**	0.177	**0.165**	0.083	2.140	**0.032**
INFD <--- FIL	0.000	-0.003	0.004	-0.046	0.963	INFD <--- MAR	-0.068	-0.164	0.032	-2.117	0.034**
INFD <--- FINFS	0.046	**0.145**	0.019	2.367	**0.018**	LEVE <--- AGE	0.045	0.055	0.068	0.661	0.509
INFD <--- MAR	-0.039	-0.100	0.023	-1.660	0.097*	LEVE <--- INC	0.188	0.221	0.075	2.507	0.012**
INFD <--- PERI	0.015	**0.205**	0.005	3.320	**0.000***	INFD <--- FIL	-0.009	-0.132	0.005	-1.723	0.085*
LEVE <--- PERI	-0.027	**-0.131**	0.013	-2.176	**0.030**	INFD <--- FINFS	0.048	0.123	0.031	1.573	0.116

*: p<0.1, **: p<0.01, ***: p<0.001, PERI: perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

The last sub-group analysis is between users and non-users of borrowing sources including non-users (N=92) and users of informal borrowing sources (N=328), and non-users (N=79) and users of formal borrowing sources (N=341). As the sample size of non-users of borrowing is less than 100, multiple regression is applied to ensure a model fit.

The results of the relationship between perceived risk and informal debt among users and non-users of borrowing sources are presented in Table 4.11. Model 7 finds a link of perceived risk to informal debt among users of informal borrowing sources at 0.129 (*p<0.05*), while Model 6 does not. Both Models 8 and 9 show an association of perceived risk with informal debt at 0.24 (*p<0.1*) and 0.14 (*p<0.01*), respectively. These results indicate that perceived risk does predict the use of informal debt among users of informal borrowing sources, and both non-users and users of formal borrowing sources, but does not relate to the use of informal debt among non-users of informal borrowing sources.

Table 4.11: Perceived risk, borrowing sources and debt decisions between users and non-users of borrowing sources

This table presents a positive link of perceived risk to informal debt at a significant level among users of informal borrowing sources, and non-users and users of formal borrowing sources. Note that unstandardised estimates are in parentheses.

IVs	Non-users of informal borrowing sources	Users of informal borrowing sources	Non-users of formal borrowing sources	Users of formal borrowing sources
	(6)	(7)	(8)	(9)
PERI	0.111	**0.129****	**0.235***	**0.143*****
	(0.007)	**(0.011)**	**(0.021)**	**(0.011)**
GEN	-0.038	0.005	0.07	-0.025
	(-0.016)	(0.002)	(0.041)	(-0.01)
AGE	-0.02	-0.024	0.103	-0.043
	(-0.004)	(-0.007)	(0.03)	(-0.011)
MAR	0.067	**-0.144****	0.006	**-0.135*****
	(0.024)	**(-0.056)**	(0.003)	**(-0.049)**
EDU	-0.04	0.063	0.008	0.051
	(-0.021)	(0.031)	(0.005)	(0.026)
INC	-0.037	-0.065	0.023	**-0.142*****
	(-0.011)	(-0.019)	(0.009)	**(-0.039)**
FIL	-0.125	-0.026	-0.009	-0.06
	(-0.008)	(-0.002)	(-0.001)	(-0.004)
Adj. R^2	-0.053	0.032	-0.032	0.061
F	(0.3,7)	(2.6,7) ***	(0.7,7)	(0.2,7) ***
N	92	328	79	341

Dependent variable: INFD: informal debt. *: $p<0.1$, **: $p<0.05$, ***: $p<0.01$, PERI: perceived risk, GEN: gender, AGE: age, MAR: marital status, EDU: education levels, INC: income, FIL: financial literacy, INFD: informal debt.

In summary, between subgroups, perceived risk has the strongest relationship to the use of informal debt among non-users of formal borrowing, followed by male investors, users of formal borrowing, stockbrokers, users of informal borrowing, and non-stockbrokers. Female investors' perceived risk does not explain their use of informal debt. Alternatively, some demographics, marital status, and financial literacy can explain this use of informal debt among female investors, which are presented in Section 4.7.

4.6 Robustness check

This chapter applies other techniques to ensure the robustness of the results found by the SEM findings. The additional tests are the following; alternative measures of perceived risk and debt decisions, multiple linear regression, stepwise regression, Hayes and Preacher's approach, causality analysis in the SEM model, the T-test, and solutions to locations and response biases. The methodology used here was outlined in Section 3.4.

4.6.1 Robustness check using alternative measures

Additional measures are then applied to perceived risk and debt decisions. Perceived risk is measured by summing up the seven facets without using logarithm (ln) for each facet. Debt decisions are computed through the total informal and formal debt.

The eighth SEM model, SEM8, is developed to test the relationship of perceived risk to borrowing sources and debt decisions. SEM8 aims to examine the robustness of the results by SEMs using alternative measures for perceived risk and debt decisions.

Figure 4.7 and Table 4.12 summarise the results of SEM8. Perceived risk directly relates to borrowing sources at 0.13 (*p<0.01*) and debt decisions at 0.08 (*p<0.1*). Borrowing sources is associated with debt decisions at 0.32 (*p<0.01*). Borrowing sources mediate between perceived risk and debt decisions at 0.04 (*p<0.01*). These results are consistent with those from SEM1, indicating the link of perceived risk to debt decisions are robust using additional measures.

Figure 4.7: Perceived risk, borrowing sources and debt decisions (SEM8)

This figure shows a direct association of perceived risk with borrowing sources, the perceived risk with debt decisions, and borrowing sources with debt decisions at a significant level (*p<0.1*). SEM8 also uncovers borrowing sources as a mediator between perceived risk and debt decisions at a significant level.
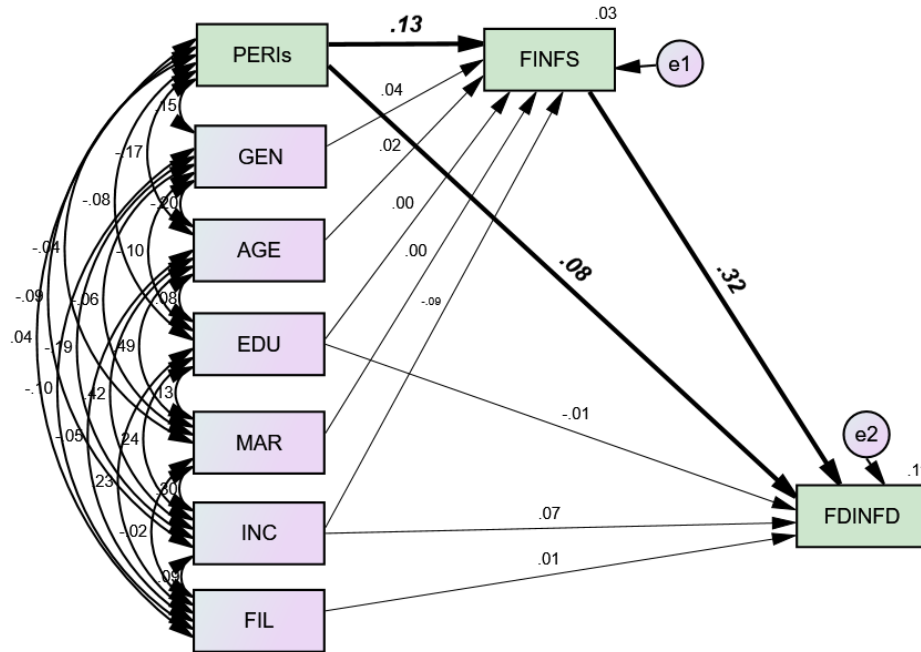
A model fit with criteria: Chi-square: 1.826, df: 4, GFI: 0.999, TLI: 1.058, CFI: 1.000, RMSEA: 0.000.
PERIs: overall perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy, FDINFD: debt decisions.

Table 4.12: Perceived risk, borrowing sources and debt decisions (SEM8)

This table presents a direct link of perceived risk to borrowing sources, perceived risk to debt decisions, and borrowing sources to debt decisions at a significant level (*p<0.1*). SEM8 also uncovers borrowing sources as a mediator between perceived risk and debt decisions at a significant level (*p<0.1*).

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P
I. Direct relationship							
FINFS	**<---**	**PERIs**	0.003	**0.134**	0.001	2.724	**0.006***
FINFS	<---	GEN	0.048	0.038	0.063	0.765	0.444
FINFS	<---	AGE	0.012	0.015	0.046	0.256	0.798
FINFS	<---	MAR	0.004	0.003	0.065	0.060	0.952
FINFS	<---	INC	-0.076	-0.087	0.048	-1.583	0.113
FINFS	<---	EDU	-0.003	-0.002	0.077	-0.045	0.964
FDINFD	**<---**	**FINFS**	0.133	**0.317**	0.019	6.800	**0.000***
FDINFD	<---	FIL	0.001	0.011	0.004	0.225	0.822
FDINFD	<---	EDU	-0.006	-0.009	0.031	-0.183	0.855
FDINFD	<---	INC	0.025	0.069	0.017	1.447	0.148
FDINFD	**<---**	**PERIs**	0.001	**0.078**	0.000	1.674	**0.094***
II. Indirect relationships							
PERIs->FINFS->FDINFD			0.000	**0.043**			*

*: p<0.1, **: p<0.01, ***: p<0.001, PERIs: overall perceived risk, FINFS: borrowing sources, GEN: gender, AGE: age, EDU: education levels, MAR: marital status, INC: income, FIL: financial literacy, FDINFD: debt decisions.

4.6.2 Robustness check using multiple and stepwise regression

The models using multiple regression are each labelled "a" and models with stepwise regression are each labelled "b", with results shown in Table 4.13. The results show a significant relationship of perceived risk and borrowing sources to informal debt, borrowing sources to financial leverage, perceived risk to borrowing sources, borrowing sources to perceived risk, and opportunity risk and leverage risk to borrowing sources. In general, these results are consistent with those from the SEMs.

4.6.3 Robustness check using the Hayes and Preacher's approach

The approach by Hayes and Preacher (2010) tests perceived risk as a mediator between borrowing sources and informal debt and borrowing sources as a mediator between perceived risk and debt decisions. This approach was mentioned in Section 3.4.1.

The results are shown in Table 4.14. Models 1-7 indicate that borrowing sources significantly mediate between perceived risk and informal debt in Model 1, between perceived risk and financial leverage in Model 2, opportunity risk and informal debt in Model 3, opportunity risk and financial leverage in Model 4, leverage risk and informal debt in Model 5, and leverage risk and financial leverage in Model 6. Moreover, perceived risk significantly mediates between borrowing sources and informal debt in Model 7. Overall, the results from applying the Hayes and Preacher's approach are consistent with those using SEMs.

Table 4.13: Results of direct relationships using multiple regression and stepwise regression

This table shows a direct link of perceived risk and borrowing sources to informal debt at a significant level in Models 1a and 1b. Borrowing sources significantly relate to financial leverage in both Models 2a and 2b. Models 3a and 3b indicate that perceived risk has a significant link to borrowing sources. Borrowing sources are significantly associated with the perceived risk in Models 4a and Model 4b. Models 5a and 5b find that opportunity and leverage risk have a relationship with borrowing sources at a significant level $(p<0.1)$. Note that unstandardised estimates are in parentheses.

IVs	DV: INFD		DV: LEVE		DV: FINFS		DV: PERI		IVs	DV: FINFS	
	1a	1b	2a	2b	3a	3b	4a	4b	Model 5	5a	5b
PERI	**0.133***** **(0.019)**	**0.124**** **(0.01)**	-0.029 (-0.006)		**0.187***** **(0.043)**	**0.188***** **(0.043)**			SAFR	0.019 (0.019)	
FINFS	**0.141***** **(0.048)**	**0.149***** **(0.051)**	**0.284***** **(0.273)**	**0.276***** **(0.265)**			**0.181***** **(0.796)**	**0.180***** **(0.793)**	SOCR	0.017 (0.013)	
GEN	-0.001 (-0.001)		-0.052 (-0.063)		0.029 (0.037)		**0.124**** **(0.690)**	**0.133***** **(0.739)**	**OPPR**	**0.107**** **(0.097)**	**0.104**** **(0.095)**
AGE	-0.007 (-0.002)		0.004 (0.003)		0.019 (0.015)		**-0.139*** **(-0.472)**		TIMR	0.009 (0.010)	
MAR	**-0.108*** **(-0.043)**	**-0.130***** **(-0.052)**	0.023 (0.026)		0.00 (0.001)		0.057 (0.289)		CHOIR	-0.078 (-0.083)	
EDU	0.048 (0.026)		-0.056 (-0.083)		0.00 (0.00)		-0.061 (-0.413)		**LEVR**	**0.242***** **(0.209)**	**0.225***** **(0.194)**
INC	-0.088* (-0.026)		**0.138***** **(0.116)**	**0.144***** **(0.121)**	-0.096* (-0.084)	-0.095** (-0.083)	0.067 (0.259)		FINR	0.017 (0.012)	
FIL	-0.056 (-0.004)		**0.177***** **(0.033)**	**0.165***** **(0.03)**	-0.013 (-0.003)		**0.092*** **(0.077)**				
Adj. R²	0.056	0.056	0.109	0.065	0.03	0.041	0.062	0.049	Adj. R²	0.037	0.065
F,df	(4.1, 8) ***	(6.6,3) **	(7.4,8) ***	(9.6,3) ***	(2.9,7) ***	(3.9,2) **	(4.9,7) ***	(7.7,2) ***	F, df	(3.3,7) ***	(4.7,2) ***
N	420	420	420	420	420	420	420	420	N	420	420

Note: a: multiple linear regression, b: stepwise regression, DV: dependent variable. IVs: independent variables.

*: p<0.1, **: p<0.01, ***: p<0.001, PERI: perceived risk of stock investment, FINFS: borrowing sources, GEN: gender, AGE: age, MAR: marital status, EDU: education levels, INC: income, FIL: financial literacy, SAFR: safety risk, SOCR: social risk, OPPR: opportunity risk, TIMR: time risk, CHOIR: choice risk, LEVR: leverage risk, FINR: financial risk, INFD: informal debt, LEVE: financial leverage.

Table 4.14: Results of indirect effects – Hayes and Preacher's approach

This table finds borrowing sources and perceived risk as mediators at a significant level ($p \leq 0.1$). Borrowing sources significantly mediate between perceived risk and informal debt in Model 1, perceived risk and financial leverage in Model 2, opportunity risk and informal debt in Model 3, opportunity risk and financial leverage in Model 4, leverage risk and informal debt in Model 5, and leverage risk and financial leverage in Model 6. The perceived risk significantly mediates between borrowing sources and informal debt in Model 7.

Models	Unstandardised value	Se	LLCI	ULCI	z
1.PERI->FINFS-> INFD	0.0023*	0.0009	0.0007	0.0038	2.4007
2.PERI->FINFS->LEVE	0.011***	0.0035	0.0053	0.0167	3.1755
3.OPPR->FINFS->INFD	0.0075**	0.0034	0.0019	0.0132	2.1978
4.OPPR->FINFS->LEVE	0.0335***	0.1290	0.0122	0.0548	2.5908
5.LEVR->FINFS->INFD	0.0114***	0.0043	0.0044	0.0185	2.6766
6.LEVR->FINFS->LEVE	0.0505***	0.0141	0.0274	0.0736	3.5924
7.FINFS->PERI->INFD	0.0082**	0.0039	0.0018	0.0146	2.1121

*: p≤0.1, **: p<0.05, ***: p<0.01. LLCI: lower level confidence interval, ULCI: upper-level confidence interval. Se: errors. PERI: perceived risk, OPPR: opportunity risk, LEVR: leverage risk, FINFS: borrowing sources, INFD: informal debt, LEVE: financial leverage.

4.6.4 Robustness check using the t-test and propensity score matching approach

The key finding of this chapter is a significantly positive relationship of perceived risk to the use of informal debt after controlling for six demographics (gender, age, education, marital status, income, and financial literacy). Perceived risk is coded as a dummy variable; 0 when the perceived risk is less than the Mean, and 1 when the perceived risk is higher than the Mean. Each group has these six control variables. This chapter first applies the two-sample t-test to examine whether these six demographics between the two groups are equal. The t-test is also outlined in Section 3.4.3.

The t-test results with N= 420 find that the means of gender, age, education, and income between the two groups of perceived risk are different at a significant level ($p<0.1$), meaning that these control variables may be confounding variables that influence both perceived risk

and informal debt. Propensity score matching (PSM), accordingly, is applied to deal with these differences. After the PSM is performed, the sample size reduces to 392 respondents.

The results of Table 4.15 present that the means of six demographic variables between the two groups of perceived risk are different at an insignificant level ($p>0.1$), using the sample of 392 respondents. There are no differences in the means of these six control variables between the two groups of perceived risk, reducing the bias in choosing these six variables.

The results of the link of perceived risk to the use of informal debt are presented in Table 4.16 using the sample of 392. The perceived risk maintains a strong relationship with informal debt at 0.27 ($p<0.01$) after the scores of the six control variables are matched. In summary, the relationship between perceived risk and informal debt is robust using the propensity score matching technique.

Table 4.15: The T-test results of the six variables between the two groups of perceived risk (N=392)

This table presents that after the propensity matching score is performed, there are no differences in the means of each of the six variables between the two groups of perceived risk, reducing the bias in choosing these six variables.

IVs	Group	Mean	Standard error	Standard deviation	90% Confidence Interval		t	Ha: diff < 0 Pr	Hb: diff =0 Pr	Hc: diff>0 Pr
GEN	0	1.37	0.0354	0.496	1.32	1.31	-1.52	0.06	0.13	0.93
	1	1.45	0.0356	0.499	1.39	1.39				
AGE	0	1.96	0.045	0.64	1.89	2.04	1.10	0.86	0.27	0.13
	1	1.88	0.05	0.73	1.80	1.97				
EDU	0	3.04	0.027	0.38	3.00	3.09	1.07	0.85	0.28	0.14
	1	3.00	0.026	0.37	2.96	3.05				
MAR	0	1.38	0.035	0.49	1.32	1.446	0.19	0.57	0.85	0.43
	1	1.37	0.04	0.57	1.31	1.445				
INC	0	2.59	0.048	0.68	2.51	2.67	1.01	0.84	0.31	0.16
	1	2.52	0.05	0.71	2.44	2.61				
FIL	0	9.59	0.23	3.30	9.20	9.98	-0.39	0.36	0.72	0.64
	1	9.70	0.20	2.88	9.36	10.04				

Note: *: p<10%, **: p<5%, ***: p<1%; GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

Table 4.16: The results for the relationship between perceived risk and debt decisions
(N=392)

This table presents that perceived risk maintains a strong relationship with the use of informal debt at 0.27 (*p<0.05*) using the propensity score matching method.

Probit regression				Number of obs	=	392
				Wald chi2(7)	=	13.66
				Prob>chi2	=	0.0576
Log pseudolikelihood		= -261.47		Pseudo R2	=	0.0262

INFD	Coef.	Robust Std. Err.	z	p> |z|	[90% Conf. Interval]	
PERIdummy	**0.274**	0.129	2.11	**0.035****	0.060	0.487
GEN	0.003	0.132	0.03	0.980	-0.214	0.221
AGE	0.024	0.112	0.22	0.827	-0.160	0.209
EDU	0.038	0.172	0.22	0.824	-0.245	0.322
MAR	-0.221	0.139	-1.59	0.112	-0.451	0.007
INC	-0.128	0.106	-1.20	0.229	-0.302	0.046
FIL	-0.039	0.022	-1.80	0.072	-0.075	-0.003
Constant	0.873	0.605	1.44	0.149	-0.122	1.868

**: p<5%, Dependent variable: INFD: informal debt. PERIdummy: perceived risk, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

4.6.5 Robustness check on locations selection bias and response bias

The methodology used here has been presented in Chapter 3. Briefly, this chapter examines and concludes that locations and response bias are not related to the relationship of perceived risk to informal debt.

This chapter also examines whether respondents' locations dampen the association between perceived risk and informal debt alongside other demographics such as gender, age, marital status, education, income, and financial literacy.

The results are shown in Table 4.17, in which locations (denoted as PLACE) in both Model 1 and 2 do not relate to informal debt at a significant level (*p<0.1*). Locations also do not dampen the link of perceived risk to informal debt and, as a result, this minimises the bias in location selections.

Table 4.17: Results of an effect of locations on debt decisions

Models	Unstandardised Coefficients	Standardised error	Standardised Coefficients	t	Sig.	Model summary
Model 1						
Constant	0.078	0.115		0.681	0.496	
PERI	0.012	0.004	0.157	3.191	0.002***	Adjusted R
GEN	-0.002	0.024	-0.004	-0.070	0.944	square:
AGE	-0.001	0.016	-0.005	-0.083	0.934	0.037;
MAR	-0.043	0.022	-0.107	-1.908	0.057**	F = 2.99
EDU	0.026	0.027	0.048	0.951	0.342	Df: 8
INC	-0.030	0.016	-0.101	-1.836	0.067*	Sig.:
FIL	-0.004	0.003	-0.059	-1.173	0.242	0.003***
PLACE	-0.003	0.010	-0.016	-0.301	**0.764**	
Model 2:						
Constant	0.071	0.112		0.631	0.528	
PERI	0.012	0.004	0.155	3.169	0.002***	Adjusted R
GEN	0.016	0.026	0.037	0.629	0.530	square:
AGE	-0.001	0.016	-0.004	-0.062	0.950	0.039;
MAR	-0.045	0.022	-0.112	-2.005	0.046**	F = 3.14
EDU	0.026	0.027	0.049	0.967	0.334	Df: 8
INC	-0.032	0.017	-0.107	-1.940	0.053**	Sig.:
FIL	-0.004	0.003	-0.056	-1.113	0.267	0.002***
PLACE	-0.028	0.025	-0.064	-1.104	**0.270**	

Note: *: $p < 10\%$, **: $p < 5\%$, ***: $p < 1\%$,

INFD: informal debt, PERI: perceived risk, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, PLACE: locations.

Model 1: PLACE is a categorical variable

Model 2: PLACE is a dummy variable: HCMC and outside HCMC

4.7 Demographics

The chapter next tests how demographics relate to perceived risk, borrowing sources, and debt decisions, with results summarised in Figure 4.8. Education has no association with perceived risk, borrowing sources, or debt decisions at a significant level. Instead, financial literacy is related to these factors. This is perhaps because education focuses simply on academics degrees, while financial literacy is assessed through 16 questions of financial knowledge by Balloch et al. (2014) and Van Rooij et al. (2011). In short, only education has no significant association with perceived risk, borrowing sources, or debt decisions. The five demographics have a significant relationship with three main variables, as follows.

Firstly, gender positively relates to perceived risk and negatively pertains to financial leverage among stockbrokers. This means that female investors have a higher level of risk concerns than male investors, and female stockbrokers use a lower level of financial leverage than male stockbrokers. This result seems consistent with prior studies in which females are more risk-averse than males (e.g. Barber & Odean, 2001; Frijns et al., 2008; Grable, 2000; Hallahan et al., 2003; Kannadhasan, 2015; Lucarelli & Brighetti, 2011; Tho et al., 2018; Yao et al., 2011).

Secondly, age is negatively associated with perceived risk but positively connected with financial leverage among non-stockbrokers. That is, the older the investors are, the lower the level of risk concerns about stock investment, and the higher the financial leverage used. This is consistent with previous studies (Frijns et al., 2008; Grable, 2000; Pålsson, 1996; Wang & Hanna, 1997).

Thirdly, marital status has a negative association with the use of informal debt. Marital status also has an inverse association with informal debt among users of borrowing sources and female investors. This indicates that married investors use a lower level of informal debt than single investors. These results are consistent with that of Grable (2000), in which single people take more risk than married ones.

Fourthly, income has an inverse relationship with borrowing sources and informal debt, and a positive link with financial leverage. This means that higher-income investors tend to use fewer borrowing sources and a lower level of informal debt but use a higher level of financial leverage. This also reveals that higher-income investors are less likely to use informal debt but more likely to use formal debt. This appears consistent with previous research in which higher-income investors tend to take more risk (Grable, 2000; Hallahan et al., 2003; Hallahan, Faff, & McKenzie, 2004; Morin & Suarez, 1983; Riley Jr & Chow, 1992; Yao et al., 2011).

Lastly, financial literacy positively relates to perceived risk and financial leverage but is negatively related to the use of informal debt among female investors. This means that higher financial literacy investors have a higher level of risk concerns about stock investment and use a higher level of financial leverage. Female investors with higher scores of financial literacy tend to use a lower level of informal debt for stock investment. Overall, these findings are similar to those of prior research in which people with higher financial knowledge, education, or literacy are willing to take more risk (Grable, 2000; Hallahan et al., 2004; Kannadhasan, 2015; Riley Jr & Chow, 1992; Yao et al., 2011).

Figure 4.8: A summary of demographics

Demographics	Positive (+)/ Negative (-) relationship	Findings in
1. Gender		
Gender -> Perceived risk among investors	+	SEM3, Table 4.13
Gender -> Financial leverage among stockbrokers	-	SEM4
2. Age		
Age -> Perceived risk among investors	-	SEM3, Table 4.13
Age -> Financial leverage among non-stockbrokers	+	SEM5
3. Marital status		
Marital status -> Informal debt among investors, non-stockbrokers, male and female investors, users of informal and formal borrowing	-	SEM1, SEM3, SEM5, SEM6, SEM7, Table 4.11, Table 4.13
4. Income		
Income -> Borrowing sources among investors, female investors, non-stockbrokers,	-	SEM1, SEM5, SEM7, Table 4.13
Income -> Financial leverage among investors, female investors	+	SEM1, SEM3, SEM7, Table 4.13
Income -> Informal debt among stockbrokers, female investors, users of formal borrowing.	-	SEM4, Table 4.11
5. Financial literacy		
Financial literacy -> Financial leverage among investors, stockbrokers, non-stockbrokers, male investors, female investors	+	SEM1, SEM3, SEM4, SEM5, SEM6, SEM7, Table 4.13
Financial literacy -> Perceived risk among investors	+	SEM3, Table 4.13
Financial literacy -> Informal debt among female investors	-	SEM7

4.8 Conclusions, contributions, implications, limitations and further research

4.8.1 Conclusions

This chapter investigates the extent to which perceived risk directly relates to borrowing sources and debt decisions and mediates between borrowing sources and debt decisions. Perceived risk is positively associated with borrowing sources and the use of informal debt. Leverage risk and opportunity risk also directly relates to borrowing sources. Borrowing sources is positively related to perceived risk and debt decisions. Perceived risk is a mediator between borrowing sources and informal debt, and borrowing sources acts as a mediator between perceived risk and debt decisions. These results are robust after controlling for demographics and using additional techniques.

Perceived risk also has the strongest relationship with informal debt among non-users of formal borrowing, followed by male investors, users of formal borrowing, stockbrokers, users of informal borrowing, and non-stockbrokers. In addition, perceived risk inversely pertains to the use of financial leverage among male investors.

4.8.2 Contributions and implications

This chapter provides useful insights into investors' use of debt in the Vietnam stock market, and the vital roles of perceived risk and borrowing sources in this use of debt. This may generalise to other stock markets. Additionally, the concept of perceived risk derived from consumer behaviour framework provides a better understanding of investors' behaviour towards debt decisions. The assumption by finance theory is that investors are only concerned about gains or losses (financial risk) when making an investment decision. Alternatively, this chapter finds that investors are concerned not only about financial risk but also about safety

risk, social risk, time risk, opportunity risk, choice risk, and leverage risk. Finally, the structural equation models employed to detect the inter-relationship between perceived risk, borrowing sources, and debt decisions among investors, stockbrokers, non-stockbrokers, male investors, female investors, users of borrowing, and non-users of borrowing contribute to the finance literature.

The results of this chapter have two implications. First is the risk concerns between investors and consumers. When making a purchase decision, both investors and consumers are concerned about financial loss, personal information leaked by hackers or virus, low esteem when making a large loss, and time loss when spending much time for research on information related to the purchase but the outcomes being not what they expect. Integrating consumer behaviour theory into investor behaviour implies that either consumers or investors have some similar risk concerns when making any purchase decisions despite their different preferences for the purchase. Apart from the similarity, investors have additional risk concerns about missing out on other financial investment opportunities, a wrong choice of stocks for investment and stock returns are inadequate to cover their debt. Hence, these risk concerns should be taken into account during the investment decision-making process due to the impact on choices between informal and formal debt.

Second is the tendency of high-risk perception associated with the use of informal debt and more borrowing sources related to the use of both informal and formal debt for stock investment. In general, investors borrow money from parents, friends and/or brokerage firms for stock investment having the following implications.

(i) For borrowers, they should be careful about choices of stocks for investment and monitor the investment results frequently to execute timely adjustments in investment strategy,

reducing the risk of breaking private relationships with informal lenders and legal problems with formal lenders. An additional recommendation to the borrowers is that although informal borrowing is common in Vietnamese culture, borrowers should be aware of using money from these sources effectively and respectfully.

(ii) For lenders, especially informal lenders, they should consider prudently about lending money to investors because, in some instances, investors borrow money from many informal sources, and as a result, failure in stock investment may have a negative influence on the family life of many lenders, even spreading outside the network. To minimise the possible problems, informal lenders should improve knowledge of stock investment to advise their borrowers on stock investment, rather than giving money to borrowers and leaving them to make all investment decisions themselves. Moreover, informal lenders should have good financial plans for their family in which money should be divided into many blocks to ensure that lending money to investors does not affect their family life.

4.8.3 Limitations and further research

This chapter has some limitations. The use of debt may be affected by investors' payment methods. Investors may pay interest to informal lenders, share benefits based on contributed capital with informal lenders, or pay no interest. Differences in payment approaches may lead to differences in the use of debt. It is also essential to examine the heterogeneity in perceived risk, as well as debt decisions between non-payers and payers of interest. An additional possible situation is that informal lenders may borrow money from third parties and lend investors this borrowing. If they do so, debt problems may spread to the broader network and even the entire community.

Although the findings are robust after controlling for demographic variables and using additional techniques, this chapter finds no instrumental variables (IVs) to deal with endogenous problems that may be a threat to inferring a causal relationship of perceived risk to the use of informal debt. This chapter also focuses on the relationship between perceived risk and debt decisions. Other behavioural factors, for example, risk tolerance or trust in the stock market, should be considered because they may impact on debt decisions. Future research should pay attention to these aspects.

Chapter 5 Essay Two: Risk Tolerance, Investment Horizons and Debt Decisions[14]

5.1 Introduction

The main objective of this chapter is to investigate the extent to which risk tolerance directly relates to debt decisions and mediates between investment horizons and debt decisions.

Use of debt is a contributor to the stock market and economic development as a whole (Mohieldin & Wright, 2000; Turvey & Kong, 2010; Wu et al., 2016). The literature, however, has paid little attention to the use of debt by investors. This chapter will investigate whether risk tolerance is strongly related to debt decisions.

"Debt decisions" was defined in Chapter 3 as the level of debt investors use for stock investment. "Financial leverage" is the credit investors obtain through only brokerage firms. "Informal debt" is the credit investors obtain through family and non-family sources. A debt decision is a risky decision no matter what kind of debt is used, informal or formal, because users of debt may face possible insolvency if they do not manage debt well. The importance of debt decisions in the stock market was mentioned in Chapter 1.

"Risk tolerance" is defined by Grable (2000) as "the maximum amount of uncertainty that someone is willing to accept when making a financial decision" (p. 625). Risk tolerance lies

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[14] The early version of this chapter was presented at the 23rd International Congress on Modeling and Simulation (MODSIM2019), Modeling and Simulation Society of Australia and New Zealand Inc., Australia, December 2019. https://mssanz.org.au/modsim2019/index.html

The proposal related to this chapter was presented at *the 23rd New Zealand Finance Colloquium* – NZFC, Lincoln University, New Zealand, February 2019 https://nzfc.ac.nz/cfp/.

at the heart of the financial field because it affects a broad range of personal financial choices (Grable & Roszkowski, 2008). The existing literature finds that risk tolerance is associated with risky decisions (see, for example, Bailey & Kinerson, 2005; Corter & Chen, 2006; Dorn & Huberman, 2005).

The remainder of this chapter is as follows. The literature review and hypothesis development are presented in Section 5.2. Section 5.3 outlines the methodology. Section 5.4 reports the main results. Section 5.5 reports the results of the additional analysis. Section 5.6 exhibits the robustness check. Section 5.7 presents the demographics discussion. Section 5.8 ends with conclusions, contributions, implications, limitations and further research.

5.2. Literature review and hypothesis development

5.2.1 Risk tolerance in decision-making

Risk tolerance is defined as the willingness to engage in risky activities (Grable, 2008; Okun, 1976; Weber et al., 2002). The risk tolerance of a person is described as his or her perception of change and danger (Okun, 1976); or as "a tendency to be attracted or repelled by alternatives that he or she perceives as more risky over alternatives perceived as less risky" (Weber & Milliman, 1997, p. 128). Risk tolerance is sometimes referred to as "risk preference" (Grable, 2008).

There has been no research on the relationships between risk tolerance, investment horizons and debt decisions to the best of the author's knowledge. This chapter thus examines these using the following hypotheses.

5.2.2 Hypothesis development

Direct relationships

The literature finds a higher level of risk tolerance is associated with a riskier decision. For example, risk tolerance causes investors to hold a higher-risk investment portfolio or invest in stocks over bonds (Bailey & Kinerson, 2005; Corter & Chen, 2006; Dorn & Huberman, 2005). There is a possibility that higher-risk tolerance relates to the use of higher debt for stock investment.

H5.1: The higher the level of risk tolerance, the higher the level of the financial leverage used.

H5.2: The higher the level of risk tolerance, the higher the level of the informal debt used.

Previous studies find that higher risk tolerance is associated with higher stock ownership (Cong & Hanna, 2007; Sung & Hanna, 1998; Xiao, 1996). Between short term and long term stock investment, short term investment (e.g. four months) has lower returns than long term investment (e.g., 15 months) (Gaspar, Massa, & Matos, 2005). Very short term investors, that is, day traders, often buy and sell speculative stocks (Barber, Lee, Liu, & Odean, 2014), which also has sub-optimal outcomes (Lo, Repin, & Steenbarger, 2005). Risk levels between short-term and long-term stock investment remain unclear in academic research. This chapter, therefore, argues that investing in stocks for the short-term may be riskier than investing in stocks for the long-term, and that risk tolerance may be positively associated with the short term over long term stock investment.

H5.3: The higher the level of risk tolerance, the higher the ratio of short-term stock investment to long term.

Recent research, for example, Schooley & Worden (1996) find that investment in risky assets is positively associated with risk tolerance. Markiewicz and Weber (2013) also find that day stock trading positively relates to gambling risk propensity. Given these results, this thesis

argues that a shorter stock investment horizon positively relates to higher risk tolerance and the use of higher debt, using the following hypotheses.

H5.4: The higher the ratio of short-term stock investment to long term, the higher the level of informal debt used.

H5.5: The higher the ratio of short-term stock investment to long term, the higher the level of financial leverage used.

H5.6: The higher the ratio of short term stock investment to long term, the higher the level of risk tolerance.

Indirect (mediating) relationships

Previous studies find some behavioural factors as mediators in decision-making. For example, perceived uncertainty mediates between extraversion traits and safer investment decisions (Trang & Khuong, 2017). The mediating role of perceived uncertainty is used to account for why a higher level of extraversion trait leads to a choice of safer investment. Performance risk is a mediating variable between perceived quality and value (Sweeney et al., 1999). Financial risk is a mediator between perceived sacrifice and perceived value (Agarwal & Teas, 2001). Given this evidence, and also as hypothesised above in that investment horizons may relate to risk tolerance, and risk tolerance may pertain to debt decisions, this chapter argues that risk tolerance may mediate between investment horizons and debt decisions.

H5.7: Risk tolerance mediates between investment horizons and informal debt.

H5.8: Risk tolerance mediates between investment horizons and formal debt.

5.3 Methodology

The methodology of this section was covered in Chapter 3. This chapter thus only presents measures of risk tolerance, investment horizons, and debt decisions, as shown in Figure 5.1.

Risk tolerance is measured by the total scores of the 13-questions developed by Grable and Lytton (2001) and Grable and Lytton (1999). The 13-questions scale of risk tolerance has been widely used and assessed as a highly explanatory instrument for one's risk tolerance (e.g. Gilliam, Chatterjee, & Grable, 2010; Grable & Joo, 2004; Grable & Lytton, 2001; Grable & Roszkowski, 2008).

The term "investment horizons" is defined as the ratio of short-term stock investment to long term (less than one year divided by one year or more). This is consistent with prior research (e.g. Bebchuk & Stole, 1993; Levhari & Levy, 1977; Vives, 1995).

Figure 5.1: Measures of risk tolerance, investment horizons, and debt decisions

Risk tolerance	Investment horizons	Debt decisions
RITO = $\sum_{j=1}^{t} RITO_j$	**SHORT** = $\sum_{i}^{n}(SHORT)_i$	**LEVE** = $\sum_{i}^{n}(LEVE_i)$
	LONG = $\sum_{i}^{n}(LONG)_i$	
RITOm = $\sum_{i=1}^{n} RITOm_i$		**INFD** = $\sum_{i}^{n}(INFD_i)$
	SHOLO = $\sum_{i}^{n}(\frac{SHORT}{LONG})_i$	
	where:	**FDINFD**=$\sum_{i}^{n}(INFD + FD)_i$
where:	SHORT: Short-term stock investment (less than one year)	
RITO : Risk tolerance		where:
RITOm: Risk tolerance	LONG: Long-term stock investment (one year or more)	LEVE: Financial leverage
RITO$_j$: the score of question j[th]		INFD: Informal debt
RITOmi: low, moderate or high scores of risk tolerance of ith investors	SHOLO: the ratio of short-term stock investment to long term (known as investment horizons)	FD: Formal debt
		FDINFD: total debt
j =1, t=13, i: i[th] investors, n=420.	i: i[th] investors, n=420.	i: i[th] investors, n=420.

5.4 Main results

5.4.1 Investor characteristics and investment horizons

The investor characteristics were introduced in Chapter 3. This chapter thus only presents investment horizons. Stock investment is divided into 60% for the short term (less than one year) and 40% for the long term (one year or more), on average (Mean), as revealed in Table 5.1. Around 3% of investors do not invest in stocks for the short term, and about 18% of them do not invest in stocks for the long term. This means that 97% of investors invest in stocks for the short term, and 82% of investors invest in stocks for the long term.

Table 5.1: A summary of investment horizons

This table shows that stock investment is divided into 60% for the short term (less than 1 year) and 40% for the long term (1 year or more), on average. Stock investment is divided into short term higher than long term.

% of the stock investment for	Short term (less than one year)		Long term (one year or more)	
	Frequency	%	Frequency	%
0%	14	3	79	18
Between over 0% and under 50%	113	27	167	40
50%	53	13	53	13
Between over 50% and under 100%	167	40	113	27
100%	73	17	8	2
Mean	**0.6**		**0.4**	
N	420	100%	420	100%

5.4.2 Levels of risk tolerance

The levels of risk tolerance are shown in Table 5.2 among non-users and users of debt, non-stockbrokers and stockbrokers, male and female investors, and all investors. Overall, the level of risk tolerance of users of debt is higher than that of non-users of debt. It is noted that on average, users of debt have a higher risk tolerance than non-users of debt, no matter what kinds

of debt are used. This table also shows that non-stockbrokers and male investors have slightly higher scores of risk tolerance than stockbrokers and female investors, respectively.

For the data of the 420 investors, the result indicates that among investors, 49% of investors are classified as having a low risk tolerance, 8% as having a moderate risk tolerance, and 43% as having a high risk tolerance. These figures are not much different from the result of prior research. For example, Grable & Lytton (2001) finds that 27% of students and staff have a low risk tolerance, 60% have a moderate risk tolerance, and 13% have a high risk tolerance. As a result, investors may be higher risk tolerant than university students and staff.

Table 5.2: A summary of investors' risk tolerance

This table shows that users of debt, non-stockbrokers, and male investors have a higher level of risk tolerance than non-users of debt, stockbrokers, and female investors, respectively. Moreover, 49% of investors are classified as having low risk tolerance, 8% as having a moderate risk tolerance, and 43% as having high risk tolerance.

Risk tolerance	Non-users of debt	Users of debt	Non-stock-brokers	Stock-brokers	Male investors	Female investors	All investors	
							Freq.	%
Mean	28.55	29.58	29.47	29.28	29.41	29.39	29.40	
Median	28.00	30.00	30	30	30	29	30.00	
Minimum	18.00	15.00	15	15	15	15	15.00	
Maximum	41.00	44.00	44	42	44	41	44.00	
Std. dev.	5.12	4.52	4.83	4.36	4.8	4.39	4.64	
Low							206	49
Moderate							33	8
High							181	43
N	74	346	250	170	258	162	420	100%

Note: Std. dev.: standard deviation

5.4.3 Test of reliability of the risk tolerance scale and correlations

The reliability coefficients (Cronbach's alpha) of 13 items of risk tolerance is 0.618, as shown in Table 5.3. This result indicates an acceptable internal consistency and allows this scale to be used as a variable in a model.

Table 5.3: Results of the reliability of the 13-item risk tolerance

This table shows that the reliability of the 13-item scale of risk tolerance measured by Cronbach's alpha is 0.618. This means that the 13-item scale of risk tolerance has sufficient reliability to be used as an independent variable in a model.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's alpha
RITO: risk tolerance					**0.618**
RITO1	26.7500	19.248	0.268	0.582	
RITO2	26.6548	17.845	0.319	0.569	
RITO3	26.7238	19.336	0.196	0.594	
RITO4	26.8762	19.407	0.204	0.593	
RITO5	27.1143	19.681	0.248	0.586	
RITO6	27.3024	18.799	0.267	0.581	
RITO7	27.3524	18.873	0.249	0.584	
RITO8	27.1286	18.198	0.306	0.573	
RITO9	27.6929	18.385	0.273	0.580	
RITO10	26.9167	19.623	0.147	0.604	
RITO11	26.8857	18.889	0.176	0.602	
RITO12	28.0524	19.754	0.358	0.578	
RITO13	27.3214	18.414	0.310	0.572	

Mean: 29.39; Variance: 21.5; Standard deviation: 4.64; No of item: 13

The correlations between factors are shown in Table 5.4. As guided by Hair et al. (2014), a high correlation "as indicative of a poor correlation matrix" occurs if the variables had a partial correlation value above 0.7 (p.102). This chapter finds that most variables have inter-correlations at a significant level ($p<0.05$) and have correlation coefficients lower than 0.7. Risk tolerance is positively correlated with financial leverage at 0.16 ($p<0.01$), and investment horizons positively correlated with informal debt at 0.096 ($p<0.05$).

Table 5.4: The correlations between risk tolerance, investment horizons, and debt decisions

This table shows that most variables have inter-correlations at a significant level ($p<0.05$), and most pairs of variables have correlation coefficients lower than 0.7, except risk tolerance (between RITO and RITOm) and debt decisions (between INFD and FDINFD). Risk tolerance has two measures (RITO and RITOm), and debt decisions include informal debt (INFD) and total debt (FDINFD). This may explain why these pairs have high inter-correlations. Risk tolerance is positively correlated with financial leverage at 0.16 ($p<0.01$), statistically meaning that risk tolerance increases as the use of financial leverage increases, and vice versa. Investment horizons are positively correlated with informal debt at 0.096 ($p<0.05$), showing that stock investment for the short term over long term goes up as the use of informal debt goes up, and vice versa.

	RITO	2	3	4	5	6	7	8	9	10	11	12	13
1.RITO	1.000												
2.RITOm	.786**	1.000											
3.SHOLO	0.066	0.075	1.000										
4.LONG	0.018	0.033	-0.384**	1.000									
5.GEN	0.003	-0.027	-0.025	0.036	1.000								
6.AGE	0.041	0.002	0.012	0.062	-0.197**	1.000							
7.MAR	0.032	-0.009	-0.005	0.054	-0.055	0.496**	1.000						
8.EDU	0.117*	0.136**	0.114*	-0.046	-0.105*	0.077	0.141**	1.000					
9.INC	0.142**	0.144**	0.001	0.059	-0.209**	0.374**	0.276**	0.288**	1.000				
10.FIL	0.136**	0.113*	0.057	-0.089	-0.108*	-0.031	-0.034	0.232**	0.126**	1.000			
11.INFD	-0.018	0.041	0.096*	0.037	0.049	-0.112*	-0.140**	-0.012	-0.096*	-0.055	1.000		
12.LEVE	0.160**	0.086	0.021	-0.038	-0.081	0.065	0.048	0.017	0.125*	0.174**	-0.071	1.000	
13.FDINFD	0.063	0.110*	0.106*	0.030	-0.002	-0.030	-0.055	-0.009	0.055	0.010	0.618**	0.287**	1.000
N	420	420	420	420	420	420	420	420	420	420	420	420	420

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

RITO (RITOm): risk tolerance, SHOLO: investment horizons, LONG: long term stock investment. GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage, FDINFD: total debt

5.4.4 Main results and discussion

Two main structural equation models (SEMs) are developed to examine the direct and indirect relationship between risk tolerance, investment horizons and debt decisions. SEM1 examines the direct effect of risk tolerance on investment horizons and debt decisions. SEM2 investigates risk tolerance as a mediator between stock investment horizons and debt decisions.

Both these SEM models include six demographics acting as control variables; gender, age, marital status, education, income, and financial literacy; with the aim of examining whether these control variables dampen the relationships between risk tolerance, investment horizons, and debt decisions. The link of these control variables to risk tolerance, investment horizons, and debt decisions is presented in Section 5.7.

The results of SEM1 are presented in Figure 5.2 and Table 5.5. Risk tolerance is significantly related to the use of financial leverage at 0.12 ($p<0.05$), supporting H5.1 but is insignificantly associated with the use of informal debt and investment horizons, which does not support H5.2 and H5.3. However, the results of SEM3 below show a significantly positive relationship of risk tolerance to the use of informal debt and investment horizons among stockbrokers, which partly supports H5.2 and H5.3.

Statistically, when risk tolerance increases by one standard deviation, the use of financial leverage increases by 0.12 ($p<0.05$). This result is consistent with prior scholars (see, for example, Bailey & Kinerson, 2005; Corter & Chen, 2006; Dorn & Huberman, 2005). This means that risk tolerance can explain the use of financial leverage for stock investment in which higher risk tolerance leads to the use of higher financial leverage. The reasons why investors use financial leverage were presented in Section 3.6. As defined by Grable (2000), risk tolerance refers to the willingness to take risk, and thus, risk-tolerant investors are more likely

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to accept higher debt to achieve higher returns. They tend to invest a large amount of money in stocks, and consequently, they would borrow money from formal lenders rather than informal lenders because only formal lenders, i.e. brokerage firms can financially meet this borrowing.

Investment horizons are associated with the use of informal debt at 0.1 ($p<0.05$), supporting H5.4, but are not related to the use of financial leverage at a significant level ($p<0.1$), which does not support H5.5. Investment horizons only explain the use of informal debt in which the higher the level of short term over long term stock investment, the higher the level of informal debt being used. This result adds to the literature alongside previous studies (e.g. Jordan & Diltz, 2003; Jordan & Diltz, 2004). In general, compared to long-term stock investment (1 year or more stock holdings), short-term stock investment (less-than-1-year stock holdings) is positively associated with the use of informal debt. That is, short-term investors are more likely to borrow money from parents and friends for stock investment. An outcome of this is that short-term investors prefer buying stocks and then selling them quickly, and as a consequence, informal borrowing is the best choice because it helps borrowers avoid wasting time on account of complex procedures and regulations with formal borrowing, and importantly then being able to purchase stocks in a timely manner.

Figure 5.2: Risk tolerance, investment horizons, and debt decisions (SEM1)

This figure shows a direct relationship of investment horizons to the use of informal debt at 0.096 (*p<0.05*) and risk tolerance to the use of financial leverage at 0.12 (*p<0.05*).
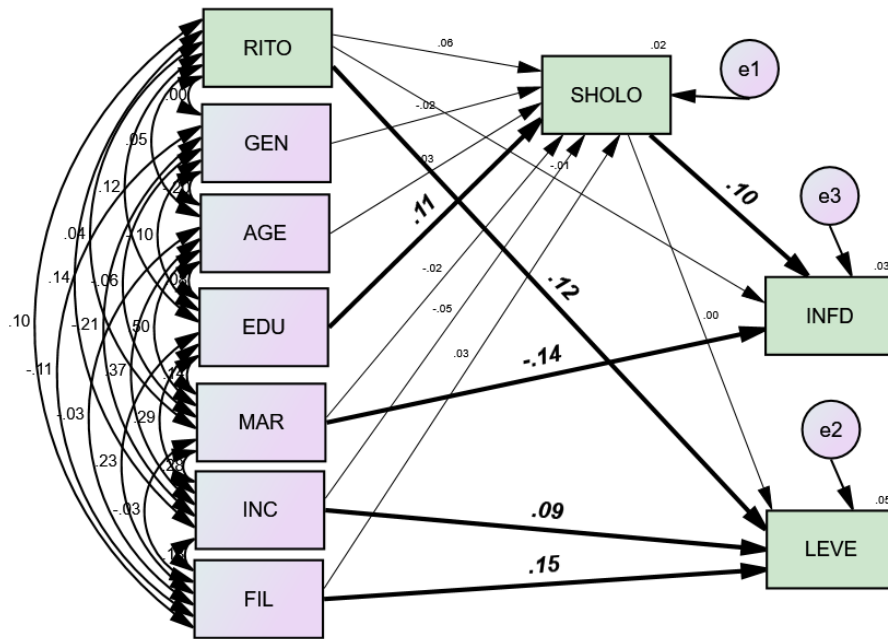
Model fit: Chi-square: 8.292, df: 10, GFI: 0.996, TLI: 1.025, CFI: 1.000, RMSEA: 0.000.
RITO: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, SHOLO: investment horizons, INFD: informal debt, LEVE: financial leverage.

Table 5.5: Risk tolerance, short-term stock investment, and debt decisions (SEM1)

This table shows a direct association of investment horizons with the use of informal debt at 0.096 (*p<0.05*) and risk tolerance with the use of financial leverage at 0.12 (*p<0.05*).

Direct relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
SHOLO	<---	RITO	0.025	0.061	0.020	1.239	0.215	H5.3
SHOLO	<---	GEN	-0.061	-0.016	0.197	-0.312	0.755	
SHOLO	<---	EDU	0.543	0.114	0.248	2.193	0.028**	
SHOLO	<---	AGE	0.070	0.029	0.141	0.496	0.620	
SHOLO	<---	MAR	-0.082	-0.023	0.202	-0.404	0.686	
SHOLO	<---	INC	-0.132	-0.053	0.140	-0.948	0.343	
SHOLO	<---	FIL	0.018	0.030	0.030	0.587	0.557	
LEVE	<---	INC	0.070	0.090	0.038	1.866	0.062*	
INFD	<---	MAR	-0.055	-0.140	0.019	-2.900	0.004***	
LEVE	<---	FIL	0.028	0.151	0.009	3.128	0.002***	
INFD	**<---**	**SHOLO**	0.011	**0.096**	0.005	1.990	**0.047****	**H5.4**
INFD	<---	RITO	0.000	-0.010	0.002	-0.204	0.838	H5.2
LEVE	**<---**	**RITO**	0.015	**0.116**	0.006	2.397	**0.017****	**H5.1**
LEVE	<---	SHOLO	0.001	0.004	0.015	0.084	0.933	H5.5

Note: *: p<10%, **: p<5%, ***: p<1%
RITO: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, SHOLO: investment horizons, INFD: informal debt, LEVE: financial leverage.

The findings of SEM2 are shown in Figure 5.3 and Table 5.6. Like SEM1, SEM2 also finds a positive association of risk tolerance with financial leverage at 0.12 ($p<0.05$) (H5.1) and investment horizons with informal debt at 0.1 ($p<0.05$) (H5.4), which supports H5.1 and H5.4, as already discussed in SEM1.

The results of SEM2 do not support H5.6, H5.5, and H5.2 because it finds an insignificant relationship of investment horizons to risk tolerance (H5.6) and to financial leverage (H5.5), and risk tolerance to informal debt (H5.2). However, the results of SEM3 find a significantly positive association between investment horizons and risk tolerance, and between risk tolerance and informal debt among stockbrokers, which partly supports H5.6 and H5.2. Overall, it is only H5.5 that the findings from SEMs do not support; that is, there is no support found for the hypothesis that there is a relationship between investment horizons and financial leverage.

The results of SEM2 also find no significant mediating role of risk tolerance in the relationship between investment horizons and debt decisions, which does not support H5.7 and H5.8. However, the results of SEM7 uncover risk tolerance as a mediator between investment horizons and informal debt among stockbrokers, which partly supports H5.7.

Figure 5.3: Investment horizons, risk tolerance and debt decisions (SEM2)

This figure shows the direct relationship of investment horizons to the use of informal debt at 0.1 (*p<0.05*) and risk tolerance to financial leverage at 0.12 (*p<0.05*). SEM2 finds no mediating role of risk tolerance in the association between investment horizons and informal debt at a significant level (*p<0.1*).
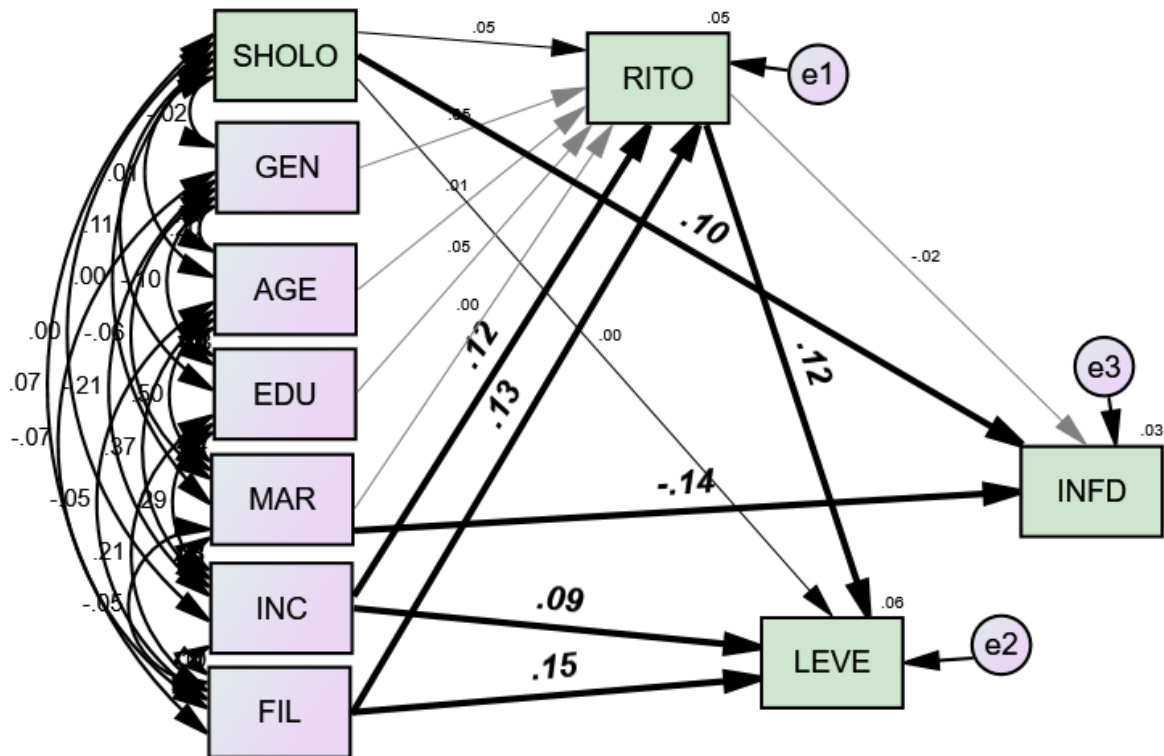
Model fit: Chi-square: 8.596, df: 10, GFI: 0.996, TLI: 1.020, CFI: 1.000, RMSEA: 0.000.
SHOLO: investment horizons, RITO: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 5.6: Investment horizons, risk tolerance, and debt decisions (SEM2)

This table shows a direct impact of both short term and long-term stock investment on the use of informal debt at 0.13 and 0.1 (*p<0.05*), respectively. Remarkably, short term stock investment has a stronger impact on the use of informal debt than long term stock investment.

Direct relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
RITO	<---	AGE	0.001	0.007	0.012	0.116	0.908	
RITO	<---	GEN	0.015	0.045	0.017	0.918	0.358	
RITO	<---	SHOLO	0.004	0.052	0.004	1.078	0.281	H5.6
RITO	<---	FIL	0.037	0.125	0.014	2.541	0.011**	
RITO	<---	INC	0.026	0.122	0.012	2.244	0.025	
RITO	<---	EDU	0.022	0.054	0.021	1.041	0.298	
RITO	<---	MAR	-0.001	-0.003	0.017	-0.053	0.958	
LEVE	<---	FIL	0.158	0.150	0.051	3.118	0.002***	
LEVE	**<---**	**RITO**	0.447	**0.124**	0.175	2.559	**0.011****	**H5.1**
LEVE	<---	SHOLO	0.000	0.001	0.015	0.027	0.979	H5.5
LEVE	<---	INC	0.073	0.093	0.037	1.937	0.053*	
INFD	<---	MAR	-0.055	-0.139	0.019	-2.895	0.004***	
INFD	**<---**	**SHOLO**	0.011	**0.097**	0.005	2.004	**0.045****	**H5.4**
INFD	<---	RITO	-0.026	-0.020	0.063	-0.413	0.680	H5.2
Indirect relationships								
SHOLO->RITO->INFD			0.000	-0.001				H5.7
SHOLO->RITO->LEVE			0.002	0.006				H5.8

Note: *: p≤10%, **: p<5%, ***: p<1%. SHOLO: investment horizons, RITO: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

In summary, this chapter mainly finds risk-tolerant investors tend to prefer formal debt. However, investors who prefer investing short-term to long-term stock investment and stockbrokers are more likely to use informal debt. This reconfirms that not only formal but informal finance sector is also central to investors' borrowing source.

5.5 Results of additional analysis

5.5.1 Sub-groups

The differences in the relationship between risk tolerance, investment horizons and debt decisions are possibly different between subgroups, including stockbrokers and non-stockbrokers, male and female investors, and users and non-users of borrowing sources.

Eight models are developed to examine this relationship. SEM3 will investigate this relationship among stockbrokers, while SEM4 will test this relationship among non-stockbrokers. Male and female investors will be presented in SEM5 and SEM6, respectively. Users and non-users of borrowing sources will be tested in four models using multiple regression techniques due to the small sample. This analysis investigates what sub-groups have a stronger effect of risk tolerance and investment horizons in debt decisions.

The first subgroup is between stockbrokers (N=170) and non-stockbrokers (N=250).[15] The results are presented in Figure 5.4 and Table 5.7. There is a difference in the relationship between risk tolerance, investment horizons, and debt decisions between stockbrokers and non-stockbrokers. Namely, the risk tolerance of stockbrokers relates to investment horizons at 0.14 (*p<0.1*) and informal debt at 0.14 (*p<0.1*) in SEM3, while the risk tolerance of non-stockbrokers is associated with financial leverage at 0.16 (*p<0.05*) in SEM4. Investment horizons also pertain to informal debt at 0.17 (*p<0.01*) among non-stockbrokers in SEM4.

Only the results of SEM4 are consistent with SEM1. SEM3 presents new findings regarding the significant relationship of risk tolerance to investment horizons and informal debt among

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[15] Non-stockbrokers (N=251) include, in descending order, other jobs (25.1%), banking officers (17.9%), sales/marketing managers (14.7%), administrators (12%), investment officers (9.6%), business owners (4.8%), accountants (3.9%), teachers/lecturers (3.2%), financial advisors (3.2%), find managers (2.8%), brokerage managers (1.2%), CFOs (1.2%), and CEOs (0.4%).

stockbrokers. As presented above, levels of risk tolerance of non-stockbrokers are higher than those of stockbrokers, on average. This may explain why risk-tolerant non-stockbrokers tend to use financial leverage, while risk-tolerant stockbrokers are prone to use informal debt for stock investment.

Figure 5.4: Risk tolerance, investment horizons and debt decisions between stockbrokers and non-stockbrokers

The results of SEM3 differ from those of SEM4. The risk tolerance of stockbrokers relates to investment horizons at 0.14 (*p<0.1*) and informal debt at 0.14 (*p<0.1*) in SEM3, while the risk tolerance of non-stockbrokers is associated with financial leverage at 0.16 (*p<0.05*) in SEM4. Investment horizons also pertain to informal debt at 0.17 (*p<0.01*) among non-stockbrokers in SEM4.

Risk tolerance, investment horizons and debt decisions among stockbrokers (SEM3) (N=170)

Risk tolerance, investment horizons and debt decisions among non-stockbrokers (SEM4) (N=250)
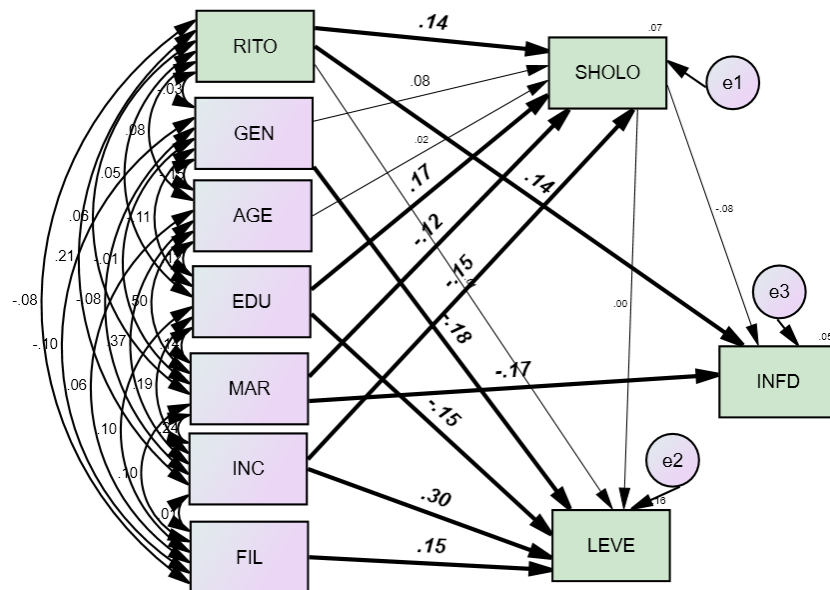
Model fit criteria: Chi-square: 8.352, Df: 9, GFI: 0.990, TLI: 1.028, CFI: 1.000, RMSEA: 0.000.
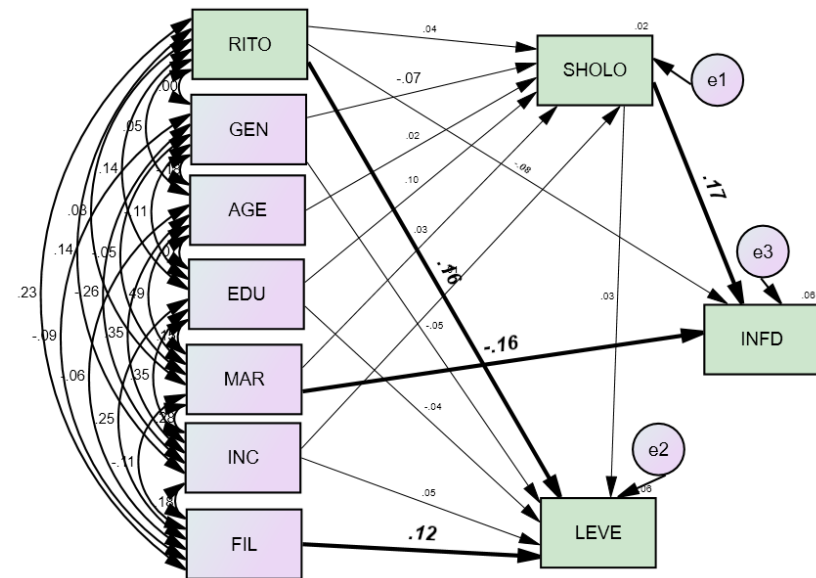
Model fit criteria: Chi-square: 6.545, Df: 9, GFI: 0.965, TLI: 1.060, CFI: 1.000, RMSEA: 0.031.

RITO: risk tolerance, SHOLO: stock investment horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 5.7: Risk tolerance, investment horizons and debt decisions between stockbrokers and non-stockbrokers

The results of SEM3 differ from those of SEM4. The risk tolerance of stockbrokers relates to investment horizons at 0.14 (*p<0.1*) and informal debt at 0.14 (*p<0.1*) in SEM3, while the risk tolerance of non-stockbrokers is associated with financial leverage at 0.16 (*p<0.05*) in SEM4. Investment horizons also pertain to informal debt at 0.17 (*p<0.01*) among non-stockbrokers in SEM4.

Risk tolerance, investment horizons and debt decisions among stockbrokers (SEM3) (N=170)							Risk tolerance, investment horizons and debt decisions among non-non-stockbrokers (SEM4) (N=250)						
Direct relationship			Unstandardized Weights	Standardized Weights	S.E.	C.R.	P	Direct relationship			Unstandardized Weights	Standardized Weights	S.E.	C.R.	P

Direct relationship			Unstandardized Weights	Standardized Weights	S.E.	C.R.	P
SHOLO	<---	**RITO**	1.590	**0.143**	0.843	1.887	**0.059***
SHOLO	<---	EDU	0.857	0.171	0.381	2.246	0.025**
SHOLO	<---	AGE	0.045	0.019	0.215	0.208	0.835
SHOLO	<---	GEN	0.250	0.085	0.223	1.124	0.261
SHOLO	<---	INC	-0.305	-0.148	0.170	-1.802	0.072*
SHOLO	<---	MAR	-0.339	-0.123	0.238	-1.423	0.155
LEVE	<---	INC	0.223	0.301	0.055	4.033	0.00***
LEVE	<---	FIL	0.172	0.150	0.082	2.096	0.036**
INFD	<---	SHOLO	-0.011	-0.083	0.010	-1.087	0.277
LEVE	<---	SHOLO	0.000	-0.001	0.026	-0.018	0.986
LEVE	<---	RITO	0.043	0.011	0.293	0.148	0.882
LEVE	<---	EDU	-0.268	-0.148	0.133	-2.021	0.043**
INFD	<---	**RITO**	0.212	**0.144**	0.112	1.900	**0.057***
INFD	<---	MAR	-0.063	-0.172	0.028	-2.275	0.023**
LEVE	<---	GEN	-0.192	-0.181	0.076	-2.520	0.012**

Direct relationship			Unstandardized Weights	Standardized Weights	S.E.	C.R.	P
SHOLO	<---	RITO	0.425	0.036	0.756	0.562	0.574
SHOLO	<---	EDU	0.446	0.095	0.318	1.405	0.160
SHOLO	<---	AGE	0.040	0.016	0.185	0.214	0.831
SHOLO	<---	GEN	-0.320	-0.069	0.306	-1.046	0.296
SHOLO	<---	INC	-0.037	-0.013	0.207	-0.181	0.857
SHOLO	<---	MAR	0.123	0.030	0.299	0.409	0.682
LEVE	<---	INC	0.044	0.055	0.054	0.806	0.420
LEVE	<---	FIL	0.117	0.117	0.065	1.799	0.072*
INFD	<---	**SHOLO**	0.018	**0.172**	0.006	2.794	**0.005***
LEVE	<---	SHOLO	0.009	0.032	0.018	0.510	0.610
LEVE	<---	EDU	-0.052	-0.040	0.089	-0.586	0.558
INFD	<---	RITO	-0.093	-0.076	0.075	-1.237	0.216
INFD	<---	MAR	-0.068	-0.161	0.026	-2.620	0.009***
LEVE	<---	GEN	-0.059	-0.045	0.084	-0.704	0.482
LEVE	<---	**RITO**	0.537	**0.160**	0.214	2.512	**0.012****

*: p<0.1, **: p<0.01, ***: p<0.001, RITO: risk tolerance, SHOLO: stock investment horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

The second subgroup is between male (N= 258) and female investors (N=162). The results of SEM5 focusing on male investors, and SEM6 focusing on female investors, are shown in Figure 5.5 and Table 5.8. SEM5 shows an association of risk tolerance with financial leverage at 0.18 ($p<0.01$), and investment horizons with informal debt at 0.15 ($p<0.05$), while SEM6 does not.

The results, in general, show that male investors' risk tolerance and investment horizons can explain their debt decisions, which is consistent with SEM1. In contrast, female investors' risk tolerance or investment horizons do not relate to their debt decisions. Female investors' demographics which do partly account for their debt decisions are income, marital status, and financial literacy, which are presented in Section 5.7.

The last subgroup is between users and non-users of borrowing sources, for which the data subsets are users (N=328) and non-users of informal borrowing sources (N=92), and users (N=78) and non-users of formal borrowing sources (N=342). Since the number of non-users of borrowing is less than 100, in order to ensure that a model can fit with such a small sample, this chapter applies multiple regression to test the relationship between risk tolerance, investment horizons, and debt decisions among this subgroup.

The results of the relationship of risk tolerance and investment horizons to debt decisions between users and non-users of borrowing sources are presented in Table 5.9. Only the risk tolerance of users of formal borrowing sources has a significant link to financial leverage, at 0.09 ($p<0.1$). Also, only the investment horizons of users of borrowing sources are associated with informal debt, at 0.13 ($p<0.01$). In short, risk tolerance or investment horizons can explain debt decisions among users of borrowing sources.

Figure 5.5: Risk tolerance, investment horizons and debt decisions between male and female investors

This figure shows that only SEM5 finds an association of risk tolerance with financial leverage at 0.18 (*p<0.01*), and investment horizons with informal debt at 0.15 (*p<0.05*), while SEM6 does not. This means that only male investors' risk tolerance and investment horizons can explain their debt decisions.
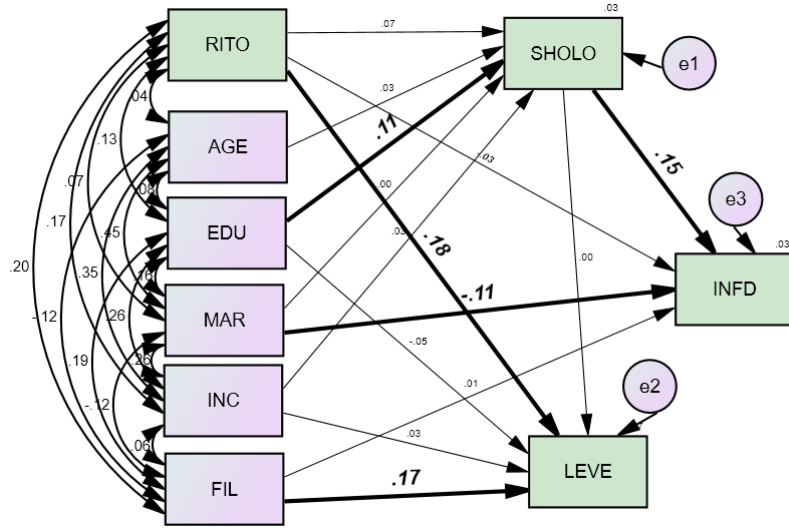
Risk tolerance, investment horizons and debt decisions among male investors (SEM5) (N=258)	Risk tolerance, investment horizons and debt decisions among female investors (SEM6) (N=162)
Model fit criteria: Chi-square: 3.346, Df: 7, GFI: 0.997, TLI: 1.121, CFI: 1.000, RMSEA: 0.000.	Model fit criteria: Chi-square: 4.228, Df: 7, GFI: 0.994, TLI: 1.114, CFI: 1.000, RMSEA: 0.000.
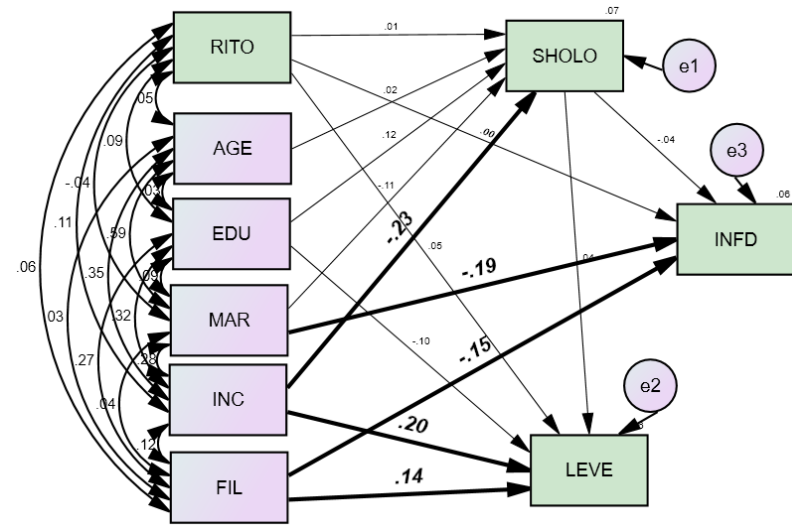
RITO: risk tolerance, SHOLO: stock investment horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 5.8: Risk tolerance, investment horizons and debt decisions between male and female investors

This table presents that only SEM5 finds an association of risk tolerance with financial leverage at 0.18 (*p<0.01*), and investment horizons with informal debt at 0.15 (*p<0.05*), while SEM6 does not. This means that only male investors' risk tolerance and investment horizons can explain their debt decisions.

Risk tolerance, investment horizons and debt decisions among male investors (SEM5) (N=258)						Risk tolerance, investment horizons and debt decisions among female investors (SEM6) (N=162)					
Direct relationship	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P	Direct relationship	Unstandardized Weights	Standardized Weights	S.E.	C.R.	P
SHOLO <--- RITO	0.910	0.069	0.823	1.106	0.269	SHOLO <--- RITO	0.081	0.010	0.634	0.128	0.898
SHOLO <--- EDU	0.566	0.112	0.326	1.734	0.083*	SHOLO <--- EDU	0.469	0.118	0.322	1.457	0.145
SHOLO <--- AGE	0.080	0.029	0.197	0.405	0.685	SHOLO <--- AGE	0.026	0.016	0.167	0.159	0.874
SHOLO <--- MAR	0.013	0.003	0.290	0.044	0.965	SHOLO <--- MAR	-0.258	-0.109	0.226	-1.140	0.254
SHOLO <--- INC	0.096	0.030	0.219	0.441	0.660	SHOLO <--- INC	-0.360	-0.228	0.137	-2.631	0.009***
LEVE <--- INC	0.026	0.031	0.052	0.492	0.623	LEVE <--- INC	0.149	0.199	0.063	2.381	0.017**
LEVE <--- FIL	0.172	0.166	0.065	2.663	0.008***	LEVE <--- FIL	0.147	0.137	0.086	1.714	0.087*
INFD <--- SHOLO	0.014	**0.153**	0.006	2.482	**0.013****	INFD <--- SHOLO	-0.006	-0.035	0.014	-0.453	0.651
LEVE <--- SHOLO	0.000	-0.001	0.016	-0.020	0.984	LEVE <--- SHOLO	0.021	0.044	0.038	0.560	0.575
LEVE <--- EDU	-0.062	-0.047	0.084	-0.731	0.465	LEVE <--- EDU	-0.185	-0.098	0.159	-1.167	0.243
INFD <--- RITO	-0.039	-0.033	0.076	-0.516	0.606	INFD <--- RITO	-0.007	-0.005	0.111	-0.064	0.949
INFD <--- MAR	-0.041	-0.106	0.024	-1.711	0.087*	INFD <--- MAR	-0.078	-0.188	0.032	-2.421	0.015**
INFD <--- FIL	0.003	0.008	0.023	0.132	0.895	INFD <--- FIL	-0.060	-0.152	0.030	-1.973	0.049**
LEVE <--- RITO	0.621	**0.182**	0.213	2.911	**0.004****	LEVE <--- RITO	0.201	0.051	0.302	0.664	0.507

*: p<0.1, **: p<0.01, ***: p<0.001, RITO: risk tolerance, SHOLO: stock investment horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 5.9: Risk tolerance, investment horizons, and informal debt between users and non-users of borrowing sources

Only the risk tolerance of users of formal borrowing has a significant link to financial leverage at 0.09 (*p<0.1*). Also, only investment horizons of users of borrowing are associated with informal debt at 0.13 (p<0.01). In short, only debtors' risk tolerance or investment horizons can explain their debt decisions. Note: unstandardised coefficients in the parentheses.

IVs	Informal borrowing sources				Formal borrowing sources			
	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users
	DV: INFD		DV: LEVE		DV: INFD		DV: LEVE	
RITO	-0.073	0.008	0.23**	0.087	-0.01	-0.011	0.15	0.09*
	(-0.089)	(0.01)	(0.869)	(0.31)	(-0.016)	(-0.014)	(0.53)	(0.28)
SHOLO	-0.052	0.137***	-0.035	-0.01	0.076	0.137**	0.03	-0.03
	(-0.006)	(0.014)	(-0.012)	(-0.003)	(0.015)	(0.013)	(0.012)	(-0.008)
GEN	-0.001	0.027	0.04	-0.068	0.091	-0.007	0.03	-0.11**
	(0.000)	(0.011)	(0.05)	(-0.081)	(0.053)	(-0.003)	(0.042)	(-0.12)
AGE	-0.049	-0.042	-0.154	0.1	0.047	-0.077	-0.014	0.04
	(-0.01)	(-0.011)	(-0.102)	(0.077)	(0.014)	(-0.02)	(-0.009)	(0.028)
MAR	0.059	-0.158**	-0.031	0.015	-0.003	-0.14**	-0.211	0.068
	(0.02)	(-0.061)	(-0.035)	(0.017)	(-0.002)	(-0.051)	(-0.255)	(0.065)
EDU	-0.045	0.03	0.059	-0.11*	-0.07	0.034	-0.085	-0.028
	(-0.024)	(0.02)	(0.098)	(-0.16)	(-0.041)	(0.017)	(-0.109)	(-0.038)
INC	-0.001	-0.03	0.053	0.08	0.087	-0.085	0.01	0.1*
	(0.000)	(-0.008)	(0.043)	(0.07)	(0.035)	(-0.021)	(0.008)	(0.069)
FIL	-0.045	-0.063	-0.01	0.22***	0.091	-0.059	-0.001	0.23***
	(-0.017)	(-0.023)	(-0.01)	(0.22)	(0.045)	(-0.004)	(-0.001)	(0.21)
Adj. R2	-0.078	0.033	0.003	0.074	-0.085	0.045	-0.039	0.099
F,df	0.18,8	2.39**,8	1.03,8	4.26***,8	0.246,8	2.8***,9	0.64,8	5.7***,8
N	92	328	92	328	78	342	78	342

*: p<0.1, **: p<0.05, ***: p<0.01. IVs: independent variables, DV: dependent variables
RITO: risk tolerance, SHOLO: short-term stock investment, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

In summary, risk tolerance has the strongest relationship to the use of financial leverage among non-users of informal borrowing sources, followed by male investors, non-stockbrokers, and users of formal borrowing sources. In addition, risk tolerance also positively relates to the use of informal debt among stockbrokers, which was above-mentioned (Section 5.4.4).

5.5.2 Mediating role of risk tolerance

This thesis develops the seventh SEM model, SEM7, to examine the mediating role of risk tolerance. As presented above, SEM2 finds no significantly mediating role of risk tolerance in the association of investment horizons to debt decisions among investors. This is because

SEM3 uncovers a significant relationship of investment horizons to risk tolerance, and risk tolerance to informal debt among stockbrokers. SEM7, therefore, will find risk tolerance is a mediator between investment horizons and debt decisions among stockbrokers (N=170).

The results of SEM7 are presented in Figure 5.6 and Table 5.10. Investment horizons are related to risk tolerance at 0.14 ($p<0.1$), and risk tolerance to informal debt at 0.14 ($p<0.1$). Risk tolerance mediates between investment horizons and informal debt at 0.021 ($p<0.1$). Importantly, investment horizons are not significantly related to informal debt. Due to risk tolerance, this relationship is significant among stockbrokers. In summary, this chapter finds risk tolerance is not a mediator between investment horizons and debt decisions among investors but does mediate for this relationship among stockbrokers.

Figure 5.6: Investment horizons, risk tolerance and debt decisions among stockbrokers (N=170) (SEM7)

This figure shows an association of investment horizons with risk tolerance at 0.15 ($p<0.1$) and risk tolerance with informal debt at 0.14 ($p<0.1$). Risk tolerance is a mediator between investment horizons and informal debt at 0.021 ($p<0.1$).
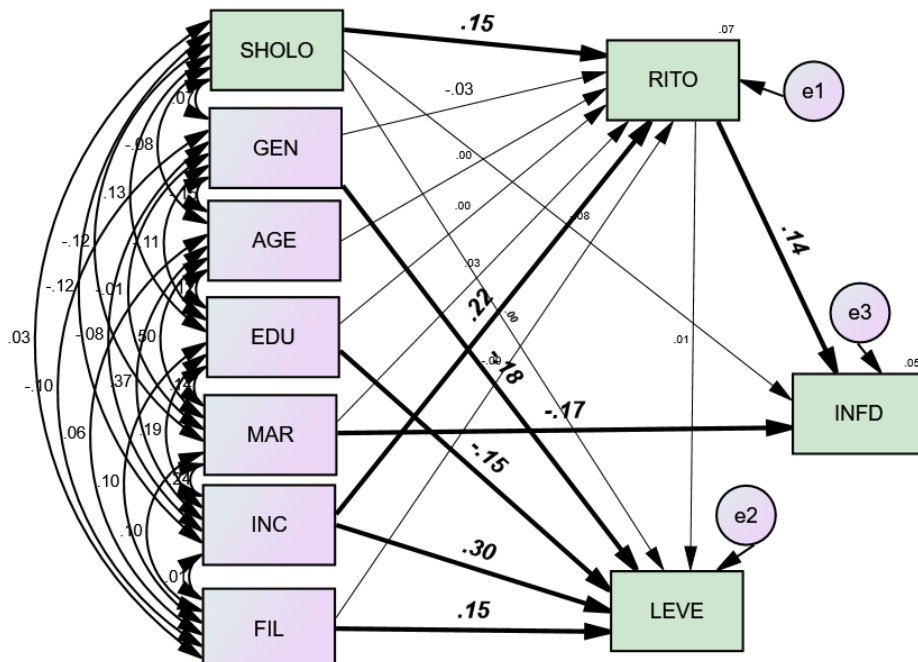
Model fit: Chi-square: 7.936, df: 8, GFI: 0.991, TLI: 1.003, CFI: 1.000, RMSEA: 0.000.
SHOLO: investment horizons, RITO: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

Table 5.10: Investment horizons, risk tolerance and debt decisions among stockbrokers
(N=170) (SEM7)

This table shows an association of investment horizons with risk tolerance at 0.15 (*p<0.1*) and risk tolerance with informal debt at 0.14 (*p<0.1*). Risk tolerance is a mediator between investment horizons and informal debt at 0.021 (*p<0.1*).

Direct and indirect relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P
I. Direct relationships							
RITO	**<---**	**SHOLO**	0.013	**0.148**	0.007	1.937	**0.053***
RITO	<---	EDU	-0.002	-0.004	0.035	-0.048	0.961
RITO	<---	AGE	0.001	0.003	0.019	0.030	0.976
RITO	<---	GEN	-0.008	-0.029	0.020	-0.385	0.700
RITO	<---	MAR	0.007	0.030	0.022	0.341	0.733
RITO	<---	INC	0.040	0.215	0.015	2.644	0.008***
RITO	<---	FIL	-0.025	-0.088	0.021	-1.175	0.240
LEVE	<---	INC	0.223	0.301	0.055	4.033	0.000***
LEVE	<---	FIL	0.172	0.150	0.082	2.095	0.036**
INFD	**<---**	**RITO**	0.212	**0.144**	0.112	1.900	**0.057***
LEVE	<---	RITO	0.043	0.011	0.294	0.148	0.882
LEVE	<---	SHOLO	0.000	-0.001	0.026	-0.018	0.986
LEVE	<---	EDU	-0.268	-0.148	0.133	-2.022	0.043**
INFD	<---	SHOLO	-0.011	-0.083	0.010	-1.087	0.277
LEVE	<---	GEN	-0.192	-0.181	0.076	-2.519	0.012***
INFD	<---	MAR	-0.063	-0.172	0.028	-2.275	0.023***
II. Indirect relationships							
SHOLO->RITO->INFD			0.003	**0.021**			*

*: p<0.1, **: p<0.05, ***: p<0.01. IVs: independent variables, DV: dependent variables
RITO: risk tolerance, SHOLO: investment, horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage.

5.5.3 Facets of risk tolerance

Grable and Lytton (1999) and Grable and Lytton (2001) perform a principal components analysis[16] on their data and find 3 components of risk tolerance. The first factor is "investment risk tolerance", which is examined through questions 4, 5, 8, 11, and 12. The second factor is "financial risk tolerance", which is examined through questions 21, 3, 6, 7, and 13. The last

---

[16] "Factor analysis" provides the structure of the intercorrelations among variables by defining sets of variables that are highly correlated, which is known as "factors" (Hair et al., 2014). The term "factor loadings" indicate the correlation between each variable and the factor, and a higher factor loading indicates higher representativeness of the factor (Hair et al., 2014). The minimal factor loading is from ±0.3 through ±0.4, reaching 1 as the highest factor loading.

factor is "speculative risk tolerance" comprising questions 2, 9, and 10. The 13 questions of risk tolerance are attached at the end of this chapter.

This chapter also undertook the principal components analysis. As shown in Table 5.11 and 5.12, risk tolerance has 5 components, the eigenvalues of which are greater than 1 and explain approximately 53% of the total variance, in comparison with the 3 components found by Grable and Lytton (1999) and Grable and Lytton (2001). This difference may be due to the differences between respondents (i.e., students versus investors in this chapter).

Table 5.11: Results of the total variance explained by the components of risk tolerance

This table indicates that 5 factors with eigenvalues greater than 1 account for 53.077% of the total variance of the 13 variables.

Comp-onent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.395	18.421	18.421	2.395	18.421	18.421	1.591	12.239	12.239
2	1.351	10.394	28.815	1.351	10.394	28.815	1.561	12.005	24.244
3	1.093	8.406	37.22	1.093	8.406	37.22	1.436	11.048	35.292
4	1.05	8.078	45.299	1.05	8.078	45.299	1.175	9.037	44.329
5	1.011	7.779	53.077	1.011	7.779	53.077	1.137	8.749	53.077
6	0.939	7.225	60.302						
7	0.889	6.842	67.144						
8	0.799	6.145	73.289						
9	0.793	6.099	79.388						
10	0.768	5.91	85.298						
11	0.666	5.124	90.422						
12	0.66	5.075	95.497						
13	0.585	4.503	100						

Extraction Method: Principal Component Analysis. KMO and Bartlett's Test: Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.713; Bartlett's Test of Sphericity: Approx. Chi-Square: 386.8, df: 78, Sig. .000

The results of Table 5.12 also show that some variables' communalities are lower than 0.5, and the Cronbach's alpha of the 5 factors are each below 0.6, indicating that these 5 factors are not individually strong enough to be used as distinct measures, which is consistent with the finding of Grable and Lytton (1999), in which the Cronbach's alpha of factors 2 and 3 are below 0.6.

Table 5.12: Five components of risk tolerance

This table shows that most loadings of each factor are highly correlated with each factor. For example, RITO09 has the loading of 0.774, indicating that the degree of correspondence between RITO09 and factor 1 is 77.4%.

Variables	Cronbach alpha (α)	Factor					Communalities[17] extraction
		1	2	3	4	5	
RITO9	0.494	0.774					0.640
RITO12		0.693					0.557
RITO3	0.478		0.742				0.625
RITO2			0.560				0.454
RITO7			0.483				0.407
RITO13			0.429				0.425
RITO6			0.385				0.257
RITO5	0.425			0.747			0.593
RITO4				0.739			0.559
RITO11	0.254				0.824		0.708
RITO8					0.517		0.480
RITO10	0.229					0.825	0.693
RITO1						0.464	0.503

RITO: risk tolerance, i: the question ith of risk tolerance

Cronbach's alpha of risk tolerance including 13 variables: 0.618

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

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[17] Communality is defined as the total amount of variance an original variable shares with all other variables included in the analysis (Hair et. all, 2014).

It is also important to note that the five factors of risk tolerance by this chapter are sub-categories of the original three factors developed by Grable and Lytton (1999) and Grable and Lytton (2001). Namely, as revealed in Table 5.13, investment risk tolerance is divided into two sub-groups; risk as a level of comfort,[18] and risk as a level of preferences; while in Grable and Lytton's studies, the two are grouped as one. Speculative risk tolerance also has two types; risk for the choice between sure gain, and risk for the choice between sure loss; instead of the two types being gathered into one as in the Grable and Lytton studies. In terms of financial risk tolerance, both this chapter and Grable and Lytton's studies have a similar result. Only question 1 in Grable and Lytton's studies is replaced by question 2 in this chapter.

Risk tolerance, in short, has five facets instead of the three facets found by Grable and Lytton. These are investment risk as a level of comfort, investment risk as a level of preference, financial risk, speculative risk as a choice for a sure gain, and speculative risk as a choice for a sure loss.

Table 5.13: Facets of risk tolerance between this chapter and Grable and Lytton's studies

This table shows that compared with Grable and Lytton's studies, investment risk tolerance has two sub-groups; risk as a level of comfort, and risk as a level of preferences. Speculative risk tolerance also has two types; risk for the choice between sure gain, and risk for the choice between sure loss. In terms of financial risk tolerance, both this study and Grable and Lytton's studies have a similar result, with the exception that question 1 in Grable and Lytton's studies is replaced by question 2 in this chapter.

Facets	(Grable & Lytton, 1999, 2001)	This chapter
1/ Investment risk tolerance	RITO4, RITO5, RITO8, RITO11 and RITO12	
In terms of comfort		RITO4 and RITO5
In terms of preferences		RITO8 and RITO11
2/ Financial risk tolerance	RITO1, RITO3, RITO6, RITO7 and RITO13	RITO2, RITO3, RITO6, RITO7 and RITO13
3/ Speculative risk tolerance	RITO2, RITO9 and RITO10	
In terms of gains		RITO9 and RITO12
In terms of losses		RITO1 and RITO10
RITOi: the ith question of risk tolerance.		

---

[18] Grable and Lytton (1999) classified the questions of risk tolerance into eight groups, for example, the question of "how comfortable investors are investing in shares" termed "risk as a level of comfort" (Grable & Lytton, 1999, p. 173). This study follows the terms developed by Grable and Lytton (1999).

5.6 Robustness check

This chapter applies additional techniques to ensure the robustness of the results by SEMs. The robustness check has six sections. First, risk tolerance and debt decisions have additional measures. Second, multiple and stepwise regression testing is performed on direct relationships. Third, Hayes and Preacher's approach examines indirect relationships. Fourth, the t-test and the propensity matching score examines the key result of this chapter, which is a causal relationship of risk tolerance to debt decisions. Fifth, the instrumental variable approach detects a causal relationship of risk tolerance to debt decisions. Lastly, the solutions reduce the locations selection and responses biases.

5.6.1 Robustness check using additional measures

The eighth SEM model, SEM8, is developed to examine the relationship of risk tolerance to investment horizons and debt decisions. Risk tolerance is classified as low, moderate and high compared with Median as suggested by Grable and Lytton (1999). Debt decisions are measured by the sum of informal and formal debt. This analysis aims to prove the robustness of results using an alternative measure for risk tolerance and debt decisions

The results of SEM8 are presented in Figure 5.7 and Table 5.14. There is a positive link of risk tolerance and investment horizons to debt decisions at 0.1 ($p<0.05$). These results are consistent with those in SEM1 and SEM2.

Figure 5.7: Risk tolerance, investment horizons and debt decisions (SEM8)

This figure shows an association of risk tolerance and investment horizons to debt decisions at 0.1 (*p<0.05*). These results are consistent with those from SEM1 and SEM2.
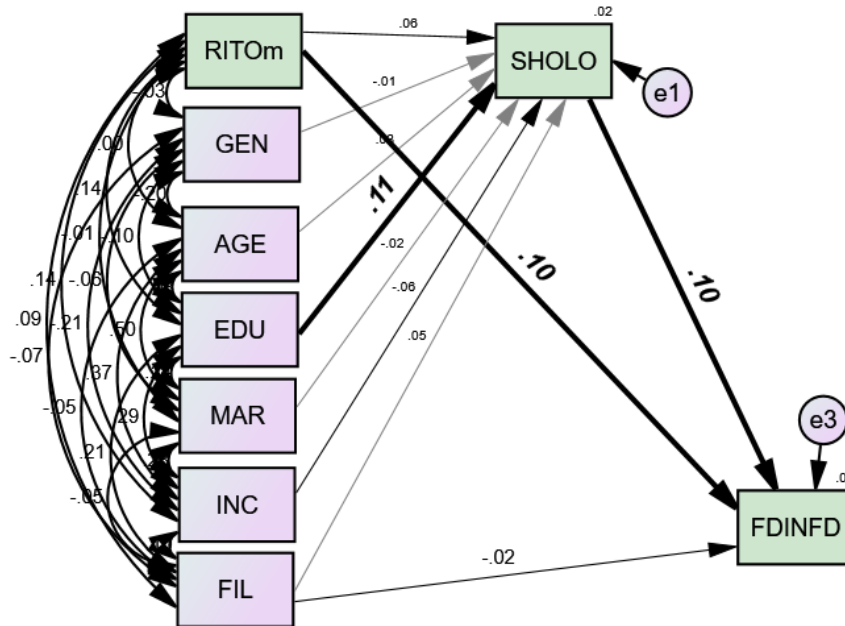
Model fit: Chi-square: 3.794, df: 5, GFI: 0.998, TLI: 1.030, CFI: 1.000, RMSEA: 0.000.

SHOLO: investment horizons, RITOm: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, FDINFD: debt decisions.

Table 5.14: Risk tolerance, investment horizons and debt decisions (SEM3)

This table shows an association of risk tolerance and investment horizons to debt decisions at 0.1 (*p<0.05*). These results are consistent with those from SEM1 and SEM2.

Direct relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P
SHOLO	<---	AGE	0.080	0.033	0.141	0.566	0.571
SHOLO	<---	GEN	-0.055	-0.014	0.196	-0.279	0.780
SHOLO	<---	RITOm	0.127	0.063	0.099	1.282	0.200
SHOLO	<---	FIL	0.173	0.051	0.170	1.020	0.308
SHOLO	<---	INC	-0.139	-0.055	0.140	-0.992	0.321
SHOLO	<---	MAR	-0.067	-0.019	0.202	-0.333	0.739
SHOLO	<---	EDU	0.517	0.109	0.247	2.088	0.037**
FDINFD	**<---**	**SHOLO**	0.013	**0.100**	0.007	2.053	**0.040****
FDINFD	**<---**	**RITOm**	0.028	**0.104**	0.013	2.142	**0.032****
FDINFD	<---	FIL	-0.007	-0.016	0.022	-0.333	0.739

Note: *: p<10%, **: p<5%, ***: p<1%

SHOLO: investment horizons, RITOm: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, FDINFD: debt decisions.

5.6.2 Robustness check using multiple and stepwise regressions

Table 5.15 shows six models from 1 through 3 with multiple regression, and models from 1'
through 3' with stepwise regression. Both Models 1 and 1' show an association of investment
horizons with informal debt at 0.099 ($p<0.05$) and 0.095 ($p<0.05$), respectively. Models 2 and
2' find a relationship of risk tolerance to financial leverage at 0.129 ($p<0.05$) and 0.124
($p<0.05$), respectively. Models 3 and 3' present a significant link of risk tolerance and
investment horizons to debt decisions. These findings are consistent with those by SEM1,
SEM2 and SEM8.

Table 5.15: Robustness check on the direct relationships

Both Models 1 and 1' show an association of investment horizons with informal debt at 0.099 ($p<0.05$) and 0.095 ($p<0.05$), respectively. Models 2 and 2' find a relationship of risk tolerance to financial leverage at 0.129 ($p<0.05$) and 0.124 ($p<0.05$), respectively. Models 3 and 3' present a significant link of risk tolerance and investment horizons to debt decisions. Note: Unstandardised coefficients are in parenthesis.

IVs	DV: INFD		DV: LEVE		DV: FDINFD	
	(1)	(1')	(2)	(2')	(3)	(3')
RITO	-0.006		**0.129****	**0.124*****		
	(-0.008)		**(0.467)**	**(0.448)**		
RITOm					**0.098****	**0.103****
					(0.027)	**(0.028)**
SHOLO	**0.099****	**0.095****	0.006		**0.105****	**0.099****
	(0.011)	**(0.011)**	(0.002)		**(0.014)**	**(0.013)**
GEN	0.026		-0.054		0.006	
	(0.011)		(-0.066)		(0.003)	
AGE	-0.039		0.016		-0.031	
	(-0.01)		(0.012)		(-0.01)	
MAR	**-0.114****	**-0.14*****	0.028		-0.056	
	(-0.045)	**(-0.056)**	(0.031)		(-0.027)	
EDU	0.026		-0.070		-0.043	
	(0.014)		(-0.103)		(0.028)	
INC	-0.045		0.086	**0.093***	0.083	
	(-0.013)		(0.067)	**(0.073)**	(0.027)	
FIL	-0.065		**0.16*****	**0.15*****	-0.019	
	(-0.025)		**(0.172)**	**(0.158)**	(-0.009)	
Adj. R^2	0.02	0.024	0.048	0.051	0.03	0.017
F change	2.06**	3.9***	3.6***	3.7*	2.8***	4.11**
Df	8	2	8	3	7	2
N	420	420	420	420	420	420

Note: *: $p<10\%$, **: $p<5\%$, ***: $p<1\%$, IVs: independent variables, DV: dependent variable, Models 1-3: multiple regression. Models 1'-3': stepwise regression. RITO: risk tolerance, SHOLO: investment horizons, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, INFD: informal debt, LEVE: financial leverage, FDINFD: debt decisions.

5.6.3 Robustness check using Hayes and Preacher's approach

This approach by Hayes and Preacher (2010) is used to examine the mediating roles of risk tolerance in the relationship of investment horizons to debt decisions among stockbrokers (N=170). This method was mentioned in Section 3.4.1.

The results of Hayes and Preacher's approach are exhibited in Table 5.16. Only risk tolerance significantly relates to informal debt at 0.13 ($p<0.1$), which is consistent with the results from SEM3 and SEM8. This approach, however, finds no significant indirect relationship of investment horizons to informal debt through risk tolerance, which is inconsistent with SEM8. The main cause of this inconsistency may emanate from the difference between the two techniques, that is, SEM and Hayes and Preacher.

Table 5.16: A summary of the results using Hayes and Preacher's approach (N=170)

This table finds a link of risk tolerance to informal debt at 0.13 ($p<0.1$) but an insignificant indirect relationship of investment horizons to informal debt through risk tolerance at 0.015 ($p>0.1$).

IVs	Direct effect of X on M	Direct effect of X and M on Y (INFD)	Indirect effect of X on Y via M	
			Coefficient	LLCI - ULCI
X: SHOLO	0.11	-0.06		
	(0.01)	(-0.008)	0.015	-0.0042 - 0.043
M: RITO		**0.13***	(0.002)	
		(0.19)		
R^2	0.013	0.02		
F, df1	2.20,1	1.64, 2		
N	170	170	170	

Note: *: p<10%, **: p<5%, ***: p<1%, IVs: independent variables, Y: (INFD) informal debt, LL/ULCI: lower/upper level confidence interval. RITO: risk tolerance, SHOLO: investment horizons, INFD: Informal debt.

5.6.4 Robustness check using the t-test and propensity score matching approach

The t-test and propensity score matching (PSM) methods are applied to examine the key finding of the positive relationship of risk tolerance to the use of financial leverage. Risk tolerance is a treatment with 0 coded as risk tolerance less than Mean, and 1 as risk tolerance higher than Mean.

The t-test results (N=420) find that the means of income and financial literacy between the two groups are significantly different ($p<0.1$), indicating that these variables may affect both risk tolerance and financial leverage. As a result of this, propensity score matching is undertaken to deal with these issues.

The number of investors after the scores matched is 336, with 168 for each group. As shown in Table 5.17, the means of the six control variables between the two groups are insignificantly different ($p>0.1$), meaning that the means of each of the control variables are equal between the two groups of risk tolerance. This result reduces the bias in choosing these variables.

Table 5.17: The t-test results of six variables between two groups of risk tolerance (N=336)

This table presents that, after the propensity matching score is performed, there are no differences in the means of each of the six variables between the two groups. This reduces the bias in choosing these variables.

IVs	Group	Mean	Standard error	Standard deviation	90% Confidence Interval		t	Ha: diff < 0 Pr	Hb: diff =0 Pr	Hc: diff>0 Pr
GEN	0	1.38	0.04	0.49	1.30	1.45	0.89	0.81	0.37	0.18
	1	1.33	0.03	0.47	1.26	1.40				
AGE	0	1.98	0.06	0.81	1.85	2.10	0.75	0.77	0.45	0.22
	1	1.91	0.05	0.77	1.79	2.03				
EDU	0	3	0.04	0.48	2.92	3.07	0.28	0.61	0.77	0.38
	1	2.98	0.02	0.24	2.95	3.02				
MAR	0	1.39	0.04	0.52	1.31	1.47	0.39	0.65	0.69	0.34
	1	1.36	0.04	0.57	1.28	1.45				
INC	0	2.45	0.06	0.78	2.33	2.57	1.03	0.8	0.3	0.15
	1	2.37	0.05	0.68	2.27	2.48				
FIL	0	2.08	0.05	0.64	1.98	2.17	-0.43	0.33	0.67	0.67
	1	2.11	0.04	0.58	2.02	2.19				

RITOdummy: risk tolerance, IVs: independent variables, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

The results of the relationship of risk tolerance to the use of financial leverage are presented in Table 5.18 using the sample size of 336. Risk tolerance is associated with financial leverage at 0.25 ($p<0.1$) after the scores of the 6 control variables are matched. In summary, the relationship between risk tolerance and financial leverage is robust using the propensity score matching technique.

Table 5.18: The results of the relationship between risk tolerance and debt decisions (N=336)

This table presents that risk tolerance maintains a strong relationship with the use of financial leverage at 0.26 ($p<0.1$) using the propensity score matching method.

Probit regression				Number of obs	=	336
				Wald chi2(7)	=	10.49
				Prob>chi2	=	0.1626
Log pseudolikelihood		= -177.80		Pseudo R2	=	0.0297
LEVE	Coef.	Robust Std. Err.	z	p> |z|	[90% Conf. Interval]	
RITOdummy	**0.257**	0.154	1.67	**0.095***	0.034	0.509
GEN	-0.003	0.167	-0.02	0.987	-0.278	0.272
AGE	0.115	0.128	0.90	0.369	-0.095	0.326
EDU	-0.115	0.226	-0.51	0.609	-0.487	0.256
MAR	-0.039	0.148	-0.26	0.792	-0.284	0.205
INC	0.075	0.121	0.62	0.533	-0.124	0.275
FIL	0.307	0.119	2.57	0.010	0.110	0.504
Constant	-0.035	0.744	-0.05	0.962	-1.259	1.189

Note: *: $p<10\%$, **: $p<5\%$, ***: $p<1\%$. Dependent variable: LEVE: financial leverage. RITOdummy: risk tolerance, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

5.6.5 Robustness check using the instrumental variables method

This chapter attempts to find an instrumental variable to deal with these issues that are a threat to inferring the causal relationship of risk tolerance to the use of financial leverage. The methodology was presented in Section 3.4.3.

Trading accounts are the accounts investors use for stocks trading. This chapter finds investors have from one through five trading accounts, and that 80% of them have from one through two accounts. This chapter argues that risk tolerance is positively correlated with the number of trading accounts, meaning the higher the level of risk tolerance, the higher the number of trading accounts. Also, the number of trading accounts does not relate to a debt decision to be made. Chu and Vuong (2015) find that trading accounts are an instrumental variable for

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investment experience relating to investment decisions. Based on this evidence, trading accounts may also be postulated as an instrumental variable for risk tolerance concerning debt decisions.

The results of trading accounts as the instrumental variable for risk tolerance are shown in Table 5.19. This chapter applies the IVs approach with two-stage least squares and finds that trading accounts are highly significant in predicting the instrumented variable for risk tolerance. Durbin Chi-squared and Wu-Hausman F also detect endogeneity at a significant level ($p<0.05$), rejecting the null hypothesis of no endogeneity. This result adds to the literature alongside Chu and Vuong (2015).

Table 5.19: The findings of an instrumental variable for risk tolerance

This table shows that trading accounts as the instrumental variable are highly significant in predicting the instrumented variable of risk tolerance. Durbin Chi-squared and Wu-Hausman F stats also detect endogeneity at a significant level ($p<0.05$), rejecting the null hypothesis of no endogeneity.

Instrumental variables (2SLS) regression				Number of obs	=	420
				Wald chi2(7)	=	19.61
				Prob>chi2	=	0.0065
				Pseudo R2	=	.
				Root MSE	=	0.7547

LEVE	Coef.	Robust Std. Err.	z	p> |z|	[95% Conf. Interval]	
RITO	**3.466**	1.370	2.53	**0.011****	0.779	6.153
GEN	-0.111	0.080	-1.39	0.166	-0.268	0.046
AGE	0.007	0.056	0.12	0.902	-0.102	0.116
EDU	-0.175	0.103	-1.70	0.089	-0.376	0.027
MAR	0.034	0.079	0.43	0.664	-0.121	0.190
INC	-0.011	0.065	-0.16	0.869	-0.138	0.117
FIL	0.060	0.084	0.71	0.475	-0.105	0.225
Constant	-10.170	4.296	-2.37	0.018	-18.591	-1.749

Instrumented: RITO
Instruments: GEN AGE EDU MAR INC FIL ACC

Tests of endogeneity
Ho: variables are exogenous

Durbin (score) chi2(1)	=	8.39	(p = 0.0038)***
Wu-Hausman F(1,411)	=	8.377	(p = 0.0040)***

Note: *: p<10%, **: p<5%, ***: p<1%. Dependent variable: LEVE: financial leverage. RITO: risk tolerance, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy.

The number of trading accounts, in short, can solve the endogeneity issues in the causal relationship of risk tolerance to the use of financial leverage. This evidence confirms that risk tolerance strongly relates to the use of financial leverage, and higher-risk tolerance leads to the use of higher-financial leverage.

5.6.6 Robustness check on locations selection and response bias

The methodology for this section was presented in Chapter 3. This chapter thus only examines whether respondents' locations dampen the relationship of risk tolerance to debt decisions, as shown in Table 5.20. Locations (PLACE) in Model 1 is measured as a categorical variable (1: HCM City, 2: Ha Noi Capital, 3: Da Nang City, 4: Mekong Delta, and 5: other places), and a dummy variable (1: HCM City and 0: outside HCM City) in Model 2. Both models show no significant relationship of locations to the use of financial leverage ($p<0.1$), meaning that the places investors have been living do not relate to debt decisions. This minimises the bias in location selection.

Table 5.20: Results of an effect of locations on debt decisions

Both Models 1 and 2 indicate a significant relationship of risk tolerance to financial leverage ($p<0.1$). Importantly, locations have no significant link to financial leverage. This reduces bias in location selection.

Models	Unstandardised Coefficients	Standardised error	Standardised Coefficients	t	Sig.	Model summary
			Model 1			
Constant	-0.809			-1.325	0.186	
RITO	0.468	0.610	**0.130**	2.660	**0.008***	
GEN	-0.066	0.176	-0.054	-1.090	0.276	Adjusted R square:
AGE	0.012	0.060	0.016	0.272	0.786	0.048;
MAR	0.030	0.043	0.028	0.494	0.621	F = 3.65
EDU	-0.103	0.062	-0.070	-1.359	0.175	Df: 8
INC	0.067	0.076	0.086	1.571	0.117	Sig.:
FIL	0.173	0.043	0.164	3.301	0.001***	0.00***
PLACE	0.004	0.052	**0.007**	0.147	**0.883**	

Models	Unstandardised Coefficients	Standardised error	Standardised Coefficients	t	Sig.	Model summary
Model 2:						
Constant	-0.802	0.610		-1.315	0.189	
RITO	0.471	0.176	**0.130**	2.671	**0.008*****	
GEN	-0.066	0.060	-0.054	-1.095	0.274	Adjusted R square: 0.048;
AGE	0.012	0.043	0.016	0.280	0.780	
MAR	0.031	0.062	0.028	0.509	0.611	F = 3.65
EDU	-0.103	0.076	-0.070	-1.365	0.173	Df: 8
INC	0.066	0.043	0.085	1.554	0.121	Sig.: 0.000***
FIL	0.173	0.052	0.164	3.305	0.001***	
PLACE	-0.013	0.059	**-0.011**	-0.229	**0.819**	

Dependent variable: LEVE: financial leverage, ***: $p < 1\%$, RITO: risk tolerance, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, PLACE: locations.

5.7 Demographics

The results of the demographics are shown in Table 5.21. This chapter finds that five out of six demographics relates to risk tolerance, investment horizons, or debt decisions, with the exception of age. Firstly, gender does play a role in relation to the use of financial leverage among stockbrokers and users of formal borrowing sources. This means that female investors tend to use a lower level of financial leverage than male investors, which is in line with prior studies, in which females are less risk-tolerant than males (Barber & Odean, 2001; Frijns et al., 2008; Grable, 2000; Hallahan et al., 2003; Kannadhasan, 2015; Lucarelli & Brighetti, 2011; Yao et al., 2011).

Secondly, education has a positive association with investment horizons and risk tolerance, meaning an increase in education levels leads to an increase in stock investment for the short term, rather than the long term, and levels of risk tolerance. These findings seem consistent with prior studies in which the higher the education levels, the higher the level of risk tolerance

(Grable, 2000; Hallahan et al., 2004; Kannadhasan, 2015; Riley Jr & Chow, 1992; Yao et al., 2011). Education, however, has a negative relationship with the use of financial leverage among stockbrokers and users of informal borrowing. This may be explained based on the results of Blume and Friend (1978) in which educated heads of households are somewhat less willing to take substantial risks and Halek and Eisenhauer (2001) who find education increases a person's risk aversion but also increases one's risk-seeking based on his/her desire to control the environment.

Thirdly, married investors may collectively have less need to use informal debt. This result contributes to the literature alongside the result of Grable (2000), in which married people are found to be less risk-tolerant.

Fourthly, income is positively associated with risk tolerance and financial leverage, manifesting that higher-income investors are more willing to take on risk and use higher levels of financial leverage. This is consistent with prior studies in which people who earn higher income are found to take on more risk (Grable, 2000; Hallahan et al., 2003, 2004; Morin & Suarez, 1983; Yao et al., 2011). Higher-income investors are, however, less likely to invest in short term stocks than in long term stocks among stockbrokers and female investors. This result adds to the literature.

Finally, financial literacy positively relates to risk tolerance and financial leverage and negatively pertains to informal debt among female investors. This means that investors with higher financial literacy are prone to be more risk tolerant, use higher levels of financial leverage, and use lower levels of informal debt. This finding seems similar to that of Balloch et al. (2014) in which people with higher stock market literacy tend to have higher risk tolerance.

Table 5.21: A summary of demographics

Demographic variables	Positive (+) negative (-) relationship	Findings in the models
1. Gender		
Gender -> financial leverage among users of formal borrowing sources	-	Table 5.9
2. Education		
Education -> investment horizons among investors, stockbrokers, male investors	+	SEM1, SEM3, SEM5, SEM8,
Education -> financial leverage among stockbrokers, users of informal borrowing sources	-	SEM3, Table 5.9
3. Marital status		
Marital status -> informal debt among investors, stockbrokers, non-stockbrokers, male investors, female investors, users of borrowing sources.	-	SEM1, SEM2, SEM3, SEM4, SEM5, SEM6, Table 5.9, SEM7, Table 5.15
Marital status -> investment horizons among stockbrokers	-	SEM3
4. Income		
Income -> financial leverage among investors, stockbrokers, female investors, users of formal borrowing sources,	+	SEM1, SEM2, SEM3, SEM6, Table 5.9, SEM7, Table 5.15
Income -> risk tolerance among investors, stockbrokers,	+	SEM2, SEM7
Income -> investment horizons among stockbrokers, female investors	-	SEM3, SEM6
5. Financial literacy		
Financial literacy -> financial leverage among investors, stockbrokers, non-stockbrokers, male investors, female investors, users of formal borrowing sources	+	SEM1, SEM2, SEM3, SEM4, SEM5, SEM6, Table 5.9, SEM7, Table 5.15
Financial literacy -> risk tolerance among investors	+	SEM2
Financial literacy -> informal debt among female investors	-	SEM6

5.8 Conclusions, contributions, implications, limitations and further research

5.8.1 Conclusions

This chapter investigates the extent to which risk tolerance directly relates to debt decisions and mediates between investment horizons and debt decisions. The results indicate that risk tolerance has a direct relationship to the use of financial leverage, while investment horizons are related to the use of informal debt. Risk tolerance positively relates to the use of informal debt and also mediates between investment horizons and debt decisions among stockbrokers. The results are, in general, robust after controlling for demographics and using additional techniques.

Risk tolerance has the strongest relationship to the use of financial leverage among non-users of informal borrowing sources, followed by male investors, non-stockbrokers and users of formal borrowing sources.

5.8.2 Contributions and implications

The following contributions are made by this chapter. Firstly, this chapter provides useful insights into investors' use of debt in the Vietnam stock market and the vital roles of risk tolerance and investment horizons in this use of debt. Secondly, the informal debt sector plays a vital role in the Vietnam stock market, and it is also possible to generalise this importance to other stock markets. Thirdly, the SEM models are developed to examine the inter-relationship between risk tolerance, investment horizons and debt decisions among investors, as well as stockbrokers, non-stockbrokers, male investors, female investors, users of borrowing and non-users of borrowing. Lastly, "trading accounts" are found as an instrumental variable for risk

tolerance to solve the endogeneity problem in the relationship of risk tolerance to debt decisions, which contribute to the finance literature.

The findings of this chapter have the following implications. First, risk tolerance is positively associated with the use of financial leverage. Use of financial leverage for stock investment has advantages and disadvantages. The benefit this brings to investors is to earn higher returns or greater returns from a small equity base. However, the risks investors face are a large loss and then legal problems if insolvency situations occur. Therefore, risk-tolerant investors should consider prudently what stocks are financially leveraged to minimise the risks. Moreover, they should control levels of returns expected from financial leverage by following strictly the trading strategy of "cut losses and take profits". That is, investors identify how much the stocks are sold for to achieve loss-cutting or for profit-taking.

Second, short-term investors and stockbrokers tend to use informal debt for stock investment in which informal lenders are mainly parents and friends. This implies that investors' stock investment may impact on the life of parents and friends. Therefore, investors should contemplate the choices of stocks for investment and effectiveness of these stocks to avoid harm to their family or friends. Although informal borrowing is common in Vietnamese culture, investors should limit the amount of borrowed money from informal lenders because this borrowing could have flow-on effects on the broader network.

Lastly, stockbrokers are more likely to borrow money from parents or friends for stock investment, perhaps because of their social standing in stock market circles. This implies that they may care "too much" for their reputations, leading them to ignore the possible risk to their family or friends. Thus, stockbrokers should be careful when making decisions on informal borrowing due to its influence on others' lives. Importantly, they should not pay much attention

to the social standing while borrowing money for stock investment, leading to biases in the decision-making process.

5.8.3 Limitations and further research

This chapter has some limitations. Firstly, the result of risk tolerance as a mediator is not robust using Hayes and Preacher's approach. This chapter suggests extra tests for this mediating relationship. Secondly, as already mentioned in Chapter 4, debt decisions may be affected by payment methods. Investors may pay interest to the informal lenders, or they share profits or losses based on their contributed capital, or they pay no interest. A difference in payment methods may cause heterogeneity in the use of debt. Also, debt decisions may differ between payers and non-payers of interest. Besides, in some instances, informal lenders may borrow money from third parties, then give these borrowings to investors. This may lead to the flow-on effect in a broader network if investors' stock investments encounter problems. Thirdly, other behavioural factors, for example, trust or perceived risk, may also impact on risk tolerance or debt decisions. All these unexplored aspects should be considered in future research.

Chapter 6 Essay Three: Trust, Trading Frequency and Debt Decisions[19]

6.1 Introduction

The main objective of this chapter is to investigate the extent to which trust in the stock market is directly associated with trading frequency and debt decisions, and whether it mediates between trading frequency and debt decisions.

"Trust" is an essential ingredient for the success of a securities market (Stout, 2009). Trust also contributes to economic development; for example, aggregate economic activity (Knack & Keefer, 1997), or growth rates (Zak & Knack, 2001). While there are numerous publicised studies on the relationship between trust and stock market participation (e.g. Balloch et al., 2014; Georgarakos & Pasini, 2011; Guiso et al., 2008), there has been no academic research examining an association of trust with the use of informal debt for stock investment. This chapter will investigate whether trust directly relates to debt decisions and mediates between trading frequency and debt decisions.

This chapter, as presented in Chapter 3, defines "debt decisions" as the level of debt which investors use for stock investment. "Financial leverage" is the credit investors obtain only through brokerage firms. "Informal debt" is the credit investors obtain through family and non-family sources. A debt decision is a risky decision, regardless of whether it is informal or formal

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[19] The early version of this chapter was presented at the *International Conference on Business and Finance 2019*, University of Economics Ho Chi Minh City, Vietnam, August 2019 https://vietnam2019.sciencesconf.org/

and at *the 24rd New Zealand Finance Colloquium* – NZFC, Auckland University of Technology, New Zealand, February 2020 https://www.nzfc.ac.nz/cfp/index.html

debt, because debtors may face insolvency or bankruptcy if their results cannot cover their debt. The importance of debt decisions for both enterprises and individuals was discussed in Chapter 1.

"Trust" lies at the centre of our global life, in which society itself would disintegrate unless people trust each other (Blair & Stout, 2001; Möllering, 2001). Hardin (2006) characterises trust as the willingness to make oneself vulnerable to another under uncertain conditions. Trust is pointless unless there is some risk of loss, as there is no trust without vulnerability (Blair & Stout, 2001; Hardin, 2006).

The remainder of this chapter is as follows. Section 6.2 presents the literature review and hypothesis development. Section 6.3 shows the methodology. Section 6.4 reports the main results. Section 6.5 presents the results of the additional analysis. Section 6.6 focuses on the robustness check. Section 6.7 presents the demographics discussion. Section 6.8 ends with conclusions, contributions, implications, limitations and further research.

6.2 Literature review and hypothesis development

The concept of trust and trust in finance are presented in Section 2.4. While there are numerous studies on the link between trust and investment decisions, to the author's knowledge, there has been no research on the relationships between trust, trading frequency and debt decisions. This chapter examines the following hypotheses.

Direct relationships

The existing literature finds that trust in the stock market is positively associated with trading frequency (stock market participation) (e.g. Balloch et al., 2014; Georgarakos & Pasini, 2011; Guiso et al., 2008). Trusting people are willing to bear the risk (Ben-Ner & Putterman, 2001;

Cook & Cooper, 2003). Like prior studies, this chapter argues that there is a positive link between trust and trading frequency and debt decisions.

H6.1: The higher the level of trust in the stock market, the higher the trading frequency.

H6.2: The higher the level of trust in the stock market, the higher the level of informal debt used.

H6.3: The higher the level of trust in the stock market, the higher the level of financial leverage used.

Investors who trade excessively hold riskier investment portfolios (Barber & Odean, 2000, 2001; Frijns et al., 2008; Glaser & Weber, 2007; Grable, 2000; Hallahan et al., 2003; Nofsinger, 2008; Odean, 1999). In this chapter, it is argued that investors who trade more often may use higher debt for stock investment, under the following hypotheses:

H6.4: The higher the trading frequency, the higher the level of informal debt used.

H6.5: The higher the trading frequency, the higher the level of financial leverage used.

Li, Turmunkh, and Wakker (2019) define trust as a decision made under ambiguity. A trust decision is a risky decision because trust givers (those who trust someone else) may have adverse results if their trust is misplaced, and thus, a higher trading frequency may lead to a higher level of trust.

H6.6: The higher the trading frequency, the higher the trust in the stock market.

Indirect relationships

Prior studies find trust in the stock market relates to trading frequency, and trading frequency is associated with risky decisions (Balloch et al., 2014; Barber & Odean, 2000, 2001; Frijns et al., 2008; Georgarakos & Pasini, 2011; Glaser & Weber, 2007; Grable, 2000; Guiso et al.,

2008; Hallahan et al., 2003; Nofsinger, 2008; Odean, 1999). Hence, this chapter argues that trading frequency mediates between trust and debt decisions.

H6.7: Trading frequency mediates between trust and the use of informal debt.

H6.8: Trading frequency mediates between trust and the use of financial leverage.

This chapter also argues that trading frequency may relate to trust in the stock market, and trust in the stock market is associated with debt decisions. Hence, trust in the stock market is possibly a mediator between trading frequency and debt decisions.

H6.9: Trust mediates between trading frequency and the use of informal debt.

H6.10: Trust mediates between trading frequency and the use of financial leverage.

6.3 Methodology

The methodology for this section was presented in Chapter 3. Debt decisions and six control variables were presented in Section 3.6. This chapter thus only presents measures of trust in the stock market, trading frequency, and debt decisions, as shown in Figure 6.1.

Trust in the stock market, known as "overall trust", is measured by the sum of the scores of six facets; trust in stockbrokers, websites of financial investment, brokerage firms, listed firms, friends or relatives who are working for brokerage firms (abbreviated to trust in friends), and the stock exchanges. This measure of trust is based on prior studies (e.g. Balloch et al., 2014; Georgarakos & Pasini, 2011; Guiso et al., 2008). Trading frequency is measured by how often investors trade in stocks, which is in line with previous research (for example, Graham, Harvey, & Huang (2009). Lastly, debt decisions have two measures; informal debt, and financial leverage. As already mentioned in Chapter 3, informal debt is credit obtained by

investors through informal lenders, while financial leverage is credit obtained by investors through formal lenders (i.e. brokerage firms).

Figure 6.1: Measures of trust, trading frequency and debt decisions

Trust	Trading frequency	Debt decisions
$\mathbf{TRUS} = \frac{1}{m} \sum_i^n (\mathbf{SHBR_i} + \mathbf{WEBS_i} + \mathbf{BFRM_i} + \mathbf{LICO_i} + \mathbf{FREN_i} + \mathbf{EXCH_i})$ where: SHBR : trust in stockbrokers WEBS : trust in websites of financial investment BFRM : trust in brokerage firms LICO : trust in listed firms FREN : trust in friends or relatives who are working for brokerage firms EXCH : trust in the stock exchange(s) TRUS : overall trust; n=420, m=6	$\mathbf{TRAD} = \sum_i^n TRAD_i$ where: TRAD$_i$: the level of trading frequency of ith investor TRAD: trading frequency. n=420	$\mathbf{LEVE} = \sum_i^n (LEVE_i)$ $\mathbf{INFD} = \sum_i^n (INFD_i)$ where: LEVE: Financial leverage INFD: Informal debt i: ith investors, n=420. Note: debt over total assets.

6.4. Main results and discussion

The investor characteristics were demonstrated in Section 3.5. This chapter describes investors' overall trust and its facets, the reliability of the scale of trust, correlations between variables, and main results by SEMs. The description of trading frequency and debt decisions was presented in Sections 3.5 and 3.6.

6.4.1 Levels of trust

The levels of trust (overall) among users and non-users of debt, non-stockbrokers and stockbrokers, male and female investors, and all investors are shown in Table 6.1. Most investors (60%) have a higher level of trust than the average, indicating most investors have, in general, high levels of trust in the stock market.

The average trust (mean) of users of debt is higher than that of non-users of debt. Stockbrokers and female investors have a higher level of trust than non-stockbrokers and male investors, respectively.

Table 6.1: A summary of trust between groups

Overall Trust	Non-users of debt	Users of debt	Non-stock-brokers	Stock-brokers	Male investors	Female investors	All investors	
							Freq.	%
Mean	18.57	19.16	18.91	19.28	19.057	19.062	19.06	
Median	19	19	19	19	19	19	19	
Mode	19	18	18	18	18	18	18	
Std. dev.	3.6	3.4	3.65	3.10	3.46	3.43	3.44	
Minimum	8	5	5	6	5	6	5	
Maximum	29	28	29	26	29	25	29	
Low trust							168	40
High trust							252	60
N	75	345	250	170	259	161	420	100%

Table 6.2 presents the extent to which investors trust stockbrokers, websites, brokerage firms, listed firms, friends who work for securities companies, and stock exchanges. Among them, investors have the highest level of trust in the listed firms (49%), followed by trust in the stock exchange (42%), brokerage firms (37%), websites and friends (36%), and stockbrokers (30%). In general, most investors have a level of trust between moderate and high.

Table 6.2: A summary of six facets of trust

This table indicates investors have the highest level of trust in the listed firms (49%), followed by trust in the stock exchange (42%), brokerage firms (37%), websites and friends (36%), and stockbrokers (30%).

Six facets of trust	Do not trust		Neutral		Trust		Do not have this one	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Trust in stockbrokers	24	1.70	206	49.0	126	30.0	64	15.2
2. Trust in websites	58	13.8	245	58.4	122	36.2		
3. Trust in brokerage firms	39	9.30	222	52.9	156	37.1		
4. Trust in listed firms	29	6.90	185	44.0	206	49.0		
5. Trust in friends*	36	8.60	201	47.9	152	36.2	31	7.4
6. Trust in stock exchanges	42	10.0	189	45.0	178	42.4		

Note: *: Trust in friends or relatives who are working for brokerage firms.

6.4.2 Reliability test of the scale of trust

The reliability coefficients (Cronbach's alpha) of overall trust created by its six facets is 0.618, as shown in Table 6.3. This result indicates an acceptable internal consistency and allows this scale to be used as a variable in a model.

Table 6.3: Test of reliability of the scale of overall trust

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's alpha
TRUS: overall trust						**0.61**
SHBR	16.2291	8.345	0.196	0.102	0.604	
WEBS	15.9069	8.998	0.352	0.190	0.504	
BFRM	15.7924	9.567	0.354	0.252	0.512	
LICO	15.6110	9.640	0.349	0.222	0.515	
FREN	15.9881	8.385	0.320	0.140	0.518	
EXCH	15.8067	8.673	0.385	0.216	0.488	

6.4.3 Test of correlations

The correlations between variables are shown in Table 6.4. Most variables have positive inter-correlations at a significant level (*p<0.05*). More specifically, the six facets of trust have significant correlations with overall trust, ranked in descending order, trust in the stock exchange at 0.606 (*p<0.01*), trust in friends or relatives who work for the securities companies at 0.593 (*p<0.01*), trust in websites of financial investment at 0.564 (*p<0.01*), trust in stockbrokers at 0.549 (*p<0.01*), trust in listed firms at 0.535 (*p<0.01*), and trust in brokerage firms at 0.522 (*p<0.01*). Trust also correlates with trading frequency at 0.107 (*p<0.05*) and informal debt at 0.143 (*p<0.01*). Overall, all variables have lower correlation coefficients than 0.7. This indicates that "a poor correlation matrix" does not occur if these variables are tested in the same model (Hair et al., 2014, p. 102).

Table 6.4: The correlations between trust, trading frequency and debt decisions

Most variables have positive inter-correlations at a significant level ($p<0.05$). Trust in stock exchange had the highest correlation coefficient with overall trust at 0.606 ($p<0.01$). Overall trust correlated with trading frequency at 0.107 ($p<0.01$), and informal debt at 0.143 ($p<0.01$). Trading frequency correlated with financial leverage at 0.122 ($p<0.01$).

	SHBR	WEBS	BFRM	LICO	FREN	EXCH	TRUS	TRAD	INFD	LEVE	GEN	AGE	MAR	EDU	INC	FIL
SHBR	1.000															
WEBS	0.103*	1.000														
BFRM	0.039	0.385**	1.000													
LICO	0.021	0.250**	0.378**	1.000												
FREN	0.309**	0.131**	0.073	0.149**	1.000											
EXCH	0.073	0.285**	0.322**	0.371**	0.209**	1.000										
TRUS	0.549**	0.564**	0.522**	0.535**	0.593**	0.606**	1.000									
TRAD	0.073	0.011	0.071	0.032	0.061	0.092	0.107*	1.000								
INFD	0.119*	0.054	0.099*	0.038	0.108*	0.059	0.143**	-0.066	1.000							
LEVE	0.068	0.005	-0.015	-0.004	0.010	-0.002	0.033	0.122*	-0.063	1.000						
GEN	0.019	0.022	0.004	-0.114*	0.123*	-0.115*	-0.002	0.064	0.047	-0.073	1.000					
AGE	-0.032	-0.136**	-0.058	0.012	-0.025	-0.051	-0.090	-0.068	-0.109*	0.060	-0.194**	1.000				
MAR	-0.005	-0.112*	-0.040	0.015	-0.001	-0.065	-0.055	0.004	-0.136**	0.048	-0.052	0.475**	1.000			
EDU	-0.028	0.025	0.089	0.090	0.046	0.054	0.083	0.016	0.003	0.043	-0.085	0.072	0.123*	1.000		
INC	-0.055	-0.036	-0.017	0.150**	0.038	0.105*	0.048	0.037	-0.087	0.134**	-0.198**	0.368**	0.258**	0.322**	1.000	
FIL	0.041	0.089	0.061	0.144**	0.032	0.200**	0.173**	0.147**	-0.044	0.172**	-0.097*	-0.040	-0.031	0.253**	0.137**	1.000
N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

TRUS: overall trust, SHBR: trust in stockbrokers, WEBS: trust in websites of financial investment, BFRM: trust in brokerage firms, LICO: trust in listed firms, FREN: trust in friends or relatives working for brokerage firms, EXCH: trust in the stock exchange, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage. GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy.

6.4.4 Results of main SEM models and discussion

Two structural equation models (SEM1 and SEM2) are developed with six control variables (gender, age, marital status, education levels, investment experience, and financial literacy). SEM1 examines the direct impact of trust on trading frequency, trading frequency on debt decisions, and both trust and trading frequency on debt decisions. SEM2 examines the direct effect of trading frequency on trust, trust on debt decisions, and both trading frequency and trust on debt decisions. SEM1 also examines trading frequency as a mediator between trust and debt decisions, and SEM2 investigates trust as a mediator between trading frequency and debt decisions. Demographics found by the SEM models are presented in Section 6.7.

The results of SEM1 are shown in Figure 6.2 and Table 6.5. SEM1 finds a direct relationship of trust (overall) to the trading frequency with a standardised coefficient of 0.102 (*p<0.05*), in support of H6.1. Statistically, when trust increases by 1 standard deviation, trading frequency increases by 0.1. This result is consistent with prior studies (for example, Balloch et al., 2014; Georgarakos & Pasini, 2011; Guiso et al., 2008). In general, investors who trust the stock market tend to trade frequently. Investors trust many parties such as stockbrokers, websites on financial investment, brokerage firms, listed companies, friends who are working for brokerage firms and stock exchanges. These parties hold a belief and have a given reputation to investors. Therefore, when these parties advise investors on stock investment, investors feel more confident to engage in the stock market.

Trust is also related to informal debt at 0.145 (*p<0.01*), supporting H6.2. Trust, however, has no significant association with the use of financial leverage, which does not support H6.3. Trusting investors tend to use informal debt for stock investment. There is a possibility that trusting investors may rely on the advice by trust parties to make investing decisions, rather

than they themselves making decisions, leading them to feel safer with informal borrowing. Importantly, they would minimise legal issues if the stock investment failed.

Trading frequency is associated with the use of financial leverage at 0.02 ($p<0.05$), in support of H6.5, but has no significant link to the use of informal debt, which does not support H6.4. The reasons for the use of debt are presented in Chapter 3 – Section 3.6.3. Frequent traders tend to use financial leverage rather than informal debt for stock investment. Frequent traders are associated with risk-taking behaviour (Barber & Odean, 2000, 2001), leading them to use financial leverage in an attempt to achieve high returns from a small equity outlay. In addition, they may borrow a large amount of money for stock investment for which only formal lenders, i.e. brokerage firms can financially meet this borrowing.

The results of SEM1 also indicate that trading frequency is a mediator between trust and financial leverage at 0.01 ($p<0.05$), supporting H6.8. Trading frequency, however, insignificantly mediates between trust and informal debt, which does not support H6.7. This mediating role of trading frequency accounts for why a higher level of trust leads to a higher level of financial leverage. Noticeably, trust has no significant link to the use of financial leverage. Thanks to trading frequency, trust relates to the use of financial leverage.

Figure 6.2: Trust, trading frequency and debt decisions (SEM1)

This figure shows a significant positive link of trust to trading frequency, trust to informal debt, and trading frequency to financial leverage. Trading frequency significantly mediates between trust and financial leverage.
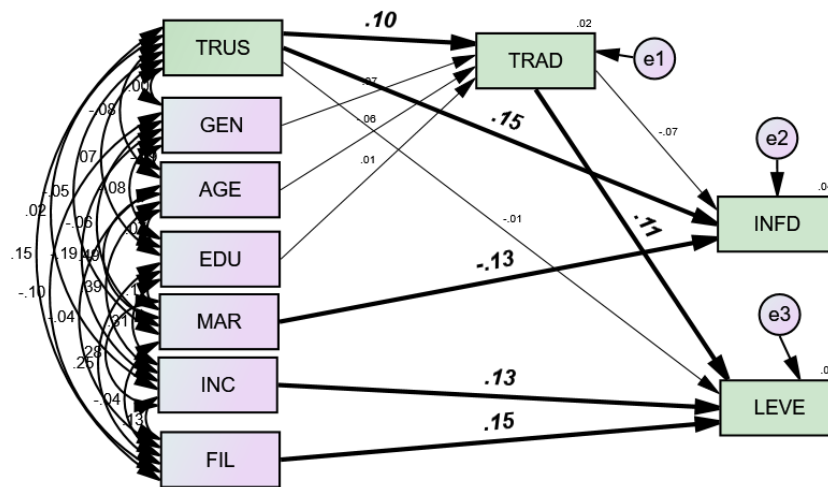
Model fit criteria: Chi-square: 10.105, Df: 13, GFI: 0.995, TLI: 1.031, CFI: 1.000, RMSEA: 0.000
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Table 6.5: Trust, trading frequency and debt decisions (SEM1)

This table indicates a significant direct relationship of trust to the trading frequency and informal debt, and trading frequency to financial leverage. Trading frequency mediates between trust and financial leverage significantly.

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
I. Direct relationship								
TRAD	**<---**	**TRUS**	0.038	**0.098**	0.019	2.022	**0.043****	**H6.1**
TRAD	<---	EDU	0.022	0.007	0.149	0.146	0.884	
TRAD	<---	GEN	0.189	0.07	0.133	1.422	0.155	
TRAD	<---	AGE	-0.09	-0.055	0.081	-1.11	0.267	
INFD	<---	TRAD	-0.012	-0.071	0.008	-1.487	0.137	H6.4
LEVE	<---	TRUS	-0.002	-0.009	0.008	-0.184	0.854	H6.3
INFD	**<---**	**TRUS**	0.009	**0.146**	0.003	3.045	**0.002*****	**H6.2**
INFD	<---	MAR	-0.053	-0.134	0.019	-2.807	0.005***	
LEVE	<---	INC	0.103	0.129	0.038	2.682	0.007***	
LEVE	<---	FIL	0.028	0.147	0.009	3.034	0.002***	
LEVE	**<---**	**TRAD**	0.05	0.11	**0.022**	2.308	**0.021****	**H6.5**
II. Indirect relationship								
TRUS->TRAD->INFD			0.000	-0.007				**H6.7**
TRUS->TRAD->LEVE			0.002	**0.011**			****	**H6.8**

Note: *: p<0.1, **: p<0.05, ***: p<0.01
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

The results of SEM2 are presented in Figure 6.3 and Table 6.6. SEM2 finds a direct association of trading frequency with trust at 0.09 (*p<0.1*), in support of H6.6. This result adds to the literature alongside prior studies (e.g., Corritore, Kracher, & Wiedenbeck, 2003; Kwon & Suh, 2004).

Like SEM1, SEM2 also uncovers a link of trust to informal debt at 0.146 (*p<0.01*), supporting H6.2, and trading frequency to financial leverage at 0.11 (*p<0.05*), in support of H6.4. These hypotheses were presented in SEM1.

The results of SEM2 also find trust as a mediator between trading frequency and informal debt at 0.013 (*p<0.1*), supporting H6.9. Trust, however, insignificantly mediates between trading frequency and financial leverage, which does not support H6.10. More importantly, trading frequency has no significant link to the use of informal debt. Thanks to trust, trading frequency relates to the use of informal debt. The mediating role of trust accounts for why a higher level of trading frequency leads to the use of higher informal debt.

Figure 6.3: Trading frequency, trust and debt decisions (SEM2)

This figure shows a significant direct link of trading frequency on trust and financial leverage and trust on informal debt. Trust mediates between the trading frequency and informal debt significantly.
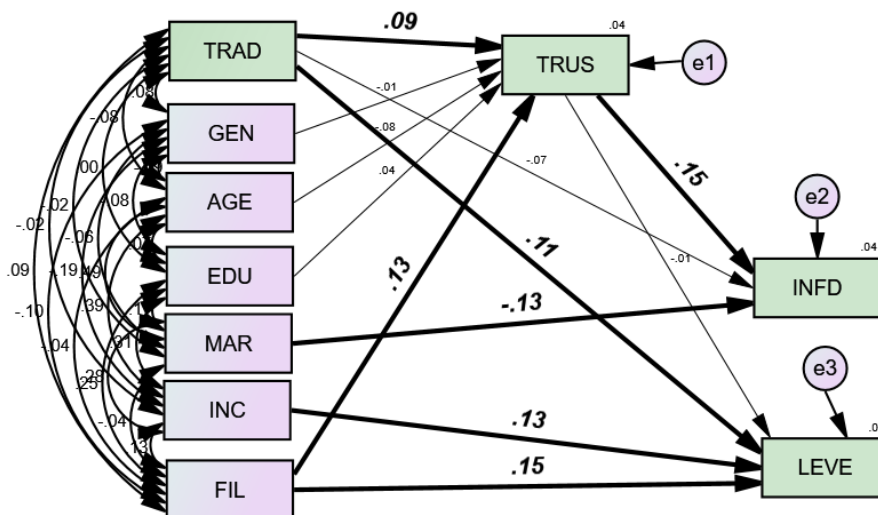
Model fit criteria: Chi-square: 7.119, Df: 12, GFI: 0.997, TLI: 1.056, CFI: 1.000, RMSEA: 0.000
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Table 6.6: Trading frequency, trust and debt decisions (SEM2)

This table indicates trading frequency directly relates to trust, informal debt and financial leverage, and trust has a direct link to informal debt at a significant level. Trust significantly mediates between trading frequency and informal debt.

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P	Hypotheses
I. Direct relationship								
TRUS	**<---**	**TRAD**	0.224	**0.086**	0.126	1.772	**0.076***	**H6.6**
TRUS	<---	EDU	0.293	0.037	0.396	0.738	0.46	
TRUS	<---	GEN	-0.051	-0.007	0.345	-0.147	0.883	
TRUS	<---	AGE	-0.321	-0.075	0.21	-1.532	0.125	
TRUS	<---	FIL	0.143	0.133	0.054	2.647	**0.008***	
INFD	**<---**	**TRUS**	0.009	**0.146**	0.003	3.047	**0.002***	**H6.2**
LEVE	**<---**	**TRAD**	0.05	**0.11**	0.022	2.301	**0.021**	**H6.4**
INFD	<---	TRAD	-0.012	-0.071	0.008	-1.487	0.137	H6.5
INFD	<---	MAR	-0.053	-0.134	0.019	-2.81	0.005***	
LEVE	<---	INC	0.103	0.128	0.038	2.682	0.007***	
LEVE	<---	FIL	0.028	0.147	0.009	3.023	0.003***	
LEVE	<---	TRUS	-0.002	-0.009	0.008	-0.184	0.854	H6.3
II. Indirect impact								
TRAD->TRUS->INFD			0.002	**0.013**			*	**H6.9**
TRAD->TRUS->LEVE			0.000	-0.001				H6.10

Note: *: p<0.1, **: p<0.05, ***: p<0.01

TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

In summary, based on SEMs' results, as presented above, trusting investors tend to prefer informal debt, while investors who trade frequently are more likely to use formal debt for stock investment. This reemphasises that informal and formal finance sectors are the important sources for stock market investors.

6.5. Results of additional analysis

This chapter further analyses what facets of trust relate to debt decisions and find a difference in the relationship of trust and trading frequency to debt decisions between non-stockbrokers and stockbrokers, male and female investors, and non-users and users of borrowing sources. These analyses aim at exploring what facets of trust relate to debt decisions and find that who and what investors trust has the strongest relationship to debt decisions.

6.5.1 Results of six facets of trust

The third SEM model, SEM3 is developed to examine the relationship between the facets of trust, trading frequency and debt decisions. Trust has six facets, including trust in share brokers, trust in websites of financial investment, trust in brokerage firms, trust in listed companies, trust in friends, and trust in the stock exchange. As presented above, 64 out of 420 investors do not have any stockbrokers (about 15%), and 31 out of 420 investors do not have any friends or relatives who are working for brokerage firms (around 7%). Due to this inconsistency in levels of trust, these 6 facets of trust should each be deemed to be categorical variables.

The results of SEM3 are indicated in Figure 6.4 and Table 6.7; both trusts in stockbrokers and brokerage firms have a connection with informal debt at 0.1 ($p<0.1$). Trading frequency also pertains to financial leverage at 0.12 ($p<0.05$), which is consistent with SEM1 and SEM2. Not only does overall trust, but trust in stockbrokers and brokerage firms also strongly relates to the use of informal debt.

Figure 6.4: Six facets of trust, trading frequency and debt decisions (SEM3)

This figure indicates both trusts in stockbrokers and brokerage firms has a relationship on informal debt at 0.1 (*p<0.1*). Trading frequency also affects financial leverage at 0.12 (*p<0.05*).
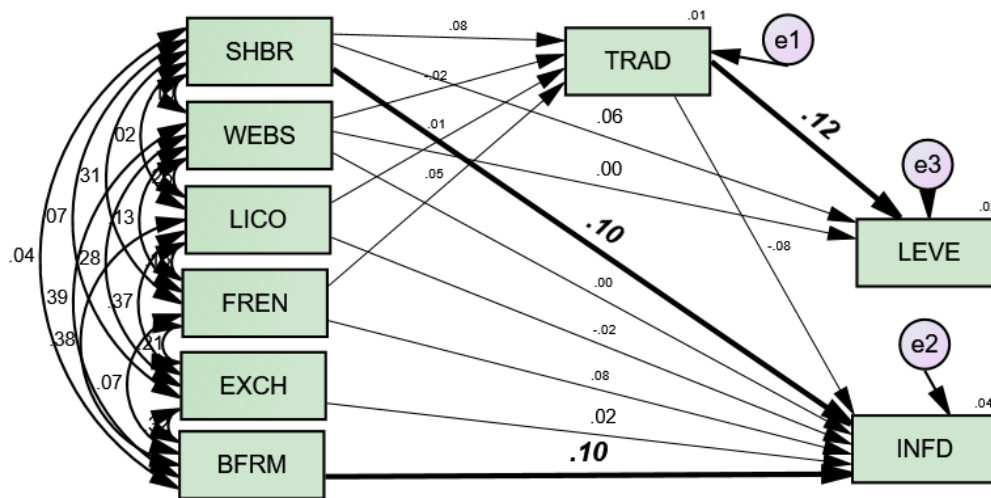
Model fit criteria: Chi-square: 6.280, Df: 7, GFI: 0.997, TLI: 1.013, CFI: 1.000, RMSEA: 0.000
SHBR: trust in stockbrokers, WEBS: trust in websites of financial investment, LICO: trust in listed firms, FREN: trust in friends or relatives who are working for brokerage firms, EXCH: trust in the stock exchange, BFRM: trust in brokerage firms, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Table 6.7: The results of six facets of trust, trading frequency, and debt decisions (SEM3)

This table presents both trusts in stockbrokers and brokerage firms have an impact on informal debt at 0.1 (p<0.1). Trading frequency also affects financial leverage at 0.12 (*p<0.05*).

Direct relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P
TRAD	<---	LICO	0.015	0.009	0.089	0.171	0.864
TRAD	<---	WEBS	-0.022	-0.016	0.072	-0.311	0.756
TRAD	<---	SHBR	0.077	0.081	0.049	1.576	0.115
TRAD	<---	FREN	0.055	0.048	0.059	0.921	0.357
INFD	**<---**	**SHBR**	0.015	**0.099**	0.008	1.952	**0.051***
INFD	<---	FREN	0.014	0.075	0.01	1.458	0.145
INFD	<---	WEBS	-0.001	-0.005	0.012	-0.09	0.928
INFD	**<---**	**BFRM**	0.027	**0.098**	0.016	1.758	**0.079***
INFD	<---	LICO	-0.005	-0.016	0.016	-0.297	0.767
INFD	<---	EXCH	0.004	0.017	0.012	0.316	0.752
INFD	<---	TRAD	-0.013	-0.077	0.008	-1.602	0.109
LEVE	**<---**	**TRAD**	0.052	**0.115**	0.022	2.371	**0.018****
LEVE	<---	SHBR	0.024	0.057	0.021	1.165	0.244
LEVE	<---	WEBS	0	-0.001	0.031	-0.014	0.989

Note: *: p<0.1, **: p<0.05, ***: p<0.01
SHBR: trust in stockbrokers, WEBS: trust in websites of financial investment, LICO: trust in listed firms, FREN: trust in friends or relatives who are working for brokerage firms, EXCH: trust in the stock exchange, BFRM: trust in brokerage firms, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

6.5.2 Results of subgroup analysis

The first subgroup analysis is between stockbrokers (N=170) and non-stockbrokers (N=250).[20] Among stockbrokers, only 13.5% have no stockbrokers themselves, meaning that most stockbrokers (86.5%) have other stockbrokers. This indicates that most individual investors have stockbrokers, no matter who they are, stockbrokers or non-stockbrokers.

The results of SEM4 and SEM5 are presented in Figure 6.5 and Table 6.8. Both SEM4 and SEM5 find a relationship of trust (overall) to the use of informal debt at 0.13 ($p<0.1$) and 0.16 ($p<0.1$), respectively. SEM4 also uncovers a link from the trust to trading frequency among stockbrokers at 0.135 ($p<0.1$), while SEM5 does not. SEM5 detects an association of trading frequency with financial leverage among non-stockbrokers at 0.1 ($p<0.1$), whereas SEM4 does not. In general, trust has a strong relationship with the use of informal debt among all investors, stockbrokers and non-stockbrokers.

The second subgroup analysis is between male (N=260) and female (N=160) investors. The results are shown in Figure 6.6 and Table 6.9. SEM6 indicates an association of trust with informal debt at 0.22 ($p<0.01$), and trading frequency with financial leverage at 0.12 ($p<0.05$) among male investors, while SEM7 does not. Overall, between male and female investors, only male investors' trust significantly relates to the use of informal debt.

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[20] Non-stockbrokers (60%) includes, ranked in descending order, other careers (15.4%), banking officers (10.7%), sales/marketing managers (8.8%), administrative officer/manager (7.1%), investment officers (5.5%), business owners (2.9%), accountants (2%), teachers/lecturers (2%), financial advisors (2%), fund managers (1.7%), CFOs (1%), brokerage managers (0.7%), and CEOs (0.2%).

Figure 6.5: Trust, trading frequency and debt decisions between stockbrokers and non-stockbrokers

This figure shows that both SEM4 and SEM5 find an effect of trust (overall) on the use of informal debt at 0.13 (*p<0.1*) and 0.16 (*p<0.1*), respectively. SEM4 also finds an effect of trust on trading frequency among stockbrokers at 0.135 (*p<0.1*), and SEM5 reveals an impact of trading frequency on financial leverage among non-stockbrokers at 0.1 (*p<0.1*). In general, trust exerts a strong impact on informal debt, regardless of whether investors are stockbrokers or non-stockbrokers.

Trust, trading frequency and debt decisions among stockbrokers (SEM4) (N=170)

Trust, trading frequency and debt decisions among non-stockbrokers (SEM5) (N=250)
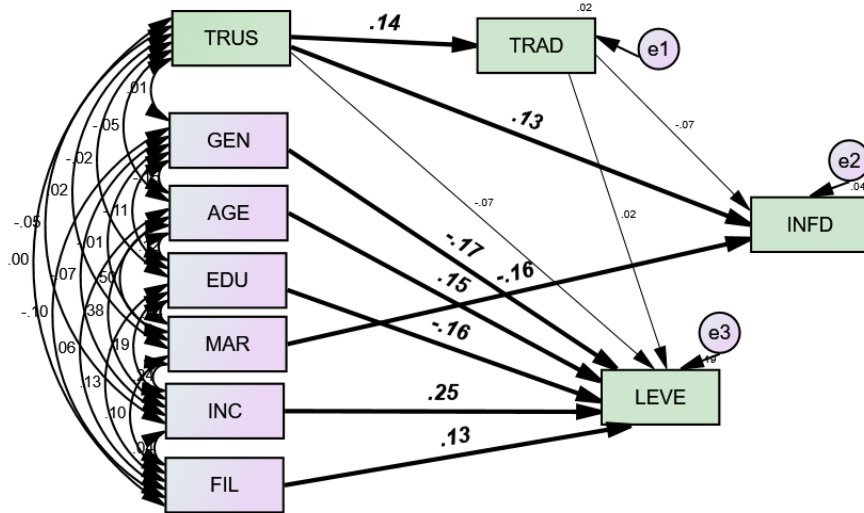
Model fit criteria: Chi-square: 10.819, Df: 13, GFI: 0.988, TLI: 1.017, CFI: 1.000, RMSEA: 0.000.

Model fit criteria: Chi-square: 11.073, Df: 13, GFI: 0.991, TLI: 1.032, CFI: 1.000, RMSEA: 0.000.

Note: TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Table 6.8: Trust, trading frequency and debt decisions between stockbrokers and non-stockbrokers

This table indicates that both SEM4 and SEM5 find a link of trust (overall) to the use of informal debt at 0.13 (*p<0.1*) and 0.16 (*p<0.1*), respectively. SEM4 also finds a relationship of trust to trading frequency among stockbrokers at 0.135 (*p<0.1*), and SEM5 reveals an association of trading frequency with financial leverage among non-stockbrokers at 0.1 (*p<0.1*). In general, trust strongly relates to informal debt, regardless of whether investors are stockbrokers or non-stockbrokers.

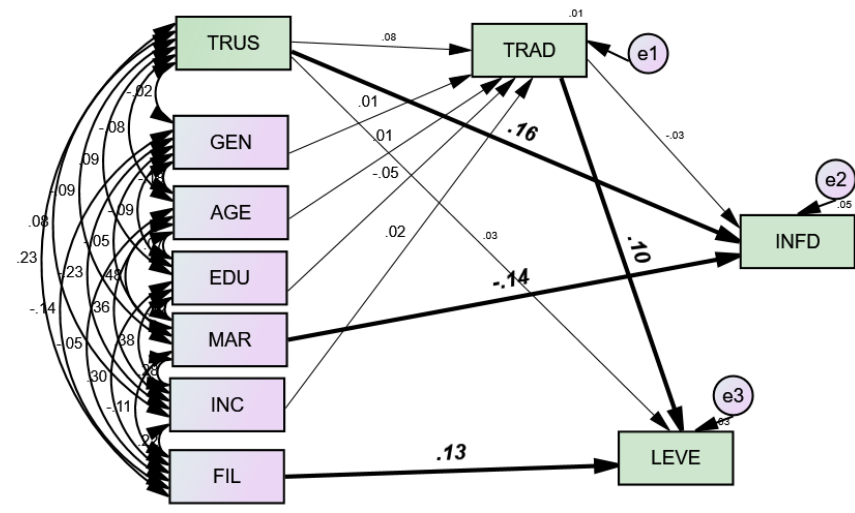| Trust, trading frequency and debt decisions among stockbrokers (SEM4) (N=170)								Trust, trading frequency and debt decisions among non-stockbrokers (SEM5) (N=250)							
Direct relationships			UnStd. Weights	Std. Weights	S.E.	C.R.	P	Direct relationship			UnStd. Weights	Std. Weights	S.E.	C.R.	P
TRAD	**<---**	**TRUS**	0.044	**0.135**	0.025	1.775	**0.076***	TRAD	<---	TRUS	0.032	0.081	0.025	1.269	0.204
INFD	<---	TRAD	-0.014	-0.073	0.015	-0.965	0.334	TRAD	<---	GEN	0.035	0.011	0.202	0.172	0.863
LEVE	<---	EDU	-0.293	-0.162	0.129	-2.268	0.023**	TRAD	<---	AGE	0.009	0.005	0.113	0.080	0.936
INFD	<---	MAR	-0.059	-0.161	0.028	-2.145	0.032**	TRAD	<---	EDU	-0.142	-0.049	0.197	-0.722	0.470
LEVE	<---	TRUS	-0.011	-0.065	0.012	-0.932	0.351	TRAD	<---	INC	0.040	0.020	0.144	0.274	0.784
LEVE	<---	GEN	-0.178	-0.168	0.075	-2.375	0.018**	INFD	<---	TRAD	-0.005	-0.034	0.010	-0.546	0.585
LEVE	<---	AGE	0.132	0.154	0.065	2.035	0.042**	INFD	<---	MAR	-0.059	-0.139	0.026	-2.249	0.025**
LEVE	<---	FIL	0.024	0.132	0.013	1.876	0.061*	LEVE	<---	TRUS	0.005	0.030	0.011	0.470	0.638
LEVE	<---	INC	0.192	0.253	0.058	3.331	0.000***	**LEVE**	**<---**	**TRAD**	0.044	**0.104**	0.027	1.670	**0.095***
LEVE	<---	TRAD	0.011	0.020	0.038	0.289	0.773	**INFD**	**<---**	**TRUS**	0.010	**0.160**	0.004	2.577	**0.010***
INFD	**<---**	**TRUS**	0.008	**0.131**	0.005	1.722	**0.085***	LEVE	<---	FIL	0.025	0.133	0.012	2.078	0.038**

Note: *: p≤0.1, **: p<0.05, ***: p<0.01. Unstd.: unstandardised, Std.: standardised
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Figure 6.6: Trust, trading frequency and debt decisions between male and female investors

This figure presents that SEM6 finds a link of trust to informal debt at 0.22 (p<0.01) and trading frequency to financial leverage at 0.12 (p<0.05) among male investors. By contrast, the results of SEM7 finds no relationship of trust to informal debt among female investors. Overall, between male and female investors, only male investors' trust is found to have a link to their use of informal debt at a significant level (*p<0.1*).

Note: TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

Table 6.9: Trust, trading frequency and debt decisions between male and female investors

This table shows that SEM5 finds an association of trust with informal debt at 0.22 (p<0.01) and trading frequency with financial leverage at 0.12 (p<0.05) among male investors. By contrast, the results of SEM6 find no significant link of trust to informal debt among female investors. Overall, between male and female investors, only male investors' trust is found to have a relationship to their use of informal debt at a significant level (*p<0.1*).

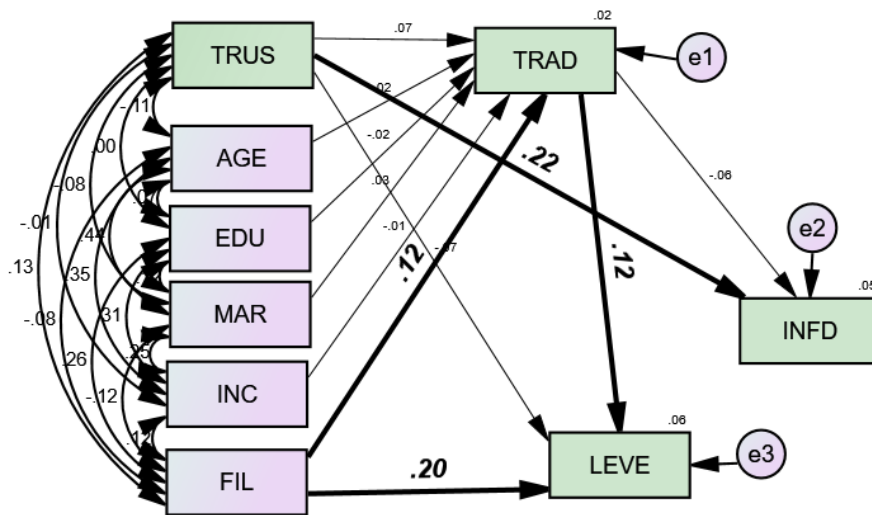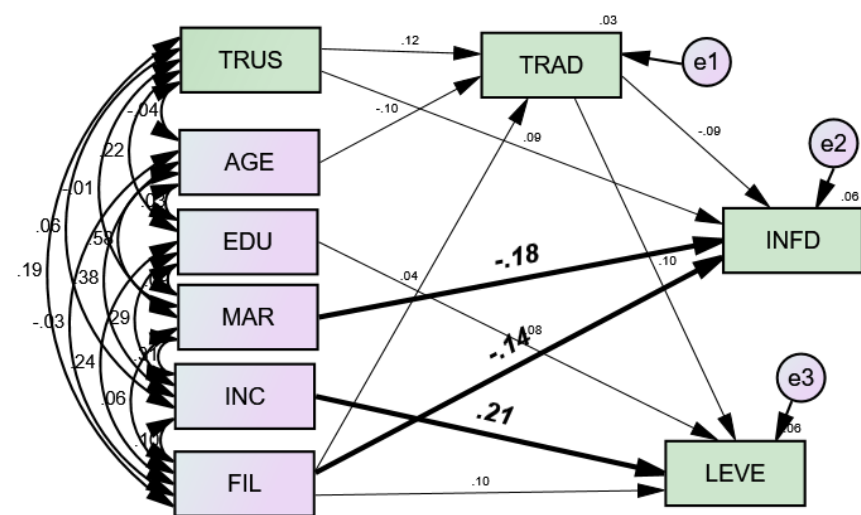| Trust, trading frequency and debt decisions among male investors (SEM6) (N=260)								Trust, trading frequency and debt decisions among female investors (SEM7) (N=160)						
Direct impact			UnStd. Weights	Std. Weights	S.E.	C.R.	P	Direct impact			UnStd. Weights	Std. Weights	S.E.	C.R.	P
TRAD	<---	TRUS	0.026	0.068	0.024	1.086	0.278	TRAD	<---	TRUS	0.048	0.122	0.031	1.529	0.126
TRAD	<---	AGE	-0.038	-0.024	0.115	-0.331	0.741	TRAD	<---	AGE	-0.185	-0.104	0.139	-1.334	0.182
TRAD	<---	EDU	-0.063	-0.023	0.181	-0.349	0.727	TRAD	<---	FIL	0.017	0.041	0.033	0.517	0.605
TRAD	<---	MAR	0.063	0.026	0.169	0.374	0.708	LEVE	<---	TRAD	0.047	0.103	0.035	1.337	0.181
TRAD	<---	FIL	0.050	0.122	0.027	1.865	0.062*	INFD	<---	TRAD	-0.016	-0.093	0.013	-1.200	0.230
TRAD	<---	INC	-0.011	-0.006	0.127	-0.090	0.928	INFD	<---	TRUS	0.006	0.087	0.005	1.100	0.272
LEVE	<---	TRUS	-0.012	-0.071	0.010	-1.166	0.244	LEVE	<---	FIL	0.019	0.102	0.015	1.285	0.199
LEVE	**<---**	**TRAD**	0.055	**0.123**	0.028	2.015	**0.044****	LEVE	<---	INC	0.172	0.214	0.065	2.663	0.008***
LEVE	<---	FIL	0.036	0.196	0.011	3.191	0.001***	INFD	<---	MAR	-0.075	-0.179	0.032	-2.330	0.020**
INFD	<---	TRAD	-0.009	-0.055	0.010	-0.910	0.363	INFD	<---	FIL	-0.010	-0.142	0.005	-1.808	0.071*
INFD	**<---**	**TRUS**	0.013	**0.217**	0.004	3.566	**0.000****	LEVE	<---	EDU	-0.148	-0.079	0.154	-0.961	0.337

Note: *: p≤0.1, **: p<0.05, ***: p<0.01. Unstd.: unstandardised, Std.: standardised

TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

The third subgroup analysis is between users and non-users of borrowing sources; users (N=328) and non-users (N=92) of informal borrowing sources, and users (N=342) and non-users (N=78) of formal borrowing sources. The number of investors who do not borrow money from informal or formal borrowing sources is less than 100. This chapter applies the multiple regression to ensure a model fit, and then to examine the differences in the relationship of trust and trading frequency to debt decisions between these groups.

Eight models are developed to examine this relationship. Model 5a and 5b will examine the relationship of trust and trading frequency with informal debt, while Model 6a and 6b will test this relationship with financial leverage among users and non-users of informal borrowing sources, respectively. Model 7a and 7b will also test this relationship with informal debt, while Model 8a and 8b will investigate this relationship with financial leverage among users and non-users of formal borrowing sources, respectively.

The results are presented in Table 6.10. Both models 5b and 6b find a link of trust to informal debt at 0.193 ($p<0.01$), and trading frequency to financial leverage at 0.09 ($p<0.1$) among users of informal borrowing sources. Both models 7b and 8b also reveal a connection between trust and informal debt at 0.17 ($p<0.01$), and trading frequency to financial leverage at 0.1 ($p<0.1$) among users of formal borrowing sources.

The results, in short, indicate that between users and non-users of borrowing sources, only trust (and trading frequency) of users of borrowing sources have a significant relationship with informal debt (and financial leverage).

In summary, between subgroups, trust has the strongest relationship to the use of informal debt among male investors, followed by users of informal borrowing, users of formal borrowing, non-stockbrokers, and stockbrokers. Trust has no significant association with the use of

informal debt among female investors. Alternatively, some demographics of female investors; marital status, income, and financial literacy; are associated with the use of informal debt. These demographics are presented in Section 6.7.

Table 6.10: Trust, trading frequency and debt decisions between users and non-users of borrowing sources

This table shows that both models 5b and 6b find a link of trust to informal debt at 0.193 (*p<0.01*), and trading frequency to financial leverage at 0.09 (*p<0.1*) among users of informal borrowing sources. Both models 7b and 8b reveal the association of trust with informal debt at 0.17 (p<0.01) and trading frequency with financial leverage at 0.1 (*p<0.1*) among users of formal borrowing sources. The results, in short, indicate that between users and non-users of borrowing sources, only trust (and trading frequency) of users of borrowing sources relate to their informal debt (and financial leverage). Note. Unstandardised coefficients in the parenthesis.

IVs	DV: INFD		DV: LEVE		DV: INFD		DV: LEVE	
	NINFS	INFS	NINFS	INFS	NFS	FS	NFS	FS
	(5a)	(5b)	(6a)	(6b)	(7a)	(7b)	(8a)	(8b)
TRUS	-0.006	**0.193***	0.04	-0.014	0.093	**0.174***	-0.09	0.018
	(0.000)	**(0.012)**	(0.007)	(-0.003)	(0.007)	**(0.01)**	(-0.019)	(0.003)
TRAD	-0.101	-0.049	0.154	**0.094***	-0.034	-0.073	0.145	**0.104***
	(-0.018)	(-0.008)	(0.071)	**(0.042)**	(-0.006)	(-0.012)	(0.07)	**(0.046)**
GEN	0.119	0.006	-0.183	-0.004	0.137	0.005	-0.116	-0.018
	(0.057)	(0.002)	(-0.228)	(-0.005)	(0.062)	(0.002)	(-0.139)	(-0.022)
AGE	0.119	-0.057	-0.035	0.014	-0.018	-0.034	0.009	0.021
	(0.034)	(-0.015)	(-0.027)	(0.011)	(-0.005)	(-0.009)	(0.007)	(0.016)
MAR	-0.147	-0.102	-0.008	0.028	**-0.245***	-0.072	-0.087	0.025
	(-0.061)	(-0.04)	(-0.009)	(0.031)	**(-0.108)**	(-0.028)	(-0.102)	(0.027)
EDU	-0.056	0.062	-0.041	-0.047	0.055	0.032	-0.03	-0.055
	(-0.046)	(0.028)	(-0.088)	(-0.06)	(0.027)	(0.016)	(-0.039)	(-0.076)
INC	-0.015	-0.067	0.047	**0.138****	**-0.229***	-0.001	0.039	**0.157****
	(-0.005)	(-0.018)	(0.041)	**(0.109)**	**(-0.07)**	(0.000)	(0.032)	**(0.127)**
FIL	0.114	**-0.110***	-0.036	**0.205***	0.072	**-0.123****	0.273	**0.12****
	(0.008)	**(-0.007)**	(-0.007)	**(0.038)**	(0.005)	**(-0.008)**	(0.048)	**(0.023)**
Adjust R^2	-0.042	0.058	-0.032	0.057	0.109	0.029	0.022	0.038
F, df	0.543,8	3.5, 8***	0.65,8	3.5,8***	2.17,8**	2.3,8**	1.22,8	2.7,8***
N	92	328	92	328	78	342	78	342

Note: *: p≤0.1, **: p<0.05, ***: p<0.01. Unstd.: unstandardised, Std.: standardised
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, INFD: informal debt, LEVE: financial leverage.

6.6 Robustness check

This chapter applies additional techniques to ensure the robustness of the results from the SEMs. The robustness check has six sections. First, debt decisions have additional measures. Second, multiple and stepwise regression test the direct relationships. Third, Hayes and Preacher's approach examines indirect relationships. Fourth, the t-test and the propensity

matching score examines the key result of this chapter: a causal relationship of trust to debt decisions. Lastly, solutions reduce the locations selection and responses biases.

6.6.1 Robustness check using additional measures

The eighth SEM model, SEM8, is developed to test the relationship between trust, trading frequency and debt decisions using additional measures. Debt decisions are measured by the sum of informal and formal debt. This analysis aims to examine whether the results are robust using an alternative measure for debt decisions

The results of SEM8 are presented in Figure 6.7 and Table 6.11. There is a positive link of trading frequency to trust (overall) at 0.09 ($p<0.1$) and trust to debt decisions at 0.14 ($p<0.01$). Trust is also a mediator between trading frequency and debt decisions at 0.01 ($p<0.1$). These results are consistent with those from SEM2. In short, the relationship of trust to debt decisions are robust using an additional measure for debt decisions.

Figure 6.7: Trading frequency, trust and debt decisions (SEM8)

This figure shows an association of trading frequency with trust at 0.09 ($p<0.1$), and trust with debt decisions at 0.14 ($p<0.01$). Trust is a mediator between trading frequency and debt decisions. These results are consistent with those from SEM2.
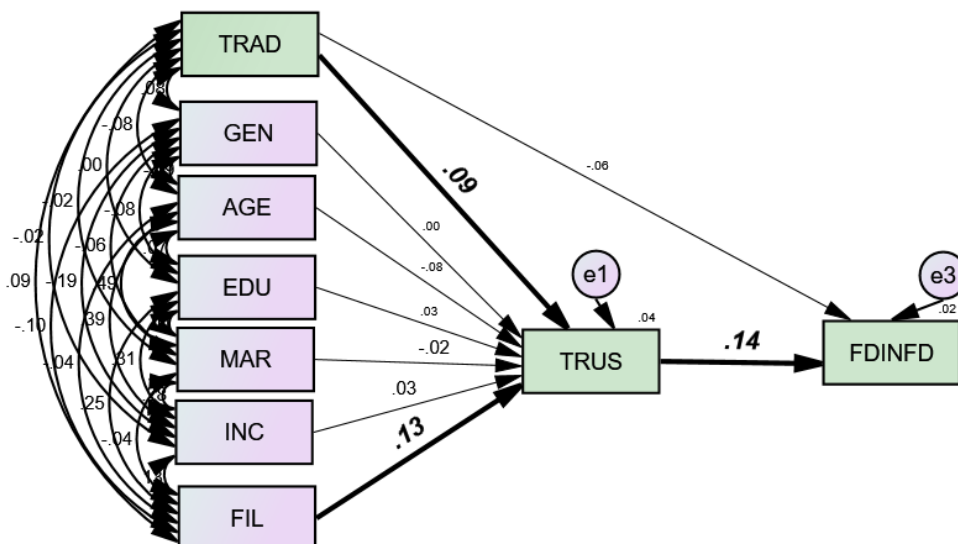
Model fit criteria: Chi-square: 4.147, Df: 6, GFI: 0.998, TLI: 1.037, CFI: 1.000, RMSEA: 0.000
TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, FDINFD: total debt.

Table 6.11: Trading frequency, trust and debt decisions (SEM8)

This table presents a link of trading frequency to trust at 0.09 (*p<0.1*), and trust to debt decisions at 0.14 (*p<0.01*). Trust is a mediator between trading frequency and debt decisions at 0.01 (*p<0.1*). These results are consistent with those from SEM2.

Relationships			Unstandardised Weights	Standardised Weights	S.E.	C.R.	P
I. Direct relationships							
TRUS	<---	**TRAD**	0.224	**0.086**	0.126	1.774	**0.076***
TRUS	<---	EDU	0.250	0.031	0.413	0.607	0.544
TRUS	<---	GEN	-0.026	-0.004	0.348	-0.076	0.940
TRUS	<---	AGE	-0.323	-0.076	0.251	-1.289	0.197
TRUS	<---	MAR	-0.120	-0.019	0.354	-0.337	0.736
TRUS	<---	INC	0.128	0.028	0.256	0.502	0.615
TRUS	<---	FIL	0.140	0.130	0.054	2.582	0.010
FDINFD	**<---**	**TRUS**	0.011	**0.139**	0.004	2.865	**0.004***
FDINFD	<---	TRAD	-0.011	-0.055	0.010	-1.141	0.254
II. Indirect relationships							
TRAD->TRUS->FDINFD			0.002	**0.012**			*

Note: *: p≤0.1, **: p<0.05, ***: p<0.01. Unstd.: unstandardised, Std.: standardised

TRUS: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy, TRAD: trading frequency, FDINFD: total debt.

6.6.2 Robustness check using multiple and stepwise regression

The results from multiple regression using the models 1a to 4a, and stepwise regression using the models 1b to 4b, are presented in Table 6.12. The results show significant links of trust to informal debt (Models 1a and 1b), trading frequency to financial leverage (Models 2a and 2b), trust to trading frequency (Models 3a and 3b), and trading frequency on trust (Models 4a and 4b). Overall, the results of both techniques are consistent with the SEM findings.

Table 6.12: Results of direct relationships between multiple and stepwise regression

This table shows the effect of trust on informal debt (in Models 1a and 1b), trading frequency on financial leverage (in Models 2a and 2b), trust on trading frequency (in Models 3a and 3b), and trading frequency on trust (Models 4a and 4b) at a significant level ($p<0.1$). Unstandardised coefficients are in the parentheses.

Variables	DV: INFD		DV: LEVE		DV: TRAD		DV: TRUS	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
TRUS	**0.154***	**0.139***	-0.006		**0.087***	**0.09***		
	(0.01)	**(0.009)**	(-0.001)		**(0.033)**	**(0.035)**		
TRAD	-0.071		**0.114**	**0.109**			**0.086***	**0.09***
	(-0.011)		**(0.052)**	**(0.05)**			**(0.224)**	**(0.234)**
GEN	0.028		-0.043		0.078	**0.089***	-0.004	
	(0.012)		(-0.052)		(0.209)	**(0.238)**	(-0.026)	
AGE	-0.024		0.017		-0.067		-0.076	
	(-0.006)		(0.013)		(-0.109)		(-0.323)	
MAR	**-0.113***	**-0.133***	0.009		0.028		-0.019	
	(-0.045)	**(-0.053)**	(0.01)		(0.068)		(-0.120)	
EDU	0.044		-0.039		-0.019		0.031	
	(0.022)		(-0.055)		(-0.059)		(0.250)	
INC	-0.057		**0.122**	**0.128***	0.01		0.028	
	(-0.017)		**(0.098)**	**(0.103)**	(0.017)		(0.128)	
FIL	-0.068		**0.154***	**0.146***	**0.089***	**0.087***	**0.13***	**0.145***
	(-0.005)		**(0.029)**	**(0.027)**	**(0.037)**	**(0.036)**	**(0.140)**	**(0.156)**
Adjust R^2	0.036	0.034	0.042	0.05	0.011	0.017	0.022	0.027
F, df	2.97, 8***	8.481, 2***	3.318, 8***	8.366, 3**	1.681, 7	3.47, 3**	2.366, 7**	6.794, 2***
N	420	420	420	420	420	420	420	420

*: $p<0.1$, **: $p<0.01$, ***: $p<0.001$. (1a) -> (4a): multiple regression, (1b) -> (4b): stepwise regression. TRUS: overall trust, TRAD: trading frequency, INFD: Informal debt, LEVE: financial leverage, GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy.

6.6.3 Robustness check using the Hayes and Preacher's approach

This approach by Hayes and Preacher (2010) was presented in Section 3.4.1. The results using Hayes and Preacher's approach are displayed in Table 6.13. Namely, Model 1 indicates a

significant relationship between trading frequency and trust, and trust and informal debt, and as a result, trust significantly mediates between trading frequency and informal debt. Model 2 reveals a link between trust and the trading frequency, and trading frequency and financial leverage, and as a consequence, trading frequency significantly mediates between trust and financial leverage. These findings, using Hayes and Preacher's approach are consistent with those of SEM1 and SEM2 and show that trust and trading frequency are mediators.

Table 6.13: Results of the relationships using Hayes and Preacher's approach

This table shows mediating roles of trust and trading frequency for other factors in debt decisions. Model 1 indicates a significant link of trading frequency to trust, trust to informal debt, and as a result, trust significantly mediates between trading frequency and informal debt. Model 2 reveals a significant relationship of trust to the trading frequency and trading frequency to financial leverage, and as a consequence, trading frequency significantly mediates between trust and financial leverage.

IVs	Model 1: TRAD (X) -> TRUS (M) -> INFD (Y)			Model 2: TRUS (X) -> TRAD (M) -> LEVE (Y)		
	TRUS	INFD	Indirect effect of TRAD on INFD via TRUS	TRAD	LEVE	Indirect effect of TRUS on LEVE via TRAD
Constant	17.97***	0.03		3.25***	0.715***	
TRAD	**0.103****	-0.07			**0.119****	**0.012***
	(0.269)	(-0.011)			**(0.054)**	**(0.002)**
TRUS		**0.15****	**0.016***	**0.103****	0.015	
		(0.009)	**(0.012)**	**(0.04)**	(0.003)	
R square	0.01	0.02		0.01	0.015	
F	4.508**	5.59***		4.508**	3.129**	
Df1-df2	1-418	2-417		1-418	2-417	
LLCI-ULCI			0.0024 - 0.0320			0.0012- 0.0283

Note: *: $p<10\%$, **: $p<5\%$, ***: $p<1\%$. TRUS: overall trust, TRAD: trading frequency, INFD: Informal debt, LEVE: financial leverage. A relationship is assessed as significance ($p<0.1$) if zero does not include between LLCI and ULCI

6.6.4 Robustness check using the T-test method

The key finding of this chapter is a significantly positive relationship of trust to the use of informal debt after controlling for six demographics (gender, age, education, marital status, income, and financial literacy). This chapter applies the two-sample t-test to examine whether the means of these six demographics are equal between two groups of trust. The t-test is presented in Section 3.4.3.

The results are presented in Table 6.14 and 6.15. Trust is coded as a dummy variable: 0 as trust less than Mean; and 1 as trust higher than Mean. The means of each of the six demographics between the two groups of trust is insignificantly different ($p>0.1$), accepting the null hypothesis of no differences in means between two groups of trust. This reduces the selection bias in the six demographics as the control variables in a model between trust and informal debt.

Table 6.14: The t-test results of six control variables between two groups of trust (N=420)

This table presents that the means of the six control variables between two groups of trust are insignificantly different ($p>0.1$). This indicates no differences in each of the six variables between the two groups of trust.

IVs	Group	Mean	Standard error	Standard deviation	90% Confidence Interval		t	Ha: diff < 0 Pr	Hb: diff =0 Pr	Hc: diff>0 Pr
GEN	0	1.39	0.03	0.49	1.33	1.44	0.19	0.57	0.84	0.42
	1	1.38	0.034	0.48	1.32	1.43				
AGE	0	2.03	0.05	0.78	1.94	2.11	0.14	0.55	0.88	0.44
	1	2.02	0.06	0.83	1.92	2.12				
EDU	0	3.02	0.03	0.49	2.96	3.07	-0.91	0.18	0.36	0.81
	1	3.06	0.02	0.34	3.02	3.10				
MAR	0	1.41	0.03	0.52	1.34	1.46	0.22	0.59	0.81	0.40
	1	1.39	0.04	0.55	1.33	1.46				
INC	0	2.54	0.05	0.73	2.45	2.62	-1.18	0.12	0.23	0.88
	1	2.62	0.053	0.74	2.53	2.71				
FIL	0	9.38	0.23	3.43	9.00	9.76	-1.58	0.05	0.16	0.94
	1	9.87	0.21	2.88	9.53	10.21				

Dependent variable: TRUSdummy: overall trust, IVs: independent variables, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

The results of the relationship of trust to informal debt, including the six demographics variables are presented in Table 6.15. The findings show that trust significantly relates to the use of informal debt at 0.36 (*p<0.01*) and that there are no significant relationships of each of six control variables to informal debt (*p<0.1*). Trust is strongly related to the use of informal debt after controlling for the six demographic variables.

Table 6.15: The results of the relationship of trust to informal debt (N=420)

This table presents that trust significantly relates to the use of informal debt after controlling for the six demographic variables.

Probit regression				Number of obs	=	420
				Wald chi2(7)	=	18.43
				Prob>chi2	=	0.0102
Log pseudolikelihood		= -279.573		Pseudo R2	=	0.0320
LEVE	Coef.	Robust Std. Err.	z	p> |z|	[90% Conf. Interval]	
TRUSdummy	**0.367**	0.125	2.92	**0.003***	0.160	0.573
GEN	0.047	0.130	0.36	0.720	-0.167	0.262
AGE	-0.107	0.094	-1.13	0.259	-0.263	0.048
EDU	0.142	0.152	0.93	0.353	-0.109	0.393
MAR	-0.174	0.134	-1.29	0.195	-0.395	0.047
INC	-0.061	0.096	-0.64	0.523	-0.221	0.097
FIL	-0.033	0.020	-1.63	0.103	-0.067	0.0003
Constant	0.409	0.533	0.77	0.443	-0.467	1.287

Dependent variable: INFD: informal debt, TRUSdummy: overall trust, GEN: gender, AGE: age, EDU: education, MAR: marital status, INC: income, FIL: financial literacy.

6.6.5 Robustness check on locations selection and response bias

The methodology used in this section was presented in Chapter 3. This chapter thus only examines whether respondents' locations dampen the relationship of risk tolerance to debt decisions alongside other demographics such as gender, age, marital status, education, income, and financial literacy.

As shown in Table 6.16, both Model 1 and 2 find no significant relationship between locations (denoted as PLACE) and informal debt. This means that locations do not dampen the link of trust to the use of informal debt. This chapter, as a result, minimises the bias in location selection.

Table 6.16: Results of an effect of locations on debt decisions

Both Models 1 and 2 indicate a strong relationship of trust (overall) to informal debt at a significant level ($p<0.1$) after controlling for seven demographics. Both Models 1 and 2 find no links of locations to the use of informal debt at a significant level (p<0.1). This means that locations do not dampen the relationship of trust to informal debt.

Models	Unstandardised Coefficients	Standardised error	Standardised Coefficients	t	Sig.	Model summary
Model 1						
Constant	0.069	0.104		0.665	0.507	
TRUS	0.009	0.003	**0.150**	3.067	**0.002***	Adjusted R square: 0.032;
GEN	0.010	0.022	0.024	0.478	0.633	
AGE	-0.005	0.016	-0.020	-0.337	0.736	
MAR	-0.046	0.022	-0.116	-2.078	0.038	F = 2.75
EDU	0.021	0.026	0.043	0.822	0.412	Df: 8
INC	-0.017	0.016	-0.059	-1.066	0.287	Sig.: 0.006***
FIL	-0.005	0.003	-0.073	-1.448	0.148	
PLACE	0.006	0.009	0.032	0.659	0.511	
Model 2:						
Constant	0.097	0.104		0.932	0.352	
TRUS	0.009	0.003	**0.151**	3.093	**0.002***	Adjusted R square: 0.036;
GEN	0.011	0.022	0.025	0.501	0.617	
AGE	-0.005	0.016	-0.020	-0.339	0.735	
MAR	-0.045	0.022	-0.112	-2.013	0.045**	F = 2.97
EDU	0.020	0.026	0.041	0.784	0.434	Df: 8
INC	-0.018	0.016	-0.061	-1.102	0.271	Sig.: 0.003***
FIL	-0.005	0.003	-0.070	-1.391	0.165	
PLACE	-0.031	0.021	-0.071	-1.465	0.144	

Dependent variable: INFD, *: p < 10%, **: p < 5%, ***: p < 1%

INFD: informal debt, TRUS: trust (overall), GEN: gender, AGE: age, MAR: marital status, EDU: education, INC: income, FIL: financial literacy, PLACE: locations.

Model 1: PLACE is a categorical variable

Model 2: PLACE is a dummy variable: HCMC and outside HCMC

6.7 Demographics

Six investor characteristics; gender, age, education, marital status, income, and financial literacy; are found to affect trust, trading frequency, and debt decisions, as shown in Figure 6.8.

Firstly, gender positively impacts on trading frequency among investors and negatively affects financial leverage among stockbrokers. Female investors trade stocks more often than male investors, and female stockbrokers use lower levels of financial leverage than male stockbrokers. In general, this result seems to be consistent with prior studies (Barber & Odean, 2001; Frijns et al., 2008; Grable, 2000; Hallahan et al., 2003; Kannadhasan, 2015; Lucarelli & Brighetti, 2011; Yao et al., 2011) in which females take less risk than males.

Secondly, age has a positive impact on financial leverage among stockbrokers. That is, the older they are, the higher the level of financial leverage used. This finding is similar to prior research (see, for example, Frijns et al., 2008; Grable, 2000; Pålsson, 1996; Wang & Hanna, 1997).

Thirdly, education is inversely associated with the use of financial leverage among stockbrokers. Higher education leads to a lower level of financial leverage. This result is inconsistent with previous studies (see, for example, Grable, 2000; Hallahan et al., 2004; Kannadhasan, 2015; Riley Jr & Chow, 1992; Yao et al., 2011) in which the higher the level of education, the higher the risk-taking. This chapter, however, has a similar finding to Blume and Friend (1978) who argue that higher-educated individuals are somewhat less risk-taking.

Figure 6.8: A summary of six demographics

Demographics	Positive (+), negative (-)	Models
1. Gender		
Gender -> Trading frequency among investors	+	Table 6.12
Gender -> financial leverage (stockbrokers)	-	SEM4
2. Age		
Age -> financial leverage (stockbrokers)	+	SEM4
3. Education		
Education -> financial leverage (stockbrokers)	-	SEM4
4. Marital status		
Marital status -> Informal debt (all investors, stockbrokers, non-stockbrokers, female investors, non-users of formal borrowing sources	-	SEM1, SEM2, SEM4, SEM5, SEM7, Table 6.10, Table 6.12
5. Income		
Income -> Financial leverage (all investors, stockbrokers, female investors, users of borrowing sources)	+	SEM1, SEM2, SEM4, SEM7, Table 6.10, Table 6.12
Income -> Informal debt (non-users of formal borrowing sources)	-	Table 6.10
6. Financial literacy		
Financial literacy -> Financial leverage (all investors, male investors, stockbrokers, non-stockbrokers, users of borrowing sources, female investors)	+	SEM1, SEM2, SEM4, SEM5, SEM6, Table 6.10, Table 6.12
Financial literacy -> Trading frequency among investors, male investors	+	SEM6, Table 6.12,
Financial literacy -> Trust among investors	+	SEM2, SEM8, Table 6.12
Financial literacy -> Informal debt (female investors, users of borrowing sources)	-	SEM7, Table 6.10

Fourthly, marital status has a negative influence on informal debt among investors, stockbrokers, non-stockbrokers, and female investors. Married investors use lower levels of informal debt than single investors. These findings are in line with those of prior studies in which married people take less risk than single people (e.g. Cohn, Lewellen, Lease, & Schlarbaum, 1975; Dohmen et al., 2011; Roussanov & Savor, 2014).

Fifthly, income positively affects financial leverage among investors, stockbrokers, female investors and users of informal borrowing sources, and negatively impacts informal debt use among non-users of formal borrowing sources. In general, a higher income causes a higher level of financial leverage use and a lower level of informal debt use. This result is similar to those of previous studies in which people having higher income tend to take more risk (see, for example, Grable, 2000; Hallahan et al., 2003, 2004; Morin & Suarez, 1983; Riley Jr & Chow, 1992; Yao et al., 2011).

Lastly, financial literacy has a positive impact on financial leverage, trading frequency and trust among investors, and a negative effect on informal debt among female investors and users of borrowing sources, in general. That is a higher level of financial literacy results in a higher level of financial leverage use, a higher level of trading frequency, a higher level of trust, and a lower level of informal debt use. These results appear consistent with those of prior studies in which people with a high level of stock market literacy tend to participate in the stock market more frequently and take more risk (see, for example, Lusardi & Mitchelli, 2007; Lusardi & Tufano, 2015; Van Rooij et al., 2011).

6.8 Conclusions, contributions, implications, limitations and further research

6.8.1 Conclusions

This chapter investigates the extent to which trust in the stock market directly relates to trading frequency and debt decisions and mediates between trading frequency and debt decisions. The results show a significantly positive relationship between trust and trading frequency and the use of informal debt. Trust in stockbrokers and brokerage firms is directly related to the use of informal debt. Trading frequency is also positively associated with trust in the stock market and the use of financial leverage. Trust is a mediator between trading frequency and informal debt, and trading frequency acts as a mediator between trust and financial leverage. The results are robust after controlling for demographics and using additional techniques.

6.8.2 Contributions and implications

This chapter provides useful insights into investors' use of debt in the Vietnam stock market, and the vital roles of trust in the stock market and trading frequency in this use of debt. The informal debt sector also plays a vital role in the Vietnam stock market, and the importance of this result can be generalised to other stock markets. The SEM models are developed to examine the inter-relationship between trust in the stock market, trading frequency and debt decisions among investors, stockbrokers, non-stockbrokers, male investors, female investors, users of borrowing and non-users of borrowing, which all contribute to the literature in finance.

The results of this chapter have the following implications. First, investors trust many parties such as stockbrokers, websites of financial investment, brokerage firms, listed companies, friends who are working for brokerage firms and stock exchanges. Trust is related to vulnerability (Blair & Stout, 2001), leading investors to be vulnerable if their trust is misplaced.

To reduce mistrust, investors should consider the levels of trust in the parties and assess when and what situations they should trust, especially, they should evaluate the reliability of the advice by the parties.

Second, higher trust is associated with trading more frequently. It is noted that excessive trading is a proxy for overconfidence and that overconfident investors tend to think that they are better than they actually are (Barber & Odean, 2000, 2001), leading them to earn suboptimal returns. Therefore, trusting investors should control the levels of trading frequency to avoid overconfidence in investment decisions, which often leads to poor outcomes.

Third, higher trust is associated with higher levels of informal debt use. There are two implications to this. First is for trusting investors in which they may think that borrowing from parents and friends makes it safer to engage in stock investment. However, this choice might affect parents and friends' lives if the stock investment is not successful. Trusting investors, therefore, should be careful about choices of stocks for investment and importantly, they should evaluate the effectiveness and trends of the stocks to reduce the possible risk to informal lenders. Second is for informal lenders in that they may face difficulties with their lending. For example, they may bring financial hardship to their family if the investors they lend to meet with failure in their stock investments. To reduce the risk to the family, informal lenders should not leave all financial decisions to investors. Alternatively, informal lenders should improve knowledge of stock investment to advise investors on how to invest in stocks effectively, or at least informal lenders may monitor their money alongside investors.

Finally, trading frequency is positively related to the use of financial leverage. This implies that frequent traders prefer financial leverage for stock investment. A major reason for the use of financial leverage could be to try to earn high returns from a small equity outlay. In practice,

returns on equity (ROE) or returns on assets (ROA) are the key financial ratios to assess performances for both individual and institutional investors. Using financial leverage effectively can help investors earn high returns from a small equity outlay, but investors may face bankruptcy if the investment fails. Frequent traders, thus, should balance the ratios between equity and leverage so as to reduce the possible risk of bankruptcy if stock prices go down.

6.8.3 Limitations and further research

Despite great efforts, this chapter has not still found an instrumental variable for trust to deal with the endogenous problem that may be a threat to inferring a causal relationship of trust to the use of informal debt. Further research should consider this. Besides, the key focus of this chapter is on the relationship of trust to debt decisions. Other behavioural factors; for example, perceived risk or risk tolerance; may affect debt decisions.

Debt decisions may be affected by payment methods, as already mentioned in Chapter 4 and 5. Investors may pay interest or distribute returns from stock investments to informal lenders. Therefore, a difference in payment methods may cause heterogeneity in debt decisions. Investors may also pay without interest to informal lenders. This may lead to differences in a debt decision to be made between payers and non-payers of interest. In some instances, informal lenders borrow money from third parties, then lend investors this money. This may adversely affect a broader network if investors' stock investments fail. These unexplored aspects should be considered in future research.

Chapter 7 Conclusions

Introduction to this chapter

This thesis mainly examines the relationships between debt decisions and three behavioural factors' being perceived risk of stock investment, financial risk tolerance, and trust in the stock market. The results find perceived risk and trust positively relate to the use of informal debt, and risk tolerance is positively associated with the use of financial leverage. These behavioural factors also act as mediators for other factors in debt decisions. This chapter presents the significant findings, contributions, implications and recommendations of the three essays, and suggests further areas for research.

7.1 Major findings

The findings of Essay One respond to the primary research question in Chapter 1, being *what role does perceived risk play in debt decisions*? The finding is that *perceived risk is positively associated with the use of informal debt and mediates between borrowing sources and the use of informal debt*.

The results are summarised in Figure 7.1. Essay One finds that perceived risk positively relates to borrowing sources and the use of informal debt. Besides this, borrowing sources are positively associated with perceived risk and the use of debt. Perceived risk also mediates between borrowing sources and informal debt and borrowing sources act as a mediator between perceived risk and debt decisions. These findings are robust after controlling for six demographic variables and using additional techniques.

Figure 7.1: A summary of the findings of Essay One

	Hypotheses	Findings supported
H4.1	The higher the level of perceived risk, the higher the number of borrowing sources used.	Yes
H4.2	The higher the level of perceived risk, the higher the level of informal debt used	Yes
H4.3	The higher the level of perceived risk, the higher the level of financial leverage used.	No
H4.4	The higher the number of borrowing sources, the higher the level of perceived risk.	Yes
H4.5	The higher the number of borrowing sources, the higher the level of informal debt used.	Yes
H4.6	The higher the number of borrowing sources, the higher the level of financial leverage used.	Yes
H4.7	Perceived risk mediates between borrowing sources and informal debt	Yes
H4.8	Perceived risk mediates between borrowing sources and financial leverage	No
H4.9	Borrowing sources mediates between perceived risk (opportunity risk and leverage risk) and informal debt	Yes
H4.10	Borrowing sources mediates between perceived risk (opportunity risk and leverage risk) and financial leverage	Yes

The findings of Essay Two respond to the primary research question of *what role does risk tolerance play in debt decisions*? The answer is that *risk tolerance positively relates to financial leverage and mediates between investment horizons and informal debt*.[21]

The results are summarised in Figure 7.2. This essay finds that risk tolerance is positively associated with the use of financial leverage, and investment horizons have a positive relationship with the use of informal debt. Risk tolerance also mediates between investment horizons and financial leverage. Most findings are robust after controlling for demographics and using additional techniques.

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[21] The mediating role of risk tolerance in the relationship between investment horizons and debt decisions is only found among stockbrokers.

Figure 7.2: A summary of the findings of Essay Two

	Hypotheses	Supported
H5.1	The higher the level of risk tolerance, the higher the level of financial leverage used.	Yes
H5.2	The higher the level of risk tolerance, the higher the level of informal debt used.	No
H5.3	The higher the level of risk tolerance, the higher the stock investment for the short term over the long term.	No
H5.4	The higher the stock investment for the short term over the long term, the higher the level of informal debt used.	Yes
H5.5	The higher the stock investment for the short term over the long term, the higher the level of financial leverage used.	No
H5.6	The higher the stock investment for the short term over the long term, the higher the level of risk tolerance.	Yes
H5.7	Risk tolerance as a mediator between investment horizons and informal debt	Yes – among stockbrokers
H5.8	Risk tolerance as a mediator between investment horizons and financial leverage	No

The findings of Essay Three, as summarised in Figure 7.3, respond to the primary research question of *what role does trust in the stock market play in debt decisions*? The answer is that *trust has a positive relationship with the use of informal debt and mediates between trading frequency and informal debt*.

This essay finds trust in the stock market (overall) positively pertains to the trading frequency and the use of informal debt. Trading frequency is positively associated with the use of debt. Trust also mediates between trading frequency and the use of informal debt, and trading frequency as a mediator between trust and debt decisions. The findings are robust after controlling for demographics and using additional techniques.

Figure 7.3: A summary of the findings of Essay Three

	Hypotheses	Supported
H6.1	The higher the level of trust in the stock market, the higher the level of trading frequency.	Yes
H6.2	The higher the level of trust in the stock market, the higher the level of informal debt used.	Yes
H6.3	The higher the level of trust in the stock market, the higher the level of financial leverage used.	No
H6.4	The higher the level of trading frequency, the higher the level of financial leverage used.	Yes
H6.5	The higher the level of trading frequency, the higher the level of informal debt used.	Yes
H6.6	The higher the level of trading frequency, the higher the level of trust in the stock market.	Yes
H6.7	Trading frequency mediates between trust and informal debt	Yes
H6.8	Trading frequency mediates between trust and financial leverage	Yes
H6.9	Trust mediates between trading frequency and informal debt	Yes
H6.10	Trust mediates between trading frequency and financial leverage	No

7.2 Contributions

This thesis makes the following contributions for academics and practitioners. Firstly, this thesis provides useful insights into Vietnamese investors' debt decisions and three key behavioural factors related to the use of debt in the Vietnam stock markets. That is, the perceived risk of stock investment and trust in the stock market can account for the use of informal debt, and risk tolerance can explain the use of financial leverage for stock investment. These findings may be generalised to other stock markets.

Secondly, the concept of perceived risk examined within the consumer behavioural framework contributes to a better understanding of investors' perceived risk and its relationship with debt decisions and is a novel contribution. Numerous studies in finance (e.g. Kahneman & Tversky, 1979; Nofsinger, 2008; Thaler & Johnson, 1990), find that investors are only concerned about financial risk. However, this thesis finds that, with stock investing, investors have more aspects

of risk concern than only financial risk. The additional concerns are information safety (safety risk), time waste (time risk), social standing (social risk), wrong choices among stocks (choice risk), missing out on other financial opportunities (opportunity risk), and debt problems (leverage risk).

Lastly, the structural equation models (SEM) developed in this thesis to examine direct and indirect relationships between perceived risk, risk tolerance, trust, and debt decisions are an additional contribution to the current methodology in finance. SEM techniques are widely applied in consumer behaviour, but little utilised in finance. The advantage of SEM compared to the traditional techniques; for example, multiple regression with fixed effect and the random effect; is that SEM can test the relationships between multiple independent and dependent variables in a model.

7.3 Implications and recommendations

The results of this thesis have nine implications, as presented in chapter 4,5 and 6. First, a major finding is that perceived risk of stock investment directly relates to the use of informal debt, while risk tolerance is associated with the use of financial leverage. Although perceived risk and risk tolerance both refer to the subjective risk attitudes, risk tolerance, shaped through the 13-item scale developed by Grable and Lytton (1999), is more prone to personality traits, whereas risk perception is more inclined to be a subjective judgement, that is, how to think and feel about the risks (Renner, Gamp, Schmälzle, & Schupp, 2015). Therefore, the findings of this thesis imply that the subjective judgement about risk and personality traits toward risk may work differently in regard to the choice of borrowing, either formal or informal.

Second, when making a purchase decision, both investors and consumers are concerned about financial loss, safety loss (i.e. personal information leaked by hackers or virus), social loss (i.e.

holding low esteem when making a large loss), and time loss (i.e. spending much time on looking for information, but the outcomes being not what are expected). This implies that these four risk concerns are the general risk concerns for people who make purchase decisions despite their different preferences for the purchase. However, buyers need to be aware that the more the concerns about these types of risk, the more the borrowing is from informal lenders.

For investors who borrow money for stock investment, they should be careful about their choices of stocks for investment and monitor the investment results frequently to execute a timely adjustment in their investment strategy, reducing the risk of breaking private relationships with informal lenders and legal problems with formal lenders. Besides, although informal borrowing is common in Vietnamese culture, borrowers should be aware of using money from these sources effectively and respectfully.

For lenders, especially informal lenders, they should consider prudently about lending money to investors because, in some instances, investors borrow money from many informal sources, and as a result, failure in stock investment may impact on the family life of many lenders, even spreading out to a larger network. To minimise the possible problems, informal lenders should improve knowledge of stock investment to advise their borrowers on the stock investment, rather than giving money to borrowers and leaving them to make all investment decisions themselves. Moreover, informal lenders should have good financial plans for their family in which money should be divided into many alternative uses to ensure that lending money to investors does not affect their family life.

Third, risk tolerance is positively associated with the use of financial leverage. Use of financial leverage for stock investment has advantages and disadvantages. The benefits this brings for investors are to hopefully earn higher returns or larger returns from a small equity outlay.

However, the risks investors face are a large loss and then legal problems if insolvency occurs. Therefore, risk-tolerant investors should consider prudently which stocks to financially leverage to minimise the risks. Moreover, they should control levels of returns expected from financial leverage by following strictly the trading strategy of "cut losses and take profits". That is, investors identify the parameters in which stocks are sold for loss-cutting or profit-taking.

Short-term investors and stockbrokers tend to use informal debt for stock investment in which informal lenders are mainly parents and friends. This implies that investors' stock investment may impact on the life of parents and friends. Therefore, investors should contemplate the choices of stocks for investment and effectiveness of these investments to avoid harm to their family or friends. Although informal borrowing is common in Vietnamese culture, investors should limit the amount of money borrowed from informal lenders because this borrowing could have flow-on effects on the broader network.

Fourth, stockbrokers are more likely to borrow money from parents or friends for stock investment, perhaps because of their social standing in stock market cycles. This implies that they may care "too much" for their reputations, leading them to ignore the possible risk to their family or friends. Thus, stockbrokers should be careful when making decisions on informal borrowing due to its influence on others' lives. Importantly, they should not pay much attention to the social standing while borrowing money for stock investment, leading to biases in the decision-making process.

Fifth, trust is also associated with the use of informal debt. Investors highly trust many parties, ranked in descending order, listed firms, stock exchanges, brokerage firms, friends or relatives who are working for securities companies, websites of financial investment, and stockbrokers.

This thesis, hence, draws attention to the trustworthiness of these trust parties for investors, particularly stock market corporations and policymakers. This is because, if trust in the stock market is misplaced, this problem may spread to a wider network.

Sixth, investors trust many parties such as stockbrokers, websites of financial investment, brokerage firms, listed companies, friends who are working for brokerage firms and stock exchanges. Trust is related to vulnerability (Blair & Stout, 2001), leading investors to be vulnerable if their trust is misplaced. To reduce mistrust, investors should consider the levels of trust in the parties and assess when and what situations they should trust, especially, they should evaluate the reliability of the advice by the parties.

Seventh, higher trust is associated with trading more frequently. It is noted that excessive trading is a proxy for overconfidence and that overconfident investors tend to think that they are better than they actually have (Barber & Odean, 2000, 2001), leading them to earn suboptimal returns. Therefore, trusting investors should control the levels of trading frequency to avoid overconfidence in investment decisions, which can result in poor outcomes.

Eighth, higher trust is associated with higher levels of informal debt use. There are two implications to this. First is for trusting investors in which they may think that borrowing from parents and friends makes stock investment safer. However, this choice might affect parents and friends' lives if the stock investment was not successful. Trusting investors, therefore, should be careful about choices of stocks for investment and importantly, should evaluate the effectiveness and trends of the stocks to reduce the possible risk to informal lenders. Second is for the informal lenders themselves in that they may face difficulties with their lending, for example, putting financial pressure on their families if the investors they lend to failure in their stock investment. To reduce the risk to the family, informal lenders should not leave all

financial decisions to investors. Alternatively, informal lenders should improve knowledge of stock investment to advise investors on how to invest in stocks effectively, or at least informal lenders may monitor the investments they are exposed to alongside investors.

Finally, trading frequency is positively related to the use of financial leverage. This implies that frequent traders prefer financial leverage for stock investment. The likely main cause for the use of financial leverage is to earn higher returns from a small equity outlay. In practice, returns on equity (ROE) or returns on assets (ROA) are the key financial ratios to assess performance for both individual and institutional investors. Using financial leverage effectively helps investors to earn higher returns from a small equity outlay, but can lead to investors facing bankruptcy. Frequent traders, thus, should balance the ratios between equity and leverage so as to reduce the possible risk if stock prices go down.

7.4 Further areas of research

This thesis has the following limitations. Although the findings of a relationship between perceived risk and informal debt are robust after controlling for demographic variables and using additional techniques, this thesis finds no instrumental variables (IVs) to deal with endogenous problems that may be a threat to inferring a causal relationship of perceived risk to the use of informal debt. This thesis also focuses on the relationship between perceived risk and debt decisions. Other behavioural factors, for example, risk tolerance or trust in the stock market, should be considered because they may impact on debt decisions. Future research should pay attention to these aspects.

Next, the result of risk tolerance as a mediator is not robust using Hayes and Preacher's approach. This study suggests extra tests for this mediating relationship. Secondly, as already mentioned, debt decisions may be affected by payment methods. Investors may pay interest to

the informal lenders, or they share profits or losses based on their contributed capital, or they pay no interest. A difference in payment methods may cause heterogeneity in the use of debt. Also, debt decisions may differ between payers and non-payers of interest. Besides, in some instances, informal lenders may borrow money from third parties, then give these borrowings to investors. This may lead to the flow-on effect to a broader network if investors' stock investments encounter problems. Thirdly, other behavioural factors, for example, trust or perceived risk, may also impact on risk tolerance or debt decisions. All these unexplored aspects should be considered in future research.

This thesis has not found an instrumental variable for trust to deal with the endogenous problem that may be a threat to inferring a causal relationship of trust to the use of informal debt. Further research should consider this. Besides, the key focus is on the relationship of trust (or perceived risk and risk tolerance) with debt decisions. Other behavioural biases, including herding behaviour, representativeness, mental accounting and anchor bias, should be considered as the antecedents of debt decisions.

Lastly, an unexplored aspect pertains to investors' payment methods, which may affect debt decisions. Investors may pay interest or dividend returns on the contributed capital to informal lenders. A difference in payment methods may lead to heterogeneity in the level of debt used. There may also be a difference in the use of debt between payers and non-payers of interest. Moreover, in some instances, informal lenders (to investors) may borrow money from third parties, and then lend investors this borrowing. This means that the credit that investors obtain through informal lenders may not be the informal lenders' own money. This could magnify the flow-on effect in a broader network if investors' stock investment fails. Future research could address this issue.

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Appendix 1 – Consent form and Questionnaire – English version

CONSENT FORM

TITLE OF STUDY:

THE EFFECT OF PERCEIVED RISK, RISK TOLERANCE AND TRUST ON DEBT DECISIONS

PRINCIPAL INVESTIGATOR:

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PURPOSE OF STUDY

You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information. The purpose of this study is to find out the effects of individual investors' risk perception of investing in stocks, risk tolerance, and trust in the stock market on their debt decisions.

STUDY PROCEDURES AND RISKS IF ANY

The survey should only take about 45 minutes of your time. All responses will remain anonymous, and you are free to opt out at any time. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

CONFIDENTIALITY

Your responses to this survey will be anonymous. Please do not write any identifying

information on your survey. Every effort will be made by the researcher to preserve your

confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents

- Keeping notes and any other identifying participant information in a locked file cabinet in the personal possession of the researcher.

Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 19/07. If you have any concerns about the conduct of this research, please contact Dr Rochelle Stewart-Withers, Chair, Massey University Human Ethics Committee: Southern B, telephone 06 356 9099 x 83657, email humanethicsouthb@massey.ac.nz

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form.

After you sign the consent form, you are still free to withdraw at any time (e.g. two weeks after taking part in the data collection) and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read and I understand the provided information and have had the opportunity to ask

questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

A questionnaire on the effect of perceived risk, risk tolerance and trust on debt decisions

1/ Thinking about your typical share investment portfolio, how do you divide your portfolio into the short-term and long-term investment?

Typical share investment	Proportion (%) of portfolio
Short-term investment (less than 1 year)	
Long-term investment (1 year or more)	
Total	100%

2/ Thinking about your short-term investment, how do you divide your short-term investment that depends on trading time?

Short-term share investment	Proportion (%) of short-term investment
1 month or less	
Between more than 1 month and 3 months	
Between more than 3 months and 6 months	
Between more than 6 months and less than 1 year	
Total	100%

3/ Thinking about borrowing from family sources such as parents, a spouse, sisters, brothers, relatives, to invest in shares (you can choose more than 1 answer):
□ 1. Parents.
□ 2. Grandparents.
□ 3. Brothers/sisters.
□ 4. Parents in law.
□ 5. Brothers/sisters in law.
□ 6. Cousins/nieces/nephews.
□ 7. Husband/wife.
□ 8. Other family sources: ……….
□ 9. I do not borrow from any family sources.

4/ If you have from two family sources, please choose ONE you use most:

1	2	3	4	5	6	7	8
Parents	Grand-parents	Brother /sisters	Parents in law	Brothers/ sisters in law	Cousins/ nieces/ nephews	Husband /wife	Other family sources

5/ Borrowing from non-family sources such as friends, teachers, co-workers, ... (you can choose more than 1 answer):
□ 1. Friends
□ 2. Girlfriends/boyfriends/partners
□ 3. Teachers/lecturers
□ 4. Colleagues/co-workers
□ 5. Bosses/managers
□ 6. Business partners
□ 7. Neighbours
□ 8. Other non-family sources: ……….
□ 9. I do not borrow from any non-family sources.

6/ If you have from two sources, please choose ONE you use most

1	2	3	4	5	6	7	8
Friends	Girl/boyfriends/ boyfriends/ partners	Teachers/ Lecturers	Colleagues/ co-workers	Bosses/ Managers	Business partners	Neighbors	Other non-family sources

7/ Borrowing from formal sources such as banks, credit institutions, brokerage firms, (you can choose more than 1 answer):
□ 1. Banks
□ 2. Credit institutions
□ 3. Brokerage firms
□ 4. Other formal sources: ………………
□ 5. I do not borrow from any formal sources.

8/If you have from two sources, please choose ONE you use most:

1	2	3	4
Banks	Credit institutions	Brokerage firms	Other formal sources

9/ Thinking about the total money for stock investment, how would you divide this amount between the borrowing and your own money?

The total money for stock investment:	%
Borrowing from informal sources	
Borrowing from formal sources	
My equity	
Total	100%

10/ Supposing that a share has the highest financial leverage in accordance with the brokerage firms' rules, if you would like to buy this share, what financial leverage ratios do you often use?
□ do not leverage
□ less than 20%
□ 20% to less than 30%
□ 30% to less than 50%
□ Use the highest lending ratio

11a/ How concerned are you about your confidential information being leaked to others if you trade shares online or you ask someone else (e.g. brokers, individuals or institutions) to trade for you?
(1: not at all concerned, 2: slightly concerned, 3: somewhat concerned, 4: moderately concerned, 5: extremely concerned).
       1   2   3   4   5

11b/ How important is it to you if your confidential information is leaked to others?
(1: not at all important, 2: slightly important, 3: somewhat important, 4: moderately important, 5: extremely important).
       1   2   3   4   5

12a/ How concerned are you about a negative impact of this loss on your social standing if you make a large loss in share investments?
       1   2   3   4   5

12b/ How important is it to you if you are held in lower esteem due to your large loss in share investment?
       1   2   3   4   5

13a/ How concerned are you about missing out on other financial investment opportunities if you used all the money for share investments?
       1   2   3   4   5

13b/ How important is it to you if you miss out on other financial investment opportunities?
       1   2   3   4   5

14a/ How concerned are you about spending a lot of time on share investment and the results are not what you expect?

<div align="center">1   2   3   4   5</div>

14b/ How important is it to you If you spend a lot of time on share investment and the results are not what you expect?

<div align="center">1   2   3   4   5</div>

15a/ How concerned are you about your wrong choices when choosing shares for your portfolio?

<div align="center">1   2   3   4   5</div>

15b/ How important is it to you if you make a wrong decision on choosing shares for your portfolio?

<div align="center">1   2   3   4   5</div>

For those who borrow to invest in shares:

16a/ How concerned are you about your investment returns being inadequate to cover your loan interest and principal at maturity?

<div align="center">1   2   3   4   5</div>

16b/ How important is it to you if your investment results cannot cover your debt?

<div align="center">1   2   3   4   5</div>

17a/ What ratios of loss over equity below make you concerned?

□ ≤ 10%
□ > 10% to 20%
□ > 20% to 30%
□ > 30% to 50%
□ > 50%

17b/ What ratios of loss over equity are important to you?

□ ≤ 10%
□ > 10% to 20%
□ > 20% to 30%
□ > 30% to 50%
□ > 50%

18/ Suppose you had 100 million VND in a savings account and the interest rate was 2% per year. After 1 year, how much do you think you would have in this account if you left the money to grow?

    (i)   More than VND 102 million;
    (ii) Exactly VND 102 million;
    (iii) Less than VND 102 million;
    (iv) I don't know.

19/ Suppose you had 100 million VND in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total?

    (i)   More than VND 20 million;
    (ii) Exactly VND 20 million;
    (iii) Less than VND 20 million;
    (iv) I don't know.

20/ Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

    (i)   More than today;
    (ii) Exactly the same;
    (iii) Less than today;
    (iv) I don't know.

21/ Assume Peter inherits VND 10,000 million today and John inherits 10,000 million 3 years from now. Who is richer because of the inheritance? (note: other factors do not mention)

    (i)   Peter;
    (ii) John;
    (iii) They are equally rich;
    (iv) I don't know.

22/ Suppose that in the year 2020, your income has doubled, and the price of all goods has also doubled. In 2020, how much will you be able to buy with your income? (note: other factors are not considered)?
- (i) More than today;
- (ii) The same;
- (iii) Less than today;
- (iv) I don't know.

23/ Which of the following statements describes the main function of the share market?
- (i) The share market helps to predict share earnings;
- (ii) The share market results in an increase in the price of shares;
- (iii) The share market brings people who want to buy shares together with those who want to sell shares;
- (iv) None of the above;
- (v) I don't know.

24/ If somebody buys the share of firm B in the share market:
- (i) He owns part of firm B;
- (ii) He has lent money to firm B
- (iii) He is liable for firm B's debts;
- (iv) None of the above;
- (v) I don't know.

25/ If somebody buys a bond of firm B:
- (i) He owns a part of firm B;
- (ii) He has lent money to firm B;
- (iii) He is liable for firm B's debts;
- (iv) None of the above;
- (v) I don't know.

26/ If the interest rate falls, what should happen to bond prices of bondholders?
- (i) Rise;
- (ii) Fall;
- (iii) Stay the same;
- (iv) None of the above;
- (v) I don't know.

27/ Normally, which asset displays the highest fluctuations over time?
- (i) Savings accounts;
- (ii) Bonds;
- (iii) Shares;
- (iv) I don't know.

28/ Which of the following statements is correct?
- (i) Once one invests in a mutual fund, one cannot withdraw the money in the first year;
- (ii) Mutual funds can invest in several assets, for example invest in both stocks and bonds; (iii) Mutual funds pay a guaranteed rate of return which depends on their past performance;
- (iii) None of the above;
- (iv) Don't Know.

29/ Buying a company stock usually provides a safer return than a stock mutual fund.
- (i) True;
- (ii) False;
- (iii) Don't Know.

30/ Shares are normally riskier than bonds.
- (i) True;
- (ii) False;
- (iii) Don't Know.

31/ Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?
  (i)   Savings accounts;
  (ii) Bonds;
  (iii) Shares;
  (iv) Don't Know.

32/ When an investor spreads his money among different assets, does the risk of losing money:
  (i)   Increase;
  (ii) Decrease;
  (iii) Stay the same;
  (iv) Don't Know.

33/ If you buya10-year bond, it means you cannot sell it after 5 years without incurring a major penalty.
  (i)   True;
  (ii) False;
  (iii) Don't know.

34/ In general, how would you describe yourself in share investment?
a/ A real gambler
b/ Willing to take risks after completing adequate research
c/ Cautious
d/ A real risk avoider

35/ You are on a TV game show and can choose one of the following. Which would you take?
a/ VND 1 million in cash.
b/ A 50% chance at winning VND 5 million.
c/ A 30% chance at winning VND 10 million.
d/ A 5% chance at winning VND 100 million.

36/ You have just finished saving for a "once-in-a-lifetime" vacation, but you have not yet paid. Three weeks before you plan to leave, you lose your job. You would:
a/ Cancel the vacation
b/ Take a much more modest vacation
c/ Go as scheduled, reasoning that you need the time to prepare for a job search
d/ Extend your vacation, because this might be your last chance to go vacation.

37/ If you unexpectedly received VND 200 million to invest, what would you do?
a/ Deposit it in a bank account.
b/ Invest it in bond mutual funds.
c/ Invest it in shares or share mutual funds.

38/ In terms of experience, how comfortable are you investing in shares or share mutual funds?
a/ Not at all comfortable
b/ Somewhat comfortable
c/ Very comfortable

39/ When you think of the word "risk" which of the following words comes to mind first?
a/ Loss of money
b/ Uncertainty
c/ Opportunity
d/ Thrill
40/ Experts agree that government bonds should be relatively safe. Most of your investment assets are now in high interest government bonds. What would you do?
a/ Hold the bonds
b/ Sell the bonds, put half the proceeds into money market account, and the other half into other assets
c/ Sell the bonds and put the total proceeds into other assets
d/ Sell the bonds, put all the money into other assets, and borrow additional money to buy more

41/ Given the best and worst case returns of the four investment choices below, which would you prefer?
a/ The best case: gain (+) VND 200 million; The worst case: loss (-) VND 0.
b/ The best case: gain (+) VND 800 million; The worst case: loss (-) VND 200 million.
c/ The best case: gain (+) 2,600 million VND; The worst case: loss (-) VND 800 million.
d/ The best case: gain (+) 4,800 million VND; The worst case: loss (-) VND 2,400 million.

42/ In addition to whatever you own, you have been given VND 1 billion. You are now asked to choose between:
a/ A sure gain of VND 500 million.
b/ A 50% chance to gain 1 billion and a 50% chance to gain nothing.

43/ In addition to whatever you own, you have been given VND 1 billion. You are now asked to choose between:
a/ A sure loss of VND 500 million.
b/ A 50% chance to lose VND 1 billion and a 50% chance to lose nothing.

44/ Suppose a relative left you an inheritance of VND 1 billion, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?
a/ A savings account or money market mutual fund
b/ A mutual fund that owns shares and bonds
c/ A portfolio of 15 common shares
d/ Commodities like gold, silver, and oil

45/ If you had to invest VND 20 billion, which of the following investment choices would you find most appealing?
a/ 60% in low-risk investment 30% in medium-risk investment 10% in high-risk investments.
b/ 30% in low-risk investment 40% in medium-risk investment 30% in high-risk investments

46/ Your trusted friend and neighbour, an experienced geologist, is putting together a group of investors to fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had VND 1 billion, how much would you invest?
a/ Nothing
b/ 10% - <30%
c/ 30% - < 60%
d/ > 60%

47/ How much do you trust stockbroker(s)? (*1: do not trust at all, 2: do not trust, 3: neutral, 4: trust, 5: completely trust*)
   1 2 3 4 5   0: I don't have one
48/ How much do you trust websites of financial investment, e.g. cafef.vn, vietstock, cophieu68.com?
   1 2 3 4 5
49/ How much do you trust brokerage firm(s)?
   1 2 3 4 5
50/ How much do you trust listed companies that you invest in?
   1 2 3 4 5
51/ How much do you trust your friends or relatives' advice, who are working for brokerage firms?
   1 2 3 4 5   0: I don't have one
52/ How much do you trust the stock exchange where you invest?
   1 2 3 4 5

PERSONAL INFORMATION:

1/ Gender: □ Male □ Female □ unspecified

2/ What is your age-range:
□ < 25 years old
□ 25 – 35
□ 36 – 45
□ 46-55
□ 56 or more

3/ Marital status:
□ Single
□ Married
□ Divorced
□ Widowed

4/ How many children do you have?
□ 0
□ 1
□ 2
□ 3
□ 4 or more

5/ What place do you live in?
□ 1. District ……….Ho Chi Minh City
□ 2. District ………Ha Noi capital
□ 3. District ………Da Nang City
□ 4. Mekong delta
□ 5. Other:

6/ How many properties do you have in total?
□ 0
□ 1
□ 2
□ 3
□ 4 or more

7/ Which best describes your highest formal educational qualification?
□ Secondary school degree or less
□ High school degree
□ Bachelor's degree
□ Postgraduate qualification or more

8/ On average, how much income (VND) per month do you receive from your work?
□ 0
□ less than 10 million
□ 10 million – 50 million
□ more than 50 million – 100 million
□ more than 100 million

9/ Apart from your work income, how much other income (e.g. rental income, investment, business) per month do you receive?
□ 0
□ less than 10 million
□ 10 million – 50 million
□ more than 50 million – 100 million
□ more than 100 million

10/ Do you (or have you in the past) described yourself as the main income earner in your household?
   □ Yes   □ No

11/ When it comes to financial decision-making, what role would you play?
   □ I am the main financial decision-maker
   □ I share the financial decision-making
   □ I have limited input, someone else makes the financial decisions.

12/ What is your main field of occupation?
□ 1. Fund manager
□ 2. Broker-dealer
□ 3. Brokerage manager/director
□ 4. Financial advisor
□ 5. Banking officer
□ 6. Business owner
□ 7. CEO (Chief executive officer)
□ 8. CFO (Chief financial officer)/ Chief Accountant
□ 9. Investment officer
□ 10. Accountant
□ 11. Administrative officer/manager
□ 12. Sale/Marketing officer/manager
□ 13. Teacher/lecturer
□ 14. Other: …….

13/ What is your parents' occupation:
□1. Businessman/woman/investor
□2. Teacher/lecturer
□3. Farmer/Agricultural filed
□4. Retiree
□5. Other: …… .
□6. Died

14/ Do your parents or siblings purchase shares? □Yes   □ No

15/ How many years of work experience do you have?
□ < 3 years
□ 3 - 5 years
□ more than 5 - 10 years
□ more than 10 to 20 years
□ more than 20 years

16/ How many years of share investment experience do you have?
□ < 3 years
□ 3 - 5 years
□ more than 5 - 10 years
□ more than 10 to 20 years
□ more than 20 years

17/ What kinds of share prices (VND) do you purchase most?
□ Less than 10,000
□ 10,000 – 20,000
□ more than 20,000 - 50,000
□ more than 50,000 – 100,000
□ more than 100,000

18/ How many trading accounts do you have?

□ 1
□ 2
□ 3
□ 4
□ 5 or more

19/ In general, how often do you trade shares?

□ At least once a day
□ 1 to 6 times/week
□ 1 to 3 times/month
□ 1 to 2 times/quarter
□ 1 to 3 times/year
□ Less than once a year

20/. The total own money (equity) (VND) that you have used for share investment since last year

a) < 200 million
b) 200 million to 500 million
c) 501 million to 1 billion
d) more than 1billion to 3 billion
e) more than 3 billion

Thank you very much

Appendix 2: Consent form and Questionnaire - Vietnamese version

GIẤY CHẤP THUẬN

TIÊU ĐỀ NGHIÊN CỨU:

ẢNH HƯỞNG CỦA NHẬN THỨC RỦI RO, CHẤP NHẬN RỦI RO VÀ NIỀM TIN VÀO THỊ TRƯỜNG CHỨNG KHOÁN TRONG QUYẾT ĐỊNH SỬ DỤNG NỢ

NGHIÊN CỨU SINH:

Họ và tên   : Phùng Thái Minh Trang

Khoa   : Kinh tế - Tài chính

Địa chỉ   : Trường Đại Học Massey, Manawatū

Private Bag 11 222

Palmerston North 4442, New Zealand.

Điện thoại   : +64274745308

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MỤC ĐÍCH CỦA NGHIÊN CỨU

Bạn đang được yêu cầu tham gia vào nghiên cứu này. Trước khi bạn quyết định tham gia, điều quan trọng là bạn hiểu lý do tại sao nghiên cứu đang được thực hiện và những gì sẽ liên quan. Xin hãy đọc thông tin sau đây một cách cẩn thận. Vui lòng hỏi nhà nghiên cứu nếu có bất cứ điều gì không rõ ràng hoặc nếu bạn cần thêm thông tin. Mục đích của nghiên cứu này là khám phá sự ảnh hưởng của nhận thức rủi ro của các nhà đầu tư cá nhân khi đầu tư vào cổ phiếu, sự chấp nhận rủi ro, và sự tin tưởng vào thị trường chứng khoán đối với các quyết định nợ của họ.

THỦ TỤC NGHIÊN CỨU VÀ RỦI RO NẾU CÓ

Cuộc khảo sát mất khoảng 45 phút. Bạn có thể từ chối trả lời bất kỳ hoặc tất cả các câu hỏi và có thể chấm dứt sự tham gia bất cứ lúc nào bạn muốn.

BẢO MẬT

Tất cả các câu trả lời của bạn được bảo mật. Xin vui lòng không viết bất kỳ thông tin nhận dạng về khảo sát của bạn. Để lưu giữ và bảo mật câu trả lời của bạn, Nhà nghiên cứu thực hiện:

- Đánh số thứ tự người tham gia trên tất cả các ghi chú và tài liệu nghiên cứu của người trả lời đó.

- Lưu giữ tất cả các chi tiết và bất kỳ các thông tin nhận dạng của người tham gia trong tủ két có khoá của nhà nghiên cứu này.

Dữ liệu của người tham gia sẽ được giữ bí mật trừ trường hợp nhà nghiên cứu có nghĩa vụ pháp lý báo cáo các sự cố cụ thể. Những sự cố này bao gồm, nhưng có thể không giới hạn ở các sự cố lạm dụng và nguy cơ tự tử.

Bảng câu hỏi này đã được xem xét và chấp thuận của trường Đại Học Massey, Hội đồng Đánh Giá Về Đạo Đức Con Người: Miền Nam B, đơn số SOB 19/07.

Nếu bạn có bất kỳ mối quan tâm về việc quản lý đề tài nghiên cứu này, xin vui lòng liên hệ với tiến sĩ Rochelle Stewart-Withers, chủ tịch hội đồng, đại học Massey, Hội đồng Đánh Giá Về Đạo Đức Con Người: Miền Nam B, điện thoại 06 356 9099 x 83657, email humanethicsouthb@massey.ac.nz

THAM GIA TỰ NGUYỆN

Bạn tự nguyện tham gia vào nghiên cứu này. Nếu bạn quyết định tham gia vào nghiên cứu này, bạn sẽ được yêu cầu ký vào một mẫu đơn đồng ý. Sau khi bạn ký vào mẫu đồng ý, bạn vẫn có thể rút lui bất cứ lúc nào (ví dụ: hai tuần sau khi tham gia thu thập dữ liệu) và không cần đưa ra lý do. Rút khỏi nghiên cứu này sẽ không ảnh hưởng đến mối quan hệ bạn (nếu có) với nhà nghiên cứu. Nếu bạn rút khỏi nghiên cứu trước khi dữ liệu hoàn tất, dữ liệu của bạn sẽ được trả về cho bạn hoặc bị hủy.

ĐỒNG Ý

Tôi đã đọc và tôi hiểu các thông tin được cung cấp. Tôi hiểu rằng sự tham gia của tôi là tự nguyện và tôi có thể rút lui bất cứ lúc nào mà không cần đưa ra lý do và không mất phí. Tôi hiểu rằng tôi sẽ được cung cấp một bản sao của mẫu chấp thuận này và tự nguyện đồng ý tham gia vào nghiên cứu này.

Người tham gia ký tên _____ Ngày _____

Người điều tra ký tên _____ Ngày _____

1/ Nghĩ về danh mục đầu tư cổ phiếu của anh/chị, Anh/chị phân bổ danh mục đầu tư cổ phiếu ngắn hạn và dài hạn như thế nào?

Danh mục đầu tư cổ phiếu	Tỷ lệ phân bổ (%)
Đầu tư ngắn hạn (dưới 1 năm)	
Đầu tư dài hạn (từ 1 năm trở lên)	
Tổng cộng	100%

2/ Nghĩ về đầu tư cổ phiếu ngắn hạn của anh/chị, Anh/chị phân bổ danh mục đầu tư cổ phiếu ngắn hạn theo thời gian như thế nào?

Đầu tư ngắn hạn	Tỷ lệ phân bổ (%)
Dưới 1 tháng	
Trên 1 tháng đến 3 tháng	
Trên 3 tháng đến 6 tháng	
Trên 6 tháng đến dưới 1 năm	
Tổng cộng	100%

3/ Nghĩ về nguồn tiền cá nhân từ gia đình như ba mẹ, vợ chồng, anh chị, họ hàng, …., mà Anh/Chị mượn hoặc vay để đầu tư cổ phiếu (Anh/Chị có thể chọn nhiều nguồn):

□ 1. Ba mẹ ruột.
□ 2. Ông bà ngoại/nội.
□ 3. Anh/chị/em ruột.
□ 4. Ba mẹ chồng/vợ.
□ 5. Anh/chị/em chồng/vợ.
□ 6. Anh/chị/em họ và cháu ruột/chồng/vợ.
□ 7. Chồng/vợ.
□ 8. Nguồn gia đình khác: ……….
□ 9. Tôi không mượn nguồn gia đình.

4/ Nếu Anh/Chị mượn hoặc vay từ hai nguồn (gia đình) trở lên, vui lòng chọn MỘT nguồn mà Anh/Chị sử dụng nhiều nhất?

1	2	3	4	5	6	7	8
Ba mẹ ruột	Ông bà ngoại/nội	Anh/chị/ em ruột	Ba mẹ chồng/ vợ	Anh/chị/em chồng/vợ	Anh/chị/em họ và cháu ruột/chồng/vợ	Chồng/vợ	Nguồn gia đình khác

5/ Nguồn tiền cá nhân ngoài gia đình như từ bạn bè, thầy cô, đồng nghiệp mà Anh/Chị mượn hoặc vay để đầu tư cổ phiếu (Anh/Chị có thể chọn nhiều nguồn):

□ 1. Bạn bè
□ 2. Bạn gái/bạn trai
□ 3. Cô giáo/Thầy giáo
□ 4. Đồng nghiệp
□ 5. Cấp trên
□ 6. Đối tác làm ăn
□ 7. Hàng xóm
□ 8. Nguồn ngoài gia đình khác: ………..
□ 9. Tôi không mượn nguồn ngoài gia đình.

6/ Nếu Anh/Chị mượn hoặc vay từ hai nguồn (ngoài gia đình) trở lên, vui lòng chọn MỘT nguồn mà Anh/Chị sử dụng nhiều nhất?

1	2	3	4	5	6	7	8
Bạn bè	Bạn gái/bạn trai	Cô giáo/Thầy giáo	Đồng nghiệp	Cấp trên	Hàng xóm	Đối tác làm ăn	Nguồn ngoài gia đình khác

7/ Nguồn tiền từ tổ chức như ngân hàng, tổ chức tín dụng, công ty chứng khoán mà Anh/Chị vay để đầu tư cổ phiếu (Anh/Chị có thể chọn nhiều nguồn):

□ 1.Ngân hàng

□ 2.Tổ chức tín dụng

□ 3.Công ty chứng khoán

□ 4.Nguồn khác từ bên ngoài: …………………

□ 5.Tôi không mượn từ nguồn tổ chức.

8/ Nếu Anh/Chị mượn hoặc vay từ hai nguồn (tổ chức) trở lên, vui lòng chọn MỘT nguồn mà Anh/Chị sử dụng nhiều nhất?

1	2	3	4
Ngân hàng	Tổ chức tín dụng	Công ty chứng khoán	Nguồn khác từ bên ngoài

9/ Nghĩ về tổng số tiền trong danh mục đầu tư cổ phiếu, Anh/Chị sử dụng bao nhiêu nợ và bao nhiêu vốn tự có?

Tổng số tiền trong danh mục đầu tư cổ phiếu từ:	%
Vay cá nhân	
Vay tổ chức	
Vốn tự có	
Tổng cộng	100%

10/ Khi Anh/Chị đầu tư cổ phiếu, tỷ lệ đòn bẩy Anh/Chị sử dụng là:

□ Không sử dụng đòn bẩy

□ Dưới 20% mức ký quỹ theo quy định

□ 20% đến dưới 30% mức ký quỹ theo quy định

□ 30% đến dưới 50% mức ký quỹ theo quy định

□ Sử dụng tối đa mức ký quỹ theo quy định

11a/ Mức độ lo lắng về thông tin cá nhân của Anh/Chị có thể bị rò rỉ khi sử dụng trực tuyến (online), ủy quyền cho môi giới hoặc nhờ cá nhân (tổ chức) giao dịch giúp?

(1: Hoàn toàn không lo lắng, 2: Không lo lắng, 3: Bình thường, 4: Lo lắng, 5: Rất lo lắng)

1   2   3   4   5

11b/ Mức độ quan trọng nếu thông tin cá nhân của Anh/Chị bị rò rỉ?

(1: Hoàn toàn không quan trọng, 2: Không quan trọng, 3: Bình thường, 4: Quan trọng, 5: Rất quan trọng)

1   2   3   4   5

12a/ Mức độ lo lắng về sự thất bại có thể ảnh hưởng đến vị trí xã hội của Anh/Chị nếu Anh/Chị đầu tư chứng khoán bị thất bại (thua lỗ)?

1   2   3   4   5

12b/ Mức độ quan trọng nếu việc đầu tư chứng khoán bị thất bại (thua lỗ) ảnh hưởng đến vị trí xã hội của Anh/Chị?

1   2   3   4   5

13a/ Mức độ lo lắng về việc mất cơ hội đầu tư tài chính khác nếu Anh/Chị sử dụng toàn bộ tiền của Anh/Chị cho việc đầu tư cổ phiếu?

1   2   3   4   5

13b/ Mức độ quan trọng nếu Anh/Chị bị mất cơ hội đầu tư tài chính khác?

1   2   3   4   5

14a/ Mức độ lo lắng về việc Anh/Chị dành quá nhiều thời gian cho việc đầu tư cổ phiếu và kết quả không như mong đợi?

1   2   3   4   5

14b/ Mức độ quan trọng nếu Anh/Chị dành quá nhiều thời gian cho việc đầu tư cổ phiếu và kết quả không như mong đợi?

1   2   3   4   5

15a/ Mức độ lo lắng của Anh/Chị về việc quyết định lựa chọn các cổ phiếu khi lựa chọn cổ phiếu cho danh mục đầu tư?

1   2   3   4   5

15b/ Mức độ quan trọng nếu Anh/Chị quyết định sai trong việc lựa chọn các cổ phiếu cho danh mục đầu tư?

1   2   3   4   5

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16a/ Mức độ lo lắng của Anh/Chị về việc kết quả đầu tư cổ phiếu không thể trả được lãi vay và các khoản tiền vay?

                                     1   2   3   4   5

16b/ Mức độ quan trọng nếu Anh/Chị không thể trả được lãi vay và các khoản vay?

                                 1   2   3   4   5

17a/ Tỷ lệ lỗ so với vốn nào dưới đây khiến Anh/Chị lo lắng nếu đầu tư cổ phiếu bị lỗ?

□ ≤ 10%
□ > 10% to 20%
□ > 20% to 30%
□ > 30% to 50%
□ > 50%

17b/ Tỷ lệ lỗ so với vốn nào dưới đây khiến Anh/Chị cảm thấy quan trọng?

□ ≤ 10%
□ > 10% to 20%
□ > 20% to 30%
□ > 30% to 50%
□ > 50%

18/ Giả sử Anh/Chị có 100 triệu VND trong tài khoản tiết kiệm và lãi suất là 2%/năm. Sau 1 năm, Anh/Chị nghĩ có bao nhiêu tiền VND trong tài khoản này nếu Anh/Chị không rút ra?
(i) Lớn hơn 102 triệu VND
(ii) 102 triệu VND
(iii) Nhỏ hơn 102 triệu VND
(iv) Không biết

19/ Giả sử Anh/Chị có 100 triệu VND trong tài khoản tiết kiệm và lãi suất là 20%/năm và Anh/Chị không rút số tiền này ra hoặc lãi suất tiền gửi. Sau 5 năm, Anh/Chị có tổng cộng bao nhiêu tiền VND trong tài khoản?
(i) Lớn hơn 200 triệu VND
(ii) 200 triệu VND
(iii) Nhỏ hơn 200 triệu VND
(iv) Không biết

20/ Giả sử rằng lãi suất của tài khoản tiết kiệm của Anh/Chị là 1%/năm và lạm phát là 2%/năm. Sau 1 năm, Anh/Chị có thể mua được bao nhiêu hàng hóa với số tiền trong tài khoản này?
(i) Lớn hơn hôm nay
(ii) Bằng hôm nay
(iii) Thấp hơn hôm nay
(iv) Không biết.

21/ Giả sử hôm nay Nam thừa kế 10,000 triệu VND và Khoa sẽ thừa kế 10 tỷ VND sau 3 năm. Ai giàu hơn bởi vì sự thừa kế này? (Các yếu tố khác không thay đổi)
(i) Nam
(ii) Khoa
(iii) Cả hai đều giàu bằng nhau
(iv) Không biết

22/ Giả sử rằng năm 2020, thu nhập của Anh/Chị tăng gấp đôi và giá của tất cả hàng hóa cũng tăng gấp đôi. Trong năm 2020, Anh/Chị sẽ mua được bao nhiêu hàng hóa với mức thu nhập này?
(i) Lớn hơn hôm nay
(ii) Bằng hôm nay
(iii) Thấp hơn hôm nay
(iv) Không biết.

23/ Câu nào sau đây mô tả chức năng chính của thị trường chứng khoán?

(i) Thị trường chứng khoán giúp dự đoán lợi nhuận cổ phiếu;

(ii) Thị trường chứng khoán dẫn đến sự tăng giá của cổ phiếu;

(iii) Thị trường chứng khoán mang mọi người muốn mua cổ phiếu và mọi người muốn bán cổ phiếu lại với nhau;

(iv) Không câu nào ở trên đúng;

(v) Không biết.

24/ Nếu một người nào đó mua cổ phiếu của công ty B:

(i) Người này sở hữu một phần của công ty B;

(ii) Người này cho công ty B mượn tiền;

(iii) Người này nợ tiền của công ty B;

(iv) Không câu nào ở trên đúng;

(v) Không biết.

25/ Nếu một người nào đó mua trái phiếu của công ty B

(i) Người này sở hữu một phần của công ty B;

(ii) Người này cho công ty B mượn tiền;

(iii) Người này nợ tiền của công ty B;

(iv) Không câu nào ở trên đúng;

(v) Không biết.

26/ Nếu lãi suất giảm, điều gì xảy đến với giá trái phiếu của Anh/Chị đang nắm giữ?

(i) Tăng;(ii) Giảm;   (iii) Vẫn giữ nguyên;   (iv) Không câu nào ở trên đúng;

(v) Không biết.

27/ Thông thường, đầu tư nào hiển thị sự biến động cao nhất theo thời gian?

(i) Tiền tiết kiệm;

(ii) Trái phiếu;

(iii) Cổ phiếu;

(iv) Không biết.

28/ Câu nào sau đây là đúng?

(i) Khi một người đầu tư vào công ty quản lý quỹ, người này không thể rút tiền trong năm đầu tiên.

(ii) Công ty quỹ có thể đầu tư vào một vài tài sản, ví dụ, đầu tư vào cổ phiếu và trái phiếu;

(iii) Công ty quỹ trả lãi suất bảo đảm tùy thuộc vào năng lực quá khứ của công ty;

(iv) Không câu nào ở trên đúng;

(v) Không biết.

29/ Mua một cổ phiếu của công ty niêm yết thường an toàn hơn mua một chứng chỉ quỹ

(i) Đúng;   (ii) Sai; (iii) Không biết.

30/ Cổ phiếu thường rủi ro hơn trái phiếu.

(i) Đúng;   (ii) Sai; (iii) Không biết.

31/ Xem xét một thời gian dài (ví dụ 10 hoặc 20 năm), tài sản nào thường có lợi nhuận cao nhất? (Các yếu tố khác không thay đổi)

(i) Tài khoản tiết kiệm; (ii) Trái phiếu; (iii) Cổ phiếu; (iv) Không biết.

32/ Khi một nhà đầu tư phân bổ tiền đầu tư vào các loại tài sản khác nhau, rủi ro về mất tiền:

(i) Tăng;   (ii) Giảm;   (iii) Giữ nguyên; (iv) Không biết.

33/ Nếu Anh/Chị mua một trái phiếu 10 năm, điều này có nghĩa là Anh/Chị thể bán nó sau 5 năm mà không bị phạt nặng.

(i) Đúng;   (ii) Sai; (iii) Không biết.

34/ Nhìn chung, Anh/Chị mô tả về Anh/Chị như là một người như thế nào trong đầu tư cổ phiếu?
a/ Như một người chơi bài chuyên nghiệp.
b/ Sẵn sàng chấp nhận rủi ro sau khi hoàn thành nghiên cứu thông tin đầy đủ.
c/ Dè dặt.
d/ Một người tránh rủi ro thực sự.

35/ Anh/Chị tham gia trò chơi trên truyền hình (ti vi) và có thể chọn lựa một trong các trường hợp sau đây.
Anh/Chị sẽ chọn cái nào?
a/ 1 triệu VND tiền mặt.
b/ 50% cơ hội để thắng 5 triệu VND.
c/ 30% cơ hội để thắng 10 triệu VND.
d/ 5% cơ hội để thắng 100 triệu VND.

36/ Anh/Chị vừa hoàn thành tiết kiệm cho một kỳ nghỉ "một lần trong đời" nhưng Anh/Chị chưa thực hiện. Ba tuần trước khi Anh/Chị định rời đi, Anh/Chị mất việc. Anh/Chị sẽ:
a) Hủy bỏ kỳ nghỉ này.
b) Tham gia một kỳ nghỉ vừa phải (rẻ) hơn nhiều kỳ nghỉ này.
c) Vẫn theo đúng tiến độ, bởi vì Anh/Chị cần thời gian để chuẩn bị tìm việc.
d) Kéo dài kỳ nghỉ của Anh/Chị, bởi vì đây có thể là cơ hội đi nghỉ của Anh/Chị.

37/ Nếu Anh/Chị bất ngờ nhận được 200 triệu VND để đầu tư, Anh/Chị sẽ làm gì?
a) Gửi tiền vào tài khoản ngân hàng.
b) Đầu tư trái phiếu.
c) Đầu tư cổ phiếu.

38/ Xét về kinh nghiệm, mức độ thoải mái của Anh/Chị khi đầu tư vào cổ phiếu như thế nào?
a) Hoàn toàn không thoải mái.
b) Hơi thoải mái.
c) Rất thoải mái.

39/ Khi Anh/Chị nghĩ về từ "rủi ro", những từ nào sau đây xuất hiện trong tâm trí của Anh/Chị đầu tiên?
a) Mất tiền
b) Không chắc chắn
c) Cơ hội
d) Rất hào hứng.

40/ Các chuyên gia đồng ý rằng trái phiếu chính phủ tương đối an toàn hơn tất cả các tài sản khác, hiện nay Anh/Chi đang sở hữu trái phiếu này, Anh/Chị sẽ làm gì?
a) Giữ các trái phiếu này.
b) Bán các trái phiếu này, dùng một nửa số tiền đã bán để đầu tư thị trường tiền tệ, và một nửa số tiền còn lại đầu tư vào các loại tài sản khác.
c) Bán các trái phiếu này và dùng tất cả số tiền thu được để đầu tư các loại tài sản khác.
d) Bán trái phiếu, dùng tất cả số tiền thu được để đầu tư các loại tài sản khác trên, và mượn thêm tiền để mua thêm.

41/ Dựa vào kết quả đầu tư: tốt nhất (thu được) và xấu nhất (mất/lỗ) của 4 lựa chọn đầu tư dưới đây, Anh/Chị sẽ thích trường hợp nào hơn?
a /Trường hợp tốt nhất: thu được (+) 200 triệu VND; Trường hợp xấu nhất: mất (-) 0VND .
b) Trường hợp tốt nhất: + 800 triệu VND; Trường hợp xấu nhất: - 200 triệu VND.
c) Trường hợp tốt nhất: + 2,600 triệu VND; Trường hợp xấu nhất: - 800 triệu VND.
d) Trường hợp tốt nhất: + 4,800 triệu VND; Trường hợp xấu nhất: - 2,400 triệu VND.

42/ Ngoài những gì Anh/Chị đang sở hữu, Anh/Chị được tặng thêm 1,000,000,000 VND. Bây giờ Anh/Chị được yêu cầu chọn giữa:
a) Lợi nhuận chắc chắn là 500,000,000 VND.
b) Có 50% cơ hội kiếm được 1,000,000,000 VND và 50% cơ hội không đạt được gì.

43/ Anh/Chị được yêu cầu chọn giữa:
a) Chắc chắn bị mất 500,000,000 VND.
b) Có 50% cơ hội bị mất 1,000,000,000 VND và 50% cơ hội không mất gì cả.

44/ Giả sử một người họ hàng để lại cho Anh/Chị một khoản thừa kế là 1 tỉ VND, quy định trong bản di chúc rằng Anh/Chị đầu tư TẤT CẢ số tiền vào MỘT trong các lựa chọn sau đây. Anh/Chị sẽ chọn cái nào?
a) Tài khoản tiết kiệm hoặc quỹ tương trợ trên thị trường tiền tệ
b) Quỹ tương trợ mà nó sở hữu cổ phiếu và trái phiếu
c) Danh mục 15 cổ phiếu phổ thông
d) Hàng hóa như vàng, bạc, và dầu.

45/ Nếu Anh/Chị phải đầu tư 20 tỉ VND, những lựa chọn đầu tư nào sau đây mà Anh/Chị cảm thấy hấp dẫn nhất?
a/ 60% đầu tư với rủi ro thấp, 30% đầu tư với rủi ro trung bình, 10% đầu tư với rủi ro cao.
b/ 30% đầu tư với rủi ro thấp, 40% đầu tư với rủi ro trung bình, 30% đầu tư với rủi ro cao.

46/ Người bạn và người hàng xóm đáng tin cậy của Anh/Chị, một nhà địa chất có kinh nghiệm, đang tập hợp một nhóm các nhà đầu tư để đầu tư vào một công ty liên doanh thăm dò khai thác vàng. Công ty liên doanh này có thể trả 50 đến 100 lần số tiền đã đầu tư nếu thành công. Nếu thất bại, toàn bộ đầu tư bị mất. Bạn của Anh/Chị ước tính cơ hội thành công chỉ là 20%. Nếu Anh/Chị có 1 tỷ VND, Anh/Chị sẽ đầu tư bao nhiêu:
a) Không đầu tư;
b) Đầu tư 10% - < 30%;
c) Đầu tư 30% - <60%;
d) Đầu tư >60%.

47/ Nghĩ về các mối liên hệ trong quá trình đầu tư cổ phiếu, mức độ tin tưởng của Anh/Chị vào người môi giới chứng khoán? *(1: Hoàn toàn không tin tưởng, 2: Không tin tưởng, 3: Trung lập, 4: Tin tưởng, 5: Hoàn toàn tin tưởng).*
     1   2   3   4   5   0: Tôi không có người môi giới
48/ Mức độ tin tưởng của Anh/Chị vào trang điện tử về thông tin tài chính như cafef.vn, vietstock, cophieu68.com, ...
     1   2   3   4   5
49/ Mức độ tin tưởng của Anh/Chị vào các công ty chứng khoán?
     1   2   3   4   5
50/ Mức độ tin tưởng của Anh/Chị vào các công ty niêm yết mà Anh/Chị đang đầu tư?
     1   2   3   4   5
51/ Mức độ tin tưởng của Anh/Chị vào sự tư vấn của bạn bè hoặc người thân đang làm ở các công ty chứng khoán?
     1   2   3   4   5   0: không có người nào như vậy
52/ Mức độ tin tưởng của Anh/Chị vào thị trường chứng khoán mà Anh/Chị đang giao dịch?
     1   2   3   4   5

THÔNG TIN CÁ NHÂN:

1/ Giới tính: □ Nam   □ Nữ   □ Không xác định

2/ Tuổi của Anh/Chị:
          □1. dưới 25
          □2. 25 – 35
          □3. 36 – 45
          □4. 46-55
          □5. trên 55
3/ Tình trạng hôn nhân:
          □1. Độc thân
          □2. Kết hôn
          □3. Ly dị
          □4. Góa

4/ Anh/Chị có bao nhiêu con?
□ 0   □ 1   □ 2   □ 3   □ 4 trở lên

5/ Anh/Chị sống ở đâu?
□1. Quận: …………………, TP Hồ Chí Minh.
□2. Quận: …………………, Hà Nội
□3. Quận: …………………, Đà Nẵng.
□4. Đồng Bằng Sông Cửu Long
□5. Khác:

6/ Anh/Chị có tổng cộng bao nhiêu bất động sản (nhà và đất)?
□ 0   □ 1   □ 2   □ 3   □ 4 trở lên

7/ Trình độ học vấn:
□1. Trung học cơ sở hoặc thấp hơn
□2. Trung học phổ thông
□3. Đại học/Cao đẳng
□4. Thạc sĩ hoặc hơn

8/ Thu nhập (VND) bình quân mỗi tháng từ công việc chính?
□ 0
□ 1 đến dưới 10 triệu
□ 10 triệu đến 50 triệu
□ trên 50 triệu đến 100 triệu
□ trên 100 triệu

9/ Ngoài thu nhập chính, thu nhập khác (ví dụ: thu nhập cho thuê, đầu tư, kinh doanh, …) của Anh/Chị mỗi tháng?
□ 0
□ 1 đến dưới 10 triệu
□ 10 triệu đến 50 triệu
□ trên 50 triệu đến 100 triệu
□ trên 100 triệu

10/ Anh/Chị có phải là (hoặc đã từng là) lao động chính trong gia đình?
                         □ Đúng   □ Không

11/ Vai trò của Anh/Chị trong các quyết định tài chính?
□1. Tôi là người ra quyết định tài chính chính.
□2. Tôi thường kết hợp với người khác đưa ra quyết định tài chính.
□3. Tôi không đưa ra quyết định.

12/ Lĩnh vực nghề nghiệp chính của Anh/Chị là gì?
- □1. Quản lý quỹ đầu tư
- □2. Người môi giới
- □3. Giám đốc / Giám đốc môi giới
- □4. Cố vấn tài chính
- □5. Nhân viên ngân hàng
- □6. Chủ doanh nghiệp
- □7. Giám đốc điều hành
- □8. Giám đốc tài chính / Kế toán trưởng
- □9. Chuyên viên đầu tư
- □10. Kế toán
- □11. Nhân viên hành chính
- □12. Nhân viên bán hàng / tiếp thị
- □13. Giáo viên / giảng viên
- □14. Khác: …… ..

13/ Nghề nghiệp chính của Ba hoặc Mẹ của Anh Chị là?
- □1. Doanh nghiệp/Nhà đầu tư
- □2. Giáo viên / giảng viên
- □3. Nông nghiệp
- □4. Hưu trí
- □5. Khác: …… ..
- □6. Mất

14/ Ba Mẹ hoặc anh chị em của Anh Chị có mua cổ phiếu không?
<div align="center">□ Có   □ Không</div>

15/ Kinh nghiệm làm việc:
- □ < 3 năm
- □ 3 đến 5 năm
- □ trên 5 đến 10 năm
- □ trên 10 đến 20 năm
- □ trên 20 năm

16/ Anh/Chị có bao nhiêu năm kinh nghiệm đầu tư cổ phiếu?
- □ <3 năm
- □ 3 đến 5 năm
- □ trên 5 đến 10 năm
- □ trên 10 đến 20 năm
- □ trên 20 năm

17/ Anh/Chị mua loại cổ phiếu (VND) nào nhiều nhất?
- □ Thấp hơn 10.000 đồng
- □ 10.000 đến 20.000 đồng
- □ Trên 20.000 đến 50.000 đồng
- □ Trên 50.000 đến 100.000 đồng
- □ Trên 100.000 đồng

18/ Anh/Chị có bao nhiêu tài khoản giao dịch?
□ 1   □ 2   □ 3   □4   □ từ 5 trở lên

19/ Số lần giao dịch cổ phiếu của Anh/Chị?
- □ Ít nhất một lần một ngày
- □ 1 đến 6 lần/tuần
- □ 1 đến 3 lần/tháng
- □ 1 đến 2 lần/quý
- □ 1 đến 3 lần/năm
- □ Ít hơn một năm một lần

20/ Tổng số tiền (vốn sở hữu) của Anh/Chị dùng để đầu tư cổ phiếu trong năm (VND)
- □ <200 triệu
- □ 200 triệu đến 500 triệu
- □ 501 triệu đến 1 tỷ
- □ trên 1 tỷ đến 3 tỷ
- □ trên 3 tỷ.

Cảm ơn Anh/Chị rất nhiều

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

GRADUATE RESEARCH SCHOOL

STATEMENT OF CONTRIBUTION
DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Phung Thai Minh Trang (Trang Phung)
Name/title of Primary Supervisor:	Martin Young
In which chapter is the manuscript /published work:	chapter 4,5,6

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2/ Phung, T. T. M., Hsu, W.-H., Naylor, M. J., & Young, M. R. (2019). Risk tolerance, investment

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Date:	21-Nov-2020
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