Faculty of Business

Determinants of Risky Assets Investment: An Extended Information-Motivation-Behavioural Skills Model

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This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University

July 2020

DECLARATION

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number: HRE2017-0631.

Signature:

Date: 3 July 2020

ACKNOWLEDGEMENT

I would like to take this opportunity to recognise and thank many who have made this journey possible. First and foremost, I would like to express my sincere gratitude to my main supervisor, A/P Dr. Yap Ching Seng who has been a great teacher and mentor to me. He has provided me untiring guidance, support and encouragement that have helped me immensely throughout the course of this study. His passion for research and his generosity in sharing his knowledge have motivated me in this research journey. I would also like to thank my co-supervisor, Dr. Abey P. Philip for devoting his time in giving constructive feedbacks as he pored over my thesis with such dedication and meticulous attention. I also owe a debt of gratitude to my former supervisor, A/P Dr. Pauline Ho Poh Ling who has guided me since the early stages of my journey. Thank you for always believing in me and inspiring me to be better. Without her encouragement and support for my conversion application from MPhil to PhD, I would not have been able to embark my doctoral programme. I am deeply obliged to all my supervisors. Without their guidance, the completion of this thesis will not have been possible.

I am sincerely thankful to Curtin University for providing me with full scholarship which has enlightened my financial burden and enabled me to focus on my research. My appreciation extends to Dr. Ramez Abubakr Badeeb for his valuable comments, Dr. Tan Kim Lim for his guidance in my research journey and my HDR colleagues who have given me emotional support and wonderful memories. I would also like to thank my respondents and all who have assisted me in my study.

My loving gratitude goes to my parents and siblings for their unconditional love and support. Also, to Wong Kah Khing, thank you for being there for me all the time. Above all, my honour and praise to God Almighty from whom all my blessings flow. I thank God for leading and sustaining me throughout the years. Although there are ups and downs in this journey, Your grace is sufficient for me and Your power made perfect in weakness.

ABSTRACT

Individuals' participation in the stock market is important not only to the financial well-being of individuals, but also a country's financial market development. Although risky assets investment allows individuals to earn higher returns, many do not participate in the stock market. The objective of this study is to examine the determinants of individuals' risky assets investment in Malaysia. By integrating both the information-motivation-behavioural skills (IMB) model and theory of basic values as theoretical foundation, this study investigates the influence of information (financial literacy, advice-seeking) and motivation (attitude towards investing, personal values including conservation and self-transcendence, social norm) on risky assets investment directly and indirectly through the mediating role of behavioural skills (financial self-efficacy, FSE).

Using a mix of quota and snowball sampling, a total of 400 responses are collected through web-based questionnaire survey, from Malaysian who aged 18 years old and above. To examine the statistical significance of the proposed relationship between the variables, the Partial Least Square Structural Equation Modelling (PLS-SEM) technique is adopted. The results of this study support the validity of the extended IMB model in the context of risky assets investment behaviour. This study demonstrates the positive direct influence of financial literacy, attitude towards investing and FSE on risky assets investment and negative direct influence of conservation on risky assets investment. Meanwhile, advice-seeking, self-transcendence and social norm do not influence risky assets investment directly. Additionally, all informational and motivational components are significantly related to FSE. On the mediating role of FSE, the results reveal that all informational and motivational factors have significant indirect effect on risky assets investment via FSE, thereby confirming FSE's mediation effect in the model.

The findings of this study provide significant theoretical and managerial implications. Theoretically, this study contributes in shedding light on the two cross-disciplinary theories integrated to holistically explain the long-standing investment phenomenon. Being one of the first studies to leverage on the two theories in understanding

investment behaviour, the findings validate the suitability of existing social psychological theories in explaining financial behaviour and offer new theoretical perspective for behavioural economics. The integration of both the IMB components and personal values within the same model offers novel evidence on the importance of psychological factors such as attitude and personal values as predictors of investment decisions and also the mediating role of FSE as the missing piece in explaining limited stock market participation. The study refutes financial literacy as the silver bullet for promoting investment behaviour wherein FSE emerges as the most crucial direct predictor and mediator in influencing one's risky assets investment. As such, these findings necessitate not only information, but also motivation and behavioural skills as the core components of any initiates targeted to increase retail participation in the stock market. These findings should be of significant interest to different stakeholders, particularly the government agencies to allow for evaluation and innovation of initiatives targeted at enhancing retail investment; as well as financial intermediaries to adopt theoretical-guided strategies in promoting risky assets more effectively.

Keywords: Risky assets investment, stock market participation, information-motivation-behavioural skills (IMB) model, basic values

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LIST OF ABBREVIATIONS

AVE	Average variance extracted
BNM	Bank Negara Malaysia (Central Bank of Malaysia)
CB-SEM	Covariance-based structural equation modelling
FSE	Financial self-efficacy
HTMT	Heterotrait-Monotrait Ratio of Correlations
IMB model	Information-Motivation-Behavioural Skills model
PLS-SEM	Partial least squares - structural equation modelling
SC	Securities Commission Malaysia
SMP	Stock market participation
TPB	Theory of planned behaviour
TRA	Theory of reasoned action
VIF	Variance inflation factor

CHAPTER 1
INTRODUCTION

1.1 Research Background

The importance of stock market participation (SMP) in individuals' financial lives and the financial development of a country have exacerbated the role of risky assets investment. Especially with the growing uncertainty and insecurity in labour income and income supports, individuals' wealth and asset accumulation is becoming increasingly crucial in determining their financial well-being (Cynamon and Fazzari 2016).

With the expanding variety of financial products, individuals have ample choices in allocating varied portions of their funds into different asset classes. Specifically, one may accumulate income in different form of financial instruments such as short-term saving account, long-term insurance endowment plan or complex investment products in order to ensure their financial stability and also to fulfil financial goals. Among these financial tools, risky assets such as investment in stocks or mutual funds offer higher monetary return. Considering the long-term gains coupled with diversification benefits, these risky assets should appear relatively attractive to individuals, as compared to other financial assets.

Theoretically speaking, all households including those with relatively low risk tolerance or wealth level, should invest in the stock market (Campbell 2006). Yet in reality, many households do not participate or invest in risky assets despite the sizable return and many other potential advantages these assets offer. Numerous studies document a low participation in risky assets investment since decades ago. As highlighted by renowned pioneer studies, the stockholding rate was around 26.7% among the US household (Hong, Kubik and Stein 2004) and 23% in the European household (Guiso, Haliassos and Jappelli 2003). Based on data from China Household Finance Survey (CHFS) of 2011, the direct and indirect stock market participation rates are relatively lower at 7.4% and 9.6% (Rao, Mei and Zhu 2016). Although the participation rate has increased over the year, it continues to be the case where majority of the population does not participate in the stock market (Bricker et al. 2012; Angelini

and Cavapozzi 2017; Bricker et al. 2017; Poterba 2018; Vestman 2019). Furthermore, the participation rates remain relatively low in many other countries and reveal a remarkable variability across the globe (Chu et al. 2017; Thomas and Spataro 2018; Vaarmets, Liivamägi and Talpsepp 2019). Such a phenomenon is widely known as the SMP puzzle (Haliassos and Bertaut 1995). The phrase refers to a thread of well-documented literature regarding the limited participation in the stock market either directly or indirectly through mutual funds, which is at odds with the conventional portfolio theory (Markowitz 1952) and thus is brought into the limelight by many scholars since decades ago (Mankiw and Zeldes 1991; Haliassos and Bertaut 1995; Guiso, Haliassos and Jappelli 2003), even until today (Georgarakos and Pasini 2011; Bonaparte and Kumar 2013; Xia, Wang and Li 2014; Conlin et al. 2015; Beaubrun-Diant and Maury 2016; Rao, Mei and Zhu 2016; Sivaramakrishnan, Srivastava and Rastogi 2017; Vaarmets, Liivamägi and Talpsepp 2019; Niu et al. 2020).

As explained by Kumar (2014a), the stock market is comprised of primary and secondary stock markets. In the primary market, stock market serves as a platform where listed company can issue shares to the public and raise funds for business expansions. On the other hand, secondary market of stock exchanges enables retail and institutional investors to buy and sell liquid stocks issued by listed companies. The retail investors, defined as individuals who invest for personal account instead of on behalf of companies (NASDAQ 2018) and also referred to as individual investors, form the central focus of this study. Evidently, the limited SMP issue is of substantial scholarly interest due to the vital role of individual investors in the stock market, especially for both an individual's financial well-being and a country's financial market development.

At the micro-level, individuals' investment in risky assets may potentially offer support for the betterment of their financial lives over the long term. Particularly, the risk components in risky assets investment may affect one's finances adversely, but at the same time, may also be rewarding as higher risk accompany higher returns (Lu et al. 2020). According to Mehra (2003), the return from a risky asset in excess to that of earned by a relatively risk-free asset is known as the equity risk premium. Based on historical data, the stock returns have been substantially higher as compared to non-

risky assets for the past centuries, not just in the US but also many other countries (Mehra 2003).

As such, investment in risky assets either directly through stocks or indirectly through mutual funds are important as a vehicle for the creation of individuals' long-term wealth and good source of regular income (Taylor 2017). When one invests in risky assets, he/she can earn a higher passive income, thereby enhancing one's wealth and financial well-being (Xia, Wang and Li 2014). Individuals can generate, accumulate, manage and preserve wealth while further strengthen their position as a customer of the financial services (Ali 2013). Not only individuals are able to pursue their basic needs and desires, they are also less vulnerable during unexpected economic event such as unemployment or illness (Lerman and McKernan 2008). Consequently, it helps in achieving one's financial goals and ensuring future financial security against contingencies, which eventually lead to higher standard of living (Ali 2013), greater financial satisfaction (Joo and Grable 2004) and financial outcome (Perry and Morris 2005).

The importance of individuals' SMP is not only limited to individual level but also to the country as a whole. From a macro-level, previous studies show that limited market participation creates wealth inequality (Guvenen 2006), which in turn affects the consumption of household (Dynan and Maki 2001). The economic implications of not participating in the risky asset market also include substantial welfare losses on an economy (Cocco, Gomes and Maenhout 2005; Michaelides and Zhang 2017). One important question to raise is that why the rich are becoming richer while other segments of the population remain the same in terms of wealth. Studies reveal that the types of financial assets individuals invest in, may explain the wealth inequality. According to Wolff (2017), in the US, top 1% of the wealthiest individuals place 80% of their savings into investments assets such as stocks directly or indirectly owned, bonds, real estate investment and business equity; the next 19% of the wealthy have 41% of wealth in these investments; while the middle class allocate 63% of their assets for their mortgage debt. Similarly in Sweden, Bach, Calvet, and Sodini (2016) find that the wealthy individuals hold a higher proportion of risky assets including risky financial assets, commercial real estate and private equity. These studies collectively

claim that high proportion of wealth in risky assets allows individuals to earn higher potential returns and the wealth gains from asset holdings are the cause of wealth inequality. Based on the argument of these studies, individuals' investment in risky assets plays an important role in bridging the wealth gap.

Furthermore, the participation of retail investors in the stock market plays a prominent role in the financial market growth of any country. In particular, the participation of individuals in the financial market enhances the liquidity and resilience of the financial market. As compared to institutional buy-and-hold investors, retail investors trade more frequently (Kaniel, Saar and Titman 2008) with smaller amounts of money and shorter holding period (Koesrindartoto et al. 2020), and often opt for the opposite side of institutional investors' position when the market is unstable (Barrot, Kaniel and Sraer 2016). In other words, individuals provide liquidity which the institutional investors are not able to supply to the market, especially during times of market instability when conventional liquidity providers are constrained. Moreover, retail investors contribute to a greater depth of the financial market due to their distinct investment criteria as compared to institutional investors (Kok 2019). Hence, developing a critical mass of retail investor base is a prerequisite for stable and sustainable financial markets.

Considering the above-mentioned importance of retail participation on market liquidity, the impact of retail participation is even more immense in emerging economies where capital markets are more illiquid and immature. Specifically, the financial markets of many emerging economies remain underdeveloped (e.g. Indonesia, Peru, Egypt etc.) or are even non-existent (World Economic Forum 2016), which further pose constrain for economic growth and market development in these countries. By developing a diversified investor base consisting of both retail and institutional investors, the liquidity in emerging economies can be enhanced, thereby promoting a vibrant and healthy financial market (Wyman and World Federation of Exchanges 2016). For instance, one of the emerging market, the Stock Exchange of Thailand, has maintained a high degree of resilience during volatile periods due to its diversified investors where retail investors accounted for about 60% (World Federation of Exchanges 2017).

Considering the fact that developing countries account for approximately 75% to global growth (International Monetary Fund 2017), represent about 60% of global gross domestic product (GDP) based on Purchasing Power Parity (PPP) and consist of 85% of the world's population (International Monetary Fund 2018), the role of emerging economies in driving the global growth is becoming more important. Tackling the financial market challenges faced by the emerging countries not only boost the country's economy, but more importantly to foster global growth. Taken together, the issue of low SMP among developing countries is of global concern. In view of the above, the presence of retail investors in the emerging stock market is of foremost importance, hence should not be overlooked.

As one of the emerging countries, Malaysia is also pressured with retail participation in the financial market. Among emerging economies, Malaysia is ranked 13th place on the Inclusive Development Index by World Economic Forum (2018) and categorised as an upper middle-income country by World Bank (2020). The Malaysian capital market has the largest number of public listed companies in ASEAN (The Star 2017a) and is 2.4 times the size of Malaysia's GDP, placing the Malaysian capital market at the fifth largest in Asia on a GDP adjusted basis (Rosli 2018). Besides, Malaysia as an emerging or Islamic country has a relatively high equity risk premium (Erbas and Mirakhor 2010), thereby indicating that the stock market returns exceed safe asset returns remarkably over the years.

Despite being one of the fastest growing markets both in Asia and among emerging economies, at present, the retail participation in the Malaysian capital market does not commensurate with the growth of the capital market. As noted by World Federation of Exchanges (2017), Bursa Malaysia's retail trading value is 21% in year 2016, which is among one of the lowest as compared to other 14 exchanges in the emerging economies such as Taiwan, Thailand and Indonesia. Even up till recently, data from Bursa Malaysia indicates only 21.6% of retail investors' participation as of July 2019, which remains relatively lower as compared to other Asian countries such as Thailand, Singapore and Hong Kong (Kok 2019). In the "What's Your Goal" campaign organised by Bursa Malaysia, there are only 4% out of 853 respondents who choose

to invest in stocks (New Straits Times 2017). It appears that individuals in emerging markets tend to avoid risky investment and prefer holding savings in the form of physical assets such as gold and real estate, and bank deposits (McKinsey & Company 2017).

As such, individuals may not reap the full benefits of the explosive growth in the financial market. Statistics show that Malaysians generally have low awareness of asset diversification (Asian Institute of Finance 2015), minimal savings (Khazanah Research Institute 2016) and income (Department of Statistics Malaysia 2017b), but high household indebtedness (Bank Negara Malaysia 2017). More strikingly, data show rising wealth inequality despite the declined Gini index reported (Lee and Khalid 2016). In other words, there is a growing gap between the rich and poor. This might drift Malaysia further away from achieving the Shared Prosperity Vision 2030 (Government of Malaysia 2020) which seeks to close the wealth disparity and achieve fair distribution of wealth (Tan 2019a). Taken together, it seems that the financial situation and well-being of the Malaysians are at stake. In fact, although the economic outlook in Malaysia appears optimistic, customer sentiments are contradictorily pessimistic (Mahdzan, Mohd-Any and Chan 2017). Dr Muhammed Abdul Khalid, a Malaysian economist, argues that the effects of economic growth on the citizen's well-being matters more than just the GDP figures (Bhattacharjee and Ho 2017). As Oswald (1997) puts, "economic things matter only in so far as they make people happier" (1815). As a whole, the economic growth of the country does not translate into a rise in individuals' standard of living and well-being.

While many developing countries are still struggling with the accessibility of financial products and services, Malaysia has prevailed over this complication. Under the Central Bank Act of Malaysia 2009, financial inclusion agenda is legislated as one of the core functions of the Central Bank of Malaysia or Bank Negara Malaysia (BNM) in order to ensure access to and provision of affordable and quality financial products and services to all Malaysians. Greater accessibility and inclusion will eventually lead to sustainable economic growth (Bank Negara Malaysia 2015). With the implementations of the Financial Sector Blueprint by BNM, the financial inclusion level in Malaysia has gained recognition and global attention. The World Bank, in

their report, has highlighted Malaysia's achievement as one of the highest financial inclusion levels in Southeast Asia with 92% of adults having at least a savings account in year 2015 as compared to the global rate of 61% (De Luna-Martinez 2017). It is further noted that the current challenge faced by Malaysia is the actual use of financial products and services by individuals who own accounts. This is obvious in the Malaysian stock market where there are 2.5 million registered investors in Bursa Malaysia yet only 25,000 are active investors (Kok 2019). Having said that, the high accessibility to financial products and services has yet to be translated into greater financial market participation, thereby indicating that the root cause of low involvement in SMP does not lie in the access of these products. The long-term strategies and continuous efforts undertaken by the Malaysian Government, Bursa Malaysia and Securities Commissions (SC) over the years, as detailed in the subsequent chapter, have stressed the importance of individuals' participations in the stock markets in developing an enduring economic and social growth of the nation.

By and large, scholarly studies support that the key predictor for investing revolves around individuals' financial literacy (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017). Following that, interventions to promote better financial decision-making and greater SMP are heavily-focused on improving one's financial literacy (Willis 2011; Hastings, Madrian and Skimmyhorn 2013; Fernandes, Lynch Jr and Netemeyer 2014; Alsemgeest 2015; Tang and Peter 2015; Stolper and Walter 2017). Similarly, in Malaysia, government agencies and regulatory bodies constantly launch a great deal of financial education initiatives (Bursa Malaysia 2018b; Securities Commission 2018c; Yusof 2018) and repeatedly call for greater emphasis on financial literacy in effort to boost retail participation (The Edge 2014; New Straits Times 2017; Kok 2019). Despite ample efforts to encourage SMP over the years, individuals are still hesitant and reluctant to invest in risky assets (Surendran and Fong 2018; Kok 2019; Tan 2019b). With that, it seems that the availability of financial information does not directly or sufficiently explain individuals' decision to invest. For that reason, it is necessary to further examine the determinants that affect individuals' decision to invest in risky assets.

To better understand the factors that affect SMP, at the same time to promote higher participation in the stock market, a theoretical-based approach is much needed. Prior studies collectively suggest that interventions based upon theoretical grounding are shown to be more effective in promoting behaviours than those without clear theories (Glanz and Bishop 2010; Rothman, Klein and Cameron 2013; Klein et al. 2015; Kelly and Barker 2016; Sheeran, Klein and Rothman 2017; Johnson and Acabchuk 2018; Michie et al. 2018). Furthermore, researchers also highlight the importance of psychological factors in linking knowing and doing in the area of personal finance (Greenberg 2001; De Meza, Irlenbusch and Reyniers 2008; Kliger and Levy 2009; Hira 2012; Fernandes, Lynch Jr and Netemeyer 2014). As this study is positioned in the field of behavioural economics where psychology and sociology are assimilated into economics to understand human decision, it is therefore highly relevant to adopt social psychological theories in understanding the phenomenon under investigation. Among several well-established theories, the Information-Motivation-Behavioural Skills (IMB) model (Fisher and Fisher 1992) is deemed appropriate for this study because it focuses on individual-level determinants and includes information construct as core element. Prior empirical studies demonstrate that three core components of the IMB model including information, motivation and behavioural skills are significant in explaining a wide range of human behaviour. Despite being well-established and highly relevant, the IMB model is rarely tested in the context of financial behaviour, let alone risky assets investing behaviour.

Further to the above discussion, this study suggests an additional element to complement the motivational constructs in the IMB model: a more holistic and unifying concept of human motivations grounded in Schwartz (1992)'s theory of basic values from the social psychology field. Likewise, in line with the IMB model where motivation drives behaviour, these values are crucial motivational drivers that influence behaviours (Schwartz 1992; Schwartz 2012). This study argues that theory of basic values complements well with the IMB model and may shed light to the role of personal value in one's financial behaviour. In light of the above, this study employs a combined perspective of IMB model and theory of basic values, which explains the influence of information, motivation and behavioural skills on individuals' decision to invest in the stock market in Malaysia. The extended IMB model provides a promising

explanation through incorporating personal values as additional predictor and having behavioural skills as the core and central predictor of the financial behaviour.

The preceding discussions present the background and context of this study. The subsequent sections are dedicated to outlining the problem statement, which then leads to the formulation of research questions and research objectives. Following that, the potential theoretical and practical significances, alongside the definitions of key terms used throughout the study are outlined. This chapter ends with an overview of the thesis structure.

1.2 Problem Statement

Individuals' participation in the stock market either directly or indirectly through mutual funds is important not only to the financial well-being of individuals, but also a country's financial market development. The role of retail participation is even more crucial in emerging economies where the financial markets are more illiquid and immature. However, research has shown that many individuals do not invest in these risky assets. As one of the emerging countries, Malaysia is also pressured with the global phenomenon where the retail participation in financial market is one of the lowest among other emerging economies (World Federation of Exchanges 2017; Kok 2019). The retail investors' participation rate hovering at around 20% does not commensurate with the growth of the capital market over the years. From the burgeoning amount of studies, it has been argued that individuals' financial literacy may be the key solution to the long-standing puzzle of limited participation in the stock market (Van Rooij, Lusardi and Alessie 2011; Pan, Wu and Zhang 2020). As such, ample resources are allocated to government initiatives targeted at enhancing the level of financial literacy as a means to boost SMP in both developed and emerging countries over the years (Willis 2011; Hastings, Madrian and Skimmyhorn 2013; Alsemgeest 2015; Stolper and Walter 2017). Nevertheless, prior relevant studies collectively divulge that the existing interventions introduced thus far are of mediocre effect (Fernandes, Lynch Jr and Netemeyer 2014; Goedde-Menke, Erner and Oberste 2017), whereby retail participation rate remains rather unsatisfactory. Considering the imperative need to increase SMP alongside the deficiencies in current initiatives, it is

evident that this research area warrants further investigation. Furthermore, to effectively drive behaviour change, researchers clearly point to the desirability of interventions guided by theoretical underpinning (Kelly and Barker 2016; Sheeran, Klein and Rothman 2017; Michie et al. 2018) and echo the need to account for individuals' psychological attributes such as attitudes, self-efficacy and values (Hira 2012; Fernandes, Lynch Jr and Netemeyer 2014). The paucity of studies in these areas call for further research on the adoption of an appropriate theoretical model with psychological factors in order to enhance individuals' participation rate in the stock market. As such, the purpose of this study is to examine the determinants of individuals' risky assets investment through integrating the theoretical lens of IMB and theory of basic values.

1.3 Research Questions

With regard to the aforementioned background and problem statement of the research, this study seeks to ask: To what extent the constructs of IMB model and theory of basic values explain the determinants of individual's risky asset investment? As such, three specific research questions are posed as follows:

1. What are the influences of financial information, investment motivation and investment behavioural skills on individuals' risky assets investment?

2. What are the influences of financial information and investment motivation on investment behavioural skills?

3. How does investment behavioural skills mediate the relationships between financial information, investment motivation and risky assets investment?

1.4 Research Objectives

In seeking to address the research questions, the general objective of this study is to examine the determinants of individuals' risky assets investment by integrating the theoretical lens of IMB and theory of basic values. Specifically, the research seeks to investigate the following:

1. the influence of financial information, investment motivation and investment behavioural skills on individuals' risky assets investment.

2. the influence of financial information and investment motivation on investment behavioural skills.

3. the role of investment behavioural skills as a mediator on the relationships between financial information, investment motivation and risky assets investment.

1.5 Significance of the Study

The phenomenon of interest is examined to better understand the determinants that affect individuals' risky assets investment. This study is expected to have original and significant contribution by filling in the gaps in both theory and practice. Following that, this study proposes to make several contributions, both theoretically and practically.

1.5.1 Theoretical Significance

In terms of theoretical significance, this study could potentially contribute to the existing literature in five areas. First, it may offer theoretical framework for future personal finance research through the adoption of alternative theories and perspectives from different disciplines. Multiple review studies have denoted that personal finance literature is often empirically-based (Kliger and Levy 2009; Danes and Yang 2014), where most are not guided by a priori theoretical or conceptual grounding. However, increasing evidence indicates the importance of social and behavioural theories, whereby interventions based upon these theories are shown to be more effective in promoting behaviours, as compared to those without clear theoretical underpinnings (Glanz and Bishop 2010; Rothman, Klein and Cameron 2013; Klein et al. 2015; Kelly and Barker 2016; Sheeran, Klein and Rothman 2017; Johnson and Acabchuk 2018; Michie et al. 2018). As suggested by Hair et al. (2017c) and Ramayah et al. (2018), theory should always be the foundation of empirical analyses. This study responds to the call by incorporating two cross-disciplinary theories from social psychological

field, namely the IMB model and theory of basic values in understanding investing behaviour. The findings of this study would be helpful not only in assessing the rigour of existing social psychological theories in explaining financial behaviour, but more importantly, in offering new theoretical perspective for an emerging field such as behavioural economics. As only few studies investigate the limited SMP phenomenon through a theoretical lens, a study on the determinants of investing from social psychological perspective is potentially rewarding and insightful. The results are expected to unveil the suitability of these theories in explaining investment decisions, and open an avenue for future studies to understand the determinants of other financial behaviours.

Second, this study is expected to have novel theoretical contribution as it enhances the understanding of SMP through integrating two theories in explaining individuals' risky assets investment. Drawing on the theoretical lenses of social psychology field in the finance discipline, this study seeks to assess the applicability of the two integrated theories in explaining financial behaviour. As far as this study is concerned, this serves as one of the first few studies to apply the IMB model in exploring SMP, to examine the previously unexplored relationship between theory of basic values and financial behaviour, and to adapt the combined perspective of these two theories. Hence, the integration of both the IMB components and personal values within the same model is likely to generate new insights and enrich the existing literature. Consequently, the integration will constitute a theoretical contribution (Crane et al. 2016; Shaw et al. 2018) where it offers new ways of seeing a long-standing SMP phenomenon and add nuance to the discussion of how individuals make investment decision.

Third, based on the extended IMB model, this study integrates the IMB components in terms of information, motivation and behavioural skills, and theory of basic values elements in terms of personal basic values. These predictors are tested jointly in a single model to assess their combined influence on individuals' decision to invest in risky assets investment. This is in contrary to past studies where these constructs are frequently analysed independently in personal finance literature. Resultantly, the assessment of interrelationships among the constructs may reflect a more holistic and

comprehensive picture of the determinants of risky assets investment. Moreover, this study employs Structural Equation Modelling (SEM) as the inferential analysis approach to test the research hypotheses. With SEM, the joint effect of these determinants and mediating variables are able to be captured jointly.

The fourth theoretical significance revolves around making contribution to the empirical literature. This study attempts to enrich the literature by assessing unexplored relationships and potential predictors in order to further address the stock holding puzzle (Haliassos and Bertaut 1995). Specifically, it offers empirical evidence by assessing the mediating role of financial self-efficacy (FSE) as being the potential missing piece in investment decision. Additionally, this study responds to scholar's call to extend understanding pertaining to the role and antecedents that FSE plays. Farrell, Fry, and Risse (2016) highlight the need "for future research to closely identify the determinants of FSE" (98). Assessing FSE as a mediator and endogenous variable could potentially add value to the limited literature on FSE. Moreover, psychological factors, particularly personal value is shown to be influential on behaviour (Bardi and Schwartz 2003; Borg, Hermann and Bilsky 2017; Lopes, Sela and Shackelford 2017; Sharma and Jha 2017), yet little is known about its association with investment behaviour. By incorporating personal values variables, this study extends the body of knowledge on personal values and SMP as to whether personal values could be an additional explaining factor. In short, this study advances knowledge and offers novelty to the personal finance literature on investment behaviour by providing empirical evidence, at the same time contributes in solving the stock holding puzzle.

Lastly, the theoretical significance of this study also lies in the extension of theories and empirical research in a new geographical region and different cultural orientation. This study extends the combined IMB model and theory of basic values, both of which are developed in the western context, to understand the behaviour in a non-western context of Malaysia. In doing so, it may advance the generalisability and applicability of these theories in a non-western or emerging context. Similarly, most prior studies on the determinants of risky assets investment have been conducted in the western context, particularly among the developed countries (Brown et al. 2008; Guiso and Jappelli 2008; Van Rooij, Lusardi and Alessie 2011; Von Gaudecker 2015) (Cardak

and Wilkins 2009; Barasinska, Schäfer and Stephan 2012; Zhang 2014; León and Pfeifer 2017). The findings from these studies may only reflect the case of a western, developed countries where the culture is characterised by individualism. As a result, it may not be applicable to non-western contexts or emerging countries, and to cultures characterised as collectivistic and high power distance such as Malaysia (Hofstede Insight 2018). Hence, this study expands the SMP research in a new research context in expectation to shed light on the determinants that influence individuals to invest in risky assets. With the growing importance of emerging economies in the global context, the findings provide rich insights to address the issues of low participation in risky assets market in an emerging country.

1.5.2 Practical Significance

The outcome of this study could indicate factors that lead individuals to participate in the stock market. Having this knowledge, coupled with the adoption of extended IMB model that is intervention-oriented, this study is likely to advance the implementation of any initiatives targeted to solve limited SMP issue. Therefore, the findings of this study would seem to be of value in practice.

In terms of practical significance, the research findings of this study should be of substantial interest to a group of audience. For instance, this study should be relevant and significant to government agencies and regulatory bodies such as BNM, Bursa Malaysia and SC as they constantly reiterate the importance of retail participation over the years. Similarly, the findings may be beneficial to the financial service providers such as banks, brokerage firms, mutual funds, financial advisory companies and insurance companies that have difficulties in selling risky financial products.

In specific, this study is important as it generates rich insights that may inform the government and policy makers regarding the existing SMP issues. It may accentuate the existing gaps to the Ministry of Finance and its federal agencies including BNM, Bursa Malaysia and SC, to allow for re-evaluation and innovation of current public policies relevant to the promotion of individuals' risky assets investment. Furthermore, the findings will inform determinants that are particularly crucial in encouraging one's

decision to invest in risky assets, at the same time suggest timely solution to improve the SMP among individuals. The extended IMB model, may be useful to guide the design and implementation of effective, theoretical-based intervention program targeted at increasing retail participation in investment. It is believed that these efforts may eventually enhance the financial well-being of the nation and inclusiveness of the economy, thereby minimising the wealth gap that is outlined as priority in the Shared Prosperity Vision 2030 in Malaysia.

Moreover, this study is also of significant to the financial service providers and financial intermediaries. The insights provided will assist these group of audience to better understand the key reason behind individuals' allocation in risky assets investment, thereby allowing them to better design suitable marketing strategies, convey financial product information more effectively, and deliver financial products and services that can accommodate the local needs. Lastly, the results of this study can inform the public of their current financial competency level and foster personal initiatives to achieve effective financial decision-making, particularly in the area of investing.

1.6 Key Definitions

The definitions of key terminologies used throughout this study are presented below.

Risky assets:
Investment in stocks or mutual funds (Rosen and Wu 2004; Cardak and Wilkins 2009; Calcagno and Monticone 2015; Tang and Baker 2016; Angelini and Cavapozzi 2017; Chu et al. 2017; Chen et al. 2020; Cupák et al. 2020).

Financial literacy:
Financial knowledge (understanding) and the application of financial knowledge (use) (Huston 2010).

Advice-seeking:
Seeking financial advice from financial advisor. Financial advisor is someone who

offers professional advice pertaining to financial matters to individuals, in exchange for a specified remuneration (Cruciani 2017).

Attitudes towards investing:

Attitude towards behaviour refers to one's perceptions of the outcome of behaviour and evaluations of such outcomes (Fisher, Fisher and Harman 2003). In the context of this study, attitude towards investing is defined as one's perceptions of the outcome of investing and one's evaluation of these outcome.

Personal values:

Concepts pertaining to desirable, trans-situational goals, varying in importance, that serve as guiding principles of actions or behaviour, in the life of a person or other social entity (Schwartz 1992).

Openness to change:

Controlling one's own impulses and behaviour, according to social norms and expectations (Schwartz 2012).

Conservation:

Preserving stability and security in relations with one's surroundings, with the emphasis on subservient self-repression, the preservation of traditional practices and protecting stability (Schwartz 2012).

Self-enhancement:

Promoting self-interest at the expense of others, emphasising the search for personal success and dominance over others (Schwartz 2012).

Self-transcendence:

Promoting the wellbeing of society and nature above one's own interests, highlighting the acceptance of others as equals, as well as a concern for their wellbeing (Schwartz 2012).

Social norm:

Social norm is the perception of social pressures or social support to perform or not to perform a behaviour (Ajzen 1991; Fisher and Fisher 1992). In the context of this study, social norm refers to the perception of social support to invest in risky assets.

Financial self-efficacy (FSE):

Self-efficacy, in general, is defined as individuals' beliefs in their capability to accomplish a given task required for achieving a goal (Bandura 1997). This study defines FSE in risky assets investment as individuals' beliefs in their capability to invest in risky assets for achieving their financial goals.

1.7 Thesis Structure

This thesis comprises six chapters with its structure indicated as follows. The current chapter introduces the background and context of this study wherein the problem statement, objectives and significance of the study are discussed. The remainder of this thesis is organised as follows:

Chapter 2 presents an overview of the retail investment in Malaysia. Chapter 3 reviews the existing literature on relevant theoretical underpinning and empirical studies, leading to the formulation of research hypothesis. Chapter 4 outlines the research design and methodology adopted for this study, covering the sampling procedures, development of instruments, questionnaire design and data analysis method. In Chapter 5, the descriptive statistics and PLS-SEM results are demonstrated. The last chapter, Chapter 6, concludes the thesis with discussion and implications of the findings, at the same time presents the limitations and avenues for future studies.

CHAPTER 2
RETAIL INVESTMENT IN MALAYSIA

2.1 Chapter Overview

This chapter presents the financial market and retail investment in Malaysia. First, a brief overview of the Malaysian capital market and also the stock exchange, Bursa Malaysia is provided. This is followed by a discourse on the retail investors' participation in the Malaysian financial market. Thereafter, the chapter presents several initiatives and efforts by the government and authorities aiming at enhancing individuals' participation in the financial market. The personal financial situation among the individuals in Malaysia is covered, followed by a chapter summary in the last section.

2.2 An Overview of Malaysian Financial Market

A capital market is a platform where both equity and debt securities such as stocks and bonds are issued in order to raise capital for businesses and also traded by investors to earn potential profits. Since year 2013, the Malaysian capital market is classified as an advanced emerging market in the Financial Times Stock Exchange (FTSE) Global Equity Index Series (Financial Times Stock Exchange 2020). The SC is the regulatory authority responsible of regulating the Malaysian capital market.

The Malaysian stock exchange, Bursa Malaysia, or previously known as Kuala Lumpur Stock Exchange (KLSE), was established around year 1960 and the public trading of shares started hereafter (Bursa Malaysia 2018a). In year 2009, the Main and Second Boards were merged to form Main Market, whereas the Malaysian Exchange of Securities Dealing and Automated Quotation (MESDAQ) was replaced by the Access, Certainty, Efficiency (ACE) Market. Currently, Bursa Malaysia consists of the Main Market for the funding of established companies with sizable business, ACE Market for all business entities with outstanding growth potential, and Leading Entrepreneur Accelerator Platform (LEAP) Market which was introduced in July 2017 for emerging companies (Bursa Malaysia 2018a).

In the mid-1990s, the capital market in Malaysia was comparatively narrow. The

banking system was dominating the capital market as the primary provider of funding, which was subsequently identified as the major source of systematic risk during the 1997-1998 Asian Financial Crisis (Securities Commission 2011). Consequently, as to formulate strategies towards the recovery of financial market and to redirect further development of the capital market, the first Capital Market Master Plan Blueprint was launched by SC in year 2001. It envisaged to lay strong foundation for the Malaysian capital market within 10 years period, specifically in addressing the country's financing and investment needs, as well as achieving its long-term economic objectives, efficiently channelling the allocation of funds and providing facilitative regulatory framework that supports full functionality of the capital market (Securities Commission 2001).

Following the recommendations in the Masterplan, the capital market has grown tremendously (Securities Commission 2011). From year 2001 to 2010, the stock market capitalisation expanded triple in volume, from RM444.4 billion in year 2000 to RM1.3 trillion in year 2010, with an average growth of 11% per annum. In addition, the bond market grew 10.8% annually, with debt securities of RM273.1 billion in 2000 to RM758.6 billion in 2010. By end of year 2016, the number of listed stocks was 903 (Sustainable Stock Exchanges Initiative 2017) and overall capital market size of RM2.9 trillion (Securities Commission 2016). A recent statistics as per May 2018 from Securities Commission (2018b) reports that the capital market grew 12.6% to RM3.2 trillion with stock market capitalisation expanded 14.4% to RM1.9 trillion and an increase of 10.1% to RM1.3 trillion in the bond market last year. This places Malaysia at the fifth largest capital market based on GDP adjust basis among other Asian countries (Rosli 2018). Recent report indicates that there are 2.5 million registered individual investors in Bursa Malaysia (Kok 2019).

The role of mutual funds as an investment instrument has also become increasingly prominent in the Malaysian financial market. This was evidenced by the fund management industry being the fastest growing market segment in Malaysia, mainly driven by the exceptional growth in the mutual fund industry. At the end of year 2014, mutual funds' net asset value (NAV) was reported as consistently growing at averagely 14.7% per annum over the past ten years (Securities Commission 2015). The NAV of

mutual funds growth is maintained following the next few year. As per end of year 2017, the NAV was equivalent to 22.39% of the stock market capitalisation and was also accompanied by an increasing number of mutual funds being offered to individuals (Securities Commission 2018d). Likewise, the mutual funds net sales stood at RM45.2 billion, which exhibited an increment of RM26 billion compared to year 2016 (Securities Commission 2018b). In a similar vein, the NAV of mutual funds was 25% as at end of year 2018 (Securities Commission 2019) and 29.08% as at 31 January 2020 (Securities Commission 2020b). Based on the latest unit trust statistics, there are a total of 20,069,838 unit trust accounts (Securities Commission 2020b).

With the expanding of capital market, a wide variety of other financial services that support the market have also emerged including the advisory services, financial planning companies and stock brokerages. To achieve higher retail participation in the capital market, several intervention are introduced by SC in effort to strengthen the roles of financial planners, remisiers and unit trust agents since year 2011 (Securities Commission 2011). As per December 2017, there are 679 licensed financial planners, exhibiting a growth of 43% in relative to beginning of year 2015 (Securities Commission 2018a). The number of licensed financial planners increase each year, with the latest report showing 977 financial planners in year 2019 (Securities Commission 2020a). Constant supports are given by Bursa Malaysia to the financial intermediary professionals through the CPE Accredited Product Workshop, engagement sessions and awareness sessions on new financial products and services (Bursa Malaysia 2018b). On the other hand, the SC organises annual conferences, training programmes and "mystery shopping" to gauge financial planning's professional standards (Securities Commission 2018a).

Conclusively, the financial industry in Malaysia, as an emerging country, has grown in leaps and bounds over the past decades. Spurred by the financial market development, there exists a wider range of financial products available to individuals, thereby enabling greater access and participation in the financial market. Such financial environment positions individuals with increased opportunities to effectively manage and allocate their own savings.

2.3 Retail Participation in Malaysian Financial Market

Since years ago, the Malaysian authorities have focused on expanding individuals' participation in the financial market. In year 2010, the then Chief Executive Officer (CEO) of Bursa Malaysia, Dato' Yusli Mohamed Yusoff, has reiterated the significance of retail participation to the growth of capital market and encouraged greater retail investor participation (Bursa Malaysia 2010). He added that the Bursa Malaysia desires a 40% of market volume by retail investors in near future as compared to 20% at that time (Yap 2010).

Nevertheless, the retail participation rate hovered at around 20% over the past ten years, with institutional investors dominating the capital market (Surendran and Fong 2018). Seven years later, in November 2017, the previous CEO, Dato' Seri Tajuddin Atan similarly claimed that the Bursa Malaysia aims to boost retail investors' participation from 23.3% to 25% in near term (New Straits Times 2017). He strongly recommended the public to shift from traditional savings instrument such as fixed deposits to capital market investments to diversify portfolio and gain higher return. Yet until today, the phenomenon of low retail participation persists. Recent data from Bursa Malaysia reveals 21.6% of retail investors' participation as of July 2019 (Kok 2019). This figure is relatively lower as compared to other Asian countries such as Thailand, Singapore and Hong Kong (Kok 2019). Additionally, Malaysia has the highest level of fixed deposit among the regional neighbours including Singapore, Thailand and Indonesia (Yusof 2018). This is an indication that Malaysians save most of their money in fixed deposit account with lower interest rate, thereby forging the opportunity to create wealth through investment. According to Datuk Muhamad Umar Swift, the current CEO of Bursa Malaysia, Bursa Malaysia is currently aiming to lift retail investor participation to 30% over the long run (Tan 2019b).

Furthermore, as underlined in the SC's recent annual report, facilitating greater investor participation in the capital market is listed as one of the five key thrusts in developing an inclusive and sustainable market (Securities Commission 2018a). According to the latest annual report by Bursa Malaysia, two out of the four identified Business Pillars are also related to enhancing retail investors' participation in the capital market:

(1) “Developing and growing a diverse investor base – Facilitate the participation of a diverse mix of institutional, retail, local and foreign investors to enhance liquidity, by promoting easy access and removing barriers to entry for every investor profile;
(2) Improving and providing an enabling ecosystem – Develop an ecosystem which facilitates the offering of new products and entry of new investor segments. The ecosystem is also benchmarked against developed markets.” (Bursa Malaysia 2018b)

As the local retail investor segment only accounted for a small proportion of the investor base in relative to institutional investors, to diversify participating members is to increase the extent of retail participation. Besides, the ecosystem pillar is intended to attract more issuers and investors, which also involves more individual investors. Likewise, one of Bursa Malaysia’s current priority is to increase trading activities from the segment of retail investors, thereby ensuring the attractiveness and vibrancy of Malaysian financial market (Bursa Malaysia 2018b).

Collectively speaking, current statistics clearly point towards a low level of individuals’ participation in the Malaysian stock market. As promoting retail participation augurs well with the country’s agenda, this issue has received substantial attention over the years. It is apparent that boosting retail participation in the stock market continues to be the main focus for Bursa Malaysia at this point in time (Tan 2019b). This is further evidenced by the numerous endeavours from the Malaysian authorities to accentuate the importance of investments for the benefits of both personal and the country’s financial performance. The initiatives by the Malaysian government are further detailed in the following section.

2.4 Government Initiatives

Acknowledging the growing need for retail participation in the financial market has spurred the government to lend support for interventions targeted at improving SMP. Statistics show that a great deal of initiatives that are implemented by the government over the years in effort to entice financial market participation by individuals. This

includes enhanced investor protection, introduction of new funds catering public needs (Securities Commission 2016) and tax exemptions on investment profits (Securities Commission 2015).

Furthermore, in the World Capital Markets Symposium 2018 hosted by the SC, the then Malaysian Prime Minister, Datuk Seri Najib Tun Razak in his keynotes address has introduced new measures to enhance liquidity and vibrancy of the Malaysian capital market, as well as to encourage greater retail investor participation (New Straits Times 2018). These measures include the opening of intraday short selling to all investors, liberalisation of margin financing rules, three-year stamp duty waiver for trades involving small-cap and mid-cap stocks, six-month waiver on trading and clearing fees for new retail investors and a volume-based incentive programme (Bursa Malaysia 2018d; Securities Commission 2018c). Additionally, SC has announced that the bond and sukuk (Islamic bond) market will be liberalised for retail investors in year 2018 (Securities Commission 2017), aiming to enable greater market participation by individuals.

Moreover, the SC and Bursa Malaysia have also launched various digital platforms to serve as an education and information hub, aiming to outreach potential retail investors. In order to widen individuals' exposure to the mid-cap and small-cap market, the Bursa MidS portal[1] is launched in year 2017 under the Mid and Small Cap Research Scheme (Bursa MidS) where the reports of companies' financial results and updates are provided. In the same year, another centralised information platform on bonds, known as the Bond+Sukuk Information Exchange (BIX)[2] is also created in order to instil public interest and knowledge on the Malaysian bond market. The website consolidates bond prices and credits information.

Besides, Bursa Malaysia also provides online learning platforms for stock market, which is the BursaMKTPLC[3] and an official Facebook page that aims to equip investors with information on stock investing, market updates, upcoming events and

[1] The Bursa MidS website is accessible at: http://bursamids.com
[2] The BIX website is accessible at: https://www.bixmalaysia.com/
[3] The BursaMKTPLC website is accessible at: http://www.bursamarketplace.com/

useful tools. Recently, the BursaMKTPLC has also launched an interactive virtual education programme – Mirror, Learn & Trade (MLT) Platform, that allows individuals to learn how to invest in the stock market through mirroring strategy (Tan 2019b). Specifically, registered participants can invest using virtual cash by viewing and mirroring the stock portfolio of the professional analysts. These analysts are to share their reasons for their buy and sell decision, and provide latest stock market updates to the participants. Another website by SC, the InvestSmart[4] portal also provides comprehensive information on the Malaysian capital market investment. These online portals provide easy access and comprehensive information to enable informed retail participation and help individuals make better investment decision in the capital market.

Other than that, many education initiatives and marketing efforts are also facilitated continuously, with the aim of creating public awareness on risky assets investment and stimulate inclusive retail participation by individuals. In year 2017, Bursa Malaysia, in collaboration with trading partners, have conducted over 600 investor engagements that have outreached at least 94,000 individuals. Some notable programmes by the Bursa Malaysia include the inaugural "Jom Labur Shariah" Shariah Investing Fair, a three-month 'What's Your Goal' campaign, Bursa Investor Education Workshop, Workshop@Bursa sessions, Market Awareness visits, Shariah Trader Challenge, the Bursa Young Investor Clubs (BYICs) and "Invest Bursa, Invest in You" (Bursa Malaysia 2018b; Yusof 2018). Similarly, the SC also conducts several seminars such as InvestSmart Unit Trust Seminars, InvestSmart Stock Market Seminars, InvestSmart Cash@Campus and programmes including InvestSmart Kids & Cash and InvestSmart Teens & Cash (Securities Commission 2018a).

Taken together, in recognition of the substantial value that retail investor offers towards financial market, several initiatives have been introduced and launched by the government. These measures are implemented not only to encourage more retail participation in the stock market and stimulate economic growth, but at the same time, to allow individuals to diversify their investment, earn higher income and ultimately

[4] The InvestSmart website is accessible at: https://www.investsmartsc.my/

raise their standard of living.

2.5 Personal Financial Situation in Malaysia

The current personal financial situation in Malaysia similarly underlines the need to promote SMP at individual level. Studies demonstrate that Malaysians generally have a low level of awareness on the benefit of asset allocation and diversification. Atkinson and Messy (2012) claim that Malaysia scored the second lowest among 14 countries across 4 continents in literacy test regarding portfolio diversification, where only 43% of the population understands the need to diversify their asset. In the same vein, Janor et al. (2016) reveals that only 43% of respondents in Malaysia provide correct answers on asset diversification questions. As reported by Asian Institute of Finance (2015), a joint initiative by BNM and the SC, only 41% of young Malaysians diversify their investment into different investment products.

Furthermore, based on the statistics from Bank Negara Malaysia (2017), the ratio of Malaysia's household debt to gross domestic product (GDP) is 88.4% in 2016. This figure, as reported by Standard & Poor's, is the highest among 14 other Asian economies (Chow 2015). Moreover, report from Asian Institute of Finance (2015) reveals that the young Malaysian are accruing debts at earlier age and experiencing financial stress in which 75% of the Gen Y's have at least one long-term debt obligation for instance car loan, education loan or mortgage loan, 70% of those who own credit card pay only the minimum payment and 40% of them spent more than they can afford. Additionally, as noted by the Malaysia Department of Insolvency (2016) (MDI), there are a total of 101,958 bankruptcy cases from year 2012 to 2016. Despite all measures taken to curb the complication, figures show no decrement compared to five years ago (19,575 in 2012; 19,588 in 2016), with an average of 54 bankruptcy cases per day in year 2016. Besides, about 58% of those involved fall under the age group of 25 to 44 years. The BNM's debt counselling agency, Credit Counselling and Debt Management Agency (AKPK), has also reported that the prominent reason that individuals face financial issue and unmanageable debts are largely due to poor financial planning as this comprises around 45% of all cases handled by the organization (The Star 2017b).

As a whole, the issues of low awareness in asset diversification and high household indebtedness reflect that many Malaysians do not understand the benefit of investing and financial planning. If these issues persist, the financial security and well-being of the Malaysians will be at stake, which may further threaten the financial stability of the country. Following that, the BNM calls for more evidence-based research to support for future policies, particularly on factors that influence individuals' financial behaviour, how they decide on financial products and their preferences in learning and assessing financial education (Ali 2013).

2.6 Chapter Summary

In sum, the growth of financial industry in Malaysia has given individuals with increased opportunities to invest in the stock market. Nonetheless, it can be seen that individuals' participation in the capital market is not up to satisfactory level. Having retail participation as one of the nation's priority call for government and authorities' continuous initiatives to encourage greater participation in the stock market over the years. Besides, the personal financial situation amongst Malaysians reveals low awareness on financial planning. These statistics collectively underline the prevailing need for more retail participation in the stock market to meet the needs of a diversifying investor base for a healthy financial market.

CHAPTER 3
LITERATURE REVIEW
AND HYPOTHESES DEVELOPMENT

3.1 Chapter Overview

This chapter presents the theoretical rationale and review of empirical literature relating to risky assets investment. Particularly, the chapter begins with a discussion on the background and determinants of risky assets investment, followed by the choice of theoretical framework that is appropriate for this study. The subsequent sections in the chapter encompasses the application of the chosen theories in the context of risky assets investment. A conceptual framework and hypotheses are proposed based on theoretical grounding and empirical evidence, followed by a chapter summary in the last section.

3.2 Risky Assets Investment

By and large, financial behaviour is referred to as any human behaviours related to money management (Xiao 2008; Xiao 2015). Some common research topics on financial behaviour revolve around spending and savings, borrowing, payments, asset allocation and insurance (Beshears et al. 2018). This study focuses specifically on risky asset allocation. This section outlines the definition of risky assets and reviews the literature on determinants of risky assets investment in prior studies. The research gap in the body of research are discussed.

3.2.1 Definition

In the extant literature, the term risky assets, is variably defined. Despite the well-established topic area focusing on different financial products, none classifies a list of financial assets that is standardised, comprehensive, non-exhaustive and universally accepted.

In this study, risky assets investment refers to investment in stocks or mutual funds. Stocks, also known as shares, are equity investments which represents ownership in a corporation. The return of stocks is potentially higher and normally comes in two

forms: dividends and capital gains. The higher rate of return in stocks is accompanied by higher risk exposure. Other than directly investing in the stock market, stocks can also be held indirectly through mutual funds. Mutual funds, also referred to as unit trusts or managed funds, are investment vehicle comprises securities and other assets that are professionally managed by fund managers. As it is diversified with a wide range of different securities such as stocks and bonds, it helps lower risk for a given level of return.

This study focuses only on the two risky assets for several reasons. First, stocks and mutual funds are the two largest categories of risky financial assets (Alessie, Hochguertel and Soest 2004) and are generally the most held among risky financial assets. Based on the data from BNM (Bank Negara Malaysia 2019), more than 60% of Malaysian households' liquid financial assets (LFA) are held in non-risky assets such as bank deposits while investment in stocks and mutual funds account for approximately 29% of LFA. This reflects that Malaysians primarily participate in risky assets investment by holding stocks and mutual funds. Considering the above, the risky assets investment examined in this study are to do with investing in stocks and mutual funds. This is consistent with past studies (Chu et al. 2017; Chen et al. 2020) where the two assets have also been the most prevalent choice among risky financial products. The popularity of the two risky assets are also evident in the personal finance literature as studies typically only consider these two risky assets in the broadly defined assets groups (Rosen and Wu 2004; Cardak and Wilkins 2009; Tang and Baker 2016; Angelini and Cavapozzi 2017; Chu et al. 2017; Chen et al. 2020; Cupák et al. 2020).

Second, this study aims to understand and solve the long-standing limited SMP phenomenon. In the SMP literature, the standard measure of SMP involves direct participation through the ownership of shares and/or indirect ownership of shares in mutual funds (Grinblatt, Keloharju and Linnainmaa 2011; Balloch, Nicolae and Philip 2014; Conlin et al. 2015; Beaubrun-Diant and Maury 2016; Sivaramakrishnan, Srivastava and Rastogi 2017; Vaarmets, Liivamägi and Talpsepp 2019; Niu et al. 2020).

Lastly, there are important differences between various risky assets such as the level of risk, costs or information intensiveness (Alessie, Hochguertel and Soest 2004). That being said, individuals' level of information, motivation and behavioural skills may differ between different the types of risky assets. For instance, the information needed to invest in stocks or mutual funds are different from those of derivatives or options. The inclusion of other assets is in violation to the high level of specificity required by the IMB model (Fisher and Fisher 1992; Fisher, Fisher and Harman 2003). Therefore, these assets must be distinguished and treated separately.

On a side note, there are past studies which include bonds as one of the risky assets, including Barasinska, Schäfer, and Stephan (2012), Duasa and Yusof (2013), León and Pfeifer (2017), Kramer (2016), Von Gaudecker (2015), Becker and Dimpfl (2016). Generally, bonds such as corporate bonds, Government savings bonds and bank savings bonds fall under fixed-income securities. Corporate bonds are debt issued by companies that offer an agreed interest return (coupon) over a specified time period and fixed amount of principal repayment at the maturity (Taylor 2017), thus is less risky as compared to stocks and mutual funds. Moreover, the risk for government bonds or bank savings bonds are even lower than corporate bonds as they are issued by government or semi-government bodies. For these reasons, this study excludes bonds as part of risky assets.

Additionally, it is also note-worthy that the fixed-price unit trust funds from Amanah Saham Nasional Berhad (ASNB) are considered as non-risky assets. These funds are recognised by the World Bank as a popular long-term saving instrument in Malaysia (De Luna-Martinez 2017). The exclusion is mainly due to their product features that differentiate them from the other mutual funds, including the fixed pricing, zero subscription fee and high liquidity as it can be withdrawn anytime. These fixed-price ASNB funds including ASB, ASB 2, ASB 3 Didik, ASM, ASM 2 Wawasan, ASM 3 (Amanah Saham Nasional Berhad 2020) are specifically listed as exclusion of risky assets in the questionnaire due to their unique characteristics that may easily be confused as risky assets.

Likewise, Employee Provident Fund (EPF), the mandatory employer-based retirement

savings in Malaysia (similar to superannuation in Australia) and insurance policies are also categorised as non-risky assets in this study. The portfolio allocation of individuals' EPF savings are largely managed by government affiliated institutions, with a guaranteed minimum dividend rate of 2.5% per annum on member's savings (Employees' Provident Fund 2019a). Although eligible individuals have the option to invest part of their EPF in specified mutual funds, only individuals above 55 years old can access the savings, thereby limiting the fund liquidity. In that sense, EPF savings invested in mutual funds by individuals is also excluded from the list of risky assets due to its guaranteed return, illiquidity and mandatory nature. In a similar way, insurance policy is excluded because it offers guaranteed payments, with termination of policies before maturity resulting in substantially lower return or even capital losses as per contract clause.

3.2.2 Determinants and Research Gap

Since the inception of limited SMP puzzle (Haliassos and Bertaut 1995), research interests in solving the participation puzzle have flourished over the years. These studies reveal factors acting as barriers to investing in risky assets as documented in Table 3.1 below.

Table 3.1 Determinants of Stock Market Participation

Determinants	Sources
Academic achievement	(Vaarmets, Liivamägi and Talpsepp 2019)
Awareness	(Guiso and Jappelli 2005)
Changes in marital status	(Love 2009)
Cognitive skills	(Christelis, Jappelli and Padula 2010; Benjamin, Brown and Shapiro 2013)
Demographic variables including age, gender, number of sibling and marital status of the household head	(Bertocchi, Brunetti and Torricelli 2011; Christelis, Georgarakos and Haliassos 2011; Halko, Kaustia and Alanko 2012;

	Niu et al. 2020)
Education	(Christiansen, Joensen and Rangvid 2007)
Financial literacy	(Van Rooij, Lusardi and Alessie 2011; Xia, Wang and Li 2014; Liao et al. 2017)
Financial literacy overconfidence	(Xia, Wang and Li 2014)
Genetics	(Barnea, Cronqvist and Siegel 2010)
Happiness	(Rao, Mei and Zhu 2016)
Intelligence quotient	(Grinblatt, Keloharju and Linnainmaa 2011)
Optimism	(Puri and Robinson 2007)
Personality traits	(Conlin et al. 2015; Bucciol and Zarri 2017)
Political preference	(Kaustia and Torstila 2011)
Social interactions	(Hong, Kubik and Stein 2004; Bönte and Filipiak 2012)
Trust in financial markets	(Guiso, Sapienza and Zingales 2008; Georgarakos and Pasini 2011)

While SMP measures whether or not one invests in risky assets, it is also equally crucial to assess the proportion of risky assets (Sivaramakrishnan, Srivastava and Rastogi 2017). Reason being that by holding a low level of risky assets, one is unlikely to gain the advantages of investing in the stock market. Yet, when compared to the plethora of studies on participation in the stock market within the existing literature, there seems to be relatively less studies on the determinants of risky assets allocation. Moreover, some studies show that the factors affecting one's decision to participate in the stock market may not always be applicable to one's decision on the level of investment (Balloch, Nicolae and Philip 2014; Arrondel, Debbich and Savignac 2015; Pan, Wu and Zhang 2020), thereby further validating the need to also examine the

proportion of risky assets.

Prior studies indicate an association between health status and the proportion of risky assets (Rosen and Wu 2004; Cardak and Wilkins 2009; Fan and Zhao 2009; Atella, Brunetti and Maestas 2012), where poor health status prompts individuals to hold less risky portfolios and significantly reduce the allocation in risky assets. Studies also show that risky assets proportion is affected by factors such as home ownership (Heaton and Lucas 2000; Yamashita 2003; Beaubrun-Diant and Maury 2016; Chetty, Sándor and Szeidl 2017), financial literacy (Liao et al. 2017; Sivaramakrishnan, Srivastava and Rastogi 2017), and demographic factors such as age, income, education and net worth (Shum and Faig 2006; Cardak and Wilkins 2009). In addition, more recent studies demonstrate the influence of behavioural and psychological factors on individuals' allocation decision, including trust, self-confidence and time preference (Balloch, Nicolae and Philip 2014), perception of past portfolio, optimism and personal investment optimism (Khan, Tan and Chong 2017), financial well-being (Sivaramakrishnan, Srivastava and Rastogi 2017), and happiness (Rao, Mei and Zhu 2016), among others.

However, several gaps warrant additional investigation. First, though the determinants of risky assets investment are vast, it was not until recently that financial literacy is valued as important in influencing one's decision making in terms of risky assets investment (Liao et al. 2017). In fact, financial literacy is often cited by many scholars as the key predictor of risky assets investment ever since its emergence. In a study of portfolio allocation decisions in Australia, Cardak and Wilkins (2009) note that a unifying theme emerge from various of their empirical findings, which is the importance of financial awareness and knowledge in determining risky assets investment. In the same vein, Van Rooij, Lusardi, and Alessie (2011) reveal that financial literacy plays a pivotal role in understanding SMP, whereby households with low financial literacy are significantly less likely to hold risky assets. As Sivaramakrishnan, Srivastava, and Rastogi (2017) put it, financial literacy is one of the "strong recurrent predictors found in literature" among the large number of determinants influencing SMP (820). Likewise, Balloch, Nicolae, and Philip (2014) indicate that "stock market literacy remains a key characteristic for stock market

participation" even after accounting for sociability, trust and a large set of behavioural variables (1928). Despite these findings, the authors claim that the mechanism through which financial literacy affects stock ownership decisions is still unclear. As such, the link between financial literacy and risky assets investment still needs to be further examined.

In addition, financial literacy, though important, is deemed inadequate because intervention targeted specifically to enhance financial literacy often lead to mediocre outcome in changing financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Holzmann 2010; Hira 2012; Remmele and Seeber 2012; Fernandes, Lynch Jr and Netemeyer 2014). Despite the well-established connection between financial knowledge and financial behaviour (Hilgert, Hogarth and Beverly 2003), there are still inconsistencies between what individuals know and what they do. There are individuals who are well-aware and knowledgeable about the investment products and concepts yet they do not invest (Guiso and Jappelli 2005). In the context of health literacy, highly educated individuals still continue smoking, not wearing helmet when cycling or avoid health examinations even if they are well-informed of health-related knowledge (Greenberg 2001). That is to say, knowing is not enough as it may not necessarily translate into behaviour. Likewise, Tang and Baker (2016) shows that financial literacy is an important but inadequate driver for desirable financial behaviour. Also noted by Bay, Catasús, and Johed (2014), financial literacy does not naturally influence one's financial practices. Knowing about important investment concepts may not be sufficient for an adequate functioning of their investing behaviour. As such, this possibly points to a missing link between financial literacy (knowing) and risky assets behaviour (doing) in both the literature and practice. Failure to account for such factors alongside with financial literacy may be the main reason for ineffective intervention.

There are several studies that attempt to understand the shortcoming of current intervention programmes and the missing link between knowing and doing. Most revolves around the importance of psychological factors. For instance, Greenberg (2001) indicates a number of cognitive factors in predicting behaviour, such as self-efficacy, values and outcome expectations alongside with knowledge, as posited by

the social cognitive theory. He further adds that literacy and knowledge are still the core component to behavioural change and thus should not be ignored, yet it may not be adequate to stimulate behaviour change. In the same manner, Hira (2012) argues that most educational initiatives focusing on financial literacy do not sufficiently address the personal aspect including attitudes, personal values and beliefs. He further echoes the need for value-based education and "increased emphasis on personal values" in promoting sustainable financial behaviour. Some scholars even assert that psychological traits may be the key driver of financial behaviour rather than knowledge (Holzmann 2010). Drawing on a multitude of consumer behaviour literature, De Meza, Irlenbusch, and Reyniers (2008) argue that financial decision-making is more to do with psychological attributes rather than informational differences. They further conclude that financial programme targeted to educate should reap positive but modest impact. Likewise, the effects of financial literacy on financial behaviour diminish drastically upon controlling for psychological factors that have been neglected in prior studies (Fernandes, Lynch Jr and Netemeyer 2014). Kliger and Levy (2009) further validate the influence of investor psychology in security markets and call for the inclusion of behavioural variables. Taken together, these studies highlight the importance of psychological factors in linking knowing and doing in the area of personal finance. However, to date, there is a dearth of studies which consider these psychological traits simultaneously with financial literacy. Consequently, not much is known as to what extent these psychological traits and financial literacy interact when explaining risky assets investment.

In addition, most prior studies are not guided by a priori theoretical or conceptual grounding in understanding risky assets investment. A review of past literature in the area of financial decision-making by Danes and Yang (2014) reveals the absence of theoretical support as most studies (61% of them) based their studies on experimental evidence. Similarly, as noted by Kliger and Levy (2009), personal finance literature has mostly been empirical based, instead of explicitly guided by theoretical underpinning when explaining financial behaviour. Nonetheless, interventions based on theoretical grounding are shown to be more effective in promoting behaviours, than those without a clear theory (Glanz and Bishop 2010; Rothman, Klein and Cameron 2013; Klein et al. 2015; Kelly and Barker 2016; Sheeran, Klein and Rothman 2017;

Johnson and Acabchuk 2018; Michie et al. 2018). Although such empirical studies are vital for understanding the phenomenon of low SMP, they do not provide a clear framework to guide intervention targeted at increasing risky assets investment. Moreover, adopting a theory-based framework, whereby a set of core components are specified and validated as factors of behaviours, to explain investing can provide a more holistic understanding of low participation rate in risky assets, as well as a model for increasing investing behaviour (Glasford 2008). The importance of theories as the building block of empirical analyses is also emphasised by Hair et al. (2017c) and Ramayah et al. (2018).

Last but not least, most studies in the area of risky assets investment are conducted within the context of western, developed countries such as the US (Brown et al. 2008), Italy (Guiso and Jappelli 2008), the Netherlands (Van Rooij, Lusardi and Alessie 2011; Von Gaudecker 2015), Germany (Barasinska, Schäfer and Stephan 2012; León and Pfeifer 2017), Australia (Cardak and Wilkins 2009) and New Zealand (Zhang 2014) where the financial markets are well developed and sophisticated. Given the considerable differences in structural constraints, financial development histories and political backgrounds across countries (World Economic Forum 2016), the findings from these studies may not be generalisable to emerging countries such as Malaysia. Take the pension system for example, the mandatory retirement scheme in Malaysia, which is the EPF, is largely managed by government affiliated institutions. Different from most western countries, individuals in Malaysia do not manage the portfolio allocation of their retirement funds. Only until recently, EPF members with sufficient savings have the option and flexibility to transfer a small portion of their EPF savings for investment in mutual funds through Members Investment Scheme (MIS). The amount of savings that are allowed for investment is 30% of the amount in excess of the basic savings in EPF Account 1 (Employees' Provident Fund 2019b). Such arrangements constraint the allocation of investable wealth in risky assets.

Taken together, the above-mentioned gaps identified in the current literature form the focus of this study. To fill the noticeable literature gap in the understanding of factors affecting risky assets investment, this study attempts to develop a conceptual framework that incorporates financial literacy and other psychological factors such as

attitudes, self-efficacy and personal values as suggested by the literature, in the context of Malaysia.

3.3 Theoretical Considerations

This section is dedicated to discussing the choice of theories that are appropriate for this study. The first part presents conventional theory in the field of economics and finance, with emphasis on empirical regularities that indicate inconsistency with the classical theory. With that, it leads to the choice of behavioural economics where individuals' financial behaviour can be more accurately accounted for. A number of different behavioural models are reviewed, with the choice of theories being justified.

3.3.1 Conventional Theory

In the classical and neoclassical economics and finance theory, human is often referred to as *homo economicus*, or economic man, which portrays human as fully rational, well informed, not affected by emotions and are in an ideal environment that will allow them to make optimal decision (Fromlet 2001).

Being one of the important primitive theory for rational decision making under uncertainty, the expected utility theory developed by Von Neumann and Morgenstern (1947) accounts for how individuals should make rational decision without knowing the outcomes of the decision. As posited by the theory, individuals are assumed rational and risk adverse, whereby their choice prioritises the maximisation of expected utility, instead of maximisation of expected cash value. Moreover, another well-established conventional theory, Markowitz (1952)'s modern portfolio theory is widely used to determine the investment risk and return relationship in the capital markets, which also extends to individuals' asset allocation. This theory postulates that individuals' decision on whether to accept risks is solely based on risk aversion and investment returns. One can construct an optimal portfolio that is perfectly diversified with maximised expected return for a given level of risk and wealth maximisation is based on the final wealth position. These conventional theories, though focusing on different economic behaviours, are all evidently grounded in the concept of *homo economicus*.

Nevertheless, the growing empirical evidence of the discrepancies between traditional theories and individuals' actual behaviour cast serious doubt on the conventional paradigm. For instance, Cooper, Gulen, and Rau (2005) examine the influence of mutual fund name changes on the funds inflows. Findings indicate that the amendment of fund name to match a current popular investment strategy leads to an abnormal increment of inflow, even without improvement in fund performance. In contrary to conventional theories, the study portrays individuals' inability to act rationally as they are easily affected by cosmetic effects. Similarly, Elton, Gruber, and Busse (2004) assess investors' rational behaviour in choosing index funds. With identical investment strategies and different charges of index funds, the returns are easily predictable. Yet surprisingly, findings show otherwise as many investors opt for high charges funds that yield inferior performances, indicating that individuals fail to behave rationally even in a simple situation. Besides, individuals' irrational and biased investment behaviour are also validated by a great deal of past studies, including Kahneman and Tversky (1979), Thaler (1980)_ENREF_29, Campbell (2006), Guiso, Haliassos, and Jappelli (2002), Benartzi and Thaler (2002), Barber and Odean (2002), De Bondt, Mayoral, and Vallelado (2013), among others.

In short, it is evident that behaviours observed in reality, as demonstrated by these empirical studies, are frequently inconsistent with conventional theories. These theories fail to capture financial behaviour accurately because the ideal situation does not hold in real life (Barberis and Thaler 2003). Human is, in fact, incapable of behaving rationally in decision-making. This gap in conventional theories lead to the emergence of behavioural economics in the last decades (Thaler 2016).

3.3.2 Behavioural Theory

Behavioural economics is a subfield that studies how individuals and organisations make economic decisions (Goodwin et al. 2014) through the integration of findings from psychology and sociology into its theories (Glaser, Nöth and Weber 2004). Being an emerging field based on individuals' ingrained biases and irrationality in human judgement and decision-making (Kahneman et al. 1982), it refutes the notion of

conventional theory where individuals behave rationally and are fully informed (Wärneryd 2001; Akerlof and Shiller 2010; Altman 2012). As noted by Thaler (2016), the behavioural approach opens avenue for the development of better models of economic behaviour through assimilating insights from other social sciences disciplines.

From the perspective of behavioural economics, humans are prone to behavioural biases which affects their financial decisions from being fully rational (West 2012). Given the overloading of information, constraints in time, intellectual capacities and so-forth, individuals may not be equipped with sufficient information and knowledge (Goodwin et al. 2014). In addition, the environment in which financial decisions take place are often complicated and uncertain (Lieber and Skimmyhorn 2018). As a result, individuals tend to decide using rules of thumb and rely upon preferences and beliefs, which biased their financial investment decision (Sahi, Arora and Dhameja 2013). Some other commonly known biases include overconfidence, mental accounting, regret aversion, loss aversion, anchoring biases, representativeness bias, among others (Jain, Walia and Gupta 2019). These psychological biases challenge individuals' abilities of making optimal choice that maximises their utility or wealth. With various forms of biases sourced from different aspects of constraints, it is evident that individuals are incapable of behaving in the rational, efficient and unbiased way assumed by conventional finance models.

Similarly, individuals are subjected to the abovementioned biases when they invest (James 2002). In fact, the most direct evidence can be seen through the focus of this study – limited SMP (Haliassos and Bertaut 1995), which is one of the four puzzles in individuals' asset allocation, apart from under-diversification, poor trading performance, and investment in actively managed and costly mutual funds (Beshears et al. 2018). Conventional finance theory holds that individuals will engage in rational behaviour based on full information without constraints and emphasises mainly individuals' risk-taking preference. In the context of risky assets investment, the theory predicts that all individuals will participate in the risky financial market (Merton 1969) because such investment strategy gives superior returns and diversification benefits. That is, even household with low risk tolerance or wealth level should participate in

the stock market (Campbell 2006). Conventional theory also diminishes the role of financial education and information in enhancing financial behaviour because individuals are assumed fully rational and knowledgeable (Altman 2012). However, in reality, many households do not participate in risky assets market, which is a phenomenon known as SMP puzzle. This phenomenon suggests that individuals' investment behaviour in risky assets investment is not fully rational. Thus, as this study attempts to understand individuals' financial behaviour in investing, the behavioural approach is deemed appropriate.

Nonetheless, the theoretical framework for behavioural determinants of financial behaviours is not yet established. To date, there is a lack of complete and integrated theory of behavioural finance (Fromlet 2001) as research in this area are extensively empirical based. Also, behavioural finance theories are built upon individuals. Yet, it has been argued that the empirical studies in typical behavioural finance papers often lose sight of these individuals (Durand et al. 2013). Rather, they focus on the behaviour of the market as an aggregate and infers the determinants motivating the market participants (Durand et al. 2013). Overall, these studies call for the adoption of well-established behavioural theories that focuses on individual-level factors.

According to Thaler (2016), behavioural economic theory should be evidence-based theory where these evidences can be from psychology, other social sciences or even homemade. To recapitulate, behavioural economics, as defined earlier in this section, involves the assimilation of psychology and sociology into economics to understand economic decision. With that, it is highly relevant and potentially appropriate to incorporate social psychological theories in explaining financial behaviours such as risky assets investment. Moreover, the application of social psychological theories fulfils the need to refocus on individual-level predictors through well-established theoretical model in behavioural field. There are a number of social psychological theoretical conceptualisations that are developed by different theorists to explain, predict and understand the factors of various human behaviours. Some of these include Health Belief Model (Hochbaum 1958), Transtheoretical Model (Prochaska and Velicer 1997), Risk Reduction Model (Catania, Kegeles and Coates 1990), Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975), Theory of Planned Behaviour

(TPB) (Ajzen 1991), Social-Cognitive Theory (Bandura 1990), Information-Motivation-Behavioural Skills (IMB) model (Fisher and Fisher 1992), to name a few. Although these theories are formulated in context other than financial behaviour, the adoption of theories outside disciplines is recommended in cases where phenomena or observations are inexplicable with the existing theories in its own field (Shaw et al. 2018). In fact, there exists a need to more effectively incorporate psychological theories in understanding how personal financial behaviours are formed (Xiao 2008), so as to create a more holistic view on the determinants contributing to the financial outcomes (Farrell, Fry and Risse 2016).

Among these theories, the most influential and commonly used model for understanding financial behaviour is the TPB (Xiao 2015). Several studies apply TPB to examine a wide range of financial behaviour such as investment decision (East 1993), mortgage use (Bansal and Taylor 2002), credit counselling (Xiao and Wu 2008), and cash, credit and savings management (Shim et al. 2009; Xiao et al. 2011). Generally, past studies adopting TPB posits that individuals' financial behaviour is determined by their intention to engage in that targeted financial behaviour, and their intention to engage in financial behaviours are greatest when they feel positive towards performing the act, perceive support from their social environment and perceive low level of difficulties involved. However, one of the key variables, perceived self-control is deemed to have less predictive power than self-efficacy (Xiao 2015). More importantly, TPB as with most of the above-mentioned theories, does not include constructs relevant to knowledge or information in the model, except for the IMB model. The inclusion of financial information construct is particularly crucial as financial literacy has always been identified as the key predictor of financial behaviour in existing empirical studies.

These issues might be overcome by the IMB model. Generally, IMB model postulates that information, motivation and behavioural skills are influential on one's behaviour (Fisher and Fisher 2002). The conceptualisations of IMB model are based upon a critical review and combination of constructs in prior social psychological theories (Fisher, Fisher and Harman 2003). Conceptually, the IMB model shares similar elements with some of the theoretical models. For instance, attitude and social norm

are similar to those of TPB. On the other hand, IMB contains two distinctively unique elements to other theories, namely information and behavioural skills. The unique conceptualisation of IMB model eliminates the limitation of existing theories through the inclusion of self-efficacy as behavioural skills construct and inclusion of information as key construct of its model.

In fact, the conceptualisation of IMB model is initiated to address the shortcomings of prior theories in social and health psychology (Fisher and Fisher 1992). Some of these include the absence of specification of the relationship among constructs; lack of predictive validity in key constructs; lack of conceptual parsimony; absence of constructs central to understanding behaviour (Fisher, Fisher and Harman 2003). With that, the IMB model surpasses prior theories as it integrates the key strengths of several behaviour models and addresses their limitations with the inclusion of better constructs. The predictive adequacy of IMB model is further validated empirically. In comparison with TPB, IMB model frequently accounts for an equal or higher proportion of variance in explaining Human Immunodeficiency Viruses (HIV) preventive behaviours (Fisher and Fisher 2000). Similarly, it is found that IMB model explains voting behaviour, beyond and above TPB (Glasford 2008). The IMB model is widely adopted to examine a wide range of health and also non-health behaviours (Seacat and Northrup 2010; Bahrami and Zarani 2015; Nelson et al. 2018; Farooq, Jeske and Isoaho 2019; Fleary, Joseph and Chang 2020)

Taken together, the IMB model seems more appropriate for this study, as compared to other social psychological theories. It is a social psychological theory in behavioural field focusing on individual-level determinants and it includes information construct which is the major predictor of financial behaviour. Despite being well-established and highly relevant, IMB model is rarely tested in the context of financial behaviour, let alone risky assets investing behaviour. This leads to the final choice of IMB model as the guiding theoretical basis for this study where its suitability and applicability in understanding risky assets investment are assessed. Further details on IMB model are discussed in the following subsection.

3.3.3 Extending IMB Model with Personal Values

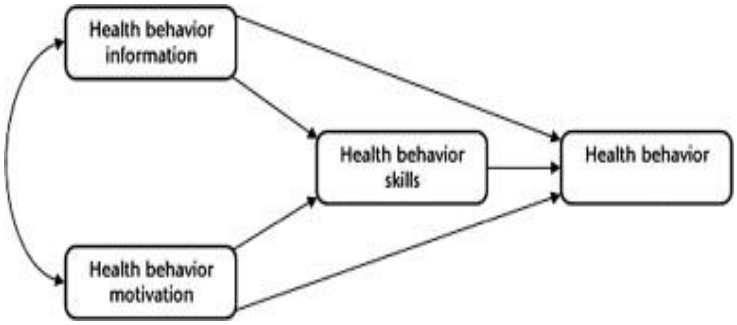
The IMB model is first developed by Fisher and Fisher (1992) to predict Acquired Immunodeficiency Syndrome (AIDS) preventive behaviour. As presented in Figure 3.1, it is based on the concept where behaviour is driven by three fundamental components, namely information, motivation and behavioural skills. The IMB model postulates that individuals are more likely to involve in a targeted behaviour when they have accurate and relevant information; personal motivation and social support for performing the act; and the behavioural skills required to confidently and effectively engage in the behaviour. Likewise, individuals with deficiencies in any of the aspect of information, motivation or behavioural skills may result in the disengagement of specific behaviour. In general, the IMB model predicts that informational and motivational factors will influence behavioural skills, which ultimately lead to engagement of behaviour. It further specifies the potential direct influence of information and motivation on behaviour in instances where complicated behavioural skills are not required in accomplishing the targeted behaviour (Fisher and Fisher 2002).

According to the IMB model, information relevant to the participation of a desired behaviour is a crucial determinant of consistent and correct performance of the behaviour (Fisher, Fisher and Harman 2003). The information component includes both accurate information that helps in facilitating the behaviour and inaccurate information (e.g. heuristics) that misinforms and hinders the behaviour. Though important, information alone is insufficient to facilitate a behaviour. In addition to information, the IMB model specifies motivation as the second prerequisite for promoting behaviour. Based on the model, motivation involves personal motivation and social motivation. Specifically, personal motivation involves one's attitude towards performing the behaviour, whereas social motivation involves one's perceived social support from their significant others concerning the behaviour.

Last but not least, the final critical component to engaging in a desired behaviour is behavioural skills. The IMB model identifies behavioural skills as the critical core determinants of whether well-informed and well-motivated individuals are capable of effectively engage in the targeted behaviour. The behavioural skills in IMB model

focuses on individuals' skills and self-efficacy in performing the given behaviour (Fisher and Fisher 1992). For complex behaviour, information and motivation works primarily through the activation of necessary behavioural skills to affect the targeted behaviour. That is, the influence of information and motivation are seen largely as a consequence of the presence of behavioural skills to initiation of behaviour. Without behavioural skills, individuals may not be able to engage in the targeted behaviour even if they are well-informed and highly motivated. In exceptional cases where complicated or novel behavioural skills are not needed, the model posits that information and motivation may exert direct influence on the behaviour (Fisher, Fisher and Harman 2003). It is also worth to note that the model regards information and motivation as independent constructs, wherein well-informed individuals are not necessarily motivated to participate in the behaviour and vice versa. These constructs should be highly specific and relevant to the behaviour of interest (Fisher and Fisher 1992; Fisher, Fisher and Harman 2003).

Figure 3.1 Original IMB Model



Source: Fisher and Fisher (2002)

The choice of IMB model in comparison to other social psychological theories is justified in previous subsection. In addition to that, the IMB model may be relevant and appropriate to the prediction of financial behaviour for several other reasons. First, desirable financial behaviour is similar to health behaviours in their conceptualisation. Desirable health behaviour is driven by both intrinsic and extrinsic motivation, which means the behaviour are beneficial at the personal and social-normative level, such as improving general state of health (personal benefit) and imposing less burden on family and medical system (social benefit) (Nisbet and Gick 2008). Similarly, in the context of this study, individuals engage in desirable financial behaviour with the

expectation of generating monetary rewards (personal benefit) and enhancing one's public recognition, social status, well-being of family as a whole and also to stimulate the economic growth (social benefit). Given these similarities, it is apparent that desirable financial behaviour is very similar to desirable health behaviour addressed by the IMB model. Recognising this commonality lead this study to choose IMB model in understanding the drivers of desirable financial behaviour.

Second, applying the IMB model from health and social psychology field in explaining financial behaviour may provide rich insights and novelty. According to Fisher and Fisher (1992), IMB model is a parsimonious, conceptually based and highly generalisable model, hence may also be extended to predict a diverse range of behaviours other than health behaviour. A broad range of behaviours are examined using the IMB model, with the majority of them targeting on health behaviours such as diabetes medication adherence (Nelson et al. 2018), HIV risk behaviour (Kalichman, Picciano and Roffman 2008), diabetes self-care (Osborn and Egede 2010), risky sexual behaviour (Bahrami and Zarani 2015), breast self-examination (Misovich et al. 2003), among others. Due to its high generalisability, the model is later utilised to also predict other non-health behaviour including security behaviour (Farooq, Jeske and Isoaho 2019), curbside recycling behaviour (Seacat and Northrup 2010), fruit and vegetable intake (Mita, Li and Goodell 2013; Fleary, Joseph and Chang 2020), voting behaviour (Glasford 2008), child sweetened beverage consumption (Goodell et al. 2012), sunlight exposure behaviour (Leung, Cheung and Chi 2015) and so-forth. As suggested by Crane et al. (2016), there is a high potential for theoretical contributions in drawing theory from outside discipline. Nevertheless, in spite of its generalisability and rich potential of contribution, there is a lack of research assessing the elements of IMB model in financial behaviour. Hence, more research needs to be done in attempt to bridge the theoretical gap.

Third, adopting the IMB model in a financial context may be useful for designing effective intervention strategies to encourage the financial behaviour at focus. The IMB model is initially developed not merely to understand the determinants of health behaviour, but more importantly to formulate interventions that targets at promoting health behaviour (Fisher and Fisher 1992). It conceptualises the social psychological

factors required for the promotion of behaviour and provides a general framework to guide the increment of the specific behaviour (Glasford 2008). As a result, the design of IMB model enables easy translation into intervention where the strategies are theoretically-based and empirically targeted (Fisher, Fisher and Harman 2003). Moreover, intervention strategies that are designed based on the IMB model are effective through successful promotion of a range of behaviours (Fisher and Fisher 2002; Fisher, Fisher and Harman 2003; Cornman et al. 2007). Yet, to date, no published financial behaviour intervention effort has adopted the IMB model in guiding the implementation. With this study, the model may serve as a blueprint for the financial services practitioners to effectively execute interventions targeted at encouraging investment in risky assets.

Lastly, the IMB model is appropriate to understand financial behaviour because it includes the key predictors that are claimed as being related to financial behaviour in prior literature, which is financial literacy. However, the components in IMB model are frequently dealt with in isolation with each other in the extant personal finance literature. To date, within the context of financial behaviour, only one existing study (Limbu 2017) is known to have assessed and confirmed the applicability of the IMB model in predicting credit card misuse behaviour among college students. As mentioned earlier, the key predictor for investing revolves around financial literacy in existing empirical studies (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017), yet studies also show how intervention focusing on financial literacy alone are not adequate to promote financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Holzmann 2010; Hira 2012; Remmele and Seeber 2012). In the same manner, the IMB model asserts that information is necessary but insufficient by itself. The model specifies behavioural skills as the core and central determinants for any complex behaviour. Irrefutably, financial decision-making is complicated and risky at the same time (Lim et al. 2018). These studies hint at the mediating effect of behavioural skills being the possible missing piece within the extant financial behaviour literature. This further justifies the need to explore the interrelationship between the IMB components, particularly the mediating effect of behavioural skills, in the context of financial behaviour.

Other than the lack of prior use in financial behaviour, another limitation of the IMB theoretical framework involves one of its key constructs, which is the motivation component. The conceptualisation of the motivational construct in the IMB model is based on two elements adopted from Fishbein and Ajzen (1975)'s theory of reasoned action (TRA), which includes individuals' attitude towards behaviour (representing personal motivation) and behaviour-related social norm (representing social motivation). According to Fisher and Fisher (1992), despite the vast array of factors that may potentially influence motivation, this approach is taken due to the absence of a unified conceptual framework on motivational determinants and that the adoption of a well-articulated social psychological conceptualisation from TRA can remedy the issue. However, in doing so, it may have overlooked another theory that fulfils its criteria of a good remedy: the commonly used and tested unifying theory of human motivation (Schwartz 2012) that also embraces both social and psychological perspective (Giménez and Tamajón 2019). Moreover, the existing elements in motivation constructs may not be sufficiently representative because attitude and social norm are rather different from motivation (Schwartz 2012). With respect to this, this study suggests an additional element to complement the attitude construct categorised under personal motivation: a more holistic and unifying concept of human motivations grounded in Schwartz (1992)'s theory of basic values from the social psychology field.

The theory of basic values is also known as theory of basic human values, theory of human motivation or motivational types of values (Schwartz 2012). According to Schwartz (1992), values are regarded as trans-situational goals which vary in importance and serve as guiding principles in the life of a person or group. This theory adopts the concept of values implicit by many theorists where six main features are identified (Schwartz 2012). First, values are beliefs that are linked to feelings. In situation where the values are activated, individuals become infused with feelings. Those for whom security is a significant value will be aroused if their security is threated, upset if they are incapable of protecting it and are happy if they are able to enjoy it. Second, values are regarded as desirable goals which motivate behaviour. One who has pleasure, enjoyable life and self-indulgent as important values will be

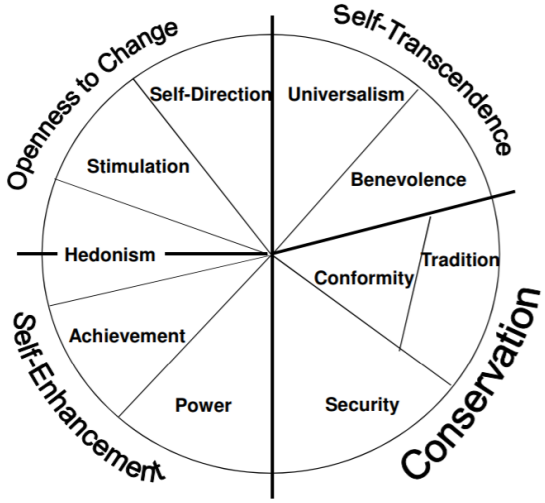
motivated in pursuing these goals. Third, values transcend specific situations, actions or objects. For instance, those who take honesty value as important, will act accordance to this value in workplace or school, in business or politics, with family or strangers. With that, value is distinguished from attitudes and norms which refer to a specific actions or objects. Fourthly, values serve as one's standards. Individuals evaluate actions, people or situations based on their values, whether it is good or bad, justified or illegitimate. The fifth feature is that values are ordered by importance in relative to one another. An ordered system of priorities is formed from one's values based on the importance of one value over another. Lastly, the relative importance of multiple values will ultimately guide behaviour. For instance, travelling solo may express hedonism and stimulation values, at the expense of tradition and conformity values. In situation where values are relevant to context, they will be activated and the trade-off among competing values will guide actions.

The theory of basic values identifies ten types of values reflecting distinct yet related motivational goals which form a continuum of related motivations in a circular framework (Schwartz 2012). As shown in Figure 3.2, the circumplex model distinguishes the values into two bipolar value dimensions that capture the congruity and conflicts among values. The first value dimension, Openness to change versus Conservation, captures the oppositions between openness to change (consist of self-direction and stimulation values) and conservation values (consist of security, conformity and tradition values). The second value dimension, Self-enhancement versus Self-transcendence, contrasts the self-enhancement (consist of power and achievements values) and self-transcendence values (consist of universalism and benevolence values). The 10^{th} basic value, hedonism, belong to both self-transcendence and conservation values (Gorgievski et al. 2018) because it shares the elements of both higher-order values (Schwartz 2003). Similar value types are nearer to each other, while contradicting value types are positioned at the opposite sides. As this study focuses on two-dimensional basic values, the refined version of this theory which includes 19 more narrowly defined, conceptually precise, discrete personal values (Schwartz et al. 2012) will not be discussed.

These values are distinguished from one another based upon the types of motivation it

expresses. That is, the ten values by this theory are defined according to the motivation that underlies each of them (Schwartz 2012). These values are universal as they are derived from the three basic requirements of human existence (Schwartz and Bilsky 1987) that applies to all individuals and societies, which include: (1) needs of individuals as biological organisms; (2) requisites of coordinated social interaction; and (3) survival and welfare needs of groups. While there are other values uniquely observed in different individuals, the values that are common and universal will be of greatest importance and influence among most individuals (Ralston, Russell and Egri 2018).

Figure 3.2 Theoretical Model of Theory of Basic Values



Source: Schwartz (2012)

Table 3.2 presents definition of the two-dimensional values with their motivational domains (Schwartz 2012; Giménez and Tamajón 2019). Generally, openness to change is characterised by independence, novelty-seeking and readiness for new experiences and challenges. It is important for those who value openness to change to be independent in action and thought, creative and free, and have a daring, exciting and enjoyable life. This is in contrary to conservation values, which focus on maintaining traditions, socially imposed expectations and security in society. As for self-enhancement, it emphasises having control over people and resources with desire for social status and prestige, as well as achieving personal success and life satisfaction. In contrast, self-transcendence values concerns being understanding and

tolerance, seeking for the welfare of others and the nature, and promote cooperative and supportive relationship. Overall, this study focuses on the two bipolar value dimensions, namely Openness to change versus Conservation dimension and Self-enhancement versus Self-transcendence dimension. Each value dimensions capture the conflicts between the two competing values (Schwartz 2012), thereby indicating individuals' relative preference for one value over the other value in the particular dimension. For instance, individuals with greater emphasis on conservation values over openness to change values are referred to as being more conservative for the Openness to change versus Conservation dimension.

Table 3.2 Definition of Two-dimensional Values with Motivational Domains

Two-dimensional Values	**Ten Basic Values with Motivational Goals**
Openness to change Definition: Controlling one's own impulses and behaviour, according to social norms and expectations.	**Self-Direction** Defining goal: independent thought and action--choosing, creating, exploring. **Stimulation** Defining goal: excitement, novelty, and challenge in life. **Hedonism*** Defining goal: pleasure or sensuous gratification for oneself.
Conservation Definition: Preserving stability and security in relations with one's surroundings, with the emphasis on subservient self-repression, the preservation of traditional practices and protecting stability.	**Security** Defining goal: safety, harmony, and stability of society, of relationships, and of self. **Conformity** Defining goal: restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.

	Tradition Defining goal: respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides.
Self-enhancement Definition: Promoting self-interest at the expense of others, emphasising the search for personal success and dominance over others.	**Achievement** Defining goal: personal success through demonstrating competence according to social standards.
	Power Defining goal: social status and prestige, control or dominance over people and resources.
	Hedonism* Defining goal: pleasure or sensuous gratification for oneself.
Self-transcendence Definition: Promoting the wellbeing of society and nature above one's own interests, highlighting the acceptance of others as equals, as well as a concern for their wellbeing.	**Benevolence** Defining goal: preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
	Universalism Defining goal: understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

*Hedonism value belongs to both self-transcendence and conservation value

Sources: Schwartz (2012), Giménez and Tamajón (2019)

The integration of theory of basic values with the IMB model to propose an extended

IMB model, is appropriate and rewarding for several reasons. First and foremost, as mentioned earlier, the IMB model adopted its motivation construct from TRA because there is an absence of a unified conceptual framework on motivational determinants during the time study was conducted (Schwartz 1992). In doing so, it seems to disregard the comprehensively elaborated, empirically grounded and widely used (Cieciuch, Schwartz and Vecchione 2013) "motivational theory" which is the theory of basic values. This theory, being referred to as unifying theory of human motivation (Schwartz 2012), are grounded in motivations. With that, it satisfies the need of IMB model which search for a unified framework that provides understanding on the determinants of motivation. Furthermore, the features wherein values transcend the specificity of situations and are ordered by importance, set values apart from attitudes and social norms (motivation construct from TRA) (Schwartz 2012). Hence, when including values as an additional component in the original motivation constructs, the concern of redundancy which may later lead to multicollinearity, will not be an issue.

Second, in line with the IMB model where motivation drives behaviour, these basic values are critical motivational drivers that affect behaviours (Schwartz 1992; Schwartz 2012). Generally, there is a need for individuals to align their behaviour with their thoughts and values (Bardi and Schwartz 2003). When a higher priority is placed on a value, individuals are more likely to formulate goals and action plans that eventually result in the expression of this value in behaviour (Gorgievski et al. 2018). As individual engage in behaviour that is consistent with their values, they experience it as rewarding and satisfying (Gorgievski et al. 2018). These highly prioritised values steer individuals to go in pursuit of value-relevant aspect of a situation (Schwartz, Sagiv and Boehnke 2000). Similarly, individuals are likely to disengage or avoid any actions that are contradicting to their values. Due to its universality that is appropriate for cross-cultural studies (Schwartz 1994), this theory has received growing attention from different fields such as consumer behaviour (De Boer, Hoogland and Boersema 2007; Botonaki and Mattas 2010; Kitsawad and Guinard 2014), environmental friendly behaviour (Thøgersen and Ölander 2002; Sharma and Jha 2017) or delinquent behaviour (Bilsky and Hermann 2016; Borg, Hermann and Bilsky 2017; Seddig and Davidov 2018), whereby the linkage between values and behaviours are further validated.

Third, the theory of basic values overlaps with the IMB model in several aspects. While findings of prior studies validate that values motivate behaviour, it is further suggested that the association between values and behaviours is, to some extent, obscured by social norms (Bardi and Schwartz 2003). This follows a similar line of argument with the IMB model wherein both personal and social factors are accounted for when explaining behaviour. In addition, recall that desirable health behaviour is guided by both intrinsic and extrinsic motivation (Nisbet and Gick 2008). By the same token, these values in the theory form primarily two polarities: one between the personal and social focuses; and another between intrinsic motivation and extrinsic motivations (Schwartz et al. 2012; Giménez and Tamajón 2019).

Lastly, the integration of these two theories may provide a better understanding and explanations on the low SMP phenomenon, as compared to before, which constitutes a theoretical contribution (Crane et al. 2016), particularly in the personal finance field. The comprehensiveness of this theory and its compatibility with the IMB model substantiates that the IMB model could be complemented by the theory of basic values to better explain behaviours than the original IMB model. This cross-disciplinary theory integration can be effective of making significant, novel and bold theoretical contribution (Shaw et al. 2018). Nevertheless, to date, no studies are framed from the combined perspective of both the IMB model and theory of basic values.

Taken together, the integration of IMB model with theory of basic values offer a holistic view on individuals' investment behaviour in risky assets. To summarise the theoretical consideration section, upon reviewing the risky assets investment literature, it is revealed that most previous studies are not guided by a priori theories about how each predictor might relate to the limited SMP phenomenon. In this situation, the application of theoretical perspective from matured disciplines with long-standing interest in conceptualising the behavioural elements in research is particularly useful. Given that, this study opts for the social psychological approach as theoretical underpinning of this study in understanding individuals' risky assets investment. Contrary to the tenets of classical theories, this study investigates individuals' investment behaviour through the integrated lens of IMB model and theory of basic

values. It extends the original IMB model by including theory of basic values as part of the motivation constructs.

Drawing on the integration of IMB model and theory of basic values, this study borrows theories from other social sciences beyond the economics and finance discipline to explain financial behaviour. The same limited SMP phenomenon, when viewed from a different angle through a combined theoretical lens, may generate new perspectives that are not known previously and enable better understanding than before. The findings of the study are expected to generate new insights and constitute a theoretical contribution in two ways: (1) to the theories - the adaptation of an extended IMB model so that it can be generalised to financial behaviour; and (2) to the personal finance literature - the components of IMB model and theory of basic values in explaining risky assets investment.

With that, the research hypotheses are formulated from the combined theoretical premises of both IMB model and theory of basic values. The application of the combined theoretical framework in this study is further discussed in the subsequent section.

3.4 Application of Extended IMB Model

In understanding the SMP phenomenon, this study employs the extended IMB model where the IMB model is combined with theory of basic values. Guided by the chosen theoretical framework, this study predicts that financial information, investment motivation and investment behavioural skills are the core determinants of individuals' risky assets investment. Particularly, when an individual is financially well-informed, motivated to invest and possesses the necessary behavioural skills to engage in risky assets investment, they are more likely to invest a higher amount in risky assets. More importantly, it is posited that investment behavioural skills act as a mediator for the relationship between financial information and risky assets investment, and also the relationship between investment motivation and risky assets investment, thereby positioning investment behavioural skills as the central of the study. The determinants of interest chosen for this study are a judicious mix of strong predictors and unexplored

variables based on theoretical and empirical groundings.

3.4.1 Financial Information

The IMB model postulates that informational factor is influential to the engagement of a behaviour at focus. Articulated to investment behaviour, the information component would include accurate information and knowledge about investing in risky assets. Following the IMB model, financial information is expected to be one of the key determinants of individuals' financial behaviour.

Generally, financial decision makers are incapable of acting rationally as they are restricted by the availability of complete information regarding the financial products. In the context of this study, such phenomenon is rather common as one may not be aware of the existence and features of all available financial assets in the market (Abreu and Mendes 2010). As a results, individuals invest only in assets they are familiar with (Grinblatt and Keloharju 2001; Kiymaz, Öztürkkal and Akkemik 2016) or assets which they have superior information about (Coval and Moskowitz 2001; Hau 2001).

Additionally, as mentioned in earlier section, individuals are prone to behavioural biases that deviate their financial decision-making from rational choices. As financial products in the financial market are increasing in number and complexity, financial decision making are becoming highly complicated and even more susceptible to behavioural biases (Sjöberg and Engelberg 2009; Sahi, Arora and Dhameja 2013). This is because individuals are not capable of analytically evaluating the overload of information, thus they rather depend on their preferences and beliefs, which eventually lead to biased decisions (James 2002). Although these biases cannot be entirely eliminated, prior research findings show that less biased decision-making are exhibited in individuals with higher financial literacy (Dhar and Zhu 2006) and financial market professionals (Kaustia, Alho and Puttonen 2008). That is, individuals who are less informed are more prone to experience behavioural biases that affect their financial decisions. When well-informed, investors are able to avoid harmful effects of these biases (Pompian 2012).

In brief, both insufficient access to complete and relevant information, and human's inability to assimilate information provided lead to issue of asymmetric information (Clifton, Fernández-Gutiérrez and García-Olalla 2017). Therefore, in this study, financial information is represented by two variables, which are (1) financial literacy; and (2) advice-seeking. The two variables involve two different types of information search, wherein financial literacy is a form of internal information search and advice-seeking is considered as an external information search (Fan and Swarn 2020). In accordance with the IMB model, this study proposes that individuals with a higher level of financial literacy or those who consult financial advisors for financial advice are more well-informed and financially competent, thus are more likely to make sound financial decisions and engage in risky assets investment. The subsequent sections provide the discussions on the two informational factors.

3.4.1.1 Financial Literacy

In the extant literature, the term financial literacy, is variably defined. Several definitions of financial literacy are proposed in past studies but none is universally accepted (Hung, Parker and Yoong 2009; Huston 2010; Remund 2010). Indeed, its very definition (Faulkner 2015) and also its relation to, or distinction from other similar terms such as financial knowledge or financial education (Abdullah and Chong 2014) are still debatable and seemingly confusing, considering the similarities between them. A majority of prior studies use these terms interchangeably or even fail to provide definition for the concept (Huston 2010). Despite many attempts by different scholars and practitioners to define financial literacy, there is no consensus definition for the term. Likewise, there seems to be no common ground for the operationalisation and measurement of financial literacy.

The President's Advisory Council on Financial Literacy, also known as Jump$tart Coalition for Personal Financial Literacy to some, define financial literacy as "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being" (President's Advisory Council on Financial Literacy (PACFL) 2008, 7), wherein this definition is later adopted by the US government (Huston 2010). Meanwhile, in Canada, financial literacy represents "having the

knowledge, skills and confidence to make responsible financial decisions" (Task Force on Financial Literacy 2011, 4). On the other hand, the OECD defines the term as "knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve financial well-being of individuals and society, and to enable participation in economic life" (Organization for Economic Co-operation and Development (OECD) 2017b, 87). Still others, such as Lusardi and Mitchell (2014) define financial literacy as people's ability to process economic information and make informed personal financial decisions. From the multitude of definitions, it is apparent that the existing financial literacy definitions encompass varying elements, such as knowledge, skills and confidence.

Following that, a few studies have attempted to examine the commonality among existing definitions and explicate the concept of financial literacy through detailed review of related literature. Based upon a review of studies from 2000 to 2010, Remund (2010) proposes that "financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions" (285). Likewise, Huston (2010), after reviewing 71 studies on financial literacy, conceptualises financial literacy as having two different dimensions, namely understanding and use of financial information. With that, she further concludes that financial literacy could be defined as how well one can understand and use personal finance-related information. Following the literature review, this study adopts the view of Huston (2010) to define financial literacy as financial knowledge (understanding) and the application of financial knowledge (use). Reason being that this definition is not in contradiction to existing financial literacy definition in the literature and is generally in consonant with standardised literacy constructs (Huston 2010). This definition is also adopted by Jia et al. (2019) in studying portfolio choice. Altman (2012) similarly deduces that financial literacy is the knowledge and skills set that enable individuals to make effective financial decisions. More importantly, it aligns with the key tenets within IMB model that information concept involve accurate information which is directly relevant to targeted behaviour and can be readily

translated into the performance of the behaviour (Fisher et al. 2006).

With the rapid growth of new and complicated financial products, including savings, investment, retirement funds, credit card, loans, and insurance, individuals are increasingly thrusted with the responsibilities to make important financial decisions. Nonetheless, prior studies indicate that financial illiteracy is widespread in both developed and emerging countries alike. Using data from the US, Lusardi and Mitchell (2011a) show that majority of the respondents lack of basic financial knowledge whereby most cannot perform simple interest-rate calculations and are unfamiliar with the concepts of inflation and risk diversification. Moreover, Lusardi (2015) also documents low level of advanced financial literacy involving more complicated financial concepts such as bonds, stocks and mutual funds. Similarly in the UK, financial capability baseline survey indicates that 40% of those with stocks and shares are unaware of their exposure to the stock market risk, 70% make no provision for sudden drop in income and are generally poor at financial planning (Financial Services Authority 2006). Findings of widespread low financial literacy are also documented in studies from other countries including emerging countries such as the OECD or OECD-partner countries, European countries, Russia, Australia and Japan (Bucher-Koenen and Lusardi 2011; Klapper and Panos 2011; Lusardi and Mitchell 2011b; Atkinson and Messy 2012; Bumcrot, Lin and Lusardi 2013). Additionally, some studies further discover a lower level of financial literacy in emerging markets as compared to developed countries (Cole, Sampson and Zia 2011; Klapper and Panos 2011; Beckmann 2013).

Likewise, several studies also investigate the financial literacy level in Malaysia. Counterintuitively, findings from majority of the studies indicate a moderate literacy level. Ali, Rahman, and Bakar (2015), in a study of working adults attending a financial programme, report a moderately high basic financial literacy level at 66.7%. In the same manner, Janor et al. (2016) record an average score of 51% and similarly, Atkinson and Messy (2012) also report 51% of knowledge score in a pilot survey by OECD, both indicating moderate level of basic financial literacy in Malaysia. Several other studies further assess advanced financial concepts covering knowledge on investment products and financial market. With sample comprising young employees,

Sabri and Zakaria (2015) indicate that a high percentage of respondents (64%) score a moderate level of financial literacy. The finding is similar with Khan, Tan, and Gan (2019) and Boon, Yee, and Ting (2011) which report a medium level of financial literacy, respectively. Still others, such as Loke (2015), Boon, Yee, and Ting (2011) and Kimiyaghalam and Yap (2017) further claim that individuals generally show a lower level of advanced financial literacy as compared to basic financial literacy. Particularly for advanced financial concepts, prior research findings reveal that many of the respondents do not possess adequate understanding on risks and investment (Mokhtar et al. 2018) and are relatively weak in knowledge relating to investments and financial market (Loke 2015), function of bonds and stocks and diversification (Kimiyaghalam and Yap 2017). In contrasts, there are relatively few studies that document low financial literacy score in Malaysia (Ibrahim, Harun and Isa 2010; Sabri and MacDonald 2010; Yew et al. 2017).

While the above-mentioned body of research mostly indicates a moderate level of financial literacy in Malaysia, it is note-worthy that these studies differ in the measures of financial literacy, hence comparison between results should be taken with cautious interpretations. Furthermore, these existing studies only target on specific groups of the Malaysian population such as college students (Ibrahim, Harun and Isa 2010; Sabri and MacDonald 2010; Yew et al. 2017), government officers (Tan and Singaravelloo 2019), women civil servants (Sabri and Juen 2014), young employees (Idris, Krishnan and Azmi 2013; Sabri and Zakaria 2015), Gen Y (Khan, Tan and Gan 2019); are mostly conducted in Peninsular Malaysia only, including center zone of Peninsular Malaysia (Sabri and Zakaria 2015), Klang Valley (Boon, Yee and Ting 2011; Loke 2015; Kimiyaghalam and Yap 2017), Penang (Loke 2015); and only consider basic financial concepts where knowledge on investment products such as stocks and bonds are disregarded (Ali, Rahman and Bakar 2015; Janor et al. 2016). As the study by Ali, Rahman, and Bakar (2015) covers both West and East Malaysia, it does not explore advanced financial literacy. Whereas another study by Khan, Tan, and Gan (2019) covers advanced knowledge relating to investment, yet the sample only includes Gen Y. From the plethora of studies available, it appears that research on basic and advanced financial literacy among general population covering both West and East Malaysia are largely missing. Hence, this study gauging both basic and advanced

financial literacy, targeting population from both West and East Malaysia is expected to fill the existing gap and provide more comprehensive insight into the financial literacy level in Malaysia.

3.4.1.2 Advice-seeking

Another alternate way of dealing with complex financial products is to delegate the decision to professional financial advisors. As defined by Cruciani (2017), financial advisor is characterised by someone who offers professional advice pertaining to financial matters to individuals, in exchange for a specified remuneration. By professional, it means that financial advisors are licensed through fulfilling specific qualification requirements and obligations that are regulated (Cruciani 2017), thereby authorising them to provide advice and sell financial products. Generally, financial advisors work within controlled licensees such multi-business financial institutions, banks, insurance companies (Taylor 2017) to advise individuals on financial concepts and products. The extent to which individuals demand for advice determines the influence of financial advisors exerts on individuals' financial decisions. In particular, individuals who rely on financial advice can choose to consult financial advisors before they make decisions, or to delegate all of their decisions to their financial advisors (Stolper 2018), both at an affordable fee.

With the growing array of advanced and complicated financial products, the role of financial advisors in providing professional and comprehensive financial information has become increasingly vital. While individuals who are less financially literate may rely on financial advisors as substitution for autonomous investment, financial sophisticated individuals may seek advice as another information source before they make decisions (Stolper 2018). Additionally, prior studies show that seeking advice from financial advisors is advantageous towards investment portfolio. Particularly, individuals who rely on professionals for financial advice often achieve reasonable investment outcomes (Von Gaudecker 2015), exhibit less disposition effect bias (Shapira and Venezia 2001) and have portfolio that are better diversified with less idiosyncratic risk (Kramer 2012). Given the great relevance of financial advice for financial behaviour and outcome, there is a growing interest to consider the use of financial advisors as part of the interventions to effectively disseminate financial

information.

Despite emerging literature revolving the influence of advice-seeking, several gaps are identified. To date, the empirical evidence as to whether financial advice is able to substitute for financial literacy remains inconclusive. For financial advice to serve as a substitute for financial literacy, the condition must first be fulfilled that individuals who are less financially literate must seek advice from professional financial advisors. Since low financial literacy individuals face more difficulty in comprehending complicated financial products (Hung and Yoong 2010), seeking financial advice may help alleviate the issue rather than acquiring financial literacy. However, as highlighted by Stolper and Walter (2017), the relationship between financial literacy and financial advice is hitherto inconsistent and ambiguous.

Some studies clearly point towards a substitutability of financial literacy and financial advice. For instance, Disney, Gathergood, and Weber (2015) investigate the demand of financial advice in terms of credit counselling by the indebted individuals in the UK and report that advice serves as a good substitute for financial literacy. Likewise, Hung and Yoong (2010) support the view of substitutability as they document that individuals with lower financial literacy level are more likely to approach financial advisors in the US. These findings are reaffirmed by Chalmers and Reuter (2012) who show that younger, lower educational level and lower income university employees are more likely to seek financial advice on retirement planning. That is, those who are economically vulnerable and financially disadvantaged due to a lack of financial knowledge are more likely to demand for financial advice. Hence, the empirical evidence supports that financial advice and financial literacy are substitutes.

On the other hand, various other studies find contradictory evidence and argue about the complementary relationship between the two constructs instead. Calcagno and Monticone (2015) claim that individuals with lower financial literacy are less likely to seek financial advice, arguing that financial advisors cannot substitute the role of financial literacy in financial decision making. Often, people who choose to obtain advice are among the most financially competent (Bhattacharya et al. 2012) or investment competent individuals (Bachmann and Hens 2015) and older, wealthier,

more experienced individuals, instead of poorer and uninformed ones (Hackethal, Haliassos and Jappelli 2012). In the same vein, studies show that households with low financial literacy tend to rely on informal source of information such as family and friends, whereas households with higher financial literacy are more likely to seek information from professional financial advisors in both retirement planning (Lusardi and Mitchell 2011a) and SMP (Van Rooij, Lusardi and Alessie 2011). Furthermore, not only the less informed individuals receive less financial information from advisor as compared to those who are more experienced (Bucher-Koenen and Lusardi 2011; Calcagno and Monticone 2015), it seems that they are also relatively undervaluing financial advice (Chauhan and Dey 2020). As noted by Pan, Wu, and Zhang (2020), the influence of financial advice is concentrated on those with higher financial literacy, thereby suggesting that those lacking financial literacy are unable to comprehend financial advice. Similarly, drawing on the data from 2009 FINRA Financial Capability Survey in the US, Collins (2012) argues that professional advice is more of a complement to financial competency instead of a substitute. To sum up, financial advice does not reach those who need it the most, thus refuting its role as a financial literacy substitute. Meanwhile, Kramer (2012) find no relationship between financial literacy and advice seeking.

In addition to the inconclusive findings, existing research on financial advisors and their influence are mainly based upon data from developed countries including the US, the UK., New Zealand, Germany, the Netherlands, Italy or the European region. Different from the well-established financial markets in developed or western countries, the advisory system of financial industry in emerging countries are less sophisticated and relatively new (Chu et al. 2017). As such, these findings may not generalise in the context of Asian developing countries including Malaysia.

Collectively speaking, prior literature yields inconclusive findings and mostly focuses on developing markets, which warrant further investigation. The question on the adequacy for one to seek financial advice rather than enhance own financial literacy remains open. By filling the abovementioned identified gaps, this study may contribute to the literature on the substitutability versus the complementarity of financial literacy and financial advice. More importantly, in the context of policy making, it is less

resource-intensive and time-consuming to increase financial advice as compared to enhance financial literacy nationwide (Pan, Wu and Zhang 2020). The intervention effort should focus on supplying quality and affordable financial advice if financial advice can in itself increase stock market participation (Pan, Wu and Zhang 2020). Besides, this study may supplement the existing literature by providing evidence from a developing country, while at the same time revealing the current state of Malaysia's advisory industry.

3.4.2 Investment Motivation

Other than information, the IMB model also asserts that one must be highly motivated to initiate and maintain health behaviours (Fisher and Fisher 1992). Motivation, as framed by the IMB model, comprises two forms: personal and social with both levels of motivation being driven differently. In relative to the personal motivation, it is based upon individuals' perspective that the behaviour will lead to outcome that is beneficial and rewarding to oneself. As for social level, motivation is based on: (1) individuals' perception that their significant others are supportive towards investing in risky assets; (2) perception of what their significant others do regarding risky assets investment; and (3) individuals' motivation to behave in accordance to them.

In the context of this study, personal motivation is conceptualised by attitude towards investing and personal values. Specifically, an individual's personal motivation to invest in risky assets is determined by their feelings on whether investing in risky assets is beneficial and by their personal values that influences how they value risky assets investment. On the other hand, at the social level, social norm acts as crucial motivation to facilitate the engagement in investing behaviour. Social motivation is based on individuals' perception of risky assets investment by their significant others, perception of what their significant others think should be done regarding risky assets investment and individuals' motivation to behave in accordance to them.

To sum up, in this study, investment motivation consists of three variables, which are (1) attitude towards investing; (2) personal values; and (3) social norm. Based upon the extended IMB model, individuals tend to have higher motivation to invest in risky

assets as their attitude towards investing in risky assets becomes more positive, are equipped with higher value priorities associated with investing and their significant others provide greater social support for investing in these assets. Consequently, they are more likely to participate and invest a higher amount in risky assets investment. An introduction of the three variables are provided in the subsequent sections.

3.4.2.1 Attitude Towards Investing

The conceptualisation of the motivational construct in the IMB model is based upon two elements adopted from Fishbein and Ajzen (1975)'s theory of reasoned action (TRA), which includes individuals' attitude towards behaviour (representing personal motivation) and behaviour-related social norm (representing social motivation). Fishbein and Ajzen (1975) initially classify attitude into two components namely attitude towards the object and attitude towards specific behaviour. The construct of attitude was later included in the TPB where it refers only to attitude towards the behaviour, instead of attitude towards the object (Ajzen 1991; Yuzhanin and Fisher 2016). Similarly, as the IMB model was first introduced, attitude refers only to one's attitude towards performing the act in question. Hence, rather than assessing attitude towards risky assets (object), this study focuses only on attitude towards investing in risky assets (behaviour).

Specifically, attitude towards the behaviour is defined as the perceived consequences of performing the behaviour and the subjective evaluation of the consequences (Fishbein and Ajzen 1975). It is the extent to which one has a favourable or unfavourable evaluation or appraisal of the targeted behaviour (Ajzen 1991). Likewise, from an IMB model perspective, Fisher, Fisher, and Harman (2003) states that attitude towards behaviour is based upon one's perceptions of the outcome of behaviour and evaluations of such outcomes. Positive attitudes are formed as individuals positively evaluates salient attributes related to the behaviour under investigation (Ajzen 1991). Articulated to the context of this study, attitude towards investing in risky assets refers to one's perceptions of the outcome of investing in risky assets (e.g. investing in risky assets would improve my wealth) and one's evaluation of these outcome (e.g. wealth accumulation is important to me).

3.4.2.2 Personal Values

The theory of basic values is also known as theory of basic human values, theory of human motivation or motivational types of values (Schwartz 2012). Values, as defined by Schwartz (1992), are concepts pertaining to desirable, trans-situational goals, varying in importance, that serve as guiding principles of actions or behaviour, in the life of a person or other social entities. This study focuses on the two-dimensional structure of personal values, which are Openness to change versus Conservation and Self-enhancement versus Self-transcendence dimension. A detailed discussion of the theory of basic values and definitions of each values are provided in Section 3.3.3.

As mentioned earlier, this study includes personal values in the original IMB model as an additional component to the motivation construct. According to Schwartz, Sagiv, and Boehnke (2000), these highly prioritised values steer individuals to go in pursuit of value-relevant aspect of a situation (Schwartz, Sagiv and Boehnke 2000). In other words, individuals are likely to engage in behaviour that aligns their values and avoid any actions contradicting to their values in situation where the values are relevant (Schwartz 2012).

Although there also exists a number of different concepts in assessing individual-level values, such as the Rokeach's values model (Rokeach 1973), basic values of the Chinese (East Asian) culture (Chinese Culture Connection 1987), Schwartz's basic values (Schwartz 1992) and functional theory of human values (Gouveia, Milfont and Guerra 2014b), the Schwartz's values model is deemed as the theory on values that is most comprehensively elaborated, empirically grounded and widely used (Cieciuch, Schwartz and Vecchione 2013) by a large number of studies across different societies (Ralston, Russell and Egri 2018). Notwithstanding the differences between these concepts, there is a unanimous consensus that values guide individuals' behaviour and actions (Rokeach 1973; Schwartz 1992; Gouveia, Milfont and Guerra 2014b).

3.4.2.3 Social Norm

Social norm is the perception of social pressures or social support to perform or not to perform a behaviour (Ajzen 1991; Fisher and Fisher 1992). It is what individuals in some group perceive to be normal in their social group, that is, believed to be either a

typical behaviour, an appropriate behaviour, or both (Paluck and Ball 2010). It may influence and force one to perform a certain behaviour because most of those in the social group of the individual engage in that behaviour and one may feel isolated or belittled for not doing so. The influence of the social environment is greater in situation whereby the participation of a specific behaviour leads to rewards or punishment by the given significant others of the individual (Fishbein and Ajzen 1975). Significant others, also known as referent to some researchers, are the group of people whose opinion and expectation matters to the individual, those to whom the individual refers to (Mackie et al. 2015).

The same conceptualisation is also employed by well-known theories including TRA, theory of planned behaviour (TPB), reasoned action approach (RAA) and extended technology acceptance model (TAM2). As IMB model adopts the social norm construct from TRA, the conceptual definition follows that of referred by the TRA. It is posited that individuals' motivation is influenced by perceived normative support from significant others such as family and friends for performing such acts (normative belief), and individuals' motivation to comply with such referents (motivation to comply) (Fisher and Fisher 1992).

However, Fishbein and Ajzen (2011) recently claim that the initial conceptualisation of normative belief represents only one source of social pressure. In contrast with the previous formulation of normative belief, which refers only to injunctive norms, they introduce an additional component: the descriptive norms. In particular, injunctive norm refers to the perception of what important others would approve or disapprove in regard to the behaviour, while descriptive norm is the perception that important others are or are not performing the behaviour (Fishbein and Ajzen 2011; Ajzen 2015). With the addition of descriptive norm, the construct accounts for the total social pressure one experience when engaging in the targeted behaviour. This definition is similar with the work by Cialdini and colleagues (Cialdini, Reno and Kallgren 1990; Cialdini et al. 2006; Goldstein, Cialdini and Griskevicius 2008), who also refer social norm as individual's belief about what others in one's group do (descriptive norms) and what they approve or disapprove (injunctive norms).

Taken together, this study defines social norm to invest as individuals' perception of social support to invest in risky assets. Guided by the latest concept of social norm by Fishbein and Ajzen (2011), the current study operationalises social norm as encompassing three main elements: (1) individuals' perception that their significant others are supportive towards investing in risky assets; (2) perception of what their significant others do regarding risky assets investment; and (3) individuals' motivation to behave in accordance to them.

3.4.3 Investment Behavioural Skills

Other than information and motivation, the IMB model posits that behavioural skills are influential to the performance of targeted behaviour. Articulated to the context of investing, behavioural skills for the engagement of risky assets investment are an additional critical determinant of whether well-informed and well-motivated individuals will invest in risky assets. Within the existing IMB model literature, behavioural skills component is most frequently represented by one's sense of self-efficacy pertaining to the performance of targeted behaviour (Glasford 2008; Bazargan et al. 2010; Senn et al. 2010; Fisher 2011; Zhang et al. 2011; Fisher 2012; Eggers et al. 2014; Pitpitan et al. 2015; John, Walsh and Weinhardt 2017; Limbu 2017). As guided by the model and empirical studies, the construct of behavioural skills is thus represented by financial self-efficacy (FSE) in this study. The subsequent section provides an introduction on FSE.

3.4.3.1 Financial Self-efficacy

Self-efficacy, in general, is defined as individuals' beliefs in their capability to accomplish a given task required for achieving a goal (Bandura 1997). That is, one's perceived ability to perform a particular behaviour. It is related to one's personal control over the behaviour which dictates if a person focuses on potential failure instead of success (Bandura and Wood 1989). As such, the perception of self-efficacy is crucial in determining how an individual approaches challenge. As noted by Bandura (1997), those with higher level of self-efficacy are more likely to accept rather than avoid challenges. They tend to engage in that behaviour, have greater goal-setting, cope with adversity, resilient in the face of barriers, recover from setbacks,

demonstrate a positive valuation of the duty at hand and be less susceptible to negative psychological consequences such as stress, anxiety, depression induced by negative events (Bandura 2001).

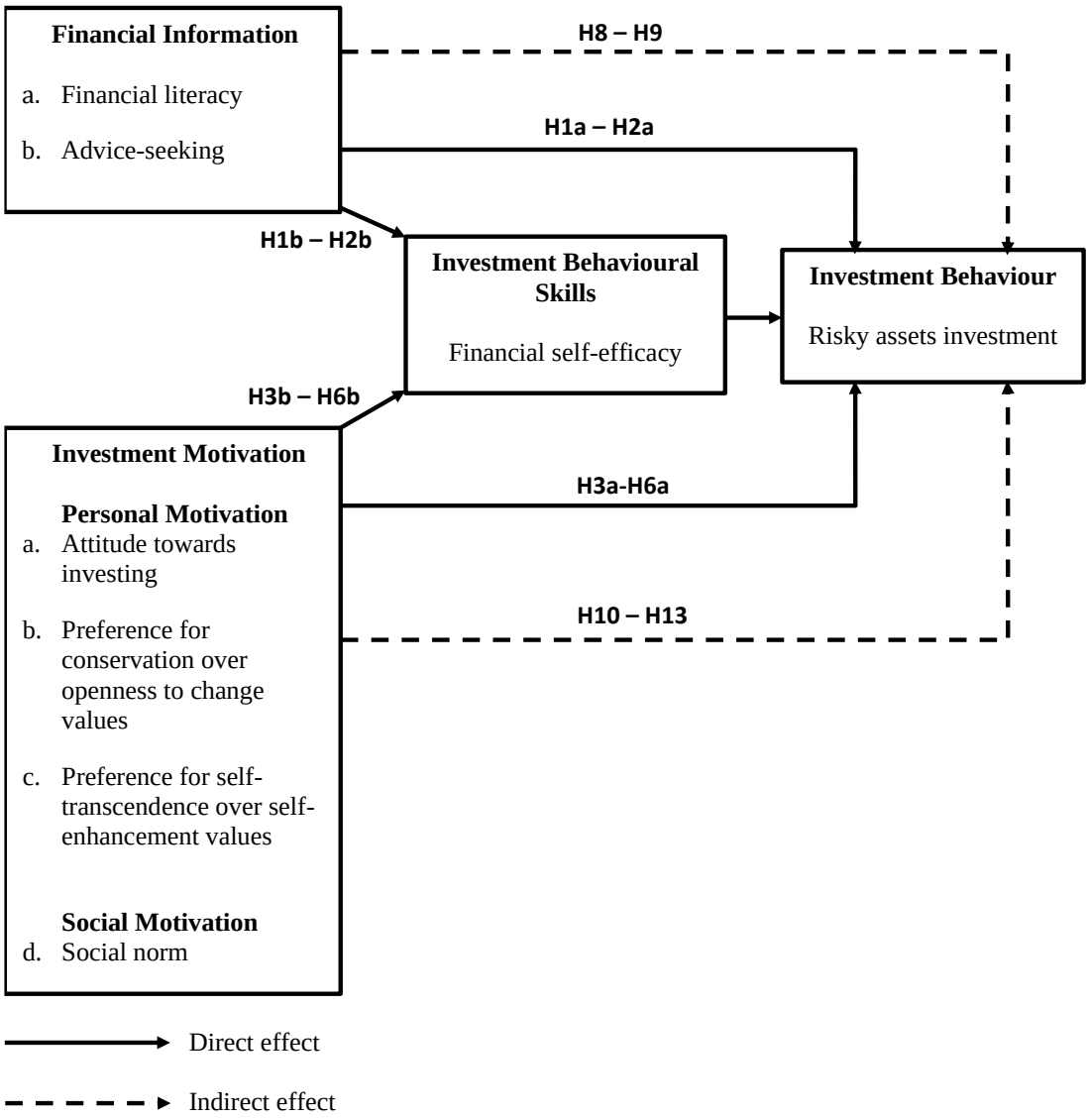
Self-efficacy can be exhibited through distinct and diverse range of behaviours. Yet, it is not a global trait because it differs across distinct domains of functioning (Bandura 2006). For instance, one may have a high computer self-efficacy but low cooking self-efficacy. For these reasons, individuals' perception of particular abilities needs to be assessed separately from other abilities' perception. The concept of self-efficacy in the domain of personal finance is relatively new. Most frequently referred to as financial self-efficacy (FSE), it is defined as the belief in one's capability in achieving one's ultimate financial goals (Forbes and Kara 2010). In the same vein, some scholars refer FSE as "individual's sense of their capacity to successfully manage their finances and accomplish their financial goals" (Farrell, Fry and Risse 2016, 86) or the "confidence that individual financial consumers require to use the formal financial services available to them to make their lives better" (Mindra et al. 2017, 339). Individuals with higher FSE perceive themselves as capable of controlling and managing their financial situation, regardless of their actual control over their finances in reality (Asebedo and Payne 2019). Based upon the literature reviewed, this study defines FSE in risky assets investment as individuals' beliefs in their capability to invest in risky assets for achieving their financial goals.

3.5 Conceptual Framework

Figure 3.3 presents the conceptual framework developed and examined in this study. It depicts the proposed relationship among financial information, investment motivation, investment behavioural skills and risky assets investment. As shown, risky assets investment is influenced by financial information, investment motivation and investment behavioural skills. Additionally, investment behavioural skills are influenced by financial information and investment motivation; while investment behavioural skills mediate the influences of financial information and investment motivation on risky assets investment. The relationships between variables in the conceptual framework are proposed based on: (1) theoretical grounding through the

integration of IMB model and theory of basic values as discussed in the previous section; and (2) the empirical evidence which are presented in the subsequent sections.

Figure 3.3 Conceptual Framework



3.6 Hypotheses Development

The main focus of this study is to examine the determinants of risky assets investment. The variables of this study are selected based upon the constructs in the extended IMB model. The hypotheses are framed from the combined perspective of both IMB model and theory of basic values, and formulated based on the interrelationship of the

constructs postulated by the model. In addition to theoretical support, this study also considers prior empirical studies to tailor the hypotheses to the financial context. To establish justification for the proposed relationships, the following sections review the theoretical and empirical evidence relevant to informational, motivational and behavioural skills as the potential determinants of risky assets investment. Nonetheless, in aspects where there is a lack of past studies, reference will also be made to evidence from reviews on other desirable human behaviours, given the similarities between these desirable behaviours in general. This section first establishes the potential direct relationship between all the variables (13 hypotheses), followed by the indirect (mediating) effect of FSE (6 hypotheses).

3.6.1 Financial Information on Risky Assets (H1a-H2a)

The IMB model provides support for the positive relationship between financial literacy and risky assets investment. Specifically, the model posits that information relevant to the participation of a targeted behaviour is influential to the consistent performance of such behaviour (Fisher and Fisher 1992). In the same manner, this study proposes, in accordance with the IMB model, that higher level of financial literacy leads to higher risky assets investment. That is, the degree to which one understands and uses personal finance-related information can exert a positive influence on the proportion of his/her risky assets investment. When individuals are equipped with sufficient knowledge and information regarding the financial market, they are capable of making rational assets allocation decisions to which eventually expand their short term and long-term wealth (Hamada, Sherris and Van der Hoek 2006).

Besides theoretical justification, empirical studies also support the relationship between financial literacy and risky assets investment. A great deal of studies examines the influence of financial literacy on financial behaviour. In particular, financial literacy has been linked to desirable financial behaviour, for instance, the use of sophisticated financial products (Grohmann 2018), participation in insurance (Lin, Hsiao and Yeh 2017), participation in derivatives market (Hsiao and Tsai 2018), better retirement planning (Lusardi and Mitchell 2007; Bucher-Koenen and Lusardi 2011;

Lusardi and Mitchell 2011a; Agnew, Bateman and Thorp 2013; Boisclair, Lusardi and Michaud 2017), better savings account returns (Deuflhard, Georgarakos and Inderst 2018), wealth accumulation (Jappelli and Padula 2013), financial well-being (Xue et al. 2019), better debt management (Lusardi and Tufano 2015), among others. By the same token, studies focusing on emerging countries also demonstrate a positive relationship between financial literacy and financial behaviour, such as increased savings (Mahdzan and Tabiani 2013), better retirement planning (Klapper and Panos 2011; Yoong, See and Baronovich 2012; Tan and Singaravelloo 2019; Niu, Zhou and Gan 2020), use of financial services and products (Cole, Sampson and Zia 2011), positive investment decision (Janor et al. 2016), better financial planning (Boon, Yee and Ting 2011; Agarwal et al. 2015; Ali, Rahman and Bakar 2015), reduced financial distress (Idris, Krishnan and Azmi 2013), greater financial well-being (Sabri 2011) and greater use of formal sources of borrowing (Klapper, Lusardi and Panos 2013).

Likewise, a substantial body of empirical research on the relationship between financial literacy and asset allocation in different countries show similar results. Hilgert, Hogarth, and Beverly (2003) demonstrate that higher financial literacy is associated with diversified portfolio. By using the 1997 National Longitudinal Survey of Youth, Letkiewicz and Fox (2014) examine the relationship between the financial literacy and asset allocation in the US. The results indicate that one-standard-deviation increment in financial literacy is correlated with a 60% increase in illiquid asset holdings and a 30% increase in liquid asset holdings, thereby validating the positive influence of financial literacy on individuals' savings and asset-building. Abreu and Mendes (2010), in a study of individual investors as disclosed by the Portuguese Securities Commission (CMVM), and Von Gaudecker (2015) using data from the Dutch household survey CentERpanel consistently claim that financial literacy is positively related to the degree of portfolio diversification. In the same vein, prior studies also examine the financial literacy level and portfolio diversification in Singapore (Koh, Mitchell and Rohwedder 2018) and Tunisia (Mouna and Anis 2015), whereby findings also show that individuals with higher financial literacy level tend to hold more diversified and complex portfolios. Putting these together, a higher level of financial literacy contributes to a higher level of asset diversification.

As for individuals' decision on whether to hold risky assets, Van Rooij, Lusardi, and Alessie (2011) concur that financial literacy increases the likelihood of stock market investment and those who have low financial literacy are significantly less likely to invest directly or indirectly in stocks. Likewise, Xia, Wang, and Li (2014), with data from a nationwide online household consumption and finance survey in China, present a positive association between financial literacy and SMP. Using the data from the 2014 Chinese Survey of Consumer Finance, Chu et al. (2017) also find that individuals with higher financial literacy are more likely to engage in stocks and mutual funds investment. In the Tunisian context, Mouna and Anis (2017) examine the implication of financial literacy on investment behaviour and report that a low financial literacy level is associated with a lower likelihood of SMP. It is due to the limited investment knowledge and skills that non-participating household tend to withdraw from investing in risky markets (Campbell 2006). As for allocation in risky assets investment, Cardak and Wilkins (2009) indicate that low risky assets holdings is associated with a lack of financial literacy. Besides, Clark, Lusardi, and Mitchell (2017) and Mahdzan, Mohd-Any, and Chan (2017) identify that those who have adequate financial knowledge have a higher retirement portfolio allocation in stocks than their less knowledgeable counterparts. Similarly, Cupák et al. (2020), Sivaramakrishnan, Srivastava, and Rastogi (2017), Liao et al. (2017) and Jia et al. (2019) find that individuals with higher financial literacy hold a larger proportion of risky financial assets. Likewise, Balloch, Nicolae, and Philip (2014) document a highly significant and positive relationship between stock market literacy and the proportion of wealth invested in stock market.

On the other hand, there are seemingly contradictory findings in the literature. Among the urban middle-class population in a developing Asian country, Grohmann (2018) find no support for the expected positive link between financial literacy and stock market participation. Similarly, Arrondel, Debbich, and Savignac (2015) reveal that basic financial literacy is non-significant in explaining the proportion of risky assets among investors. Some studies indicate that improvement in financial literacy have weak and minimal effect on financial behaviour (Fernandes, Lynch Jr and Netemeyer 2014; Cole, Paulson and Shastry 2016). These studies collectively point towards the insignificance of financial literacy in explaining their financial decision. As noted by Chu et al. (2017), there is a competing perspective on portfolio choice based on the

famous saying that “the more wit, the less courage”, whereby individuals with a higher financial literacy are actually more careful about their direct investment in stocks. Likewise, it is possible that some individuals do not understand the financial market and its potential risks, thus participate naively and aggressively in the risky assets market to earn a higher return. For instance, there are 40% of individuals in the UK who invest in stocks and shares but are unaware of the risk involved (Financial Services Authority 2006). Von Gaudecker (2015) also documents that individuals with below-median financial literacy yet trust their own capability in decision-making tend to invest in stocks and lose an expected 50 basis point averagely.

Given the inconclusive findings on the role of financial literacy in financial behaviour, there is a pressing need to further investigate more evidence for the influence of financial literacy. Moreover, as highlighted by Balloch, Nicolae, and Philip (2014), the mechanism through which financial literacy affects stock ownership decisions is still unclear. Considering financial literacy alongside with other psychological factors unravel fresh perspective that may bear important implication on current policies and intervention which heavily focused on financial literacy. Based on the theoretical support and empirical evidence, this study takes the strand that a higher level of financial literacy leads to a higher proportion of risky assets. Hence, the following hypothesis is proposed:

H1a: Financial literacy positively influences risky assets investment.

The IMB model also provides justification for the positive relationship between advice-seeking and risky assets investment. As mentioned, the model predicts that information relevant to the participation of a targeted behaviour is influential to the performing of behaviour. When investing in risky assets, individuals who seek advice from financial advisors tend to receive financial information relevant to investing. Hence, based upon the theoretical model, this study posits that seeking personal finance-related information from financial advisors can have a positive influence on the proportion of risky assets investment.

In terms of the empirical evidence pertaining to the influence of financial advice on

asset allocation, the literature is rather limited and inconclusive. As noted by Mullainathan, Noeth, and Schoar (2012), individuals who receive financial advice are more likely to invest in assets with higher risks such as equity and property related assets. Likewise, using proprietary dataset for KiwiSaver in the New Zealand, Zhang (2014) demonstrates that advised investors hold a significantly lower proportion of cash and a higher proportion of equity assets. The author derives a significant and positive relationship between financial advice and risky assets as those who seek advice invest riskier assets as compared to non-advice seekers. When individuals rely on financial advisors, it enables them to consistently learn from credible sources, thereby promoting higher allocation in risky assets investment (Bachmann and Hens 2015).

In contrast, some researchers offer contradicting views regarding the effect of financial advice on the level of risky assets investment. Using data from the Netherlands, Kramer (2012) argues that individuals who seek financial advice hold substantially less equity and more fixed income securities. On the other hand, Abreu and Mendes (2010) show that the extent of portfolio diversification are similar for those who seek information and do not seek information from professionals. The similar finding is reaffirmed by Karabulut (2013) who report that financial advice does not affect stock market participation and Zhang et al. (2018) who claim that financial advice has a rather negligible impact on asset allocation.

Given the contradicting views on both the role of financial advisors and its substitutability with financial literacy as another channel of financial information, it necessitates further research to close the identified gap. The findings may inform the potential effect of financial advice on investment, at the same time, to gauge if financial advice is a good substitute for financial literacy. Guided by theoretical perspective of the IMB model and empirical justification, this study takes the notion that financial advice leads to a higher exposure of financial information which eventually increases the proportion of risky assets investment. Therefore, this study proposes the following hypothesis:

H2a: Advice-seeking positively influences risky assets investment.

3.6.2 Investment Motivation on Risky Assets (H3a-H6a)

Other than informational factors, the IMB model also predicts that behaviour is directly influenced by motivational determinants. In the current study, motivational factors consist of personal motivation and social motivation. Specifically, personal motivation involves attitude towards investing in risky assets and personal values; whereas social motivation is represented by social norm. As such, the IMB model provides theoretical justification for the relationship between these constructs and risky assets investment.

Attitude towards investing in risky assets is the first component representing motivation construct in the IMB model. In particular, the model offers support for the positive relationship between attitude towards investing in risky assets and risky assets investment. Based upon the theoretical model, attitude towards a behaviour represents an individual's personal motivation to perform that behaviour such that favourable attitude is influential towards the performance of such behaviour (Fisher and Fisher 1992). Guided by the theoretical model, this study posits that when individual's attitude towards investing in risky assets – perceptions of the outcome of investing in risky assets and evaluation of these outcome become more positive, they are more motivated to invest in risky assets, and hence more likely to engage in risky assets investment. A high motivation level and positive attitude towards investing is based on the belief that one can successfully participate in investing and that the outcome of investing will be rewarding to oneself. If individuals believe that investing in risky assets is unsafe or too risky and evaluates the consequences as negative, they might have negative attitude towards investing in risky assets, and as a result withdraw from investing.

Despite the plethora of research on the well-established attitude – behaviour link (Fishbein and Ajzen 2011), it is surprising that the relationship between these two constructs are rarely tested in the domain of financial and economic behavioural studies (Fünfgeld and Wang 2009; Phan, Rieger and Wang 2019), let alone investing in risky assets. The limited research may be attributed to the reason that behavioural

economics has only gained attention in recent years (Thaler 2016). In the domain of financial behaviour, the literature often revolves around attitude-related constructs such as risk attitude or financial attitude, rather than specifically on individuals' attitude towards investing in risky assets.

Risk attitude, also known as risk tolerance, is the maximum amount of uncertainty an individual is willing to accept when engaging in financial decisions in which the outcome is uncertain (Grable and Joo 2004). As such, the construct represents individuals' attitude towards financial risk. Studies indicate that risk tolerance is crucial in explaining individuals' financial behaviour, including wealth accumulation, retirement planning, portfolio allocation, insurance and investment decisions (Hanna, Gutter and Fan 2001). As individuals' attitude towards financial risk becomes more positive, it seems that they are also more receptive towards assets with higher risk. The positive relationship is further supported by empirical studies on risk tolerance and risky assets. Specifically, individuals with higher risk tolerance tend to invest a higher proportion of risky assets (Cardak and Wilkins 2009; Duasa and Yusof 2013; Agarwal et al. 2015) and are more likely to participate in the stock market (Xia, Wang and Li 2014) (Rosen and Wu 2004; Van Rooij, Lusardi and Alessie 2011; Rahim, Jusoh and Samad 2012).

This study is also aware of several other studies involving attitude-related constructs. For instance, Sivaramakrishnan, Srivastava, and Rastogi (2017) indicate the intention to invest in risky assets is affected by the attitude to investment behaviour which includes three first-order constructs namely risk avoidance, hassle factor and perception of regulator. These findings corroborated with Lim et al. (2018), where the authors argue that attitude towards financial investment is related to intention to invest. In the same vein, Khan, Tan, and Chong (2017) claim that positive belief about their investment lead to higher risk taking and risky assets allocation. Other than that, Arceo-Gomez and Villagomez (2017) espouse that positive financial attitude is significantly related to positive financial behaviour, where the former represents attitude towards money and future, and the latter represents saving behaviour. The significant role of attitude is also noted by Muradoglu and Harvey (2012) as their findings illustrate that attitude towards credit is positively related to the use of credit

card or point-of-sale lending. Putting these together, one may induce that positive attitude towards investing in risky assets leads to engagement in risky assets investment based upon the strong evidence of attitude – behaviour link in other domain, combined with the empirical studies in the attitude-related constructs within the financial context.

These limited research in relevance to attitude not only define the term differently, these terms are also measured on a rather broad and general level. As mentioned earlier, the construct of attitude in the theoretical framework (of TPB and IMB model) should refer only to attitude towards the behaviour, instead of attitude towards the object (Ajzen 1991; Fisher and Fisher 2002; Yuzhanin and Fisher 2016). Yet some of the abovementioned studies focus on attitude towards object such as money, financial investment or credit (Muradoglu and Harvey 2012; Arceo-Gomez and Villagomez 2017; Lim et al. 2018). Additionally, general attitudes focus merely on the target element without specifying the particular behaviour or context (Fishbein and Ajzen 2011). Based on the IMB model, the conceptualisation of attitudes should be specifically relevant to the domain or behaviour of interest (Fisher and Fisher 1992). Fishbein and Ajzen (2011) have similarly highlighted that attitude should be treated as a specific construct in respect to the behaviour, rather than a general construct. Broad construct such as risk attitude or financial attitude may only be considered as background factor wherein its influence on behaviour may or may not exist (Fishbein and Ajzen 2011).

By and large, there are limited empirical studies that operationalise the hitherto unexplored construct – attitude towards investing in risky assets, and much lesser that elucidate the attitude – behaviour link in the domain of risky assets investment. Given the centrality of attitudes to a variety of behaviour, coupled with its proven relevance within the field of social science (Fishbein and Ajzen 2011) and the noticeable literature gaps, there is a pressing need for detailed assessment on the relationship between attitude towards investing in risky assets and the targeted behaviour – risky assets investment. Demonstrated by theoretical framework and prior related empirical studies, this study argues that one's attitude towards investing in risky assets is likely to increase his/her risky assets investment. Therefore, the following hypothesis is

suggested:

H3a: Attitude towards investing positively influences risky assets investment.

The theory of basic values is also known as theory of basic human values, theory of human motivation or motivational types of values (Schwartz 2012). The current study integrates IMB model and theory of basic values, whereby the two-dimensional personal values of conservation and self-transcendence represent the second aspect of motivation construct in the IMB model. Building on the theoretical relationship posited by the IMB model, personal values as part of the motivation construct, comprise one's personal motivation to engage in the targeted behaviour such that these value priorities are influential to the performance of the behaviour (Fisher and Fisher 1992).

Prior empirical research also examine the relationship between theory of basic values and a wide range of behaviour. Bardi and Schwartz (2003) examine the value-behaviour relations using three types of studies including self-rating, partner rating and peer rating of behaviour, and conclude that most values and their corresponding behaviours are significantly correlated. Prior studies also reveal the importance of the motivational type personal values in both general and specific behaviours. For instance, Schwartz and Butenko (2014) find linkage between each value and everyday behaviours. Likewise, the role of personal values are also validated in behaviours that are more specific including food choice (De Boer, Hoogland and Boersema 2007; Botonaki and Mattas 2010; Kitsawad and Guinard 2014), organic food purchase (Krystallis, Vassallo and Chryssohoidis 2012) and sustainable consumption (Thøgersen and Ölander 2002; Sharma and Jha 2017), among others. Furthermore, scholarly studies also offer validation for the association between these values and a widely varying behaviours such as purchasing behaviour (Krystallis, Vassallo and Chryssohoidis 2012), social entrepreneurial intention (Kruse et al. 2019), interpersonal violent or delinquent behaviour (Bilsky and Hermann 2016; Borg, Hermann and Bilsky 2017; Seddig and Davidov 2018), political choice (Caprara et al. 2006) and mate retention behaviours (Lopes, Sela and Shackelford 2017). There also exists study that assesses a single aspect of personal values such as Blekesaune (2015) who reviews

the extent of Schwartz's self-enhancement values in explaining retirement behaviour. His findings suggest that achievement and hedonism discourage disability retirement. As a whole, these studies validate the robustness of the values taxonomy and its ability in adapting itself to different human behavioural contexts.

Despite the well-established values taxonomy and its role having been identified as a source of explanation for behaviour, the influence of theory of basic values on financial behaviour has received relatively scant attention. Several existing studies in the financial context take on a general human value approach or some closely related concepts in exploring the value-behaviour link. Using individuals' political preferences as a measure of personal values, Kaustia and Torstila (2011) find a strong and negative relationship between left-wing political preferences and participation in the stock market, whereas Hong and Kostovetsky (2012) report that political values affects the investment of fund managers in socially irresponsible (e.g. tobacco, guns, defence) stocks. Additionally, Pasewark and Riley (2010) assess individuals' feelings towards socially responsible investing as personal values and suggest that personal values affect investment decisions. The similar conclusion is echoed by Agyemang and Ansong (2016) whereby value such as honesty, comfortable life and family security are significant in affecting their stock investment decisions. Other related studies include patriotism and portfolio choice (Morse and Shive 2011), materialism and financial assets (Watson 2003), optimism and stocks investment (Angelini and Cavapozzi 2017), and sensation-seeking and stock trading frequency (Grinblatt and Keloharju 2009).

The above-mentioned body of research unanimously supports the strand that personal values may be a possible determinant of investment decisions. As such, the basis for formulating hypotheses for this study is substantiated. On a side note, although there is a high extent of overlap in the way these concepts capture values, some studies mix up values with other predictors such as opinions, feelings, beliefs or adopt value concept without relying on any systematic consideration of the comprehensive value theory (Seddig and Davidov 2018). Hence, these gaps warrant further research into the effect of personal values on investment decisions based on theory of basic values. As highlighted by Agyemang and Ansong (2016), traditional methods focusing merely on

wealth-maximisation have neglected the significance of personal values, thereby ruling out germane predictor of investment decisions. Undoubtedly, individuals often invest for the monetary returns. However, to say that money is at the core of investment decision is seemingly only part of the story. To unearth the entire picture of what incentivises individuals to invest, it is imperative to account for the values that individuals possess (Agyemang and Ansong 2016).

Generally, individuals do not merely invest their money, they do so in order to attain their personal goals (Sevdalis and Harvey 2007). Guided by basic values theory, people of different values emphasise goals and rewards from investment differently – some focus on economic or material rewards, others prioritise security and stability, and still others emphasise pleasure and challenges in the process of investing. These motivational values are vital goals in life an individual makes every attempt to achieve (Chiu 2016). They act as guiding principles that motivate and drive individuals to behave accordingly in different area of lives. As individuals invest, they seek investment in consistent with their values (Pasewark and Riley 2010) and invest in a way that is more closely aligned to their values and goals (Inglehart and Baker 2001; Pasewark and Riley 2010). As noted by Cieciuch, Schwartz, and Davidov (2015), when individuals prioritise a value, that person is more likely to perform a behaviour that realises the motivation behind that value.

The two bipolar value dimensions, which are Openness to change versus Conservation and Self-enhancement versus Self-transcendence, signifies distinct motivational goals of the ten basic values. In the context of this study, risky assets investment is likely to be in alignment with openness to change and self-enhancement values, over and above their competing values. Openness to change and self-enhancement values, both categorised as personal focus, includes self-directions, stimulation, hedonism, achievement and power (Schwartz 2012). As discussed earlier, risky assets investment is of higher risk yet accompanied by higher potential financial returns. Hence, investing in risky assets, as opposed to conventional and low-risk financial assets, is expected to associate with these underlying goals.

Particularly, the risky component may attract individuals who enjoy challenges and

excitement, are willing to take the risk and switch from traditional assets with an open-mind. This is in line with the greater preference of openness to change over conservation values that appreciates independent actions, novelty, challenge and pleasure, rather than security, stability and maintaining status quo (Schwartz 1992; Schwartz 2012). Furthermore, risky assets come with higher return as compared to other assets, whereby the monetary rewards may eventually lead to a successful, wealthy life that fulfils the needs for pleasure and prestige. This is consistent with greater preference for self-enhancement over self-transcendence values as it emphasises wealth, social status, personal success, power and dominance over people, rather than tolerance, social justice and welfare of others (Schwartz 1992; Schwartz 2012). Likewise, it implies that risky assets investment contradicts the motivational goals of conservation and self-transcendence values.

In short, individuals who are highly motivated by these goals believe that the outcome of participating in risky assets will be beneficial and are aligned with their personal values, thus are more likely to invest in risky assets. Based on theoretical and empirical justifications, this study argues that openness to change and self-enhancement are positively related to risky assets investment. In other words, conservation and self-transcendence are expected to decrease one's risky assets investment. Preference for conservation over openness to change values and preference for self-transcendence over self-enhancement values represents low motivation, and vice versa. With that, the following hypotheses are considered:

> **H4a:** Preference for conservation over openness to change values negatively influences risky assets investment.
>
> **H5a:** Preference for self-transcendence over self-enhancement values negatively influences risky assets investment.

Last but not least, the third aspects of motivation constructs in the IMB model comprise social norm related to investing in risky assets. The model predicts that social norm, representing one's social motivation to engage in the targeted behaviour, is influential to the performance of such behaviour (Fisher and Fisher 1992). Hence, this study suggests, in accordance with IMB model, that the extent to which individuals

perceive greater social support to invest in risky assets can exert a positive effect on risky assets investment. In the context of risky assets investment, social motivation is based on individuals' belief that: (1) they perceive their significant others such as peers and family members invest in risky assets; (2) they perceive their significant others expect or support them to invest in risky assets; and (3) they are motivated to act in accordance to these. Upon perceiving strong social support for investing, one is more likely to invest.

Besides theoretical justification, the plethora of scholarly studies support social influence as an important antecedent of financial behaviour, thereby inferring a positive relationship between social norm and risky assets investment. Using field experiment in the Brazilian context, Bursztyn et al. (2014) show that peer effects significantly influences individuals' investment decision, particularly on the possession of assets. Their study reveals that 93% investors choose to purchase a financial asset upon knowing that their household peers purchase this asset, in contrast to merely 42% investors that choose to buy the asset when no peer information are provided. Likewise, evidence from Pool, Stoffman, and Yonker (2015) also report that fund managers living in the same neighbourhood have more similar holdings in their mutual fund portfolios than managers who live in different neighbourhoods. Brown et al. (2008) show that an increase in community stock ownership causes an increase in the likelihood of an individual to own stocks. Similarly, Hong, Kubik, and Stein (2004) document that socially active households – those who interact with their neighbours or attend church, are significantly more likely to participate in the stock market as compared to those who are less social, and the likelihood further increases if they are residing in area with high SMP.

In the same manner, Zhang et al. (2018) claim that both household and workplace peer effects are influential to assets allocation. Duflo and Saez (2002) suggest that peer effects play an important role in affecting savings decision too. They find significant differences in savings participation rates between librarians working in different building, in which one is 73% yet the other 14%. As librarians are homogeneous group with similar education and income level, the study concludes that peer effects in workplace is an important driver for individuals' financial decisions. Besides, some

other studies focus particularly on parental influence on one's financial behaviour. For instance, Yew et al. (2017) explore the Malaysian's financial socialisation factors and claim that parental guide leads to positive financial practices. Parental influence (Brounen, Koedijk and Pownall 2016) and financial expectations of the parent (Brown and Taylor 2016) are also associated with individuals' saving behaviour. These findings are in line with Li (2014) who asserts that individuals' probability of investing in stocks within the ensuing five years is approximately 20 to 30% higher if their parents or children invested in the stock market during the previous five years. In sum, these studies indicate the possibility of a positive association between individuals' social motivation and financial behaviour.

Nevertheless, there are also studies that document the non-significant direct effect of social factors towards financial decisions. Lieber and Skimmyhorn (2018) claim that peer effects appear to play significant role only in charitable giving programmes but not in retirement savings and life insurance purchase. Brown and Taylor (2016) similarly suggest that the saving behaviour of parents do not have influence on their offspring's saving decisions. According to Balloch, Nicolae, and Philip (2014), there is no association between sociability and participation in the stock market when stock market literacy is accounted for. Other than that, studies that adopted IMB model also similarly document mixed evidence with regard to the influence of social norm on behaviour in several different domains. Particularly, there are empirical studies that establish positive linkage between social motivation and behaviours such as voting behaviour (Glasford 2008), self-care behaviour (Chang et al. 2018), sexual risk behaviour (John, Walsh and Weinhardt 2017) and cancer screening (Kim, Jo and Lee 2015); yet there also exist studies that fail to relate the two constructs including exercise behaviour (Osborn et al. 2010) and the use of credit card (Limbu 2017).

Besides the inconclusive findings on the role of social motivation, other gaps are also identified from the literature. Most available studies revolve around social factors but not specifically on social motivation or social norm. As noted by Zhang et al. (2018), social factors comprise household, workplace, and neighbourhood factors, which is also known as peer effects, social interaction, community effects, word-of-mouth communication by those who are in close contact with each other due to residing in

the same house or neighbourhood, or working in the same workplace. It is apparent that the definition differs from that of social norm where the referent group refers only to those of which individuals consider significant. Furthermore, the measurement of social factors is often based upon identical street addresses, matching workplace names and locations or postal codes (Zhang et al. 2018). Hence, the mechanism as to how people of the same groups influence each other, remains unclear. Taken together, these research gaps necessitate further examination on the role of social norm.

From these studies, one can deduce that investment decisions might be affected by social norms or beliefs about the social norms. When their peers choose to purchase an asset, it is likely that they will also purchase the asset, both because they learn from peers' decision and because they want to "keep up with the Joneses" (Bursztyn et al. 2014). By observing their significant others, individuals learn about the proper behaviour of their social group and may want to conform to the same behaviour as what is commonly accepted among their social group (Duflo and Saez 2002). In addition, the cultural background of Malaysia is high in power distance, collectivism and uncertainty avoidance (Hofstede Insight 2018). Considering that social norm are often highly valued in collectivist culture (Ramayah et al. 2009) and complying to these norm may be viewed as action of higher certainty, the proposed rationale may even be further supported. Consistent with the IMB model and empirical support, this study proposes that individuals who perceive greater social support to invest in risky assets are more likely to invest in risky assets. As such, this study proposes the following hypothesis:

H6a: Social norm positively influences risky assets investment.

3.6.3 Investment Behavioural Skills on Risky Assets (H7)

The IMB model provides support for the positive link between FSE and risky assets investment. In particular, the model postulate that behavioural skills related to the performance of certain behaviour is influential towards the performance of such behaviour. As such, this study proposes that individuals' beliefs in their capability to invest in risky assets may be influential to the proportion of risky assets investment.

Also suggested by the concept of self-efficacy by Bandura (1986), individuals are more likely to engage in behaviour that they deem themselves as capable and confident; and are more likely to refrain from such behaviour when they perceive themselves as incompetent in dealing with it. By and large, risky assets offer higher return that is accompanied by higher risk, as compared to other financial products. As guided by Bandura and Wood (1989) and Bandura (2001), this study argues that individuals with higher level of self-efficacy in risky assets investment tend to focus on the potential gains instead of potential losses, and are better at handling the stress and emotions induced by stock market fluctuations as they invest. Similarly, they are more likely to demonstrate a positive valuation of investing in risky assets and are often more optimistic about the outcome of investing. As noted by Asebedo and Payne (2019), those with higher FSE tend to view themselves as capable in controlling and managing of their own financial situation. For these reasons, people with higher FSE are more likely to invest in risky assets.

Apart from theoretical justification, empirical evidence also reveals the importance of FSE in influencing on a wide array of financial behaviour. In recent financial behaviour studies, FSE is shown to have positive influence on individuals' financial satisfaction (Xiao, Chen and Chen 2014; Asebedo and Payne 2019), financial planning for retirement (Topa, Lunceford and Boyatzis 2018), usage of formal financial services Mindra et al. (2017), loan repayment (Shim, Serido and Lee 2019) and responsible use of credit card (Limbu 2017). Similarly, in terms of investment-related behaviour, Farrell, Fry, and Risse (2016) document that women who possess higher FSE are more likely to own investment and savings products and less likely to have debt-related products. As noted by Cupák et al. (2020), individuals with higher confidence in own financial skills are more likely to invest in risky assets. Using the general self-efficacy, Chatterjee, Finke, and Harness (2011) find that self-efficacy is a significant determinant of wealth creation and investment in financial assets such as stocks, mutual funds and bonds. Besides, Montford and Goldsmith (2016) assess the relationship between individuals' investing self-efficacy and risky assets investment. Their findings show that FSE is positively associated with risk taking in investment, specifically in relation to the proportion of stocks investment. These findings corroborate views from the theoretical perspective, highlighting that FSE plays an

important and pervasive role within financial decision-making.

Despite the handful of literature on FSE, several gaps are identified. First, studies pertaining to the role of FSE on financial behaviour generate mixed results. As mentioned, a heightened FSE level is often associated with positive financial behaviour and financial outcome (Xiao, Chen and Chen 2014; Limbu 2017; Mindra et al. 2017; Topa, Lunceford and Boyatzis 2018; Asebedo and Payne 2019; Shim, Serido and Lee 2019). Nevertheless, there are also studies that show otherwise. For instance, Ismail et al. (2017) report that FSE is not associated with financial behaviour such as financial planning, savings and investment. In a related vein, (Dietz, Carrozza and Ritchey 2003) argue that individuals' level of FSE is unrelated to the use of retirement plans. Given these inconsistencies in findings, additional research is needed to further one's understanding of the relationship between FSE and financial behaviour.

Second, this study surmises that the existing studies pertaining to FSE is scarce particularly in the area of risky assets investment. Generally, self-efficacy is widely adopted across different domain in many disciplines due to its vital role in influencing behaviour directly (Bandura 1986; Dzewaltowski, Noble and Shaw 1990; Ajzen 1991; Fisher and Fisher 1992; Armitage and Conner 2001). However, within the literature of IMB model, the role of behavioural skills and its association with investment behaviour are rather lacking. According to Lown (2011), the confidence level in one's ability to handle a financial situation without being overwhelmed, is one of the key factors that affects individuals' financial behaviour. Yet in comparison to other domains, the concept of FSE is relatively new and its influence on financial behaviour are under-researched (Farrell, Fry and Risse 2016).

Although scholars such as Farrell, Fry, and Risse (2016) and Chatterjee, Finke, and Harness (2011) have investigated how FSE is influential to investing, these studies gravitate towards more on the ownership of different financial products or general self-efficacy. As highlighted earlier, the effect of self-efficacy is domain specific (Bandura 2006) such that only those with domain specific self-efficacy are likely to initiate action in that particular domain. Moreover, investing in risky assets involves higher risk of incurring loses than that of other financial assets. Hence, having FSE is

relatively important as compared to products with minimal risks. As such, these findings may not be representative in the context of risky assets investment. In addition, while Montford and Goldsmith (2016) suggest a significant and positive relationship between FSE and risky assets investment, adopting undergraduate students as sample poses limitation in terms of its representativeness and generalisability of its findings to the general population. Students are considered homogenous sample and research suggests that they vary from the general population, hence generalising from students to the general public within personal and social psychology is problematic (Sears 1986; Henrich, Heine and Norenzayan 2010; Hanel and Vione 2016).

Taken together, prior literature linking FSE and financial behaviour yield inconsistent findings, and more importantly there exists limited studies assessing the relationship between FSE and risky assets investment. Collectively, these research gaps necessitate further examination on the role of FSE on risky assets investment. Guided by the theoretical grounding and empirical support, this study argues that FSE can have a positive effect on risky assets investment. Hence, this study formulates the following hypothesis:

H7: Financial self-efficacy positively influences risky assets investment.

3.6.4 Financial Information on Investment Behavioural Skills (H1b-H2b)

According to the IMB model, informational factors affect not only behaviour but also behavioural skills based upon the information and knowledge possessed. Specifically, the model proposes that information relevant to the participation of a targeted behaviour is influential towards the behavioural skills of such behaviour. In this study, informational factors comprise financial literacy and advice-seeking. Hence, the IMB model offers justification for the positive relationship between financial literacy and FSE. Guided by the model, this study postulates that the degree to which individuals understand and use personal finance-related information can exert a positive influence on their belief in own capability of investing in risky assets. Likewise, align with the above, this study also proposes a positive relationship between advice-seeking and

FSE. Individuals who seek advice from financial advisors regarding risky assets investment is expected to exhibit greater beliefs in their capability to invest in risky assets for achieving their financial goals.

The empirical evidence through the application of IMB model in other domains also validate the association between information and behavioural skills. For instance, Seacat and Northrup (2010) report that recycling information is significantly associated with recycling behavioural skills. Individuals with higher level of correct recycling information are found to have greater recycling behavioural skills. Likewise, other authors also find significant and positive relationship between behaviour-specific information and behavioural skills related to behaviour including diet behaviour (Osborn et al. 2010), self-care behaviour (Chang et al. 2018), rational drug use behaviour (Bian et al. 2015), sexual risk behaviour (John, Walsh and Weinhardt 2017) and sweetened beverage consumption (Goodell et al. 2012), among others. As demonstrated by the existing literature, one can induce that better knowledge results in higher level of self-efficacy when performing the behaviour under investigation.

However, there is a paucity of literature available that assess specifically the relationship between knowledge and self-efficacy in the domain of financial behaviour, let alone risky assets investment. Considering the notable importance of financial literacy and advice-seeking in the current literature, it is surprising that their association with FSE remains scarce. To the best of this study's knowledge, only one study by Limbu (2017) establishes an association between knowledge and self-efficacy in the context of financial behaviour. Specifically, the author, by adopting the IMB model, reveals that knowledge on credit card is significantly and positively associated with credit card self-efficacy. While this study is aware of a small number of prior studies that involve financial knowledge and FSE, such as Farrell, Fry, and Risse (2016) who document a positive association between FSE and financial product while controlling for financial literacy, Xiao and O'Neill (2016) who find that financial education is positively associated with both financial literacy and perceived financial capability, where perceived financial capability is proxied by FSE; and Forbes and Kara (2010) who espouse that individual's confidence on their investment knowledge mediates how investment knowledge influences investing self-efficacy, yet these

studies do not establish the direct linkage between financial knowledge and FSE. Furthermore, as noted by Farrell, Fry, and Risse (2016), there is a lack of studies seeking to distinguish the significance of FSE from that of financial literacy. Taken together, studies examining the significance of financial literacy and advice-seeking with respect to an individual's FSE in the domain of risky assets investment, are hitherto not found in the literature. As such, this study can only infer interactions between variables according to theoretical framework and currently available literature.

Building on the theoretical justification and scholarly studies, this study argues that financial information either through one's own knowledge or advices from financial advisors, can have a positive effect on their FSE in risky assets investing. In particular, having a higher financial literacy can increase one's understanding of financial products and the financial market, thereby enhances their financial competency. As they know better about investments, they are more likely to feel equipped and confident in their abilities to make sound investment decisions. Besides, in times of stock market fluctuations, these individuals may better handle their emotions as they understand the mechanism of the stock market.

In the same manner, some individuals who turn to professional advisors for information and advice may also achieve the same level of FSE. Despite not having sufficient financial knowledge, individuals can obtain reliable and accurate information from financial advisors. As financial advisors are financially more mature and competent than individual investors (Kramer 2012), they are able to educate and assist either through running the investment account on behalf of individual investors or by encouraging individuals to behave appropriately (Hackethal, Haliassos and Jappelli 2012). With such delegation or consultation, one who entrusts advisors with their investment decisions is likely to have a heighten FSE in investing.

In brief, this is the first few studies assessing the interplay between financial literacy and FSE; and between advice-seeking and FSE. In view of the limited empirical evidence on the relationship between financial information and FSE, this study intends to fill the noticeable research gap. The ability to draw associations between these

variables allow individuals and financial service providers to identify if one's financial literacy or advice by financial advisors can be leveraged to enhance individuals' belief in their own capability to invest in risky assets. Given the theoretical support coupled with empirical evidence, one can infer that there might be a positive relationship between financial information and FSE. Hence, this study hypothesises that:

H1b: Financial literacy positively influences financial self-efficacy.
H2b: Advice-seeking positively influences financial self-efficacy.

3.6.5 Investment Motivation on Investment Behavioural Skills (H3b-H6b)

Other than informational factors, the IMB model also posits motivation as an additional prerequisite for behavioural skills (Fisher and Fisher 1992). In particular, motivation to perform a behaviour is expected to influence the behavioural skills of such behaviour. In this study, motivational factors consist of personal motivation and social motivation. Personal motivation involves attitude towards investing in risky assets and personal values; whereas social motivation is represented by social norm. As such, the IMB model provides theoretical justification for the relationship between these variables and FSE.

A great deal of empirical studies through the application of IMB model in different domains also indicate that motivation plays a crucial role in enhancing individuals' behavioural skills. For example, Seacat and Northrup (2010) indicate that recycling motivation, at both personal and social level, is significantly associated with recycling behavioural skills. Those who have higher motivation to recycle tend to have higher behavioural skills in recycling. Similarly, Goodell et al. (2012) also document a significant positive relationship between motivation and behavioural skills in the domain of sweetened beverage consumption. Many other authors also report significant and positive relationship between behaviour-specific motivation and behavioural skills related to behaviour in different domain such as diet behaviour (Osborn et al. 2010), fruit and vegetable intake (Sinley and Albrecht 2016), and sexual risk behaviour (John, Walsh and Weinhardt 2017). Additionally, some studies also specifically capture the interactions between personal motivation and behavioural

skills that result in similar effects for behaviours such as exercise behaviour (Osborn et al. 2010), self-care behaviour (Chang et al. 2018) and cancer screening (Kim, Jo and Lee 2015). Meanwhile, the role of social motivation on behavioural skills are endorsed in studies involving behaviours such as diabetes medication adherence (Nelson et al. 2018) and credit card misuse (Limbu 2017). Putting these together, it appears that individuals with higher level of motivation tend to display higher level of self-efficacy when performing the behaviour under investigation.

Nonetheless, there are limited scholarly studies assessing the relationship between motivation and behavioural skills in the context of financial behaviour, or more specifically, the effect of attitude, personal values and social norm on FSE. To date, only one study by Limbu (2017) explores the interaction between motivation and self-efficacy in the context of financial behaviour. Another research gap identified in the literature revolves around the operationalisation of motivation construct. Some studies assess motivational factors separately at both personal and social level (Osborn et al. 2010; Kim, Jo and Lee 2015; Chang et al. 2018), whereas some measure the factor as a whole without distinguishing between the two levels (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; Sinley and Albrecht 2016; John, Walsh and Weinhardt 2017). Nevertheless, as the literature is viewed in combination, there appears inconsistency in results. Particularly, studies where motivation is measured as one collectively document significant and positive relationship with behavioural skills. In contrast, for those that distinguish between the two motivational components, it seems that only personal motivation displays evidence of significant relationship with behavioural skills. This is an indication that the two components have varied direct effect on behavioural skills, which signals the need to unravel the motivational components. Hence, unlike past studies that focus on motivation as a whole, this study decomposes motivation construct and measure the three components (including personal values) separately. All components are considered independent representations of diverse aspects of the motivation construct. By doing so, it is expected to provide important insights about each of the components, at the same time, to avoid loss of information, both of which may inform intervention effort more specifically.

Guided by the IMB model, this study suggests that favourable attitude towards investing in risky assets is positively related to one's FSE in investing in risky assets. Particularly, individuals develop positive attitudes as they positively evaluate salient attributes related to investing in risky assets (Ajzen 1991). As with the concept of self-efficacy by Bandura (1997), those with high FSE also tend to have positive valuation about investing in risky assets, at the same time, are more optimistic about the outcome. These individuals are also more likely to focus on potential success rather than failure when they invest in risky assets. Besides, they are better at managing anxiety and emotions induced by variation in the stock market performance. Hence, positive evaluation of the expected rewards of the related investing is likely to increase one's belief in their own capability of investing in risky assets and that the outcome of investing will be rewarding to themselves. If individuals have negative attitude towards investing in risky assets, they will believe that investing in risky assets is unsafe or too risky and evaluate the consequences as negative. Consequently, they may be more pessimistic about the outcome and easily triggered by the fluctuations of stock market performance, exhibiting the characteristic of low FSE. Hence, this study proposes that attitude towards investing positively influences FSE.

Likewise, align with the above, this study also proposes a positive relationship between values and FSE. Despite the well-established theory of basic values, the influence of personal values on self-efficacy in general, has remained scarce. This lack of research attention on the role of personal values represents a noticeable gap in the current literature on self-efficacy (Sousa, Coelho and Guillamon-Saorin 2012), which extends to FSE literature in the behavioural finance context. Generally, values motivate skills acquisitions, which in turn boost self-efficacy in value-congruent domain (Gorgievski et al. 2018). As such, values consistent with investing will motivate the acquisition of investing-related skills, which are reflected in higher confidence and self-efficacy in their investing skills. Individuals with high conservation score appreciate stability and certainty in life whereby their motivation revolves around preserving the status quo, restraint of actions, acceptance of traditions and customs (Schwartz 1992; Schwartz 2012). Such individuals avoid taking risks and trying new things as they emphasise safe and predictable outcome. In contrast, openness to change value dimension, which is the counterpart of conservation, focuses

on independent actions, novelty, challenge and pleasure (Schwartz 1992). People with high openness to change are more willing to cope with challenges and take risks in dealing with problems (Schwartz 2007). As FSE concerns individuals' beliefs in their capability to invest in risky assets for achieving their financial goals, openness to change converges with self-efficacy concept (Bandura 1997) in which both embraces challenges, goal-setting, cope with adversity and setbacks. Hence, openness to change should promote FSE. Similarly, conservation restraints the development of novel approaches and new skills (Sousa, Coelho and Guillamon-Saorin 2012), which appears to curtail FSE. The concept of FSE is also in consistent with self-enhancement values. Those with high self-enhancement score emphasise wealth, social status, self-esteem, personal success, power and dominance over people (Schwartz 1992). With good financial planning, people gain greater wealth alongside higher social status and recognition. Hence, such individuals are more motivated to perform well in their finances in order to achieve their financial goals. Likewise, the opposing value, self-transcendence should render the opposing tendencies.

In essence, individuals who are highly motivated by openness to change and self-enhancement goals believe that the outcome of participating in risky assets will be beneficial to themselves and are aligned with their personal values, thus are potentially more likely to demonstrate higher level of FSE. Consistent with the above, empirical findings similarly infer that personal values are related to self-efficacy. Sousa, Coelho, and Guillamon-Saorin (2012), in a study of frontline service employees, claim that both openness to change and self-enhancement values are positively associated with self-efficacy in selling products. Gorgievski et al. (2018) also document the direct influence of both value dimensions on entrepreneurial self-efficacy. Francescato et al. (2020), on the other hand, indicate that only self-transcendence is significant in predicting political career self-efficacy. In the same vein, Barni, Danioni, and Benevene (2019) report that conservation is positively related teachers' self-efficacy in teaching, whereas openness to change and self-transcendence is indirectly related to self-efficacy via the moderating effect of motivations. As the relationship between personal values and self-efficacy are completely ignored in the financial domain, this study intends to fill this gap by proposing that conservation and self-transcendence negatively influence FSE.

Lastly, previous studies also show that social motivation is related to self-efficacy. For instance, Nelson et al. (2018) find that social motivation barriers have a significant and positive effect on behavioural skills barriers when assessing barriers to diabetes medication adherence. Also as noted by Limbu (2017), when individuals receive a higher level of social motivation, their credit card self-efficacy is also higher. In contrast, there are also studies that fail to establish an association between social motivation and behavioural skills (Osborn et al. 2010; Kim, Jo and Lee 2015; Chang et al. 2018). The negligible influence is possibly attributed to issue of measurement or definition for social motivation construct (Osborn et al. 2010). To mitigate that, this study is guided by the latest conceptualisation and operationalisation of social norm by Fishbein and Ajzen (2011). Guided by the IMB model and scholarly studies, this study argues that if individuals perceive participation and social support of their significant others on risky assets investment, they are more confident to hold risky assets. In establishing the relationship between social norm and FSE, this study proposes that individuals have higher FSE if: (1) they perceive their significant others such as peers and family members invest in risky assets; (2) they perceive their significant others expect or support them to invest in risky assets; and (3) they are motivated to act in accordance to these. Having known that significant others such as friends and family invest in risky assets and received the support from them, individuals may exhibit higher receptiveness towards investing in the risky assets. Besides, it may be that individuals learn from their social circle pertaining to the historical high returns from the stock market and hence are confident and assured on the rewards of taking the investment risk. As social norm of investing in risky assets increases, individuals are more motivated to participate in risky assets investment. Additionally, given that the cultural background of Malaysia is high in collectivism (Hofstede Insight 2018) and that high collectivism population values social norm highly (Ramayah et al. 2009), social motivation is expected to play an important role compared to those of the western context.

Supported by the IMB model and empirical studies, this study argues that investment motivation is crucial in explaining behavioural skills related to investing in risky assets. This study intends to fill the research gaps by being the first few to explore the

possible interplay between the constructs, at the same time, to decompose the motivation construct in order to capture the varied effect of personal and social motivation in a collectivist culture. In essence, this study is one of the first that investigate the interaction between investment motivation and investment behavioural skills by testing the following hypothesis:

H3b: Attitude towards investing positively influences financial self-efficacy.
H4b: Preference for conservation over openness to change values negatively influences financial self-efficacy.
H5b: Preference for self-transcendence over self-enhancement values negatively influences financial self-efficacy.
H6b: Social norm positively influences financial self-efficacy.

3.6.6 Investment Behavioural Skills as a Mediator (H8-H13)

Mediation models are commonly adopted in social science research (Memon et al. 2018; Ramayah et al. 2018). Generally, a mediator variable can be referred as an intervening variable that changes that the significance or direction of the relationship between the exogenous and endogenous variables (Hair et al. 2017c). In order to explore meaningful mediation, a strong priori theoretical or conceptual support must first present (Preacher and Hayes 2008; Ramayah et al. 2018). In the present study, the mediating role of FSE as a behavioural skills construct, is supported by the IMB model.

Based on the IMB model, behavioural skills are the core and mediating factors as to whether well-informed and well-motivated individuals are capable of effectively perform a targeted behaviour. Particularly for complex behaviour, information and motivation works primarily via the activation of necessary behavioural skills to influence the targeted behaviour. Irrefutably, financial decision-making is complex and risky (Lim et al. 2018). Hence, guided by the IMB model, this study positions FSE in investing in risky assets as the mediator in the current model. Specifically, the present study proposes that FSE mediates the relationship between financial information and risky assets investment, whereby financial literacy and advice-seeking

are indirectly related to risky assets investment via FSE. Likewise, this study argues that FSE mediates the relationship between the components of investment motivation and risky assets investment, whereby attitude towards investing, conservation, self-transcendence and social norm are indirectly linked to risky assets investment through FSE as mediator. As such, the effect of financial information and investment motivation are seen largely as a consequence of the presence of FSE to initiation of investment behaviour. Without FSE, individuals may not invest in risky assets even if they are financially well-informed and highly motivated to invest.

Other than theoretical justification, empirical studies in the IMB literature also validates the mediating role of behavioural skills. Often, behavioural skills or self-efficacy is deployed as a mediator in studies that apply IMB model in different domains. For instance, Limbu (2017) demonstrate that credit card self-efficacy mediates the effect of information and social motivation on credit card use. Chang et al. (2018) also report that both self-care information and personal motivation are positively related with self-care self-efficacy, which in turn positively influenced self-care behaviour. Besides, as noted by Osborn et al. (2010), there are indirect effects of both diet-related information and motivation on diet behaviour through the mediating effect of self-efficacy. At the same time, it is validated as a mediator on the influence of information and motivation to different behaviour such as recycling (Seacat and Northrup 2010), sweetened beverage consumption (Goodell et al. 2012) and sexual risk behaviour (John, Walsh and Weinhardt 2017), among others. Based on these studies, it can be inferred that FSE may act as a mediator for the effects of financial information and motivation in the context of risky assets investment. On a side note, as and when the direct effect of financial information and motivation to FSE (H1b-H6b) and the direct effect of FSE to risky assets (H7) are justified in earlier discussion, the mediating effect of FSE will also be equally established.

Nevertheless, thus far, there is a dearth of studies exploring the role of FSE as a mediator in the context of risky assets investment. Scholarly support that specifically draw relationship among these constructs via the mediating effect of FSE are either not found or rather fragmented in the literature. In addition, as much as financial information is crucial in promoting desirable financial behaviour, evidences reveal that

relying on information alone is insufficient to drive behaviour. Specifically, the key predictor for investing often revolves around financial literacy (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017), but studies also demonstrate how intervention heavily-focused on financial literacy alone are not effective in stimulating financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Holzmann 2010; Hira 2012; Remmele and Seeber 2012). In a meta-analysis by Fernandes, Lynch Jr, and Netemeyer (2014)_ENREF_185, findings reveal that intervention intended at improving financial literacy explain only 0.1% of the variance in financial behaviour, suggesting miniscule effects of financial education on financial behaviour. Cole, Paulson, and Shastry (2016) also argue that high school personal finance courses have no effects on asset accumulation. It is apparent that information and education-only interventions are not always effective in promoting targeted behaviour as discussed earlier by Fisher and Fisher (1992).

These hint to the possibility of an intervening variable that might have mediating effect for the relationship between financial information and financial behaviour. As the association between financial knowledge and financial behaviour is complex (Perry and Morris 2005), it is possible that self-efficacy may be the missing link between financial knowledge and financial behaviour. This is further evident according to Bandura (1997) who asserts self-efficacy as the final common pathway for the effects of various personal and social influences on behaviour. Furthermore, it is imperative to note that the mediating role of FSE is established by a few studies in the finance context. For instance, Lapp (2010) highlight that FSE is the missing piece between knowledge and effective action. Mindra and Moya (2017) assert the mediating effect of FSE for the relationship between financial literacy and the use of financial products and services. Also, Limbu (2017) indicates that credit card knowledge is indirectly associated with credit card use through credit card self-efficacy. Besides, Perry and Morris (2005) claim that individuals' perceived control over own financial destiny mediates the effect of financial knowledge on their probability to save, budget and spend responsibly. In the same vein, Rothwell, Khan, and Cherney (2016) also find that FSE fully mediates the association between financial knowledge and postsecondary-education savings. These results suggest that financial information

operates primarily via FSE to affect financial behaviour positively. As much as financial knowledge is important in influencing financial behaviour, such knowledge alone may not necessarily increase individuals' propensity to invest in risky assets.

Similarly, the above argument also applies to motivational constructs. Although FSE is more frequently linked to financial literacy, it is not influenced solely by financial literacy alone (Montford and Goldsmith 2016). Rather, determinants such as personality, social influences and cultural norms (Hira 2012) may also independently or collectively affect one's FSE. As emphasised by Bandura (1997), self-efficacy is the ultimate common pathway for the effects of many personal and social factors on behaviour. It is likely that personal and social motivational factors alone are inadequate to encourage engagement in financial behaviour. In line with the argument, Mindra and Moya (2017) claim that FSE fully mediates the relationship between financial attitudes and the use of financial products and services. This point is highlighted in several studies within the IMB literature. In detail, Limbu (2017) document that social motivation is associated with behaviour indirectly through self-efficacy as his findings reveal credit card self-efficacy fully mediates the association between social motivation and misuse of credit card. In the same manner, Seacat and Northrup (2010) find that the direct effects of information and motivation on recycling behaviour are non-significant yet the non-direct paths are significant in the full mediational IMB model. They further claim that the effects of both variables are fully mediated by behavioural skills. Goodell et al. (2012) also argue that sweetened beverage consumption motivation is only indirectly related to sweetened beverage consumption through the mediating effect of behavioural skills. As such, it is evident that highly motivated individuals may not necessarily perform a behaviour provided they perceive a lack of required behavioural skills.

Taken together, information and motivation may be indirectly related to investment behaviour through FSE. However, no known studies have yet jointly explored such a mediation model. Hence, little is known about the mediating mechanisms through which these information and motivation constructs relate to risky assets investment. As such, further investigation is needed to gain a more comprehensive picture of these relationships, particularly in the financial behaviour context. Following that, this study

intends to fill this gap in the literature. Based on the theoretical grounding and empirical evidence, the present study extends the existing research by assessing the role of FSE as a mediator. This study posits that FSE mediates the relationship between each component of informational factor and risky assets investment; and the relationship between each component of motivational factor and risky assets investment. With that, the following hypotheses are formulated:

H8: Financial self-efficacy has a mediating effect on the relationship between financial literacy and risky assets investment.

H9: Financial self-efficacy has a mediating effect on the relationship between advice-seeking and risky assets investment.

H10: Financial self-efficacy has a mediating effect on the relationship between attitude towards investing and risky assets investment.

H11: Financial self-efficacy has a mediating effect on the relationship between preference for conservation values and risky assets investment.

H12: Financial self-efficacy has a mediating effect on the relationship between preference for self-transcendence values and risky assets investment.

H13: Financial self-efficacy has a mediating effect on the relationship between social norm and risky assets investment.

3.6.7 Summary of Research Hypotheses

Guided by both empirical evidence and theoretical underpinning, 19 hypotheses are formulated to address the research questions of this study. A summary of the research hypotheses is presented in Table 3.3.

Table 3.3 Summary of Research Hypotheses

	Hypothesis
Information and Motivation on Risky Assets	
H1a	Financial literacy positively influences risky assets investment.
H2a	Advice-seeking positively influences risky assets investment.

H3a Attitude towards investing positively influences risky assets investment.

H4a Preference for conservation over openness to change values negatively influences risky assets investment.

H5a Preference for self-transcendence over self-enhancement values negatively influences risky assets investment.

H6a Social norm positively influences risky assets investment.

Behavioural Skills on Risky Assets

H7 Financial self-efficacy positively influences risky assets investment.

Information and Motivation on Behavioural Skills

H1b Financial literacy positively influences financial self-efficacy.

H2b Advice-seeking positively influences financial self-efficacy.

H3b Attitude towards investing positively influences financial self-efficacy.

H4b Preference for conservation over openness to change values negatively influences financial self-efficacy.

H5b Preference for self-transcendence over self-enhancement values negatively influences financial self-efficacy.

H6b Social norm positively influences financial self-efficacy.

Behavioural Skills as a Mediator

H8 Financial self-efficacy has a mediating effect on the relationship between financial literacy and risky assets investment.

H9 Financial self-efficacy has a mediating effect on the relationship between advice-seeking and risky assets investment.

H10 Financial self-efficacy has a mediating effect on the relationship between attitude towards investing and risky assets investment.

H11 Financial self-efficacy has a mediating effect on the relationship between preference for conservation values and risky assets investment.

H12 Financial self-efficacy has a mediating effect on the relationship between preference for self-transcendence values and risky assets investment.

H13 Financial self-efficacy has a mediating effect on the relationship between social norm and risky assets investment.

3.7 Demographics as the Control Variables

Socioeconomic characteristics also act as important determinants of individual asset allocation (Campbell 2006). Prior empirical findings indicate that age, income, education level and number of dependents are associated with asset allocation decision. Hence, these socioeconomic variables are included as control variables.

First, age plays a crucial role in financial asset selection. Ackert, Church, and Englis (2002) find that choice of risky assets is influenced by age. Likewise, Zhang et al. (2018) claim the importance of age in asset allocation decision. Younger individuals tend to hold non-risky assets compared to older individuals (Duasa and Yusof 2013) and that SMP increases with age alike (Van Rooij, Lusardi and Alessie 2011). Besides, Riley Jr and Chow (1992) suggest that young individuals hold little in risky assets, under-21 and 65-and-older individuals hold more bonds and equity investment increases with age until the age of 65, then falls. The hump-shaped age effect is consistent with Campbell (2006), Guiso, Haliassos, and Jappelli (2002) and Milligan (2005).

In terms of income, Campbell (2006) indicates that the low-income households own more liquid asset and wealthier households are the main participants in equity investment. Prominent studies show that those with a higher income level tend to also have a higher participation rate in risky assets (Riley Jr and Chow 1992; Brunnermeier and Nagel 2008; Van Rooij, Lusardi and Alessie 2011; Duasa and Yusof 2013; Heo, Grable and O'Neill 2017).

Meanwhile, for educational attainment, Van Rooij, Lusardi, and Alessie (2011) report that stock ownership increases tremendously with education levels and that individuals with lower education level are unlikely to hold stocks. The finding is consistent with

prior studies (Duasa and Yusof 2013; Heo, Grable and O'Neill 2017; Mouna and Anis 2017). Hence, it is posited that education is positively related to risky asset holdings.

Last but not least, empirical evidence shows that larger household are less likely to invest in risky financial assets (Guiso, Haliassos and Jappelli 2002), the number of children has a significant positive association with having saving habit (Mahdzan and Tabiani 2013) and married individuals are less likely to participate in retirement savings plans (Sunden and Surette 1998). It appears that individuals with higher number of dependents are likely to develop financial plans and own savings for family members' future expenses but are also more reluctant to involve in high risk assets due to preference over liquid, safer assets as family's emergency funds. For these reasons, number of dependents is expected to have significant negative effect on individual's choice in allocating assets.

3.8 Chapter Summary

This chapter first sets out the classification of financial assets into three distinct classes based on their risk exposure, namely low risk, moderate risk and high-risk assets. With that, risky assets include both stocks and mutual funds. The chapter also reviews literature revolving around risky assets investment and its determinants, with the research gaps subsequently highlighted. Following that, this chapter discusses the inadequacy of conventional finance theories in explaining financial behaviour and suggests the integration of two cross-disciplinary theories, namely IMB model and theory of basic values as the theoretical underpinning of the present study. The factors influencing individuals' risky assets investment are explored through the lens of IMB model and theory of basic values, which includes financial information, investment motivation and investment behavioural skills components. As such, the proposed predictors include financial literacy, advice-seeking, attitude towards investing, personal values, social norm and FSE. A detailed discussion on the relationships between the constructs are reviewed. Guided by the theoretical foundation and empirical evidence, 19 hypotheses are postulated.

CHAPTER 4
RESEARCH METHODOLOGY

4.1 Chapter Overview

This chapter discusses the research design and methodology adopted for this study in order to answer the research questions and to test the proposed hypotheses. Specifically, this study employs the empirical research method in assessing the determinants of individuals' risky assets investment in Malaysia through the integration of IMB model and theory of basic values. This chapter begins with the selection of research paradigm, descriptions of sampling procedures, followed by the development of research instrument where the measures of dependent, independent and control variables are presented. The subsequent sections in the chapter encompass the pre-testing and pilot testing of the questionnaire, final questionnaire design, and ethical consideration. Lastly, the data collection method and data analysis techniques are discussed.

4.2 Philosophical Paradigm

A research philosophy is a system of beliefs and assumptions regarding the development of knowledge (Saunders, Lewis and Thornhill 2019). That is, these research philosophies contain assumptions that delineate fundamentally distinct perspectives or ways of seeing the world. As such, these assumptions serve as the research foundation where all aspects of the study are shaped following the chosen philosophy. Such philosophy not only underpins the methodological choice and research strategy of a research, but also defends and justifies the data collection techniques and data analysis procedures of the study (Crossan 2003; Saunders, Lewis and Thornhill 2019). As such, before dwelling into the selection of research methodologies, it is essential to identify the philosophical grounding where the current study is positioned.

Generally, there are two major research paradigms that have been identified within business research: (1) positivism; and (2) interpretivism. For the philosophy of positivism, objective reality exists and the goal of research is to discover it (Corry, Porter and McKenna 2019). To do so, hypotheses are developed based upon existing

theories, which are to be examined, and later confirmed or refuted as whole or in parts (Saunders, Lewis and Thornhill 2019). Researchers are to objectively collect and analyse observable and measurable facts using scientific methods that involves large amounts of empirical data (Crossan 2003; Weber 2004; Saunders, Lewis and Thornhill 2019). Ultimately, the study should identify explanation and laws that explain behaviour.

In contrast, the philosophy of interpretivism, as described by Saunders, Lewis, and Thornhill (2019), emphasises that reality is not rigid as individuals with different cultural backgrounds, under different circumstances and at different times develop different meanings towards certain objects. As a result, these people would experience different realities, thereby refuting the positivist attempts to determine universal laws that generalise to everyone (Saunders, Lewis and Thornhill 2019). The aim of interpretivist studies is to understand the subjective experience involving feelings, thinking or actions, to identify patterns of meaning, and to provide novel, richer interpretations of the world (Weber 2004; Saunders, Lewis and Thornhill 2019). Table 4.1 summarises the detailed differences between positivism and interpretivism in terms of different metatheoretical assumptions.

Table 4.1 Comparison between Positivism and Interpretivism

Metatheoretical Assumption on	Positivism	Interpretivism
Ontology (nature of reality or being)	Researcher and reality are separate	Researcher and reality are inseparable (life-world)
Epistemology (what constitutes acceptable knowledge)	Objective reality exists beyond the human mind	Knowledge of the world is intentionally constituted through a person's lived experience
Axiology (role of values)	Value-free research, researcher is detached, neutral and independent of what is researched, researcher maintains objective stance	Value-bound research, researchers are part of what is researched, subjective researcher interpretations key to contribution, researcher reflexive
Research Object	Research object has inherent qualities that exist independently of the researcher	Research object is interpreted in light of meaning structure of researcher's lived experience

Typical Methods	Quantitative (statistics, content analysis), deductive, large samples, highly structured	Qualitative (hermeneutics, phenomenology), inductive, small samples, in-depth investigations
Theory of Truth	Correspondence theory of truth: one-to-one mapping between research statements and reality	Truth as intentional fulfilment: interpretations of research object match lived experience of object
Validity	Certainty: data truly measures reality	Defensible knowledge claims
Reliability	Replicability: research results can be reproduced	Interpretive awareness: researchers recognise and address implications of their subjectivity
Contribution	Causal explanation and prediction as contribution	New understandings and worldviews as contribution

Sources: Weber (2004), Saunders, Lewis, and Thornhill (2019)

As highlighted by Tsoukas and Knudsen (2003), business and management researchers do not agree about one best philosophy. Evidently, both positivist and interpretive approaches to research are of substantial value (Weber 2004). The selection of approach should rely upon the research objective. It should be guided by questions pertaining to which methods tend to yield better and more comprehensive answer to the research questions initially posed (Saunders, Lewis and Thornhill 2019).

In light of the above, this study adopts the positivist approach as its philosophical stance. Particularly, this research is concerned primarily with identifying explanations and laws that predict investment behaviour, which is equated with the positivism perspective (Crossan 2003). Working within a positivist paradigm, this study involves the testing of hypotheses guided by existing theories. It involves uncovering the relationship between the information, motivation and behavioural skills variables and also the predictive ability of the extended IMB model in explaining individuals' risky assets investment.

4.3 Sampling Procedures

Sampling is defined as the process where a few (sample) from a larger group (population) is identified and selected in order to estimate or predict the prevalence of an unknown situation concerning the larger group (Kumar 2014b). This section is dedicated to the discussion of sampling procedures employed for the study, namely

the sample population, sampling unit, sampling technique and sample size.

4.3.1 Sample Population

The first stage in sampling procedures involves defining the target population of the study. Population is defined as the group of units about which researcher is interested to make inferences, depending on the goal of the research (Sarstedt and Mooi 2014). Identifying the population that is pertinent to the study is essentially crucial (Zikmund et al. 2009). The sample of this thesis is drawn from the Malaysian population who aged 18 years old and above.

The study focuses on individuals within this age group mainly because they have or had a steady source of income, will need to manage their finances from time to time, are the main contributor of funds into different asset classes and are more representative of a nationwide population. This is further justified by the definition of an employed person from official sources, whereby the basic indicator for employment are those who aged between 15 to 64 years (working age) and worked for at least one hour for pay, profit or family gain, or have a job but temporarily not working due to leave, illness, bad weather, labour dispute (Institute of Labour Market Information and Analysis 2015; Department of Statistics Malaysia 2017a; Organization for Economic Co-operation and Development (OECD) 2017a).

The exclusion of individuals who aged between 15 to 17 years old from the target population of this study is because one must be 18 years old or above to be eligible for being the primary account holder of saving and current accounts (Bank Negara Malaysia 2005), and to trade in Bursa Malaysia, which is the Malaysian stock market (Bursa Malaysia 2018c). In other words, 18 years old is the legal age for individuals to make independent financial decision. Those who aged within the age group of 15 to 17 are not able to invest in any form of risky financial assets by their own, therefore is not pertinent to this study. On a side note, the inclusion of young individuals within the age group of 18 to 25 is also justifiable. Based upon data from Bursa Malaysia, active accounts of those within this age group increase tremendously by 50.9% to 40,962 accounts as at December 2017, which made up 22.5% of Bursa Malaysia's total

retail participation along with those 26 to 35 years old in that year (Ismail 2018). As at September 2019, they constitute for 23% of active accounts and 47% of total new accounts opened (Bursa Malaysia 2019). The stock market participation rate of this age group is also identified as the fastest-growing among the account holders (Aruna 2017). Considering the escalating participation of young investors in the stock market, it is therefore imperative to include this age group in the sample.

The sample population age group chosen in this study is similar to, and deemed as appropriate by extant literature, both in the context of Malaysia (Loke 2015; Bakar and Yi 2016; Murugiah 2016b; Murugiah 2016a; Sabri 2016) and other countries (Hackethal, Haliassos and Jappelli 2012; Mimura et al. 2015; Mouna and Anis 2015; Farrell, Fry and Risse 2016; Warsame and Ireri 2016; Mindra et al. 2017; Mouna and Anis 2017; Murendo and Mutsonziwa 2017; Xiao and Porto 2017; Sekścińska, Rudzinska-Wojciechowska and Maison 2018), regardless of other demographic characteristics. Hence, in order to be eligible to participate in this study, a respondent must meet the following inclusion criteria: (1) a Malaysian; and (2) aged 18 years old and above.

4.3.2 Sampling Unit

Sampling unit, also referred to as unit of analysis, forms the basis for selecting the sample (Kumar 2014b). The level at which the variable is measured varies from individuals, stores, companies or countries (Sarstedt and Mooi 2014). In pursuit of understanding economic behaviour, past studies generally consider household as the principal unit of analysis. It is derived from the household theory and Unitary models that is pioneered by Samuelson (1956) and Becker (1976), whereby a household is treated as a single unit based on the assumption that all members of the household share common preferences. That is, in the context of this study, individuals within a household earn, spend, save and borrow in a collective manner, and they invest in different types of resources jointly (Babu, Gajanan and Hallam 2017).

However, assuming households as an individual unit is misleading as it fails to depict a complete picture of living standards, particularly in understanding human behaviour

(Chiappori and Meghir 2015). Besides, it is rather unrealistic to assume that all members have the same preferences (Babu, Gajanan and Hallam 2017) as households constitute of individuals who may have different and potentially conflicting interest with different well-being outcomes (Nelson 2001). As highlighted by Durand et al. (2013), behavioural studies are built upon individuals and hence should not lose sight of individuals. All in all, household-level information often fails to inform regarding individual situation within the households (Ponthieux and Meurs 2015).

Similarly, this study attempts to capture one's literacy, attitude, personal values, social norm and self-efficacy which are individual level variables that are unlikely to be similar across members in the same household. As noted by Sarstedt and Mooi (2014), using data at the lowest possible level is recommended because it reveals much richer detail as compared to aggregated data. Likewise, this study examines financial decisions through the lens of behavioural economics where the focus normally lies upon individuals and how they behave as a single unit.

Hence, considering the objective of this study, Malaysian individuals who aged 18 years old and above is chosen as the sampling unit. This is congruent with prior studies of similar nature whereby individual member is considered as the sampling unit (Jappelli and Padula 2013; Xiao, Chen and Chen 2014; Agarwal et al. 2015; Bachmann and Hens 2015; Farrell, Fry and Risse 2016; Khan, Tan and Chong 2017; Lin, Hsiao and Yeh 2017; Mouna and Anis 2017; Xiao and Porto 2017; Hsiao and Tsai 2018; Lim et al. 2018). Such information collected at individual level helps in understanding the implications of individual level variables on their financial behaviour. Ultimately, understanding these individual level decisions can aid in designing interventions targeted at enhancing one's asset allocation and personal finance decision.

4.3.3 Sampling Technique

Sampling technique is the method in which the sampling unit is selected from the target population. In quantitative studies, the primary objective of sampling technique is to maximise precision in estimates within the given sample size and to avoid bias in the selection of sample (Kumar 2014b). Sampling techniques can be distinguished

between probability and non-probability sampling methods. Historically, probability sampling is deemed ideal in research due to its sampling generalisability (Memon et al. 2017), and thus has long been the main paradigm (Sarstedt et al. 2017). Nevertheless, in social science research, the actual usage is more skewed towards non-probability sampling (Rowley 2014). Similarly, this cross-sectional study adopts a non-probability sampling in selecting respondents due to several reasons.

Apart from the prohibitively high cost in adopting probability sampling (Cooke 2017), the prerequisite involves identifying the sampling frame of the population, by which the complete list of all the elements in the target population must be acquired (Kumar 2014b). Unfortunately, this requirement seems impracticable and can easily be compromised in exploratory research and also in studies involving the Malaysian population. Specifically, the sampling frame could not be established in exploratory study due to the lack of concrete information regarding the population (McGivern 2009). Likewise, in Malaysia, the challenges lie in obtaining a complete list of subjects that is relevant and updated, and collecting data that provides equal chance of selection to every element in a wide geographical area (Memon et al. 2017). In fact, non-probability sampling is more often adopted and more likely suitable in fieldwork research (Bryman and Bell 2015). Moreover, as noted by Polit and Beck (2010), when humans are the main subject of research, it is unlikely to involve non-probability samples.

In addition, the representative samples drawn from probability sampling is, in many occasions, inappropriate and unnecessary (Memon et al. 2017; Sarstedt et al. 2017). As advocated by Calder, Phillips, and Tybout (1981), sample representativeness is unimportant, or even inappropriate if the research goal is rigorous theory testing. The authors further accentuate that homogenous samples are preferred in such situation. This is because for study intending to adopt theories in explaining a phenomenon under different context, it falls under theory generalisation, instead of sampling generalisation (Memon et al. 2017). As such, a non-probability sample is deemed more fitting for study that aims to generalise the theoretical explanation (Hulland, Baumgartner and Smith 2018). Furthermore, it is important to note that adopting probability sampling may not guarantee global or specific representativeness owing to

issues such as systematic non-response (Assael and Keon 1982).

In retrospect of the research objective of this study, the main intention is to assess the integration of IMB model and theory of basic values, and to examine if the extended IMB model that is originally used to predict health behaviour, can be generalised to explain individuals' financial behaviour. Hence, the use of non-probability samples in this study is deemed appropriate where the sampling frame is not accessible, and it aims to build theory for generalisation purpose. Among various non-probability sampling methods, a combination of quota sampling and snowball sampling method are chosen.

In quota sampling, respondents are selected according to a pre-determined quota that represents some visible characteristics of the population that is of interest to the researcher (Kumar 2014b). To ensure that the proportions of the sample in terms of demographic characteristics closely matches the respective composition in the Malaysian population, this study employs the proportional quota sampling whereby the sample mimics the actual proportion of the subgroups in the population (Nishishiba, Jones and Kraner 2013). The quota is determined based on gender, age group and income group as shown in Table 4.2. Besides, the sample are selected from various location in both West Malaysia and East Malaysia. These pre-determined quotas and selection criterion yield a higher degree of representativeness of the local population (Kumar 2014b).

Table 4.2 Target Responses

	Population (%)	**Target Responses**
Gender		
Male	51.9	202
Female	48.1	198
Age		
Below 35 years old	61.7	247
35 - 44 years old	14.5	58
45 - 54 years old	11.6	46
55 years old and above	12.2	49

Monthly income (RM)		
Less than 4,000	55.0	220
4,000 - 9,999	34.5	138
10,000 and above	10.5	42

As for snowball sampling, a few individuals are first identified and the required information are collected from them. Subsequent respondents are selected by requesting personal contacts who possess the selection requirement from first group of participants (Nishishiba, Jones and Kraner 2013). In selecting participants for this study, respondents are first approached based on the sampling criteria through quota sampling procedures. Respondents who complete the questionnaire are then invited to identify other potential respondents to be part of the study. To ensure the demographics quota are met, the required quota for the sample are controlled using the feature available in online survey platform as shown in Appendix A.

Given the time and financial limitations of the study, these sampling approaches are selected. Furthermore, quota sampling is useful in collecting samples that mimic the sample population while snowball sampling can help reaching out to groups who are hard to reach and increase the number of respondents. Despite the sample generalisability issue that may arise due to the adoption of non-probability sampling methods, quota sampling, to a certain degree, can actually lead to specific representativeness (Sarstedt et al. 2017), as compared to other non-probability methods. Additionally, the advantages of using mixed techniques in research designs is the complementary strengths of different methods that can assist in overcoming inherent limitations of certain data (Abowitz and Toole 2009). This mixed sampling approach is in line with other quantitative studies in the area of personal financial behaviour, such as Magendans, Gutteling, and Zebel (2017), Hancock, Jorgensen, and Swanson (2013), Fünfgeld and Wang (2009), Ming-Yen Teoh, Chong, and Mid Yong (2013) and Bakar and Yi (2016).

4.3.4 Sample Size

Sample size is the number of units from whom one collects the required data (Kumar 2014b). With very small sample size, the results may not be able to generalised to the

population and contain sampling error that large effect is improbable (insensitive); yet having very large sample size can magnify biases and may result in all effects being statistically significant when in fact there is no practical relevance (oversensitive) (Hair et al. 2006). To determine the adequacy of sample size, a number of approaches are considered, including: (1) the confidence level and margin of error; (2) statistical analysis requirement; (3) power analysis; and (4) practice in previous studies from the similar context.

First, in calculating an appropriate sample size using the level of confidence approach, the formula employed by this study is based on the work of Krejcie and Morgan (1970) as shown below:

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

where,

s = required sample size

X^2 = table value of chi-square for 1 degree of freedom at the desired confidence level (commonly adopted a 95% confidence level, whereby $X^2 = 1.96^2 = 3.841$)

N = population size

P = population proportion (generally assumed to be 0.50 to provide the maximum sample size)

d = degree of accuracy conveyed as proportion (0.05)

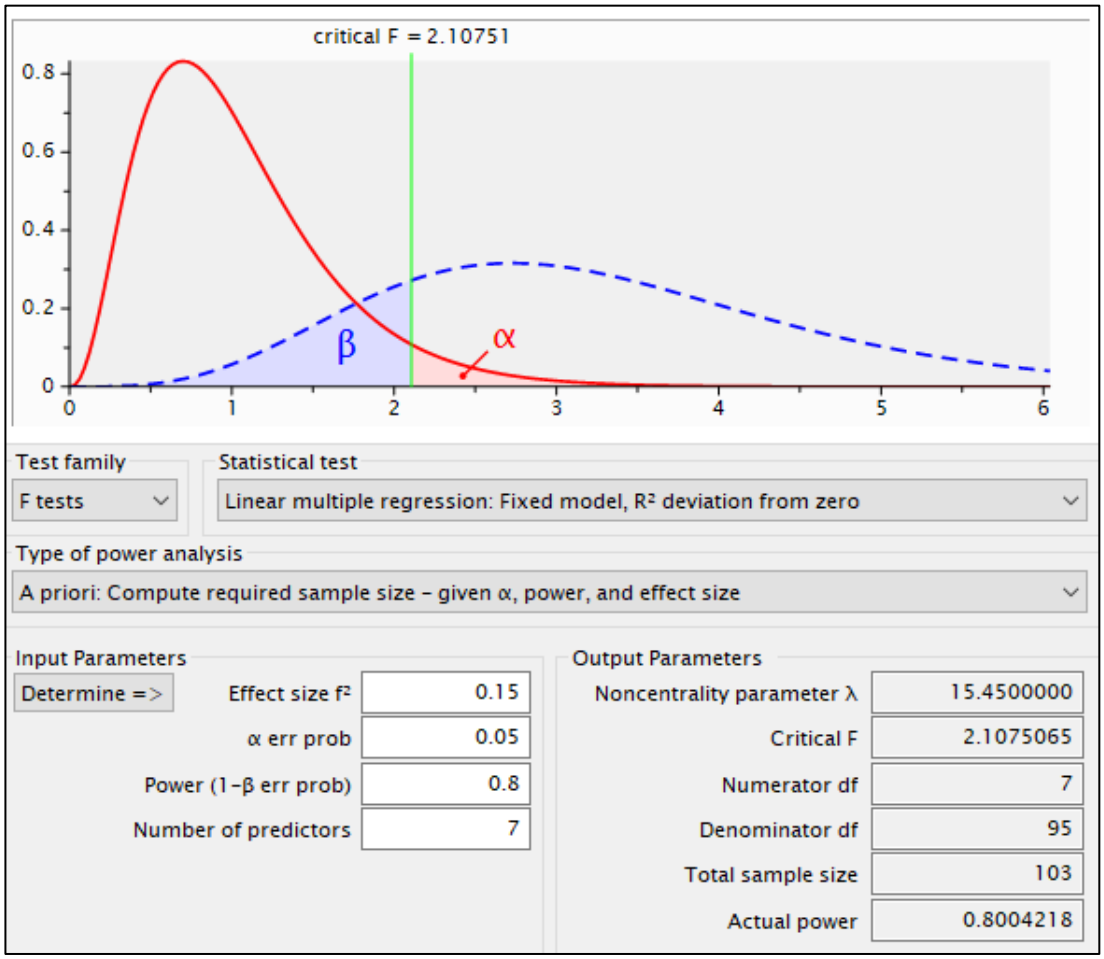
Most studies conventionally base their studies at confidence interval of 95% and sampling error of 0.05 for sample values (Bartlett, Kotrlik and Higgins 2001). Based on Krejcie and Morgan (1970)'s sample size determination table with confidence level of 95% and sampling error of 0.05, the required sample size is 384 respondents.

Second, in terms of the sample size required for statistical analysis, Hair, Ringle, and Sarstedt (2011) suggest that the minimum sample size for PLS-SEM should be equal to either ten times the largest number of formative indicators used to measure one construct or ten times the largest number of structural paths directed at a particular latent variable in the structural model, whichever the larger. Based on the given guideline, FSE is identified as the latent variable with the maximum number of

predictors (6 predictors) in the model. Given that, the minimum sample size required by PLS-SEM is 60. While the recommended rule of thumbs based on the abovementioned 1:10 ratio may serve as a rough guideline, Hair et al. (2017c) highlight that power analysis should also be considered when determining the minimum sample size.

This leads to the discussion on the third approach involving power analysis. To ensure rigor in PLS modelling, adequate sample size is essential to achieve statistical power. Power (1 – β) is the probability of correctly rejecting the null when it should be rejected, by which statistical significance will be indicated if present (Hair et al. 2006). Hence, having inadequate power lead to Type II error where relationships that are shown statistically significant when they are non-significant in actual. Power analysis involves three parameters, which are the significance level of the test (alpha), the sample size of the study and the effect size of the population (Cohen 1988). In this study, the power analysis is conducted using G*Power software (Lipsey 1990; Faul et al. 2013) based on the part of the model with the largest number of predictors (Hair et al. 2017c). Particularly, the sample size is determined in G*Power according to the pre-designed effect size at three levels where 0.02, 0.15 and 0.35 are classified as small, medium and large respectively (Cohen 1992). Generally, the acceptable and commonly used parameters are power of 80%, significance level of 0.05 (Cohen 1988) and effect size of 0.15 (Kock and Hadaya 2018). The largest number of predictors in this study is seven. In specific, the proposed model involves seven independent variables as predictors to risky assets investment, which includes financial literacy, advice-seeking, attitude towards investing, self-transcendence, conservation, social norm and financial self-efficacy. As shown in Figure 4.1, by using the G*power software, to achieve at least a medium effect size of 0.15 at the minimum acceptable level of statistical power at 0.05 and power of 0.80, with the largest number of seven predictors, the desired sample size is 103. This is determined by the power analysis using F-tests and linear multiple regression for fixed model.

Figure 4.1 G*Power Output



The last approach considers the sample size adopted by previous studies in similar field. Prior studies in the area of personal finance resorts to a wide diversity of sample sizes regardless of the total population of the research. Some studies based their research on large sample size due to the availability of large-scale, nationwide survey census, for instance: a sample size of N= 2,000 from De Nederlandsche Bank's Household Survey (DHS) (Van Rooij, Lusardi and Alessie 2011); N= 2,472 from Taiwan Supervisory Commission (FSC) Survey (Lin, Hsiao and Yeh 2017); N=1581 from Italy's Unicredit Customers' Survey (UCS) (Calcagno and Monticone 2015); N= 8855 from US National Survey of Families and Households (NSFH) (Plagnol 2011); N= 3906 from Chinese Survey of Consumer Finance by China Center for Financial Research (Chu et al. 2017); N= 1185 from Korean National Financial Literacy Test Survey (Sohn et al. 2012). However, in many other countries including Malaysia, there is a lack of nationwide financial-related survey that is recent and relevant, hence all

required data have to be collected by the research team.

The sample size of past studies with primary data are generally smaller, possibly due to time and budget constraints, low responses rate or refusal by respondents in providing financial information. Table 4.3 summarises the sample size used by various literature in different context. In spite of the readily available and accessible secondary financial data in many developed countries, primary data collection is still adopted by some studies including in the US (Agnew and Szykman 2005; Mandell and Klein 2009) with sample size ranging from N= 79 to N= 198 and in the United Arab Emirates (UAE) (Hassan Al-Tamimi and Anood Bin Kalli 2009) with sample size of N= 290. In emerging economies, such as Tunisia (Mouna and Anis 2015; Mouna and Anis 2017) and Turkey (Kiymaz, Öztürkkal and Akkemik 2016), sample size used is in the range of N= 206 to N= 256. Meanwhile, in Malaysia, the sample size ranges from N= 133 to N= 200 (Ibrahim, Harun and Isa 2010; Boon, Yee and Ting 2011; Mahdzan and Tabiani 2013; Ming-Yen Teoh, Chong and Mid Yong 2013; Bakar and Yi 2016). Through the review of sample size in the personal finance literature, it is seen that a minimum sample size of approximately 200 is widely accepted and adopted in the field of personal finance.

Table 4.3 Primary Data Sample Size Adopted in Past Studies.

Context	Sample Size (N)	Topic on Personal Finance	Author
US	198	Asset allocation and information overload	Agnew and Szykman (2005)
US	79	The impact of financial literacy education on subsequent financial behaviour	Mandell and Klein (2009)
UAE	290	Financial literacy and investment decisions of UAE investors	Hassan Al-Tamimi and Anood Bin Kalli (2009)
Tunisia	214	Financial literacy in Tunisia: Its determinants and its implications on investment behaviour	Mouna and Anis (2015)

Tunisia	256	Financial literacy and portfolio diversification: An observation from the Tunisian stock market	Mouna and Anis (2017)
Turkey	206	Behavioural biases of finance professionals: Turkish evidence	Kiymaz, Öztürkkal, and Akkemik (2016)
Malaysia	150	Exploring the factors influencing credit card spending behaviour among Malaysians	Ming-Yen Teoh, Chong, and Mid Yong (2013)
Malaysia	200	The impact of psychological factors on investors' decision making in Malaysian stock market: A case of Klang valley and Pahang	Bakar and Yi (2016)
Malaysia	133	A study on financial literacy of Malaysian degree students	Ibrahim, Harun, and Isa (2010)
Malaysia	192	The impact of financial literacy on individual saving: An exploratory study in the Malaysian context	Mahdzan and Tabiani (2013)
Malaysia	200	Financial literacy and personal financial planning in Klang Valley, Malaysia	Boon, Yee, and Ting (2011)

Taken together, according to the aforementioned guidelines, this study requires a minimum sample size of 384 respondents to fulfil the sample requirement by confidence level and margin of error (N= 384), PLS-SEM analysis requirement (N= 60), power analysis (N= 103) and past literature in the area of personal finance (N= 200).

4.4 Data Collection Method

In general, data can be distinguished between two different forms, namely primary data and secondary data. Particularly, data that is collected for a specific purpose is categorised as primary data, whereas data collected by another researcher for another purpose is considered as secondary data (Sarstedt and Mooi 2014). Due to the unavailability of recent and relevant secondary data, all the information in this study is captured through primary data collection. With that, the data collected are recent, proprietary and specific for purpose of the study (Sarstedt and Mooi 2014).

Among various ways of gathering primary data, this study relies upon self-report data through the administration of questionnaire survey. Survey is a research tool that provides a quantitative or numeric description of trends, attitudes or opinions of a target population through studying the sample of that population (Creswell 2014). This study adopts questionnaire survey as the preferred type of data collection for several reasons. First, this study aims to establish relationships between financial information, investment motivation, investment behavioural skills and financial behaviour through the integration of IMB model and theory of basic values. In doing so, the responses have to be quantified and coded into measurable variables for the required statistical analysis (Gray 2004), which justifies the suitability of questionnaire survey method. Second, questionnaire survey permits wider geographical coverage at minimal expense of effort and cost (Singh 2006), thereby allowing the selection of a large and more representative sample throughout Malaysia at relatively little cost and time. Third, as this study involves enquiring one's personal and sensitive information such as their financial assets and income, the confidentially and anonymity of respondents is of high importance. Through questionnaire survey, the respondents' identity can remain anonymous (Gray 2004). Other advantages of using questionnaire survey involves rapid turnaround in collecting the data (Creswell 2014) which ensures quick inflow of data.

As with all questionnaire survey, this study relies on self-report data where it assumes that all respondents will provide accurate, honest and truthful responses. As such, self-reporting bias may possibly exist because participants might respond strategically, conceal their financial decisions, or respond without understanding the questions (Khan, Tan and Chong 2017). With that, measures such as anonymity of responses and voluntary participation in the survey are put in place to address any form of self-reporting bias, if present. Nonetheless, as this survey is conducted solely for academic purpose, respondents are less likely to distort their responses or provide strategic answers (Menkhoff, Schmeling and Schmidt 2010). Besides, respondents consist only those who voluntarily take part in the survey, thereby suggesting their interest in financial market research and motivation to provide honest answers (Menkhoff, Schmeling and Schmidt 2010; Egan, Merkle and Weber 2014). Hence, there is no

apparent reason that respondents disguise their information level, motivation, self-efficacy and risky assets investment. In reality, self-report data are ubiquitous in behavioural research (Stone and Shiffman 2002). Evidence also shows that the largest, most reputable and popular national surveys commonly depend on self-report data, which affirms the validity and effectiveness of this methodology (Turrentine 2001).

In administering the questionnaire survey, this study opts for web-based survey, rather than paper-based survey. The web-based survey, Qualtrics Survey is chosen as the platform because Curtin University owns a site license which is accessible by all students and staff for free. Other than that, Qualtrics offers comprehensive features that is user-friendly. As mentioned earlier, the questionnaire of this study involves obtaining sensitive data from respondents. An online survey would permit individuals to attempt the survey at a time and place that is suitable and comfortable to them (Gray 2004), thereby enabling them to provide their information accurately without the fear of revealing their identity or personal information during the answering process. Due to the absence of an interviewer or administrator, interviewer bias can be eliminated, and respondents are less likely to respond with socially desirable behaviour and less exposed to evaluation apprehension in web-based survey (Grimm 2010; Sarstedt and Mooi 2014).

Furthermore, web-based survey supports survey designs with branching, skip patterns (Sarstedt and Mooi 2014) and many other build-in features that are required in this study. For instance, at the beginning of the survey, there exists option to channel respondents either to the first question or the end of survey depending on their responses on willingness to participate in the survey. The automatic summing feature in Qualtrics is particularly useful for question regarding the proportion of risky assets investment. The duration to complete the entire survey is recorded for each respondent, thereby allowing the detection of potential straight-lining behaviour or respondents who answer without reading the questions. Additionally, the "prevent ballot-box-stuffing" option is enabled to prevent respondents from taking the survey more than once. For respondents who are not able to complete the survey in one go, they are allowed to close the web browser and resume their questionnaire within the allotted time frame, without having to restart the survey again. All questions are made

compulsory where respondents are required to input responses. Despite so, as mentioned in the participant information statement, they are allowed to exit the survey as and when they want to discontinue. Lastly, the web-based survey provides file containing the survey responses that is recoded, available in multiple formats, and is compatible and readily accessible in different software. This reduces the time needed to enter the data manually and minimises any human error that may occur in the process of transferring the data.

Through cross-sectional, web-based survey, the primary data of this study are garnered from Malaysians who are 18 years old and above in both West Malaysia and East Malaysia by using a combination of quota sampling and snowball sampling procedures. The survey link is distributed to potential respondents who fulfil the inclusion criteria through email and social media platforms such as WhatsApp, WeChat or Facebook. An invitation message with brief information on research purpose, researchers' details and participating requirement are sent together with the survey link. At the end of the invitation message, a statement is included to seek favour from recipients in forwarding the survey invitation among their acquaintances. Besides, respondents are also asked for referral on potential participants. The questionnaire takes approximately 15 minutes to complete. Some respondents spend longer time to finish, potentially due to their limited familiarity with finance related questionnaire survey.

The quota for age, gender and income group are monitored through the online survey platform to ensure the distribution of survey respondents do not distinct much from the pre-specified demographics quota (see Appendix A). The data collection takes around a period of three months, commencing from December 2018 until February 2019. As a result, a total of 420 responses are collected through the questionnaire survey. The final amount of usable and valid responses is congruent with the sample size guidelines and is also sufficient for the sample requirement of statistical test.

4.5 Research Instrument

This study adopts questionnaire survey as the primary method for collection of data.

The focus of this study lies in identifying the determinants of individuals' risky asset investment through the integration of IMB model and theory of basic values. As such, the predictors of risky assets investment, which are selected based on the theoretical reasoning, empirical evidence and practical relevance, include three main categories: (1) financial information; (2) investment motivation; and (3) investment behavioural skills. The measurement of each variables is summarised in Table 4.4 and the details are further elaborated in the following subsections.

Table 4.4 Summary of Instruments

Variable	Description
Dependent Variable	
Risky assets investment (RA)	Continuous variable: Percentage of risky assets allocation ranging from 0-100%
Independent Variables	
Financial Information	
Financial literacy (FL)	Continuous variable: Number of correct responses ranging from 0-10
Advise-seeking (ADV)	Continuous variable: Reliance on professional financial advisor ranging from 1-5
Investment Motivation	
Attitude towards investing (ATT)	Latent variable: Consists of 6 items
Personal values: Self-transcendence (TRANS) Conservation (CON)	Continuous variable: Linear combination of each response on items using the weights
Social norm (SN)	Latent variable: Consists of 4 items
Investment Behavioural Skills	
Financial self-efficacy (FSE)	Latent variable: Consists of 5 items

4.5.1 Risky Assets Investment

Individuals' financial behaviour, particularly risky assets investment, is the dependent

variable of this study. In prior literature, some commonly used asset measurement in the area of personal financial behaviour includes: (1) diversification of assets (how many different types of assets one holds) (Abreu and Mendes 2010; Mariotti, Mumford and Pena‐Boquete 2015; Mouna and Anis 2015; Von Gaudecker 2015); (2) ownership of assets (whether one holds the specified type of assets) (Van Rooij, Lusardi and Alessie 2011; Farrell, Fry and Risse 2016; Chu et al. 2017; León and Pfeifer 2017; Lin, Hsiao and Yeh 2017; Hsiao and Tsai 2018); and (3) allocation of assets (what proportion or amount of wealth one allocates to the assets) (Riley Jr and Chow 1992; Gilliam, Chatterjee and Grable 2010; Duasa and Yusof 2013; Ehm, Kaufmann and Weber 2014; Agarwal et al. 2015; Khan, Tan and Chong 2017; Liao et al. 2017; Sivaramakrishnan, Srivastava and Rastogi 2017).

The pivot of this study revolves around the extent to which individual is involved in the risky investment market, rather than mere ownership. As such, the outcome of interest lies in risky assets allocation in assessing individuals' risky assets investment. Specifically, the dependent variable is represented by the proportion of risky assets allocation. This study adopts the measurement from Khan, Tan, and Chong (2017), which is a modification of the questionnaire by Ehm, Kaufmann, and Weber (2014) to suit the Malaysian context. This instrument is selected as it is tested in the context of this study. Furthermore, it captures not only the allocation of risky assets, but also safe assets and other form of assets such as savings or current account, fixed deposits, bonds or derivatives. As the two risky assets, stocks and mutual funds are the sole interest of this study, inclusion of other financial assets in the question ensures that respondents will not confuse risky assets with other financial assets such as bonds or derivatives.

As shown in Table 4.5, the measurement consists of one question on risky assets allocation to gauge the proportion of risky assets owned by the respondents. In particular, respondents are required to allocate the proportion of their wealth between safe assets, risky assets and other assets, with 0% being the lowest possible allocation, 100% being the highest and the total proportion of three assets must sum up to 100%. Individuals' risky asset allocation is assessed based on the percentage of risky assets allocated, ranging from 0 to 100%. The variable of risky assets investment, is thus a

continuous variable which is expressed in percentage form, demonstrating the extent to which respondents are involved in risky financial assets.

Table 4.5 Risky Asset Allocation Question

Risky Asset Allocation Question	
Q: Assume you have RM 100,000 to invest into different types of financial assets. How would you allocate this money between safe assets, risky assets and other assets? Please allocate 100%.	
Financial assets	(%)
1. Safe assets (e.g. savings or current account/ Fixed deposit etc.)	
2. Risky assets (e.g. stocks/ mutual funds)	
3. Other assets (e.g. bonds/ derivatives etc.)	
Total	100%

4.5.2 Financial Information

Financial information is represented by: (1) financial literacy; and (2) advice-seeking. Section 4.5.2.1 discusses the measures of financial literacy, followed by Section 4.5.2.2 on advice-seeking measures.

4.5.2.1 Financial Literacy Measures

To evaluate financial literacy, a total of ten questions on financial literacy are included in the questionnaire. The first three questions are developed by Lusardi and Mitchell (2008) for one of the US national surveys, 2004 Health and Retirement Study (HRS) to gauge respondent's fundamental economic concepts and basic numeracy knowledge, including compounding interest, inflation and risk diversification. These questions, also known as the Big Three, are widely used in national surveys across various countries (Lusardi and Mitchell 2011b) and are adopted by past studies, including Beckmann (2013) in Romania, Van Rooij, Lusardi, and Alessie (2011) in the Netherlands, Agnew, Bateman, and Thorp (2013) in Australia, Bucher-Koenen and Lusardi (2011) in Germany, Sekita (2011) in Japan, Brown and Graf (2013) in Switzerland and Agarwal et al. (2015) in India. The adoption of these three questions by various studies in different geographical context ratify its universal usability and ease comparison between countries.

Nonetheless, Huston (2010) argues that the initial instruments with only three items may not be sufficient to capture the level of financial literacy and the reliability of the measures may be questionable. Additionally, according to the IMB model, the information should be directly relevant to the targeted behaviour and readily translated into the performance of the behaviour (Fisher et al. 2006). The three questions covering mere basic financial concept are not able to quantify how knowledgeable individuals are in the area of investing, as required by the IMB model. As suggested by Lusardi (2015), sound savings and investment decision-making require knowledge beyond the Big Three questions.

As such, seven additional questions gauging respondents' advanced financial literacy are adopted from Lusardi and Mitchell (2007). Specifically, these questions assess one's knowledge on financial assets which cover the stock market function, knowledge on mutual funds, stocks and bonds, and asset diversification. As such, the advanced financial literacy questions are more complicated as compared to the basic Big Three questions. They are devised particularly to examine more advanced financial knowledge related to investment and portfolio choice (Van Rooij, Lusardi and Alessie 2011). As noted by Khan, Tan, and Gan (2019), the advanced financial literacy items gauging knowledge of stocks, mutual funds and bonds are the most relevant to investment decisions. Similarly, Liao et al. (2017) claim that the advanced financial literacy involves financial concepts closely related to risky assets investment, thereby exerting greater influence on one's decision to invest in risky assets than would the basic financial literacy. Putting these together, the relevancy, appropriateness and sufficiency of the questions as required by the IMB model is validated. The advanced financial literacy questions is also employed by past studies, alongside with basic financial literacy questions (Boon, Yee and Ting 2011; Van Rooij, Lusardi and Alessie 2011; Almenberg and Dreber 2015; Lusardi 2015; Chu et al. 2017; Mouna and Anis 2017; Niu, Zhou and Gan 2020).

Following that, this study adopts the two sets of questions to provide a more comprehensive measure of financial literacy. It comprises three questions on basic financial literacy (such as compound interest, inflation, diversification), whereas the

other seven questions on advanced financial literacy (such as riskiness of stocks and mutual funds, risk diversification). As risky financial assets are the prime focus of this study, the advanced financial literacy questions covering the aspect on financial assets such as savings accounts, mutual funds, bonds and stocks, and the return and riskiness of different assets, are of high relevance and may give additional insights. Some questions are modified to suit the context of the study, such as Ringgit Malaysia (RM) is used as the basis of currency. Furthermore, the option of "Refusal" is removed to minimise unusable responses. Table 4.6 presents the financial literacy questions for this study.

Table 4.6 Financial Literacy Questions

Financial Literacy	Questions
Basic	
Q1. Interest compounding	Suppose you had RM100 in a savings account and the interest rate was 2 percent per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (**More than RM102**; Exactly RM102; Less than RM102; Do not know)
Q2. Inflation	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, you would be able to buy_____. (More than today; Exactly the same; **Less than today**; Do not know)
Q3. Diversification	Do you think the following statement is true or false: Buying a single company stock usually provides a safer return than a stock mutual fund? (True; **False**; Do not know)
Advanced	

Q4. Stock market function	Which of the following statements describes the main function of the stock market? (The stock market helps to predict stock earnings; The stock market results in an increase in the price of stocks; **The stock market brings people who want to buy stocks together with those who want to sell stocks**; None of the above; Do not know)
Q5. Mutual fund knowledge	Which of the following statements is correct? (Once one invests in a mutual fund, one cannot withdraw the money in the first year; **Mutual funds can invest in several assets, for example, invest in both stocks and bonds**; Mutual funds pay a guaranteed rate of return which depends on their past performance; None of the above; Do not know)
Q6. Bond prices and interest rates	If the interest rate falls, what should happen to bond prices? (**Rise**; Fall; Stay the same; None of the above; Do not know)
Q7. Stock and bond risk	True or false? Stocks are normally riskier than bonds. (**True**; False; Do not know)
Q8. Long term asset return	Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return? (Savings accounts; Bonds; **Stocks**; Do not know)
Q9. Highest fluctuations (Asset risk)	Normally, which asset displays the highest fluctuations over time? (Savings accounts; Bonds; **Stocks**; Do not know)
Q10. Risk diversification	When an investor spreads his money among different assets, does the risk of losing money: (Increase; **Decrease**; Stay the same; Do not know)

Note: Options are provided in parentheses, correct answer is in bold.

For financial literacy measures, no standardised method are established to date, as a broad range of different means are used by prior studies (Huston 2010). Studies by

Lin, Hsiao, and Yeh (2017), Lusardi and Mitchell (2007) and Van Rooij, Lusardi, and Alessie (2011) apply the factor analysis to construct financial literacy index. On the other hand, some authors capture financial literacy as a categorical variable where respondents are categorised into different group according to their level of financial literacy. For instance, referring to Boon, Yee, and Ting (2011), individuals with more than 60% correct answers are categorised as the "High Financial Literacy Group"; less than 60% correct answers and less than four "do-not-know" responses are under the "Moderate Financial Literacy Group"; while more than four "do-not-know" responses are the "Low Financial Literacy Group".

This study takes another approach whereby the level of financial literacy is measured as an index represented by the total number of correct answers out of the ten questions. For this, every correct response is given one point. The score ranges from 0 (all wrong) to 10 (all correct), with higher scores indicating higher level of financial literacy. In an attempt to explore alternative means for financial literacy index construction, Behrman et al. (2012) indicate that even more sophisticated approaches perform nearly as well as the simple additive method. This measure is frequently used in a great deal of studies including Hastings and Mitchell (2020), Mouna and Anis (2017), Chu et al. (2017), Calcagno and Monticone (2015), Ali, Rahman, and Bakar (2015), (Bumcrot, Lin and Lusardi 2013), Klapper, Lusardi, and Panos (2013) and Guiso and Jappelli (2008).

4.5.2.2 Advice-seeking Measures

Generally, in measuring the influence of financial advisors, some studies adopt a binary approach while others offer multiple options. Hackethal, Haliassos, and Jappelli (2012) construct a dummy variable for financial advisors use based on data following respondents' consultation with financial advisors or without such consultation. Similarly, Zhang (2014) captures financial advice as a dummy variable, where value of one represents respondent who received financial advice. Likewise, this approach of measuring advice-seeking as a dichotomous variables is widely adopted in past studies (Lusardi and Mitchell 2011a; Kramer 2016; Lin, Hsiao and Yeh 2017). On the other hand, Calcagno and Monticone (2015) assess the demand of financial advice by allowing five alternative answers from "letting advisors to decide everything" to

"decide completely by themselves". Bachmann and Hens (2015) also adopt a similar method with six options to evaluate respondents' willingness to delegate financial decisions to a financial advisor when they are making financial decisions.

The focus of this study is to capture the intervention of financial advisors in providing financial information. The main concern lies in individuals' behaviour in consulting financial advisors, rather than whether or not respondent consult a financial advisor. Hence, the single-item measure method is deemed insufficient. With that, this study adopts the measurement from Calcagno and Monticone (2015) to capture the extent to which individuals rely on financial advisors in acquiring financial information. As shown in Table 4.7, respondents are asked on their behaviour in consulting financial advisors when deciding how to invest in risky assets. The variable takes a value of 1 to 5, with 1 being the least reliant on financial advisors.

Table 4.7 Advice-seeking Question

Advice-seeking Question
Q: Which of these statements best describes your behaviour in consulting financial advisors when deciding how to invest in risky assets?
1. I decide completely by myself, and the advisors simply execute my decisions.
2. I tell the advisors how I intend to invest and ask their opinion before deciding.
3. I consider advisors' proposals before deciding.
4. I rely mainly on advisors for my investment decisions.
5. I let my advisors decide everything.

4.5.3 Investment Motivation

Investment motivation is conceptualised by: (1) attitude towards investing; (2) personal values; and (3) social norm. Section 4.5.3.1 describes the measures on risk attitude, followed by Section 4.5.3.2 on personal values and 4.5.3.3 on social norm.

4.5.3.1 Attitude towards Investing Measures

In the financial behaviour research area, the literature often revolves around attitude-

related constructs such as risk attitude or financial attitude, and not specifically on individuals' attitude towards investing in risky assets.

Generally, attitude is a domain-specific measure (Ehm, Kaufmann and Weber 2014), whereby willingness to take risk in one domain (e.g. career) may be different from risk attitude in another domain (e.g. finance). Dohmen et al. (2011) reviewed the measurement of risk in different context (such as health, sports and leisure, driving, finance, career). The results suggest that hypothetical financial lotteries question regarding willingness to take risks in financial matters are better in predicting individual's financial decisions, specifically stocks investment, as compared to the general risk question. Another widely-used risk attitude measure is developed by Barsky et al. (1997) to assess individual's willingness in accepting gambles that offer higher but uncertain payoffs. It is adopted by many studies including Van Rooij, Lusardi, and Alessie (2011) and other nationwide surveys such as the US Health and Retirement Study, Panel Study of Income Dynamics, National Longitudinal Study, Surveys of Consumers, Dutch CentERpanel, and Chilean Social Protection Survey (Kimball, Sahm and Shapiro 2008).

Furthermore, other instruments with simple scale are also available, such as the 4-point scale by Dorn and Huberman (2005) and Dorn and Huberman (2010) or 7-point scale by Ehm, Kaufmann, and Weber (2014). Respondents are to indicate their willingness to take financial risk when they save or invest on a simple scale and are differentiated into four categories based on their responses. This instrument is similar with the 1989 Survey of Consumer Finances (SCF89) (Schooley and Worden 1996), and is also consistent with Angelini and Cavapozzi (2017), Mariotti, Mumford, and Pena-Boquete (2015), Farrell, Fry, and Risse (2016), Jianakoplos and Bernasek (1998), Hariharan, Chapman, and Domian (2000) and Household, Income and Labour Dynamics in Australia (HILDA) Survey (Mariotti, Mumford and Pena-Boquete 2015) in measuring risk attitude.

Nevertheless, these instruments are not in line with the IMB model. They assess individuals' general risk appetite in the finance domain, rather than their specific attitude towards investing in risky assets, particularly stocks and mutual funds.

Whereas the IMB model asserts that the underlying variables should have specific content which is relevant to the particular act of interest (Fisher et al. 2006). As discussed earlier, the motivation aspects (including attitude and social norm) of IMB model originates from the social psychological conceptualisation of TRA and TPB. The construct of attitude in TPB refers to attitude towards the behaviour, instead of attitude towards the object (Ajzen 1991; Yuzhanin and Fisher 2016). That is, one should not assess the attitude towards financial products (object). Rather, the attitude towards investing in the financial products (behaviour) should be measured. Hence, it is evident that the aforementioned measures are inappropriate.

Unlike other variables, instruments that gauge attitude towards investing remain limited because this is one of the first studies to adopt the IMB model in predicting financial behaviour. Fortunately, the questionnaires for IMB model and TPB are designed such that deliberate modification are allowed to suit different research context. Moreover, as highlighted by Valois and Godin (1991) and Batra and Ahtola (1991), the selection of evaluative terms (e.g., useful/valuable/beneficial/pleasant) for items under attitude construct is particularly crucial and should be chosen based on their relevance to the behaviour. Following that, this study adapts a reflective six-item scale from TPB (Ajzen and Fishbein 1972) and IMB model (Fisher et al. 2006) to examine respondents' overall evaluation towards investing in risky assets. The evaluative items are adapted from Ajzen and Fishbein (1972) because it is developed originally by the theorist for the investment context, hence they are deemed highly relevant. The evaluative terms include wise, good, beneficial and rewarding. The latent variable employs a 5-point Likert scale with options anchored by (1) "strongly disagree" to (5) "strongly agree" and the items are outlined in Table 4.8. This approach is congruent with prior studies (Lee 2009; Ramayah et al. 2009; Seacat and Northrup 2010; Warsame and Ireri 2016; Lim et al. 2018).

Table 4.8 Attitude towards Investing Items

Item code	Item
ATT_1	Investing in risky assets is wise.
ATT_2	Investing in risky assets is good.

ATT_3	Investing in risky assets is beneficial.
ATT_4	Investing in risky assets is rewarding.
ATT_5	Investing in risky assets would improve my wealth.
ATT_6	Wealth accumulation is important to me.

4.5.3.2 Personal Values Measures

In assessing personal basic values, the Portrait Values Questionnaire (PVQ) is one of the most widely utilised instruments (Gorgievski et al. 2018). The PVQ is an alternative to the Schwartz Value Survey (SVS), which is the first instrument developed to measure values with regard to the theory of basic values. Different from SVS, the PVQ is designed for respondents who are not educated in the Western schools (Schwartz 2012). Hence, the PVQ is more suitable for the context of this study. Specifically, the PVQ includes short verbal descriptions of different people in measuring the ten basic values orientations. There are several versions of PVQ questionnaire such as 21-item, 29-item and 40-item PVQ (Schwartz 2003).

In this study, a short, 21-item version of the Portrait Values Questionnaire (PVQ-21) is employed to measure the two bipolar value dimensions, which are Openness to change versus Conservation value dimension and Self-enhancement versus Self-transcendence value dimension. The preference for conservation over openness to change values is represented by the variable named conservation, whereby a higher score represents a higher relative importance of conservation values over openness to change values. In the same manner, the preference for self-transcendence over self-enhancement values is represented by the variables referred as self-transcendence. A higher score represents a higher relative importance of self-transcendence values over self-enhancement values. The details are further discussed in the following paragraphs.

There are several rationales for choosing PVQ-21 over other versions of the PVQ questionnaire. First, PVQ-21 is a shorter version of the questionnaire which is estimated to take approximately five to six minutes in completing all 21 items (Schwartz 2003). As compared to PVQ which consists of more items, PVQ-21 has a shorter survey length that is useful in reducing respondent fatigue. Due to the reduction of items as compared to other versions, it seems that the reliability of the measure may

be compromised (Schwartz 2003). However, validation studies demonstrate that the instrument reveals considerable predictive validity, with reasonable meaning equivalence across cultures (Davidov, Schmidt and Schwartz 2008; Schwartz 2012). Moreover, the reliability of PVQ-21 is only of concern when it is used to measure all 10 basic values (Verkasalo et al. 2009). This is because each value is derived from only two items (except for universalism with three items) to cover a board conceptual component of the values. Whereas for studies that collapse the 10 values into two values dimensions, the PVQ-21 is otherwise proven suitable and sufficient (Schwartz 2003). Specifically, the reliabilities of self-transcendence and conservation scales are high at 0.70 and 0.74, respectively (Verkasalo et al. 2009) as compared to individual values. Additionally, the PVQ-21 questionnaire is developed by the theorist, Schwartz (2003) for the use of European Social Survey (ESS) every two years and is administered by various studies in different cultural contexts (Verkasalo et al. 2009; Gouveia, Milfont and Guerra 2014a; Simón et al. 2017; Tulviste, Kall and Rämmer 2017; Lönnqvist, Leikas and Verkasalo 2018). Therefore, the cross-culturally validated PVQ-21 is appropriate and reliable for the study.

The PVQ-21 comprises short portraits of 21 different person. Each portrait states the descriptions on a person's goals, aspirations or wishes in life. It refers implicitly to the significance of a value without explicitly identifying values as the focus (Schwartz 2012). Respondents are required to compare themselves with each portrait and rate "How much is this person like you" on a 6-point rating scale of (1) "very much like me" to (6) "not like me at all". If the person portrayed in the description is “very much like the respondent”, it corresponds with that specific value being important to the respondent. Self-transcendence values consist of benevolence and universalism values that are opposing with power and achievement values. On the other hand, for conservation values, it involves tradition, conformity and security values that are against self-direction and simulation. The 10^{th} basic value, hedonism, belong to both self-transcendence and conservation values (Gorgievski et al. 2018) as it shares elements of both conservation and self-enhancement (Schwartz 2003). The items in PVQ-21 are listed in Table 4.9.

Table 4.9 PVQ-21 Items

Basic values	Items
Self-Direction	Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.
Power	It is important to him to be rich. He wants to have a lot of money and expensive things.
Universalism	He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.
Achievement	It's important to him to show his abilities. He wants people to admire what he does.
Security	It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.
Stimulation	He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.
Conformity	He believes that people should do what they are told. He thinks people should follow rules at all times, even when no-one is watching.
Universalism	It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
Tradition	It is important to him to be humble and modest. He tries not to draw attention to himself.
Hedonism	Having a good time is important to him. He likes to “spoil” himself.
Self-Direction	It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.
Benevolence	It's very important to him to help the people around him. He wants to care for their well-being.
Achievement	Being very successful is important to him. He hopes people will recognise his achievements.
Security	It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.
Stimulation	He looks for adventures and likes to take risks. He wants to have an exciting life.
Conformity	It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
Power	It is important to him to get respect from others. He wants people to do what he says.

Benevolence	It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
Universalism	He strongly believes that people should care for nature. Looking after the environment is important to him.
Tradition	Tradition is important to him. He tries to follow the customs handed down by his religion or his family.
Hedonism	He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

Subsequently, all responses on the items are reversed scored. In the measurement of values, the scale should measure the relative importance of a value to a person, that is, their value priorities (Schwartz 2012). However, respondents differ in their tendencies to use response scale, whereby some may use the upper part of the scale more yet others tend to use middle or lower part. To measure values priorities more accurately, individual differences in response scale use is corrected following the guidelines by Schwartz (2012). Specifically, each person's responses are centred on their own mean rating of the 21 items by subtracting the mean response from their response to each item. This correction approach is frequently practised in measuring basic values (Vecchione et al. 2012) as it removes the differences in using the scale, thereby converting the response into relative importance scores for each of the person's values.

The score of the two value dimensions is computed using the equations provided by Verkasalo et al. (2009) (see Appendix B). Referring to the given equations, respondents' scores on conservation and self-transcendence are derived as a linear combination of each respondents' answer on the items based on the weights. As mentioned earlier in this section, a high conservation score signifies that respondents have a higher relative importance of conservation values over openness to change values. Similarly, a high self-transcendence score represents relative importance of self-transcendence values over self-enhancement values. This measure and equation are elaborately validated by Verkasalo et al. (2009) across different countries using the ESS data. According to Verkasalo et al. (2009), the PVQ-21 questionnaire is highly robust and reliable in measuring the two-dimensional values, which is also the main focus of this study. Besides, this computation method is also adopted by other studies in measuring two-dimensional values (Roets, Cornelis and Van Hiel 2014; Zenker, Gollan and Van Quaquebeke 2014; Lönnqvist and Itkonen 2016; Roccato et al. 2017;

Lönnqvist, Leikas and Verkasalo 2018; Ahola 2020).

4.5.3.3 Social Norm Measures

With respect to social norm, the IMB model asserts that it is a function of normative belief and motivation to comply. As mentioned earlier, the two motivation aspects (including attitude and social norm) of IMB model originates from the social psychological conceptualisation of TRA and TPB. Social norm involves an individual's perception of what specific referent others think should be done regarding the specified behaviour (normative belief) and also the individual's motivation to comply with the referents (motivation to comply) (Fisher and Fisher 1992).

However, differing from the initial formulation of TRA and TPB, the definition of normative belief is recently redefined where it includes injunctive and descriptive normative beliefs (Fishbein and Ajzen 2011). Injunctive norm is defined as the perception of what important others would approve or disapprove in regard to the behaviour, whereas descriptive norms refer to the perception that important others are or are not performing the behaviour (Fishbein and Ajzen 2011; Ajzen 2015). In contrary to the original use of the term social norm, which regarded only to injunctive norms, the newly added descriptive norms in the current definition considers the total social pressure one experience when performing the targeted behaviour.

Guided by the updated conceptual definition of social norm, this study therefore measures social norm as the perception that people who are important to respondents are supportive towards investing in risky assets, their important others are engaged in investing in risky assets and they are motivated to conform to their important others' opinion regarding investment. The latent variable, as shown in Table 4.10, is operationalized using four items adapted from Fishbein and Ajzen (2011). These questions assess respondents' injunctive norms, descriptive norms and their motivation to comply with referent in risky assets investment. Scoring of each item is based upon a 5-point scale ranging from (1) "strongly disagree" to (5) "strongly agree".

This instrument is chosen to measure social norm for several reasons. First, the instrument is regarded as updated, comprehensive and relevant as it is developed by

the theorist, Fishbein and Ajzen (2011) wherein the measures incorporates all important elements as per latest definition. Second, it is well-tested and represents a robust and reliable means of capturing social norm in a great deal of studies across different contexts over the last few decades (Mackie et al. 2015). Likewise, this instrument is also deployed in financial behaviour studies (Ramayah et al. 2009; Limbu 2017; Sivaramakrishnan, Srivastava and Rastogi 2017), which once again proven its robustness and generalisability for adaptation in the context of this study.

Table 4.10 Social Norms Items

Item code	Item
SN_1	Most people who are important to me (e.g. friends/family) invest in risky assets.
SN_2	Most people who are important to me think I should invest in risky assets.
SN_3	Most people who are important to me would support my investment in risky assets.
SN_4	When it comes to risky assets investment, I want to do what most people who are important to me think I should do.

4.5.4 Investment Behavioural Skills

Investment behavioural skills is represented by financial self-efficacy and the measures of the variable is discussed in the section below.

4.5.4.1 Financial Self-efficacy Measures

As the concept of FSE is relatively recent, the methodology to measure FSE is also at infancy stage (Farrell, Fry and Risse 2016). A small number of studies have adapted the domain specific scale from the general self-efficacy scale, such as Dietz, Carrozza, and Ritchey (2003) who adapt items from the Pearlin Global Mastery Scale in assessing financial self-efficacy. Meanwhile, some studies have developed the FSE scale. For instance, the financial self-efficacy scale by Lown (2011), a single-item investment self-efficacy measure by Forbes and Kara (2010), and a multiple-item

investing self-efficacy scale by Montford and Goldsmith (2016).

The present study adapts and applies the reflective five-item scale developed and validated by Montford and Goldsmith (2016) that assesses respondents' self-efficacy in their ability to make personal investment decision. Reason being that this instrument consists of multiple items, with Cronbach's alpha ranged between 0.67 and 0.88 as reported in prior studies (Montford and Goldsmith 2016; Tang et al. 2019). Besides, it is developed based on established study particularly in the domain of stock investing. These features and psychometric properties, which differentiate it from other instruments, allows for high specificity and validity of FSE as required by the IMB model (Fisher and Fisher 1992; Fisher, Fisher and Harman 2003), in comparison to other alternative instruments. As this study attempts to further add specificity to the questionnaire, respondents are asked specifically on their self-efficacy in making risky assets investment decision. The items are listed in Table 4.11. Respondents are required to rate each of the five statements on a 5-point scale with options anchored by (1) "strongly disagree" to (5) "strongly agree".

Table 4.11 Financial Self-Efficacy Items

Item code	Item
FSE_1	I am fully capable of making risky assets investment decisions.
FSE_2	I am confident in my ability to make risky assets investment decisions.
FSE_3R	I do not feel I am qualified for the task of making risky assets investment decisions.
FSE_4	Using investment information available is well within the scope of my abilities.
FSE_5	My past experiences increase my confidence that I will be able to successfully make risky assets investment decisions.

4.5.5 Socio-demographic and socioeconomic Variables Measures

Last but not least, the socio-demographic and socioeconomic characteristics of respondents are collected. In this study, the socio-demographic indicators are

described by gender, age and number of dependents. The respondent's gender is classified between male and female. Age group is categorised into five groups: 18 – 24 years old, 25 – 34 years old, 35 – 44 years old, 45 – 54 years old, and 55 years old and above. Marital status is indicated identification with one of the following groups: married, never married, widowed, divorced, or separated. The responses of widowed, divorced, or separated are collapsed into one, under "others" to improve distribution. With regard to number of dependents, respondents are to indicate their number of dependents by choosing either one of the options provided: none, 1, 2, 3, or 4 and above.

Indicators of socioeconomic status include monthly income, employment status and highest educational attainment. Respondents are to report their monthly income based on the following eight categories: (1) less than RM2,500; (2) RM2,500 - 3,999; (3) RM 4,000 - 5,499; (4) RM5,500 - 6,999; (5) RM7,000 - 8,499; (6) RM8,500 - 9,999; (7) RM10,000 - 12,999; or (8) RM13,000 and above. To capture employment status, respondents are asked to indicate their current status between employed, self-employed or others. Finally, a respondent's highest educational attainment is classified into primary school, secondary school, Sijil Tinggi Persekolahan Malaysia (STPM), Diploma, Bachelor's degree, Master's degree, or Doctorate degree.

The questionnaire for acquiring respondent's socio-demographic and socioeconomic information are adapted from Duasa and Yusof (2013) and Mouna and Anis (2017). The summary of these variables is shown in Table 4.12. Socio-demographic and socioeconomic variables that are measured as ordinal variable are included in the model as control variables, including age, income, education level and number of dependents.

Table 4.12 Socio-demographic and Socioeconomic Variables

Socio-demographic and Socioeconomic Variables	
Gender	**Monthly income (RM)**
Male	Less than 2,500
Female	2,500 - 3,999
	4,000 - 5,499
Age	5,500 - 6,999

18 - 24 years old	7,000 - 8,499
25 - 34 years old	8,500 - 9,999
35 - 44 years old	10,000 - 12,999
45 - 54 years old	13,000 and above
55 years old and above	
	Highest educational level
Marital status	Primary school
Married	Secondary school
Never married	STPM
Others	Diploma
	Bachelor's degree
Number of Dependents	Master's degree
No dependents	Doctorate degree
1 dependent	
2 dependents	**Employment status**
3 dependents	Employed
4 or more dependents	Self- employed
	Others

4.6 Pre-testing and Pilot Testing

Prior to the commencement of main data collection, this study implements both pre-testing and pilot testing of the questionnaire. These two types of testing are non-redundant as they serve distinctive purposes (Memon et al. 2017), hence are both recommended as a means to test the questions (De Leeuw 2001).

The main purpose of pre-testing a questionnaire is to ensure that the questions are clear and easy to understand, with the correct wording and sequence (Kumar, Talib and Ramayah 2013). Through this process, one can rest assure that the questions are free from ambiguity and that the respondents are able to comprehend the questions as they are designed and intended by the researcher (Sekaran 2003). Although this study adopts questions from a thorough review of existing literature, they should also be pre-tested to reassure their accuracy in a new context with the new survey participants (Kumar, Talib and Ramayah 2013). With regard to the sample size requirement for pre-testing, there is a lack of clear guidance wherein the desirable number of respondents range from 5 to 50 individuals (Memon et al. 2017). This study invites eight individuals to participate in the pre-testing of questionnaire. The participants are chosen from the target population of the main data collection as suggested (Kumar,

Talib and Ramayah 2013). Particularly, the respondents consist of three lecturers from the Faculty of Business, two experts from the finance and banking industry, and three others from non-banking and non-academic background. During the pre-test, participants are informed to identify if there are issues such as unclear questions, ambiguous terms, lack of response options or other difficulties that may require alteration of the questionnaire. The pre-testing does not reveal any major problems, except for some spelling mistakes and formatting of survey layout. With the given feedback, the questionnaire is modified accordingly, yielding the final questionnaire that is ready to be distributed.

Following the pre-testing, a pilot testing of the questionnaire is conducted thereafter. In contrary to pre-testing, pilot testing aims to ensure the adequacy of instrument, feasibility of study, effectiveness of sampling frame and technique, suitability of research protocol and logistics arrangement (Van Teijlingen and Hundley 2001). Thus, this process typically mimics a full-fledged study whereby sampling, inviting respondents, collecting data, coding and editing data are taken into consideration (De Leeuw 2001). Following the Central Limit Theorem, the desirable sample size for a pilot test is 30 individuals as also advocated by Memon et al. (2017). As recommended, the pilot test is implemented similar to the procedures necessary for the main study, but on a smaller scale (De Leeuw 2001). Hence, for the pilot test, a total of 30 complete survey responses are garnered using convenience sampling. To verify the inter-item consistency reliability of the instrument, the Cronbach's Alpha Coefficient is computed (Memon et al. 2017) using SPSS. The findings from pilot testing demonstrate that Cronbach's alpha values for all the variables range from 0.624 to 0.930, which are sufficiently above the acceptable threshold of 0.6 (Hair et al. 2006). Overall, the pilot testing does not reveal any major issues that may arise during the main data collection in later phase.

4.7 Final Questionnaire Design

Based on the feedbacks given during pre-testing and preliminary result of pilot testing, the questionnaire is then finalised (see Appendix C). The final questionnaire consists of a cover page, followed by eight sections of questionnaire gauging different variables

as shown in Table 4.13. The questions included in the survey are adapted from past literature with proven reliability and validity, and is presented in the same order to all survey respondents.

Table 4.13 Questionnaire Survey Sections

Section	Questionnaire
	Cover Page
1	Attitude towards investing
2	Financial self-efficacy
3	Social norm
4	Advice-seeking
5	Risky assets investment
6	Financial literacy
7	Personal values
8	Socio-demographic and socioeconomic Information

This study administers the questionnaire survey through an online survey platform, Qualtrics. Upon clicking the survey link, respondents are navigated to the cover page of the survey. The cover page provides the purpose of the study and an overview of the instrument. As discussed earlier, the sample population adopted for this study is restricted to Malaysian who aged 18 years old and above. To ensure that the participating respondents meet the requirement of this study, the inclusion criteria of eligible participants are also presented in the cover page. Furthermore, this section also informs respondents the expected time to complete the entire questionnaire survey and that their participation is on a voluntary basis.

The topic of the study, as highlighted at the beginning of the cover page, is related to personal finance. Hence, respondents are fully aware that the information required from them might be highly sensitive. This may discourage survey participation or willingness to reveal truthful information. To safeguard this, further measures are taken. Other than the survey being self-administered, respondents are assured the confidentiality and anonymity of their responses in the cover page. As noted by Podsakoff et al. (2003), such procedures are helpful in avoiding high evaluation

apprehension and respondent's tendency to provide answers that are more socially desirable and lenient.

In addition, respondents are required to read the attached participant information statement. All necessary information regarding the survey are provided in the participant information statement for the perusal of potential respondents. The information includes the nature and purpose of the study, researchers involved, respondents' rights to voluntarily take part or withdraw from the survey, potential benefits and risks associated with participating in the study and how respondents' information would be handled and stored.

Following that, respondents are to acknowledge their consent, eligibility and willingness to take part in the survey. Those who are not eligible or unwilling to participate in the survey may opt for "No, I disagree" in the consent form where they are subsequently directed to the end of survey. On the other hand, by clicking the "Yes, I agree" checkbox, they can proceed with filling in the questionnaire thereafter.

The first section of the questionnaire involves 6 items for the measurement of respondents' attitude towards investing in risky assets. The next section assesses respondents' FSE level based on five items, followed by social norm that is measured using 4 items. In these three sections, respondents are required to indicate their responses on a 5-point scale, from (1) "strongly disagree" to (5) "strongly agree". The subsequent section focuses on one's extent of advice-seeking, where five options describing different level of advice-seeking are offered. Next, respondents are to input the proportion of wealth into risky assets, safe assets and other assets that would ultimately sum up to 100%. Following that, financial literacy is examined using 10 multiple choice questions and personal values is assesses based on 21 items, on a 6-point of (1) "very much like me" to (6) "not like me at all". The socio-demographic and socioeconomic characteristics of respondents are collected in the last section.

Other than participant information statement, the survey invitation text also highlights to respondent regarding the survey confidentiality, non-identifiability, anonymity and that only the research team and Ethics Committee will have access to the raw data

collected. Respondent's name or any identifying details are not collected. These techniques are proven to consistently reduce socially desirable responses and promote candid reporting in sensitive questions (Tourangeau and Yan 2007). Moreover, potentially sensitive and personal topics such as their asset holdings and socioeconomic details are positioned towards the end of the questionnaire. This is can reduce the risk of non-response (Sudman and Bradburn 1983). For socioeconomic questions, respondents are asked to choose in the form of category ranges instead of providing specific figures.

4.8 Ethical Considerations

As the research involves human participants, ethics clearance is sought before commencement of data collection. The application is approved by Curtin University Human Research Ethics Committee under project number HRE2017-0631 (see Appendix D-iii) for a year, from 13 September 2017 to 12 September 2018. This ethics clearance application is later extended for another year (see Appendix D-iv), until 11 September 2019. Besides, the Curtin Research Integrity Professional Development programme is also completed within the required duration. Throughout the data collection process, all practices are conducted in adherence with the National Statement on Ethical Conduct in Research 2007.

Participant information statement is made available to all respondents (see Appendix D-i and D-ii) through an embedded link, before they decide whether to participate in the survey. Specifically, the participant information statement provides respondents with information outlining nature and purpose of the research project, researchers involved, their rights to voluntarily participate or withdraw, potential benefits and risks associated with taking part in the study and how their information would be handled and stored. For participants who are willing to take part in the survey, they are to inform their voluntary consent in the consent statement at the beginning of the survey.

4.9 Data Analysis Method

After garnering the targeted amount of survey responses during data collection phase, the subsequent step is to start analysing the data. This study utilises various analysis

techniques in testing the research hypotheses proposed in the earlier chapters. Specifically, in analysing the collected data, there are three main stages involved, namely data preparation, descriptive analysis and inferential analysis using PLS-SEM method. The details of each stages of data analysis are discussed in the following sub-sections. This study employs Statistical Package for the Social Sciences (SPSS) version 23 , WebPower and SmartPLS 3.0 (Ringle, Wende and Becker 2015) to perform the required data analysis.

4.9.1 Data Preparation

Before delving into data analysis, it is essentially important to prepare the collected data (Nishishiba, Jones and Kraner 2013). The first stage of data analysis involves preparing the data, whereby the raw data is transformed into a version that is ready to be used for statistical analysis. The data preparation stage comprises entering, coding, transforming and checking the data, followed by preliminary data screening. This stage aims to verify the collected data to be reliable and valid for the intended descriptive statistics and inferential statistics.

Upon the completion of data collection, the raw data collected through Qualtrics are first coded into numbers accordingly and exported to excel. This procedure ensures that the data are readable by the chosen statistical software. Next, some variables are formed through recoding or computation of a new score based on the responses given. The data are then screened using frequencies table and descriptive statistics to minimise error cause by data input thereafter.

Next, a series of preliminary analyses are conducted to eliminate low-quality data and also to validate the data fulfil the requirements of statistical analyses. The five different types of issues that are scrutinised during preliminary testing include missing values, insufficient effort responding, presence of potential outliers, common method variance and the normality of data. These analyses are deemed necessary as the abovementioned data issues can affect the quality and validity of the research findings (Hair et al. 2017c). The implementation and outcome of data entry, coding and preliminary analysis are reported in Chapter 5.

4.9.2 Descriptive Analysis

Upon validating the completeness and accuracy of data, with all the variables ready for the subsequent analysis, the statistical analysis is then carried out. There are two forms of statistical analysis, which are descriptive statistics and inferential statistics. This sub-section is dedicated to the discussion of descriptive analysis, whereas inferential statistics is detailed in the following sub-section. The purpose of descriptive statistics is to organise and describe the characteristics of the data for a better comprehension of sample population, and the detection of data patterns and unexpected congruities (Nishishiba, Jones and Kraner 2013).

In the second stage of data analysis, the data are organised with descriptive statistics to provide an overview of the respondents' profile and the overall characteristics of the data. In particular, SPSS version 23 is utilised to assess the frequency, mean, standard deviation, minimum and maximum value for both latent and manifest variables. These variables include respondents' basic demographic variables, level of financial information, investment motivation, investment behavioural skills and extent of risky assets investment.

4.9.3 Multivariate Analysis

The third stage of analysing the data comprises inferential statistics, whereby the postulated relationships between variables are tested (Nishishiba, Jones and Kraner 2013). In particular, it involves uncovering the significance, strength and direction of the relationship between the variables, and also the predictive ability of the extended IMB model in explaining individuals' risky assets investment. With the advent of rapid technological advances, coupled with widely available and easily accessible analytical software, the application of multivariate data analysis methods in establishing hypothesised relationships has become increasingly essential.

Multivariate analysis refers to any simultaneous analysis of more than two variables (Hair et al. 2006). Generally, it can be classified into first-generation techniques and second-generation techniques as shown in Table 4.14. Various first-generation

techniques such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA) or multiple regression are widely applied by social scientists. However, there exists several limitations for these first-generation techniques such as the vague differentiation between EFA and CFA (Hair et al. 2017c) and the assumption of perfectly reliable predictors where there is no allowance for measurement error (Kline 2016). With that, the more well-established and emerging second-generation techniques, also referred to as structural equation modelling (SEM), are often adopted as a better alternative (Hair et al. 2017c).

Table 4.14 Classification of Multivariate Methods

	Primarily Exploratory	**Primarily Confirmatory**
First-Generation Techniques	1. Cluster Analysis 2. Exploratory Factor Analysis (EFA) 3. Multidimensional Scaling	1. Analysis of Variance 2. Logistics Regression 3. Multiple Regression 4. Confirmatory Factor Analysis (CFA)
Second-Generation Techniques	Partial Least Squares Structural Equation Modelling (PLS-SEM)	Covariance-based Structural Equation Modelling (CB-SEM)

Source: Hair et al. (2017c)

SEM is a statistical technique that combines factor analysis and multiple regressions to simultaneously estimate a series of interrelated relationships (Hair et al. 2006). In contrary to first-generation techniques where multiple regression models are tested one at a time, the second-generation analyses are able to examine multiple regression models or equations simultaneously (Ramayah et al. 2018) with multiple predictors, criterion variables, latent variables (Nitzl 2016). Additionally, SEM allows for holistic testing of multi-staged models such as mediating relationship that is not possible in first-generation techniques where the model is tested one at a time (Lowry and Gaskin 2014). Likewise, in representing latent variables, first-generation techniques require generating summated score through averaging or summing the score of observed variables (Hair et al. 2006). Whereas for SEM, both latent and observed variables can be captured in the analysis, thereby permitting the specification of measurement error

(Henseler, Ringle and Sarstedt 2015). Furthermore, confirmatory analysis and exploratory analysis are clearly differentiated in SEM depending on the establishment of priori theories (Ramayah et al. 2018).

In short, SEM provides the flexibility that enables one to: (1) model relationships with multiple predictor and criterion variables; (2) include unobserved latent variables; (3) account for measurement errors; (4) model mediating relationships; and (5) distinguish between confirmatory and exploratory analysis. Apparently, SEM overcomes the shortcomings of first-generation techniques, thereby justifying the wide-spread adoption of SEM as a choice of statistical method. Furthermore, the IMB model and all the hypothesised relationships among the constructs are tested using SEM, thereby justifying the use of SEM in this study (Fisher and Fisher 1992; Fisher and Fisher 2002). In view of the suitability and superior features offered by SEM, this study opts for SEM as the inferential analysis approach to test the research hypotheses.

4.9.4 Structural Equation Modelling (SEM)

There are two estimation approaches in SEM: (1) Covariance-based SEM (CB-SEM); and (2) Variance-based SEM, better known as partial least squares SEM (PLS-SEM). The former represents unobserved variables through factors, whereas the latter considers unobserved variables through composites (Lowry and Gaskin 2014). The common factors in CB-SEM and the composites in PLS-SEM are both classified as "proxy variables" (Wickens 1972; Wooldridge 2009; Rigdon 2016), which represent variables that are unobservable or simply unavailable through the observed variables in the data (Rigdon 2016). Both CB-SEM and PLS-SEM function as a tool to model and measure the relationships among multiple variables and items (Hair et al. 2017b). Nonetheless, both are distinctive with regards to their objectives, model estimation procedures, distributional assumptions, sample size requirements, efficacy for estimating reflective and formative measurement models, and treatment of construct measures (Hair, Ringle and Sarstedt 2011; Rigdon 2012; Henseler, Hubona and Ray 2016; Sarstedt et al. 2016; Hair et al. 2017c; Hair et al. 2017b; Ramayah et al. 2018).

In particular, the estimation process for CB-SEM is the maximum likelihood method

(Ramayah et al. 2018), whereby the aim is to reproduce the theoretical covariance matrix without focusing on the explained variance (Hair et al. 2017c). That is, CB-SEM focuses on minimizing the differences between the estimated theoretical matrix (theoretical model) and empirical covariance matrix (the data). Hence, it is especially suitable for study revolving theory testing, theory confirmation (Hair, Ringle and Sarstedt 2011), or comparison of alternative theories (Memon et al. 2017; Ramayah et al. 2018). Different from CB-SEM, the estimation procedure for PLS-SEM is an ordinary least square (OLS) regression-based method (Ramayah et al. 2018), in which the objective is to estimate coefficient that maximizes the explained variance of the endogenous variables. The primary focus of PLS-SEM approach is to predict and explain the key driver constructs (Rigdon 2012; Hair et al. 2017c), which is also particularly useful for developing theories in exploratory research (Hair, Ringle and Sarstedt 2011).

In contrary to CB-SEM, PLS-SEM approach is less restrictive on the distributional assumption of the data (Rigdon 2016) and the constructs' measurement properties (Hair, Ringle and Sarstedt 2011), thereby allowing non-normality in data and constructs with less than three items that are otherwise required in CB-SEM. Likewise, PLS-SEM also offers greater statistical power than that of CB-SEM due to the higher efficiency in estimating the parameter (Hair et al. 2017c). Furthermore, PLS-SEM has the ability to accommodate smaller sample size with complex model (Hair, Ringle and Sarstedt 2013; Rigdon 2016) involving many constructs and items, and readily incorporates both reflective and formative constructs (Rigdon 2014; Nitzl 2016). In that same situation, however, CB-SEM often does not converge or generates inadmissible solutions (Hair et al. 2017b). Besides, CB-SEM draws on common variance in estimating the parameters, which conforms to the measurement philosophy underlying reflective measurement models (Hair et al. 2017b), thereby limiting the estimation of formatively specified variables (Lee and Cadogan 2013). Additionally, the pursuit of satisfactory model fit in CB-SEM often drives researchers to modify their model, add or discard parameter, or worse, to remove items or the entire variables (Hair et al. 2017d; Memon et al. 2017; Rigdon, Sarstedt and Ringle 2017). Such post modification often does not correspond well with the true model, hence may not reflect the reality (Hair et al. 2017c) and is deemed irrelevant to the real-world phenomenon

(Rigdon, Sarstedt and Ringle 2017).

These justifies why PLS-SEM is regarded as one of the most fully developed and general system (McDonald 1996) and is honoured with the "silver bullet" title (Hair, Ringle and Sarstedt 2011). At the same time, these features also triggered heated debates among scholars, whereby the relaxed assumptions and sample capabilities are claimed to be abused by some researchers, as noted by Hair, Ringle, and Sarstedt (2013). Some other limitations of PLS-SEM include its inability to accommodate structural model with non-recursive relationship and its goodness-of-fit indexes that are still at infancy stage (Ramayah et al. 2018). Notably, another widely discusses issue, the PLS bias, which refers to parameter estimates that are not optimal regarding bias and consistency, is refuted (Sarstedt et al. 2016; Ramayah et al. 2018) and claimed as being minor relevance for practical application (Hair, Ringle and Sarstedt 2011; Hair et al. 2017c). Table 4.15 summarises the differences between CB-SEM and PLS-SEM in terms of model estimation, model specification and data requisite.

Table 4.15 Comparison between CB-SEM and PLS-SEM

Criterion	CB-SEM	PLS-SEM
Model estimation		
Estimation process	Estimates model parameters so that the discrepancy between the estimated and sample covariance matrices is minimized	Estimates model parameters so that the explained variance of the endogenous constructs / indicators is being maximized
Convergence	Defines convergence as the increase / decrease in the function value beyond a certain threshold	Defines convergence as the point at which no substantial difference occurs in the model estimations from one iteration to the next
Estimation objective	Explanatory modeling	Predictive modeling
Treatment of construct measures	Treats constructs as common factors–only common variance is used to estimate model parameters	Treats constructs as composites–the total variance is used to estimate model parameters

Latent variable scores	Indeterminate	Explicitly Estimated
Model specification		
Model complexity	Requires models of small to moderate complexity	Accommodates all kinds of model complexity including large models with many constructs and indicators
Measurement model specification	Handles reflectively specified constructs; limitations in handling formatively specified constructs	Handles reflectively and formatively specified constructs
Data		
Distributional assumption	Standard maximum likelihood estimation requires multivariate normality but numerous robust estimators exist	Non-parametric; makes no distributional assumptions
Sample size	Requires relatively high sample sizes to produce (robust) parameter estimates	Produces parameter estimates with small sample sizes
Fit measure	Offers goodness-of-fit statistics	Several goodness-of-fit criteria have been proposed but their adequacy and interpretation remain subject for future research

Source: Hair et al. (2017b)

This study takes the stance that both CB-SEM and PLS-SEM are complementary, rather than being interchangeable, as advocated by Hair et al. (2017b). Neither of the approach is suitable for all types of research and neither of them is more superior than the other (Hair et al. 2017c). In fact, CB-SEM and PLS-SEM generally yield comparable results, particularly when the measurement properties are correctly set up (Reinartz, Haenlein and Henseler 2009). To determine between the two SEM techniques, the key lies in identifying the most appropriate method that fulfil the data characteristics and objectives of the research (Hair, Ringle and Sarstedt 2011; Hair et al. 2017b; Memon et al. 2017). Hence, this study follows the rules of thumb listed in Table 4.16 in deciding between CB-SEM or PLS-SEM as the analysis technique.

Table 4.16 Rules of Thumb for Choosing CB-SEM or PLS-SEM

Criterion	CB-SEM	PLS-SEM
Objective	Theory testing, theory confirmation, comparison of alternative theories	Predicting key target constructs, identifying key "driver" constructs Exploratory or an extension of an existing structural theory
Model	Structural model has circular relationships (non-recursive)	Structural model is complex (many constructs and many indicators)
	Error terms require additional specification, such as covariation	Formatively measured constructs included
	Requires a global goodness-of-fit criterion	Latent variable scores needed in subsequent analyses
Data		Sample size is small (PLS-SEM works very well with large sample sizes)
		Data are non-normally distributed
		Secondary (archival) data/ Single-item measures Non-metric data (ordinal, nominal) Continuous moderators

Sources: Hair, Ringle, and Sarstedt (2011), Hair et al. (2017c)

4.9.5 Partial Least Squares Structural Equation Modelling (PLS-SEM)

Following the above guidelines, PLS-SEM is more appropriate for this study due to several reasons. First, the main focus of this study is theory development and prediction, which matches the exploratory objective and predictive ability offered by PLS-SEM. This study intends to extend the IMB model by incorporating new elements, which is the theory of basic values into the existing model. Hence, the emphasis of the study is more on exploration of the newly integrated model, rather

than confirmation of the existing theory. By using PLS-SEM, the explained variance (R^2 value) in the endogenous variables, which is risky assets investment in this study, is maximised. Thus, in this situation where prediction is crucial in answering the research question, PLS-SEM is particularly useful (Henseler, Ringle and Sinkovics 2009; Reinartz, Haenlein and Henseler 2009; Hair et al. 2017c) while CB-SEM is unreliable and inappropriate due to indeterminacy issue (Rigdon 2012; Rigdon 2014; Sarstedt, Ringle and Hair 2014). Likewise, PLS-SEM can provide advantages over CB-SEM for preliminary theory building (Lowry and Gaskin 2014) and exploration of new theories through inclusion of other theories into the model (Ramayah et al. 2018). Similarly, this study aims to assess if the extended IMB model fits well in the emerging field of personal finance and behavioural finance where theoretical support is often lacking (Kliger and Levy 2009; Danes and Yang 2014). Seemingly, the present situation in these fields are largely on an explorative stage that signals for further theory development. As highlighted by Wold (1985), PLS-SEM is useful for data-rich but theory-primitive situation. The finding of this study is expected to enhance the understanding as to whether the extended IMB model can hold in the area and the context of this study.

Second, the preliminary analysis in Section 5.2.2.5 indicates that the collected data lacks normality, which further justify the selection of PLS-SEM for this study. It is noteworthy that in social science, the collected data often do not fulfil multivariate normality (Sarstedt, Ringle and Hair 2014; Hair et al. 2017d; Ramayah et al. 2018). PLS-SEM is regarded as soft-modelling due to its flexibility in accommodating distributional assumptions (Hair et al. 2017c). Unlike CB-SEM, PLS-SEM is a non-parametric technique that does not need to assume that the variables conform to any particular distributions (Lowry and Gaskin 2014). Additionally, the two techniques in PLS, namely the bootstrapping and blindfolding techniques, are also non-parametric. As a result, the outcome of PLS-SEM demonstrates higher robustness when multivariate normality is violated (Sarstedt et al. 2016). As noted by Hair et al. (2017c), when data does not fulfil the CB-SEM assumptions in terms of normality of distribution, minimum sample size, maximum model complexity or other relevant methodological matters, PLS-SEM is indeed a good methodological alternative.

Lastly, the structural model of this study is rather complex as it comprises a mediator and many variables. As per guideline by Kumar, Talib, and Ramayah (2013), a model is regarded as complex when it contains 6 or more constructs, and/or 50 or more indicators. This study involves six exogenous variables, one mediating variable, one endogenous variable and four control variables, summing up to a total of 12 variables in the model. These variables consist of both latent variables and manifest variables, with some measured on ordinal scales while some are single-item measured. As PLS-SEM is not constrained by identification and other technical issues, it is useful in accommodating all types of model complexity, including large models with many different constructs and indicators (Rigdon 2014; Nitzl 2016; Hair et al. 2017b), as well as permitting the use of single-item constructs and ordinal data (Hair et al. 2017c; Hair et al. 2019). Additionally, PLS-SEM is superior in assessing mediation due to its ability in reducing measurement error and bias (Hair, Sarstedt and Ringle 2019).

Following Anderson and Gerbing (1988), the PLS-SEM results are evaluated using a systematic two-step model-building process that comprises two conceptually different models: first, the assessment of measurement model, followed by the assessment of structural model. The measurement model specifies the linkage between observed variables underlying the latent variables, whereas the structural model specifies the linkage among the latent variables based on the theory (Schumacker and Lomax 2016). In other words, the measurement model represents the association between the latent variable and its indicators, with assessment involving validity and reliability of the latent variable. As for the structural model, it specifies the association between the latent variables, which is assessed according to the significance and strength of these associations. The details of each evaluative measures for both measurement and structural models are discussed in the following sections.

4.10 Measurement Model Assessment

A thorough assessment of the measurement model in the proposed conceptual model is imperative to ensure the reliability and validity of the constructs. This is because failure to substantiate a valid and reliable measurement model leads to potentially flawed measure that could result in misleading and improper conclusions from the

model. To do so, reflectively measured and formatively measured constructs should first be differentiated. This is because two of these approaches have different forms of criterion for assessing their measurement model (Hair et al. 2017c). In this study, all the endogenous and exogenous variables are reflectively specified. These reflective measurement models are evaluated using three criteria, which are internal consistency, convergent validity and discriminant validity. The relevant criteria and its recommended threshold are reviewed in the following subsections.

4.10.1 Internal Consistency

In assessing reflective measurement model, the first step involves evaluating the internal consistency reliability of the constructs. Internal consistency reliability specifies the extent to which results are consistent across indicators using the same test and also determines if the indicators of a construct are correlated (Hair et al. 2017c). A low internal consistency score indicates that the items are possibly too heterogenous (Kline 2016).

Traditionally, the internal consistency reliability measure that is predominantly used in the literature is coefficient alpha, which is also referred as Cronbach's alpha (Kline 2016). When the Cronbach's alpha value is high in a construct, it means the indicators contain similar range and meaning (Cronbach 1971). Despite its prevalent use, studies have shown the deficiencies of this approach. Specifically, with Cronbach's alpha, the items are unweighted as it assumes all items are equally loaded to the construct (Werts, Linn and Jöreskog 1974). As PLS-SEM emphasises individual reliability (Hair et al. 2017c), the use of Cronbach's alpha is inappropriate (Ramayah et al. 2018). In addition, it typically underestimates the internal consistency reliability because of its sensitivity to the number of indicators in the construct (Hair et al. 2017c).

Due to these drawbacks, another metric that is highly recommended (Hair, Ringle and Sarstedt 2011) for evaluating a construct's internal consistency is Jöreskog (1971) composite reliability. In contrast with Cronbach's alpha, composite reliability measures the indicators based on their individual loadings (Hair, Ringle and Sarstedt 2011), hence the reliability is higher than Cronbach's alpha. The composite reliability

value ranges between 0 to 1 and the acceptable values differ based on the research context. For instance, values between 0.6 to 0.7 are acceptable in exploratory research and values between 0.7 to 0.9 are regarded as satisfactory to good (Hair et al. 2017c). However, values of 0.95 and above are considered problematic because it is an indication of redundant items, thereby reducing content validity (Hair et al. 2019).

Therefore, this study adopts the composite reliability as a measure of internal consistency.

4.10.2 Convergent Validity

The second criterion to be assessed is the convergent validity of the construct. Convergent validity involves the degree to which an item correlates positively with alternative items within the same construct (Hair et al. 2017c). The two criteria used for determining the convergent validity includes the indicator reliability (outer loadings) and the average variance extracted (AVE).

4.10.2.1 Indicator Reliability

Indicator reliability represents the amount of variation in an item or a set of items that is explained by the construct (Hair et al. 2017c). The aim of reviewing indicator reliability is to ensure that the indicator is consistent on what it intends to assess (Ramayah et al. 2018). Indicator reliability can be evaluated by using the indicator loadings of the items with respect to their construct. It is recommended to have outer loadings higher than 0.708 as this signifies the ability of the construct in explaining at least 50% of the variance in each indicator (Hair et al. 2017c), hence substantiating acceptable indicator reliability.

Nonetheless, it is common where the indicator loadings are lower than 0.708 for social sciences studies (Hulland 1999). Instead of omitting all these indicators, it is important to carefully review them. The decision should depend on the influence of item removal on composite reliability and content validity. The elimination of an indicator is justifiable only when the indicator's reliability is weak (Henseler, Ringle and Sinkovics 2009). A general rule of thumb is that indicator with an outer loading of less

than 0.40 should always be dropped (Bagozzi, Yi and Phillips 1991; Hair, Ringle and Sarstedt 2011). Indicators with loadings of between 0.4 to 0.708 are acceptable when the composite reliability and AVE of the constructs have achieved the cut-off values of 0.70 and 0.50 respectively (Hair et al. 2017c). The items should only be considered for removal from the latent variable if omitting them leads to an improved composite reliability and AVE above the threshold value (Hair, Ringle and Sarstedt 2011). Besides, items with lower loadings can also be retained when they contribute to the domain content of the constructs (Hair et al. 2017c).

4.10.2.2 Average Variance Extracted (AVE)

Another measure that are used for establishing the convergent validity is the AVE. AVE is the grand mean value of the squared loadings of all items in the associated constructs, which assesses the extent a construct is able to explain the variance of its items (Hair et al. 2017c). In other words, it is the amount of variance that a construct captures from its indicators relative to the amount of variance due to measurement error (Urbach and Ahlemann 2010). Similar to indicator reliability, the construct should explain at least 50% of indicators' variance, thus the recommended threshold for AVE should be above the value of 0.5 (Hair et al. 2017c; Ramayah et al. 2018). When AVE has a value below 0.5, it indicates that more than half of the variance remains in the error of the items rather than in the variance accounted by the measurement construct.

4.10.3 Discriminant Validity

The third step of the reflective measurement model assessment addresses the discriminant validity of each construct measure. It is one of the most crucial aspects in measurement model evaluation (Anderson and Gerbing 1988) as it ensures that the construct is empirically unique and captures a phenomenon not represented by other constructs (Hair et al. 2017c). When discriminant validity is not sufficiently substantiated, the results of structural model are questionable as it can be true or merely due to statistical discrepancies (Farrell 2010). The property of discriminant validity can be examined using cross-loading criterion test, Fornell-Larcker criterion test and Heterotrait-Monotrait criterion test (HTMT).

4.10.3.1 Cross-loading Criterion

Typically, researchers first assess the discriminant validity of items using the cross-loadings method. Cross-loadings is the correlation of an indicator with other constructs in the proposed model (Hair et al. 2017c). The loadings of indicators on the associated construct should be greater than all its cross-loadings on other latent variables (Ramayah et al. 2018). Furthermore, the difference of loadings across the constructs should not be lower than 0.1 (Chin 1998). Having cross-loadings that exceed the items' loading indicates a lack of discriminant validity.

4.10.3.2 Fornell-Larcker Criterion Test

The second approach to assessing discriminant validity is the Fornell-Larcker criterion test, which is proposed by Fornell and Larcker (1981). This method, also known as the average variance extracted versus shared variance (AVE-SV) method, compares the AVE of each construct with its shared variance (squared correlation) with all other constructs in the model (Voorhees et al. 2016). Alternatively, one can also compare the squared root of AVE values with its correlations with any other constructs (Hair et al. 2017c). This criterion is fulfilled if a construct's AVE (shared variance within) is greater than the squared correlation between constructs (shared variance between). This signifies that indicators share more variance with their underlying latent variable as compared to the individual constructs share with another construct.

4.10.3.3 Heterotrait-Monotrait Criterion Test (HTMT)

Crossing-loadings and the Fornell-Larcker criterion test are predominantly employed to check for discriminant validity, especially in PLS-SEM. According to the previous guidelines by Hair, Ringle, and Sarstedt (2013), the two criteria can adequately evaluate discriminant validity. Specifically, for the Fornell-Larcker criterion, researchers using PLS-SEM typically rely on it (Hair, Sarstedt and Ringle 2019) because it has been widely recognised as "the most stringent" means of detecting discriminant validity violations (Wang and Netemeyer 2002) in the past. The popularity of this criterion is also confirmed in other studies (Voorhees et al. 2016; Franke and Sarstedt 2019).

Contrary to the endorsement of the cross-loadings and Fornell-Larcker criterion by previous studies, there has been criticism on the appropriateness of these criteria for discriminant validity assessment. According to Henseler, Ringle, and Sarstedt (2015), "both the Fornell-Larcker criterion and the assessment of the cross-loadings are insufficiently sensitive to detect discriminant validity problems" (120). Specifically, the cross-loadings method is unable to detect a lack of discriminant validity if two constructs are perfectly correlated and Fornell-Larcker criterion fail to perform when the indicator loadings on a construct differ only slightly. Recent research also raises concern about the reliability of the two commonly used tests (Hair et al. 2017c; Franke and Sarstedt 2019; Hair et al. 2019; Hair, Sarstedt and Ringle 2019).

As such, an alternative technique, the Heterotrait–Monotrait (HTMT) ratio of correlations is proposed by Henseler, Ringle, and Sarstedt (2015). HTMT refers to the ratio of correlations within the constructs to the correlations between the constructs (Ramayah et al. 2018). It is an estimate of what the true correlation between two constructs would be if they were perfectly measured, whereby a true correlation close to 1 signifies a lack of discriminant validity (Hair et al. 2017c). A Monte Carlo simulation revealed that the HTMT has higher specificity and sensitivity rate in detecting discriminant validity, as compared to cross-loadings and Fornell-Larcker criterion (Henseler, Ringle and Sarstedt 2015).

There are two methods of adopting the HTMT to assess discriminant validity, which includes using it as a criterion or as a statistical test. To assess the HTMT as a criterion, one is required to compare it to a predefined threshold. The threshold level is debatable as some propose a threshold of 0.85 (Kline 2016), whereas others indicate a value of 0.90 (Gold, Malhotra and Segars 2001). Henseler, Ringle, and Sarstedt (2015) suggest that the choice of acceptable threshold depends on the conceptual similarity of the constructs in the model and the conservation level of the researcher. The HTMT cut-off value should be set at 0.9 for constructs that are conceptually similar and 0.85 when constructs are conceptually more different (Henseler, Ringle and Sarstedt 2015). If HTMT is higher than the threshold, one can conclude that there is a lack of discriminant validity.

The second approach of using HTMT as a statistical test can be done through bootstrapping procedure. Bootstrapping draws subsamples from the original dataset and assess if coefficient is statistically significant based on the confidence interval where the true HTMT population will fall (Hair et al. 2017c). When HTMT value is significantly lower than unity (1.00), the confidence interval of the construct does not contain the value of one, indicating the establishment of discriminant validity. While the threshold of 1.0 recommended by Henseler, Ringle, and Sarstedt (2015) have a high power to detect discriminant validity, it may falsely reject discriminant validity if the true HTMT population value matches the threshold value (Franke and Sarstedt 2019). As a remedy, Franke and Sarstedt (2019) suggest a lower threshold value of 0.85 or 0.90 instead, depending on the study context. Put differently, the bootstrap-based confidence interval for HTMT value should not include the threshold value of 0.85 or 0.90. The HTMT statistic can be used for reflectively-measured constructs and also between reflective multi-item construct and a single-item construct to substantiate discriminant validity (Hair, Sarstedt and Ringle 2019).

Taken together, the HTMT criterion is an appropriate assessment for discriminant validity in PLS-SEM (Hair et al. 2019; Hair, Sarstedt and Ringle 2019). Meanwhile, Voorhees et al. (2016) recommend both the Fornell-Larcker criterion and HTMT method as the standard for discriminant validity testing. Despite the limitations of cross-loadings and the Fornell-Larcker criterion, they are still the standard approach for discriminant validity assessment (Hair et al. 2017c; Ramayah et al. 2018). Therefore, this study will adopt all three criteria, namely cross-loadings, Fornell-Larcker criterion and HTMT criterion in evaluating the discriminant validity of the measurement model.

4.11 Structural Model Assessment

After establishing the reliability and validity of the measurement model, the next step in evaluating the PLS-SEM results is to assess the structural model. The standard structural model assessment considers collinearity, followed by the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2) and lastly the statistical

significance and relevance of the relationship in the structural model.

4.11.1 Collinearity

The preliminary step in assessing the structural model is to address the lateral collinearity issue. Lateral collinearity refers to the high correlation between two or more predictor constructs at structural level. It is present when two variables that are hypothesised to be related, are measuring the same construct (Ramayah et al. 2018). The presence of lateral collinearity would easily mislead the results as it tricks through the strong causal effect in the model (Kock and Lynn 2012). As the relationship between the constructs in the structural model are derived from estimating a series of regression equation, it is crucial to assess such collinearity issue to ensure unbiased regression results (Hair et al. 2019). More specifically, high correlation between explanatory variables is problematic as it often produces high standard errors of the coefficient and unstable coefficient estimates (Tabachnick and Fidell 2013).

In evaluating collinearity issue, each set of predictors are assessed separately and the inner Variance Inflator Factor (VIF) values are calculated using the latent variable scores of constructs. The VIF value is the inverse of Tolerance value (VIF = 1/Tolerance), it quantifies the variability of the specified predictor constructs that is explained by the other predictor constructs in the model (Pallant 2013). A high VIF is indicative of high correlation with other variables, suggesting multicollinearity issue. As a rule of thumb, a VIF value greater than 5 in the predictor constructs is an indication of critical collinearity issues among the constructs (Hair, Ringle and Sarstedt 2011). However, at lower VIF values of 3 to 5, collinearity problems can also occur (Mason and Perreault Jr 1991; Becker et al. 2015). For this reason, Garson (2016) suggests that the VIF should not be higher than 4 while Diamantopoulos and Siguaw (2006) propose a more stringent threshold, where the VIF value should stay below 3.3. Additionally, Hair et al. (2019) suggests that an ideal cut-off value of VIF should be close to 3 and lower.

4.11.2 Coefficient of Determination (R^2)

The succeeding step is to examine the coefficient of determination, which is the R^2

value of the endogenous constructs. The R^2 value is a measure of the model's predictive power (Shmueli and Koppius 2011) or in-sample explanatory power (Rigdon 2012), which ranges from 0 to 1, with higher value signifying greater predictive accuracy (Hair et al. 2017c). It captures the amount of variance in the endogenous constructs accounted by all the exogenous constructs related to it, and is therefore viewed as the overall effect of exogenous variables on endogenous variables (Ramayah et al. 2018). In assessing the R^2 values, there exist different benchmark as listed in Table 4.17.

Table 4.17 Different Guidelines for Acceptable R^2

Literature Support	Level of Acceptance
Cohen (1988)	Substantial (0.26), Moderate (0.13), Weak (0.02)
Chin (1998)	Substantial (0.67), Moderate (0.33), Weak (0.19)
Hair et al. (2017c)	Substantial (0.75), Moderate (0.50), Weak (0.25)

As highlighted by Hair et al. (2019), the choice of R^2 values classification is dependent on the context and the research discipline. In the area of this study, which fall under consumer behaviour, R^2 values of 0.20 are considered substantial (Hair et al. 2017c). In view of the above, this study adopts the acceptable R^2 values guidelines by Cohen (1988), whereby R^2 of 0.26 implies substantial level; R^2 of 0.13 implies moderate level; and R^2 of 0.02 implies weak level of predictive accuracy.

4.11.3 Effect Size (f^2)

In addition to the R^2 values, one can also assess the R^2 change effect (Garson 2016) through Cohen's f^2 effect size (Cohen 1988). The f^2 effect size determines the impact (weak, moderate or substantial) of exogenous constructs on endogenous constructs (Gefen, Rigdon and Straub 2011). It estimates the changes in endogenous construct's R^2 value upon the removal of a predictor constructs in order to determine if the omitted construct has a substantial effect on the endogenous constructs (Hair et al. 2017c). Put differently, it is a measure of how strongly a specified exogenous construct contributes in explaining the endogenous constructs in terms of R^2 values (Ramayah et al. 2018). As some might expect, this metric is considered rather redundant to the size of the path

coefficients. More specifically, when comparing the size of f^2 effect size and path coefficients on a ranking basis, the rank order of the predictor constructs' relevance in explaining the endogenous variables will often be the same (Hair et al. 2019). As such, Hair et al. (2019) suggest that reporting of the f^2 effect size is only necessary under either one of the following condition: (1) upon request by reviewer or editors; or (2) when the rank order of constructs' relevance differs between f^2 effect size and path coefficients. In fact, situation where f^2 effect size and path coefficients differ, is indicative of partial or full mediation (Nitzl, Roldan and Cepeda 2016) in the model. Following Cohen (1988), the rule of thumb for evaluating f^2 effect size is based on the threshold values of 0.02, 0.15, and 0.35, which denote small, medium, and large effects of the exogenous latent variable.

4.11.4 Predictive Relevance (Q^2)

Following the assessment of R^2 statistics, Stone-Geisser's Q^2 value (Stone 1974) offers additional means to assess the predictive accuracy of certain constructs in the model. While R^2 measures the in-sample predictive power of the model (Rigdon 2012), Stone-Geisser's Q^2 value combines both aspects of in-sample explanatory ability and out-of-sample prediction (Shmueli et al. 2019). Through the blindfolding procedure, Q^2 removes the data points, estimates the parameters with the remaining data points and uses the resulting estimates to predict the omitted data points (Hair et al. 2017c). The omission distance will set to determine the pattern of data point elimination and prediction during the blindfolding. The smaller the differences between the predicted and the original values, the higher the Q^2 value, thereby indicating a higher predictive relevance (Hair et al. 2019). The proposed threshold for assessing Q^2 value is to have a value larger than zero, which confirms that the predictor constructs have predictive relevance for the endogenous construct (Hair et al. 2017c; Ramayah et al. 2018). A Q^2 value of less than zero indicates the lack of predictive relevance of the PLS-path model. Recently, Hair et al. (2019) further consider Q^2 values of higher than 0 as small, 0.25 as medium and 0.50 as large predictive relevance. In the context of this study, having a higher Q^2 value signify that the extended IMB model has a higher predictive accuracy of risky assets investment for both in-sample and out-of-sample prediction.

4.12 Hypothesis Testing

After establishing the structural model's explanatory power and predictive ability, the last step is to examine the significance and relevance of the path coefficients as proposed in earlier chapter (Hair et al. 2019). This study hypothesises a total of 19 relationships based on the integration of IMB model and theory of basic values. Specifically, the hypotheses consist of 13 direct relationships (H1a-H6a, H7, H1b-H6b) to examine the relationship between variables and 6 indirect relationships (H8-H13) to explore the mediating effect of FSE.

These hypotheses are generated according to the segmentation approach and the guidelines provided by Rungtusanatham, Miller, and Boyer (2014), Ramayah et al. (2018) and Memon et al. (2018). In particular, when constructing hypotheses involving mediating relationships, Rungtusanatham, Miller, and Boyer (2014) proposes two approach: (1) segmentation approach; and (2) transmittal approach. Referring to Figure 4.2, segmentation approach involves a minimum of three hypotheses: (1) X on M (path a); (2) M on Y (path b); and (3) X on Y through M (path a x b). As for transmittal approach, the focus lies mainly on the indirect effect, thus is sufficient to hypothesise M mediates the effect of X on Y (path a x b), without having to formulate hypotheses relating X to M and M to Y. The segmentation approach is chosen because the intent of this study is not only to investigate the mediating effect of FSE but also to disentangle the relationship between all the variables according to the underpinning theoretical model. Furthermore, Rungtusanatham, Miller, and Boyer (2014) recommends the inclusion of the direct effect of X on Y when holding M constant (path c'), regardless of the choice of approach. The omission of testing c' indicates that the mediating variables are exhaustively captured by the given model (Zhao, Lynch Jr and Chen 2010), which is theoretically hard to defend (Rungtusanatham, Miller and Boyer 2014).

In sum, this study hypothesises and tests for the effect of:
(1) X on M (path a);
(2) M on Y (path b);
(3) X on Y through M (path a x b); and
(4) X on Y when holding M constant (path c')

Figure 4.2 Direct and Indirect Effect

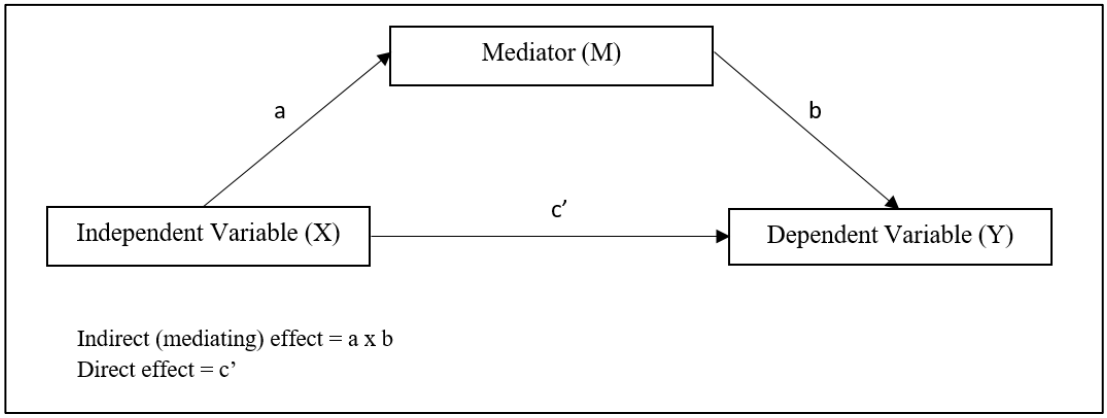


Table 4.18 summarises the hypotheses articulated for this study. The method in assessing the proposed direct and indirect relationships are presented in the following sub-sections.

Table 4.18 Summary of Hypothesis

	Hypothesis
X -> Y (c'): Information and Motivation on Risky Assets	
H1a	Financial literacy positively influences risky assets investment.
H2a	Advice-seeking positively influences risky assets investment.
H3a	Attitude towards investing positively influences risky assets investment.
H4a	Preference for conservation over openness to change values negatively influences risky assets investment.
H5a	Preference for self-transcendence over self-enhancement values negatively influences risky assets investment.
H6a	Social norm positively influences risky assets investment.
M -> Y (b): Behavioural Skills on Risky Assets	
H7	FSE positively influences risky assets investment.
X -> M (a): Information and Motivation on Behavioural Skills	

H1b	Financial literacy positively influences FSE.
H2b	Advice-seeking positively influences FSE.
H3b	Attitude towards investing positively influences FSE.
H4b	Preference for conservation over openness to change values negatively influences FSE.
H5b	Preference for self-transcendence over self-enhancement values negatively influences FSE.
H6b	Social norm positively influences FSE.
X -> M -> Y (a x b): Behavioural Skills as Mediator	
H8	FSE has a mediating effect on the relationship between financial literacy and risky assets investment.
H9	FSE has a mediating effect on the relationship between advice-seeking and risky assets investment.
H10	FSE has a mediating effect on the relationship between attitude towards investing and risky assets investment.
H11	FSE has a mediating effect on the relationship between preference for conservation values and risky assets investment.
H12	FSE has a mediating effect on the relationship between preference for self-transcendence values and risky assets investment.
H13	FSE has a mediating effect on the relationship between social norm and risky assets investment.

4.12.1 Significance and Relevance of Direct Path Coefficients

In order to assess the strength and direction of the proposed relationships, the path coefficients are examined. The path coefficients (beta) represent the hypothesised relationships in the proposed model. Its standardised value ranges between -1 to +1, with value closer to +1 indicating strong, positive relationship and value closer to -1 indicating strong, negative relationship (Ramayah et al. 2018). The strength of relationship is weaker when the coefficient is closer to zero. That is, the direction of relationship is determined by the coefficient sign, whereas the strength of the relationship depends on the value of path coefficient. If the path coefficient is statistically significant, its value signifies the extent to which the predictor construct

is associated with the endogenous construct (Hair et al. 2017c). A larger coefficient indicates a greater effect it exerts on the endogenous variable.

In line with the data's distribution-free nature, PLS-SEM depends on bootstrapping procedure to establish statistical inference (Streukens and Leroi-Werelds 2016). There are three methods in evaluating the significance of the relationship, which includes the *t*-value, *p*-value and bootstrap confidence interval (Hair et al. 2017c). First, by using the *t*-value, the coefficient is proven statistically significant when the empirical *t*-value is larger than the pre-destined critical value at a specified significance level (alpha). Second, the path coefficient is regarded as significant if the *p*-value is below the pre-determined level of alpha (Henseler, Hubona and Ray 2016). Third, the relationship is significant if the bootstrap confidence interval does not contain the value of zero.

The choice of significance level is subjective to the field and objective of the research (Hair et al. 2017c). Although significance level of 10% is acceptable and also common in prior reputable studies in the context of financial decisions and behavioural finance (Jin 2011; Van Rooij, Lusardi and Alessie 2011; Xia, Wang and Li 2014; Agarwal et al. 2015; Calcagno and Monticone 2015; Brown and Gray 2016; Farrell, Fry and Risse 2016; Chu et al. 2017; Khan, Tan and Chong 2017; Liao et al. 2017; Lin, Hsiao and Yeh 2017; Hsiao and Tsai 2018; Lim et al. 2018; Stolper 2018), this study once again opts for a more conservative and stringent significance level of 5%. By this, it reduces the occurrence of Type 1 error that ultimately leads to false positive results. This study assumes a significance level of 5%, where *p*-value must be smaller than 0.05 and *t*-value must be larger than 1.645 for one-tailed test or 1.960 for two-tailed test to substantiate significant path coefficients (Hair et al. 2017c). To choose between one-tailed and two-tailed test in PLS-SEM, Kock (2015b) recommends to refer to the hypothesised path coefficient, whereby coefficient assumed to be positive or negative should use a one-tailed test while coefficient without assumption about the direction should adopt a two-tailed test. As the hypotheses which examine the direct effect of predictor constructs to risky assets investment are directional, one-tailed testing is deemed more appropriate (Kock 2015b; Ramayah et al. 2018). Lastly, for the bootstrap confidence interval, a relationship is significant if its confidence interval at 95% does not include the value of zero. In PLS-SEM bootstrapping, it is strongly recommended

to adopt the bias-corrected and accelerated (BCa) bootstrap confidence intervals (Streukens and Leroi-Werelds 2016) with 5,000 bootstrap samples, size of bootstrap sample equal to original sample and no sign change option (Hair et al. 2017c).

Of the three methods, the calculation of *t*-value and *p*-value are more extensively and commonly used for testing the hypothesis in PLS-SEM (Hair et al. 2017c; Kock 2018). Nonetheless, confidence intervals are less prone to misinterpretation and provide information regarding the effect size, hence is more preferred to *p*-values (Wood 2005; Ramayah et al. 2018). Specifically, potential issue surrounding the reliance of *p*-value for statistical test are associated with larger sample size that lead to unstable *p*-value (Lin, Lucas Jr. and Shmueli 2013; Kock 2018). Whereas the confidence interval provides the range in which the true parameter lies (Hair et al. 2017c), whereby the interval narrows and becomes more precise as sample size increases (Lin, Lucas Jr. and Shmueli 2013). In spite of the strong pleas for the use of confidence intervals as a substitute of *p*-value (Cohen 1994; Henseler, Ringle and Sarstedt 2015), its reporting frequency remains small (Hair et al. 2017a), and reporting *p*-values and *t*-values still seems to be the solid foundation in research and publication (Henseler, Ringle and Sarstedt 2015; Streukens and Leroi-Werelds 2016).

In light of the above, this study will assess the path coefficients based on the bootstrap confidence interval method, at the same time, report the *t*-value and *p*-value to complement the interpretation of statistical significance. These criteria usually yield the same conclusion for the significance of path coefficients. In rare situation where there exist discrepancies between the outcome of *t*-value, *p*-value and confidence interval, the significance testing will rely solely on confidence interval (Hair et al. 2017c).

4.12.2 Significance and Relevance of Indirect Path Coefficients

Other than assessing the direct paths in the model, it is also crucial to evaluate the significance and relevance of the indirect paths via any intervening construct, which is known as the mediator. Mediation happens when the mediating construct governs the association between the exogenous variables and the endogenous variables (Hair

et al. 2017c), in a way that the significance or direction of the relationship between the exogenous and endogenous variables changes with the inclusion of mediator. To explore meaningful mediation effects, the key lies in the underlying theoretical or conceptual support (Preacher and Hayes 2008; Ramayah et al. 2018). Hence, in accordance to the IMB model, this study assesses the mediating effect of behavioural skills which includes financial self-efficacy in engaging risky assets investment.

To test for mediation effects, Baron and Kenny (1986)'s causal procedures remains the most popular means over the past decades, even until today. However, this approach has been widely criticised for several conceptual and methodological shortcomings. More precisely, this approach has low statistical power (MacKinnon, Fairchild and Fritz 2007), increase the probability of making Type 1 error and also fail to measure the magnitude of the mediation effect (Rungtusanatham, Miller and Boyer 2014).

In addition, the prerequisite of causal procedures for substantiating a direct effect between the independent and dependent variable without conceptual groundings remains questionable (Aguinis, Edwards and Bradley 2017), and is deemed misleading (Zhao, Lynch Jr and Chen 2010; Nitzl, Roldan and Cepeda 2016), outdated and unnecessarily restrictive (Memon et al. 2018). In situation of small sample size, insufficient power or extraneous factors such as moderation, a significant direct effect that actually present may not be detected (Ramayah et al. 2018). With that, scholars claim that the direct effect does not have to be significant in establishing mediation and argue to consider waiving the examination of direct effect on the basis that significant indirect effect is what matters (Shrout and Bolger 2002; Preacher and Hayes 2004; Hayes 2009; Zhao, Lynch Jr and Chen 2010; Rungtusanatham, Miller and Boyer 2014).

In the field of PLS-SEM, Nitzl, Roldan, and Cepeda (2016) have also shown the misapplication of Baron and Kenny (1986) method in assessing the mediation effect. Succinctly, this method may mislead findings, refute associations that are potentially significant and pose hindrance to future theory development (Rungtusanatham, Miller and Boyer 2014). Considering these consequences and the underlying limitations, it is

evident that the causal procedures by Baron and Kenny (1986) is not recommended.

Another method that is highly employed is the Sobel (1982)'s test. This method requires only one significance test instead of several as proposed by Baron and Kenny (1986), which makes it less susceptible to Type 1 error (Tabachnick and Fidell 2013). Nonetheless, this test relies on the normal distributional assumptions (Hayes 2009) that usually do not hold in social science studies (Ringle et al. 2018) and is inconsistent with the nonparametric PLS-SEM technique (Hair et al. 2017c). Hence, the Sobel test is not appropriate in testing mediation for this study (Hair et al. 2017c; Ramayah et al. 2018).

Against this background, Preacher and Hayes (2004) and Preacher and Hayes (2008) introduce the regression-based approach which is known as "bootstrapping the indirect effect" method. By using the bootstrapping procedure, the indirect effect is assessed for the mediation analysis. Similar to testing the significance of direct effect using confidence interval, the indirect effect is significant if neither the confidence intervals include zero. This approach overcomes previous limitations of the Baron and Kenny and also Sobel's test in several aspects, such as ruling out the unnecessary requirement of significant direct relationship (Ramayah et al. 2018), making no assumptions of the sampling distribution, highly applicable to small sample sizes and yielding higher statistical power (Hair et al. 2017c). In view of the above, this study adopts the approach by Preacher and Hayes (2004) and Preacher and Hayes (2008) as it is advocated by Hair et al. (2017c) as a method suited for PLS-SEM.

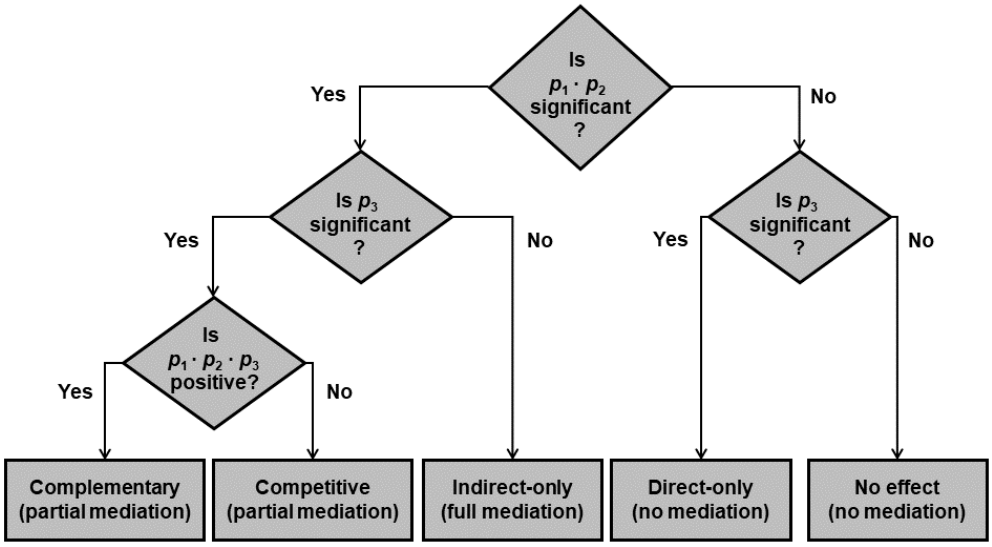
To analyse the results of PLS-SEM mediation analysis, Hair et al. (2017c), Carrión, Nitzl, and Roldán (2017) and Ramayah et al. (2018) highlight the advantages of explaining the mediation types for deliverance of more in-depth results, and further recommend the guidelines provided by Zhao, Lynch Jr, and Chen (2010). This latest mediation guidelines is adopted by many studies (Coriale et al. 2012; Jiménez and Mendoza 2013; Hollebeek, Glynn and Brodie 2014; Labrecque 2014; Alden et al. 2016; Busse, Mahlendorf and Bode 2016; Tsai, Chang and Peng 2016; Akhgari et al. 2018; Rosique-Blasco, Madrid-Guijarro and García-Pérez-de-Lema 2018), including those related to financial behaviour (Hadar, Sood and Fox 2013; Li et al. 2013; Huang

et al. 2014; Aspara, Chakravarti and Hoffmann 2015; Akhgari et al. 2018; Rai and Lin 2019; Ward and Lynch Jr 2019).

Figure 4.3 summarises the series of analysis required for testing mediation effect in the model. First, the significance of indirect effect via the mediating construct (a x b or p1 x p2 as shown in figure) is examined. If results yield non-significant indirect effect, it is conclusive that there is no empirical support for the proposed mediating relationship (no mediation). Then, the next step is to address the significance of direct effects (c' or p3) to distinguish between the two different types of non-mediation. If c' is significant, direct-only non-mediation is achieved; whereas if c' is non-significant, it can be concluded that there is a no-effect non-mediation.

On the other hand, if the indirect effect is significant, it provides support for the hypothesised mediating relationship (mediation) and the subsequent step is with the significance of direct effects. With significant indirect effect, a non-significant direct effect suggests a full mediation while a significant direct effect will lead to the examination of the sign of the product for indirect and direct effect to differentiate between the two different types of partial mediation. If the sign of the product is positive, complementary partial mediation is concluded; on the hand if the sign is negative, competitive mediation is achieved.

Figure 4.3 Mediation Analysis Procedure



Note: p1 represents the path from X to M (also referred as a); p2 represents the path from M to Y (also referred as b); p1 x p2 (also referred as a x b) is the indirect effect of X to Y through M. p3 (also referred as c') represents the direct effect of X to Y, while holding M constant.

Source: Hair et al. (2017c)

Hence, building on Zhao, Lynch Jr, and Chen (2010), this study categorises the mediation analysis results into two types of non-mediation and three types of mediation, which includes the following: (1) direct-only non-mediation, in which the direct effect is significant but not the indirect effect; (2) no-effect non-mediation, in which both direct and indirect effect are non-significant; (3) complementary mediation, in which both direct and indirect relationships are significant and in the same direction; (4) competitive mediation, in which both direct and indirect relationships are significant but in the opposite direction; and (5) indirect-only mediation, in which the indirect effect is significant but not the direct effect.

According to Zhao, Lynch Jr, and Chen (2010), in the case of non-mediation, a direct-only non-mediation signifies a possibility of omitted mediator while no-effect non-mediation is indicative of a flawed theoretical framework. As for the case of mediation, both complementary and competitive mediation represent partial mediation, whereby the effect of independent variable on dependent variable is mediated through the mediating construct, but the independent variable still explains a portion of the dependent variable that is independent of the mediator (Ramayah et al. 2018). While for indirect-only mediation, it is a representation of full mediation. As expected, indirect-only mediation is the best-case scenario whereby the mediator fully complies with the proposed model (Hair et al. 2017c).

It is worth noting that the classification of mediation type using Variance Accounted For (VAF) approach is not conducted in this study. VAF is the ratio of indirect-to-total effect which indicates the proportion of mediation in explaining the endogenous variable (Ramayah et al. 2018). This approach is commonly used to conclude the types of mediation in the past. However, due to its shortcomings, the latest guidelines for

testing mediating effect (Zhao, Lynch Jr and Chen 2010; Nitzl, Roldan and Cepeda 2016; Hair et al. 2017c) no longer include the assessment of VAF as a standard procedure. Specifically, in the case of competitive partial mediation where both paths are significant yet are of opposite signs, the suppressor effect may lead to erroneous findings. Hence, this study omits the calculation of VAF in the mediation analysis.

4.13 Chapter Summary

To summarise, this chapter discusses the design of the research and methodology employed for this study. The chapter illustrates the sampling procedure, in which it justifies the selection of Malaysian who aged 18 years old and above as sample population, individual as the sampling unit, a mix of quota sampling and snowball sampling as sampling technique, and a targeted sample size of 384 respondents. This chapter also provides details on the development of research instrument, design and administration of questionnaire, process of data collection and data analysis technique. The primary data is collected through web-based questionnaire survey and the research instrument is adopted and adapted from reliable sources with proven validity. The dependent variable, risky assets investment, is measured by the proportion of risky assets. The independent variables include financial literacy, advice-seeking (financial information); attitude towards investing, personal values, social norm (investment motivation); and FSE (investment behavioural skills), where FSE also acts as the mediator in the model. Socio-demographic and socioeconomic variables such as age, gender, income, highest educational attainment and number of dependents are included as control variables. To examine the statistical significance of the proposed association between variables, the PLS-SEM technique is adopted.

CHAPTER 5
RESULTS

5.1 Chapter Overview

This chapter presents the analysis results of all three data analysis stages involving data preparation, descriptive analysis and inferential analysis using PLS-SEM method. In particular, the chapter begins with the preparation of data where it involves data cleaning procedure, followed by preliminary data screening. Whereas in the second section, the respondents' profile and the descriptive statistics of both latent and manifest variables are discussed. This is then followed by the PLS-SEM analysis which entails the measurement model assessment, structural model assessment and mediation analysis.

5.2 Data Preparation

The data preparation process involves data entry and coding, followed by a number of preliminary data screening to facilitate the correction of potential data issues or errors. This section presents the preparation of data, in which the raw survey data collected are screened and transformed into data that is appropriate and valid for further statistical analyses such as descriptive statistics and inferential statistics.

5.2.1 Data Entry and Coding

The data collection period encompasses approximately three months, from December 2018 until February 2019, where 420 complete responses are garnered. Following the completion of data collection process, the raw data from questionnaire survey are then transformed into numerical codes using Qualtrics. This is to ensure the readability of all data by the chosen statistical software such as SPSS and SmartPLS. Specifically, each of the items is assigned a number based on their categories, except for continuous variables. Some questions such as item FSE3 for financial self-efficacy construct and all items for personal values are reversed-coded as required. Furthermore, all the individual value scores are centred on respondents' mean of the 21 value scales, thereby adjusting for social desirability and systematic response sets as commonly done. The score for personal values, including both self-transcendence and

conservation score are calculated in Excel spreadsheet using the given formula as detailed in Section 4.5.3.2. As for financial literacy construct, the total score is computed automatically by Qualtrics based on the number of correctly answered questions by the respondent. The operationalisation and description of the variables are detailed in Section 4.4.

After coding and exporting the dataset, the data are further screened for data input errors. This procedure is mandatory because even minor errors can distort the results of analysis. The data is checked using frequencies table and descriptive statistics. No data entry errors are anticipated or found as the coded data are imported directly from the online platform, whereby human-generated errors are at minimal. The screened data file is presented in Excel format, ready to be exported into software for preliminary analysis.

5.2.2 Preliminary Data Screening

Data in survey-based research are often faced with the challenges of low-quality data arising from data issues such as out of range data, presence of missing values, suspicious response patterns and data distribution (Hair et al. 2017c). As such, in effort to ensure the empirical validity of the research model and precision of results, the dataset is screened and verified using different preliminary analyses prior to statistical analysis. This step is strongly recommended, whereby problematic observations are identified and treated before further analysis and hypothesis testing (Huang et al. 2012). The following sub-sections are dedicated to the discourse of data issues regarding missing values, insufficient effort responding, presence of potential outliers, common method variance and the normality of data.

5.2.2.1 Missing Values

Due to the nature of this study involving human participants, the issue of missing data is inevitable and common. Missing data is a statistical problem that occurs when one or more respondents do not respond to one or more survey items (Newman 2014). It comes under a more general concept of “coarsened data” that includes numbers which are grouped, aggregated, rounded, censored or truncated, thereby lead to partial loss

of information (Schafer and Graham 2002). Generally, missing data can be distinguished between the three categories, namely: (1) unit non-response, (2) item non-response; and (3) wave non-response. Unit non-response occurs when data collection fails entirely, which happens when individual refuses to participate in the survey or is unreachable (Schafer and Graham 2002). Item non-response refers to a situation when respondent completes only part of the survey while leaving some questions unanswered (Graham 2012). Whereas for wave non-response, it applies only to longitudinal studies whereby participants are present for some waves of data collection but absent for others (Schafer and Graham 2002; Graham 2012). Given the nature of this study, this section is devoted to the discussion on item non-response.

Multiple factors attribute to explain the occurrence of item non-response missing data, including human errors in data entry and data collection, or technical errors caused equipment such as online survey platform or computer malfunction (Newman 2014). Besides, it can be respondents' reluctance in answering some questions out of fatigue and boredom (Schlomer, Bauman and Card 2010) or especially when items involve sensitive information, confusing wordings, are placed at the end of a rather lengthy questionnaire (Newman 2014). The issue of missing data is recognised as one of the most pervasive issues in data analysis (Tabachnick and Fidell 2013). Its presence not only lead to information loss, less efficient estimates and lower power statistical test, but also cause biased results due to systematic differences between the group who responded to an item and those who fail to respond (De Leeuw 2001). For the acceptable percentage of missing data, there is still no consensus to date. Specifically, there are recommendation on adopting 5% (Schafer 1999), 10% (Bennett 2001) or 20% (Peng et al. 2006) as the cut-off. In contrast, some scholars argue that the pattern of missingness (Schlomer, Bauman and Card 2010; Tabachnick and Fidell 2013) and the statistical power adequacy (Schlomer, Bauman and Card 2010) is more of a concern than the amount of missing data.

In view of the possible detrimental impacts of missing data, a number of precautionary steps are taken to minimise its occurrence. First, the definition of any potentially ambiguous or unfamiliar terms are provided before respondent can commence with answering the questionnaire. This is to enhance respondents' understanding towards

the items in order to avoid any confusion that will lead to non-response (Newman 2014) or abandonment. Second, the online survey is formulated in a way that respondents who fail to complete all questions at the present section are given a reminder before proceeding to the next page. Third, the survey is displayed in a multiple screen design instead of presenting the entire survey in single screen. This layout renders respondents' impression on the length of survey to appear shorter, thereby is useful in lowering non-response (Toepoel, Das and Van Soest 2009). Lastly, a progress bar is displayed on each page of the survey to inform respondents about their progress through the survey. By that, respondents are aware of how far they have progressed and how much is left to be answered. This strategy reduces survey abandonments and increase the completion rate (Couper 2000; Crawford, Couper and Lamias 2001).

With the extra measures taken to curb the foreseeable issue, only a minimal of one case is identified with missing data among the 420 responses collected. The Little's Missing Completely at Random Test is conducted using SPSS to examine the pattern of missing data. Subsequently, the results indicate that the data is missing completely at random, which means the data is missing without any systematic reason (Sarstedt and Mooi 2014). To deal with this type of missing data, the listwise deletion method is recommended (Sarstedt and Mooi 2014). By this, it means only cases with full data on all the variables are included for analysis, while cases with missing data on any of the variables are omitted from the computation (Sarstedt and Mooi 2014). One of the disadvantages of this method is that the sample size may reduce substantially. Nonetheless, the listwise deletion method is deemed appropriate for this study due to the following reasons: (1) pattern of data missingness is missing completely at random (MCAR); (2) small amount of cases with missing data downplays the disadvantage of sacrificing sample size; (3) sample size can be equal across all analyses; (4) simplicity of the method compared to others. In addition, according to Garson (2015) and Tabachnick and Fidell (2013), if the missing data consists of less than 5% of all cases, the most efficient method is to delete those cases. Hence, that one observation containing missing data is discarded from the final data set before further analysis, reducing the observation from 420 to 419 cases.

5.2.2.2 Insufficient Effort Responding

Insufficient effort responding (IER) occurs when survey respondent is not sufficiently motivated to provide answers in accordance to the survey instructions, interpret item content correctly and provide responses accurately (Huang et al. 2012). IER subsumes either random (Hough et al. 1990) or non-random responding (Costa and McCrae 2008), alongside with both intentional "speeding-through" responding and unintentional occasional careless responding (Huang et al. 2012) to surveys (Schmitt and Stuits 1985). Some examples of IER behaviours includes selecting responses randomly, endorsing the same response option repeatedly, misinterpreting items or responding without regard to item content (Huang et al. 2012; Huang et al. 2015).

There are several factors to be concerned about IER. First, and perhaps most intuitively, IER is potentially undesirable as it deviates the data from being a clean and quality data as commonly required in data analysis (Meade and Craig 2012). Furthermore, the inclusion of IER responses in the data can attenuate scale reliability, internal consistency and SEM fit (Huang et al. 2012), affect the factor structure of constructs including reversed-coded items (Woods 2006), and produce biasing effect that may deflate or inflate the association among variables, causing an inflated Type I error or Type II error rate (Huang, Liu and Bowling 2015). Taken as a whole, evidences delineate that IER poses threat on data quality that may eventually influence hypothesis testing and survey findings. Thus, the employment of various methods to detect and address issues pertaining to IER is essentially crucial and mandatory.

In identifying IER behaviour, this study adopts three major unobtrusive screening approaches as proposed by DeSimone and Harms (2018), namely: (1) response time approach; (2) response pattern approach using long string; and (3) individual response variability approach. The three screening techniques are particularly useful for this study because each are proven appropriate for web-based survey (DeSimone and Harms 2018), survey that contains large number of items (Huang et al. 2015), reverse-scored items and items with ordinal, interval or ratio data including Likert-scale (DeSimone and Harms 2018). Additionally, these approaches are generally not detectable by respondents, relatively straightforward to adopt and most importantly, are able to sufficiently (DeSimone and Harms 2018) and effectively detect IER (Huang

et al. 2012; Meade and Craig 2012) without modifying the survey. Besides, the use of multiple screening methods is advisable as they are non-redundant and are helpful in enhancing the efficiency of screening process (Meade and Craig 2012).

The response time approach assumes that a minimal amount of time is needed for one to provide valid responses to survey questions, wherein excessively short survey completion time is an indication of IER (Huang et al. 2015) resulting from the absence of cognitive processing (Huang et al. 2012). In other words, respondents who complete the survey too quickly may be a sign that they answer without actually reading the questions. This technique is incorporated in the online survey by enabling the timing feature on Qualtrics. With this, the time spent on each page and the total duration to complete the entire survey by each respondent are tracked and provided by the software. The cut-off score for total response time, as proposed by DeSimone and Harms (2018) and Huang et al. (2012), is a minimum of 2 seconds per item. That is, any respondent who answer the questions quicker than the average rate of 2 seconds per item are flagged as IER. With 78 items in the survey, respondents who complete the entire survey in less than 156 seconds are flagged.

The second detection technique employed is the response pattern approach, whereby IER is detected through the suspicious pattern of response options provided by respondent. Specifically, it involves respondent who repeatedly select the same response category for a large number of consecutive questions (Costa and McCrae 2008), which for some scholars, is referred to as straight-lining behaviour (Herzog and Bachman 1981; Hair et al. 2017c; Kim et al. 2019) or non-differentiation (Yan 2008). To check for suspicious response pattern in the data, this study adopts the long string index as recommended by Costa and McCrae (2008). The long string index is retrieved from the maximum number of consecutive invariant response option in the survey, with higher score representing longer sequence of same responses, and thus more straight-lining. As for the associated cut-off score, respondents who invariantly respond to at least nine items (DeSimone and Harms 2018) in any scale set are flagged as IER. For instance, respondents who indicate at least one string of nine “strongly agree” in a row will be identified as IER.

Last but not least, the individual response variability approach is a measure of variation in responses (Kim et al. 2019), whereby the standard deviation of the responses for each respondent is calculated (DeSimone and Harms 2018). Different from long-string, this approach is able to detect not only straight-lining, but also diagonal lining and alternating extreme pole responses. That is, on a scale of 5, respondents who select 1, 2, 3, 4, 5 or 1, 5, 1, 5, 1 consecutively also raises the red flag. A lower individual response variability score indicates less variance across the responses, signalling more IER behaviour. As this approach is relatively new, the threshold value is not specified to date. Therefore, this study flags respondents who fall within the lowest standard deviation of zero as a more conservative means.

Of the 419 complete observations collected, there are a total of 19 cases (approximately 5%) being flagged as IER by response time (1 case), long string (14 cases) and individual response variability approach (19 cases). Following the suggestion by Hair et al. (2017c), these suspicious cases are removed from the dataset, thereby reducing the final sample to 400 respondents. This finding is consistent with previous literature in which one should anticipate about 5 to 10% of the sample being detected as IER if unobtrusive screening techniques are used (DeSimone and Harms 2018).

5.2.2.3 Outliers

Outlier represents an extreme response to a specific question or to all questions (Hair et al. 2017c). There are several reasons to justify why outliers can be problematic. First, outliers can be detrimental as it distorts statistics (such as mean) and have substantial influence on the coefficients of the model. Besides, it produces both Type I and Type II errors, and generate findings that only generalise to another sample with the same type of outlier (Tabachnick and Fidell 2013). With that, the detection and treatment of outliers is deemed crucial.

Generally, outlier can be categorised into two types: (1) univariate outliers, whereby the extreme value is found on one variable; and (2) multivariate outliers, whereby the combination of two or more variables are unusual and extreme (Tabachnick and Fidell 2013). The presence of a univariate outlier can occur as a result of data collection or

entry errors (Sarstedt and Mooi 2014), for instance coding of "66" instead of "6" on a 6-point Likert-scale. Having respondent that is not a member of the intended sample population can also lead to outlier (Kline 2016). Besides, it may also occur as exceptionally high or low values are a part of reality (Hair et al. 2017c). As for multivariate outlier, it is typically found in combination of variables which are rare (Sarstedt and Mooi 2014), such as spending 90% of income on vacation. For data with outliers, the treatment depends on the types of outliers identified. When there is no clear explanation for the extreme values, the outlier should be retained (Sarstedt and Mooi 2014). Deletion or correction of the outlier should only be done as a remedy when the outliers are caused by error in data entry (Hair et al. 2017c), do not fit the research objective or influence the results severely (Sarstedt and Mooi 2014).

The outliers in this study is identified using both univariate and multivariate detections. The univariate detection examines distribution of observation of each variable in order to detect out-of-range value (Sarstedt and Mooi 2014). The data is inspected for potential univariate outliers by observing the box plots, standardised z-score and descriptive statistics of each variable. The standardised z-score, alongside with the mean, median, minimum, maximum and range of each variable are computed in SPSS. As a rule of thumb, standardised z-score greater than a value of 4 (Hair et al. 2006) or out-of-range observations in box plots and descriptive statistics (Hair et al. 2017c) may be an indication of outlier. Results reveal that none of the observations contain univariate outlier.

Next, for the multivariate detection, two or more variables are simultaneously considered to identify multivariate outlier (Sarstedt and Mooi 2014). The Mahanalobis distance (D^2) is adopted as the multivariate detection approach. The D^2 values for each variable are assessed using SPSS, with $p < 0.001$ (Kline 2016) and degree of freedom equal to the number of variables. Following guidelines provided by Hair et al. (2006), any cases with D^2/df greater than 4 signifies potential multivariate outlier for larger sample size. With that, none of the observations are noted as multivariate outlier in the examination of D^2 values (see Appendix E). As a whole, the data of this study is not affected by outliers.

5.2.2.4 Common Method Variance

The assessment of the presence of common method variance has often been required for behavioural studies where the data collected are generally self-reported. As with all survey-based data, this study faces the same issue whereby all data are self-reported, hence introducing common method variance. According to Podsakoff et al. (2003), common method variance is attributed to the measurement method instead of the constructs of interest. In the context of PLS-SEM, it means that the variation in responses is caused by the instrument rather than the construct that the instrument attempts to measure.

The most likely sources of this phenomenon result from self-report bias in which the responses for both predictor and criterion variables (endogenous and exogenous variables in PLS-SEM) are provided by the same respondent, whereas other sources of bias involve the measurement item themselves (Podsakoff et al. 2003). Consequently, as noted by Kock (2015a), the path coefficient could be inflated or deflated, leading to Type I and Type II errors that will ultimately mislead the research findings. Given these serious threats underlying common method variance, the adoption of remedies that can help mitigate or reduce the level of method variance is of immerse importance. By this, the most commonly applied procedures (Hair et al. 2017a) proposed by Podsakoff et al. (2003) are considered for this study.

According to Podsakoff et al. (2003), all procedural remedies associated with questionnaire and item design should be implemented, for instance eliminating social desirability and item ambiguity. Following this, it is also recommended that additional procedural and statistical remedies tailored to match the specific research settings are put in place to further control for common method variance. Under circumstances where the endogenous and exogenous constructs cannot be obtained from different sources, the measurement context cannot be separated and the source of method bias cannot be identified, this study implemented a combination of procedural and statistical remedies in accordance to the Podsakoff et al. (2003)'s guideline in order to minimise common method biases.

First, separation of measurement, including temporal and methodological separation,

is introduced in the online survey to separate the measurement of predictor and criterion variables. When attempting to interpret and respond to a given question, respondents usually draw on the context of surrounding questions (Dillman, Smyth and Christian 2014). Temporal separation, which refers to the physical proximity of questions on the screen or page, is accomplished in this study by presenting the survey in multiple screens. This renders the measurement of predictor and criterion variables to appear in different pages instead of having the entire survey displayed on one page. As for methodological separation, this study adopts different response format for the measurement of predictor and criterion variables, whereby predictors are measured on close-ended, ordinal scale questions while the criterion variable measured using open-ended question. By implementing the separation of measurement, it diminishes the influence of earlier questions on responses to later questions (Dillman, Smyth and Christian 2014) as earlier responses become less salient, available and relevant to respondent, thus reducing common method bias (Podsakoff et al. 2003).

Second, respondents are rest assured that their responses are anonymous, confidential and non-identifiable as noted in earlier section. All identifying information such as respondent's name and email address are not collected. This information is repeatedly highlighted in the invitation text, participant information statement and the online survey. Furthermore, respondents are also informed through the invitation text that there are no right or wrong to the questions and thus they could respond to all questions truthfully. Podsakoff et al. (2003) espouses that such procedures often help to prevent high evaluation apprehension and respondent's tendency to provide answers that are more socially desirable and lenient.

Third, the scale items are improved by avoiding item ambiguity and adopting different scales endpoints for the predictor and criterion variables. The definition of any potentially ambiguous or unfamiliar financial terms are provided before respondent can proceed to the first question. Examples for these terms are also provided throughout the questionnaire. Tourangeau, Rips, and Rasinski (2000) note that these steps would aid respondents in comprehending the questions and items in the way researcher would like them to. Also, the scale endpoint among all the variables differs from each other, hence minimising common method biases resulted from

commonalities in the scale endpoint (Podsakoff et al. 2003).

Lastly, this study also controls for method biases using statistical remedies. Some available statistical techniques include Harman's one factor test, partial correlation procedure, controlling for the effects of a directly measured latent methods factor, controlling for the effects of unmeasured latent methods factor and multiple factors (Podsakoff et al. 2003). Among these method, the Harman's one-factor test is chosen and applied to the data. This study is aware of the criticisms that the test is more of a diagnostic technique to determine the extent to which common method bias might be an issue, rather than a technique to partial off bias and it lacks sensitivity in detecting common method bias (Podsakoff et al. 2003). However, the remedy for minimising common method bias is best performed before data collection, not after (Conway and Lance 2010). Thus, the objective of post-hoc analysis should not target at reducing method bias, but rather to assess if the data is affected by common method bias after procedural remedies are put in place. In addition, the issue of common method bias is not present nearly as often as previously thought (Babin, Griffin and Hair 2016; Fuller et al. 2016) and is likely overstated (Conway and Lance 2010; Lance et al. 2010). With this, Babin, Griffin, and Hair (2016) argue that Harman's test is powerful diagnostically and indeed sufficient to detect method bias. In relation to the criticism on its lack of sensitivity, as noted by Fuller et al. (2016), Harman's test is able to capture the level of method bias which is common in survey-based studies. The authors further claim that the inaccuracy of the test, if present, more often lies in suggesting common method bias when there is actually none. Furthermore, this technique is widely-used (Podsakoff et al. 2003) and is in fact an acceptable procedure for assessing common method bias (Babin, Griffin and Hair 2016; Fuller et al. 2016), particularly in the context PLS-SEM (Hair et al. 2017a).

Thus, Harman's one-factor test is conducted, whereby the eigenvalue unrotated factor analysis results unveil that the highest portion of the total variance explained by a single factor being 24.58% (see Appendix F), which is far below the threshold of 50% (Podsakoff and Organ 1986) or 40% more conservatively (Babin, Griffin and Hair 2016). This suggests that none of the factor accounts for the majority of the variance, indicating that the data is unlikely to be influenced by common method bias. In

addition, Kock (2015a) advocates to examine the VIF in which the presence of a VIF larger than 3.3 is indicative of common method bias. With the VIF values falling in a range between 1.098 and 1.851, there appears little concern of significant bias due to common method.

To sum up, both procedural and statistical approaches are performed to minimise and detect common method bias. Taken together, priori procedural remedies are implemented to mitigate any potential method bias and post-hoc statistical remedies further infer that this study is not threatened by common method bias.

5.2.2.5 Data Normality

Data normality refers to the shape of data distribution and its correspondence to the normal distribution (Hair et al. 2006). CB-SEM rest upon the assumption that the data is normally distributed. In contrary, PLS-SEM makes no assumption on the data distribution, hence do not have specific requirement on data normality (Hair et al. 2017c). That is, deviations from normality is not much a concern in PLS-SEM. Despite that, the examination of data normality is conducted to assess the extent to which data is deviated from normality.

To identify the distribution of the collected data, this study tests for the univariate and multivariate normality in Webpower as suggested by Cain, Zhang, and Yuan (2017). The results show that univariate skewness ranged from -0.679 to 0.953, whereas univariate kurtosis ranged from -0.590 to 1.177. Following the guidelines by Hair et al. (2014), absolute skewness or kurtosis values exceeding -1 and +1 is an indication of non-normality in the data. From the results, it can be seen that univariate kurtosis values do not fall within the acceptable range, thereby signifying that the data suffers from univariate non-normality. Furthermore, both Mardia's multivariate skewness (β = 5.990, $p < 0.001$) and kurtosis (β = 112.054, $p < 0.001$) are both significant, representing deviation from multivariate normality. With violation in both univariate and multivariate normality, it further provides additional justification for the use of PLS-SEM in this study (Hair et al. 2014). The normality results from Webpower is presented in Appendix G.

Taken together, establishing the data quality in preliminary data analysis lends credibility to the subsequent statistical analysis and the research findings. Upon the completion of these five preliminary tests (on missing values, insufficient effort responding, outliers, common method bias and data normality), these results collectively highlight that the final cleaned data is not threatened by the abovementioned issues. Of the 419 complete observations collected, all problematic cases are eliminated from the dataset, thereby reducing the final sample to 400 respondents (95% usable rate). The final sample size of 400 exceeds the minimum sample requirement based upon confidence level and margin of error (N= 384), PLS-SEM analysis requirement (N= 60), power analysis (N= 103) and past literature in the area of personal finance (N= 200). With that, this study proceeds with the subsequent statistical analysis.

5.3 Descriptive Analysis

This section discusses the descriptive statistics for all variables incorporated in this study, which includes the profile of survey respondents and descriptive analysis for both latent and manifest variables. These descriptive analyses aim to provide a brief summary of the raw data before further inferential statistical evaluations.

5.3.1 Respondent Profile

Table 5.1 displays the basic socio-demographic characteristics of the respondents. As shown in the table, of the 400 respondents, there is an approximately equal balance of gender distribution with 49% male and 51% female. As for age, slightly half of them (48%) are aged between 25 to 35 years old, followed by 23% of respondents in the age group of 18 to 24 years old and 18% aged between 35 to 45 years old. In terms of monthly income, 31% of them earn less than RM2,500, followed by 27% of them have an earning ranging RM2,500 to RM3,999, 11% earning RM4,000 to RM5,499 and the remaining 32% earning RM5,500 and above. The higher income categories constitute lower proportion of respondents, ranging from 5% to 8.3%. Meanwhile, the highest educational level attained by the respondents fall mostly under the tertiary education categories with 64% being Bachelor's degree graduate, followed by 13% with a Diploma and 10% with Master's degree. Almost 65% of the respondents are

employed, while 18% are self-employed and the remaining 18% are of other employment status. Majority of the respondents have never married (66%) and have no dependents (55%).

Table 5.1 Respondent Profile (n=400)

	Frequency	Percentage (%)
Gender		
Male	196	49.0
Female	204	51.0
Age		
18 - 24 years old	92	23.0
25 - 34 years old	193	48.3
35 - 44 years old	70	17.5
45 - 54 years old	29	7.3
55 years old and above	16	4.0
Monthly income (RM)		
Less than 2,500	123	30.8
2,500 - 3,999	106	26.5
4,000 - 5,499	45	11.3
5,500 - 6,999	23	5.8
7,000 - 8,499	26	6.5
8,500 - 9,999	20	5.0
10,000 - 12,999	24	6.0
13,000 and above	33	8.3
Highest educational level		
Primary school	0	0.0
Secondary school	26	6.5
STPM	7	1.8
Diploma	50	12.5
Bachelor's degree	256	64.0
Master's degree	41	10.3
Doctorate degree	20	5.0
Employment status		
Employed	258	64.5
Self- employed	70	17.5
Others	72	18.0

Marital status		
Married	130	32.5
Never married	265	66.3
Others	5	1.3
Number of Dependents		
No dependents	219	54.8
1 dependent	52	13.0
2 dependents	76	19.0
3 dependents	24	6.0
4 or more dependents	29	7.3

As depicted in Table 5.2, the distribution of respondents in the quota sample of this study is relatively comparable, although with mere discrepancies, with the pre-determined population distribution in terms of gender, age and income. The national statistics show that the gender ratio in Malaysia is 102 males to 100 females with 51.9% male and 48.1% female (Department of Statistics Malaysia 2018). This is similar to the evenly distributed gender aspect in the sample demographics. Similarly, in regards to age group, the actual population distribution (Department of Statistics Malaysia 2018) is fairly reflected in the sample. Approximately 48% of the respondents in the study sample are reported being in the age group of below 35 years old, followed by 18% aged between 35 to 44 years old, 7% of them aged 45 to 54 years old and the remaining 4% being in the age group of 55 and above. As for income category, the income group of Malaysian population earning a monthly income less than RM4,000 represents 55% of the population, followed by 34.5% of those who earn between RM4,000 to RM9,999, and 10.5% of those who earn RM10,000 or more per month (Department of Statistics Malaysia 2018). In a similar vein, among the sample respondents, 57% of them have their monthly income below RM4,000, 29% are earning between RM4,000 to RM9,999 and 14.3% of them are earning RM10,000 and above. Overall, the sample is reasonably representative of the Malaysian population with respect to gender, age and income.

Table 5.2 Gender, age and income of sample and population (n=400)

	Population (%)	**Sample (%)**
Gender		
Male	51.9	49.0

Female	48.1	51.0
Age		
Below 35 years old	61.7	48.3
35 - 44 years old	14.5	17.5
45 - 54 years old	11.6	7.3
55 years old and above	12.2	4.0
Monthly income (RM)		
Less than 4,000	55.0	57.3
4,000 - 9,999	34.5	28.6
10,000 and above	10.5	14.3

5.3.2 Descriptive Statistics of Latent Variable

Latent variables are not directly observable but rather assessed using manifest variables which are also known as items or indicators (Hair et al. 2017c). In total, there are three latent variables in the model of this study. The mean, standard deviation, minimum and maximum value of each items in the three latent variables are assessed (see Appendix H). Table 5.3 presents the descriptive statistics for all indicators in this study.

Table 5.3 Descriptive Statistics for Latent Variables

Construct	Indicator	Min	Max	Mean	Standard Deviation
Attitude towards Investing	ATT_1	1	5	3.04	0.99
	ATT_2	1	5	3.14	0.99
	ATT_3	1	5	3.35	0.93
	ATT_4	1	5	3.50	1.00
	ATT_5	1	5	3.30	1.03
	ATT_6	1	5	4.11	0.96
Social Norm	SOC_1	1	5	2.84	1.05
	SOC_2	1	5	2.62	1.03
	SOC_3	1	5	2.76	1.04
	SOC_4	1	5	3.01	1.11
Financial Self-Efficacy	FSE_1	1	5	2.76	1.15
	FSE_2	1	5	2.71	1.13
	FSE_3	1	5	2.77	1.15
	FSE_4	1	5	3.22	1.05

FSE_5	1	5	3.05	1.16

5.3.3 Descriptive Statistics of Manifest Variable

This section presents the descriptive statistics of all five manifest variables used in this study, which include risky assets allocation, financial literacy, advice-seeking and personal values. The mean, standard deviation, minimum and maximum value of each variables are assessed (see Appendix H).

5.3.3.1 Risky Assets Allocation

The descriptive statistics of respondents' assets allocation is reported in Table 5.4. The mean for risky assets is recorded at 28.5%, suggesting that on average, respondents are willing to invest 29% of their wealth in risky assets. The standard deviation falls at 18.97. As compared to risky assets, the mean allocation for safe assets is relatively higher at 52% whereas the mean allocation for other assets is relatively lower at 19.6%. Next, the minimum amount of assets allocation for all three assets is 0% whereas the maximum amount of allocation is 100%. This indicates that the receptiveness in stocks and mutual funds investing is rather extreme among the respondents where some are willing to place all their wealth into risky assets, yet some prefer not to hold any risky assets at all.

Table 5.4 Descriptive Statistics for Risky Assets Allocation

Assets Allocation	Min	Max	Mean	Standard Deviation
Safe Assets	0	100	51.99	22.90
Risky Assets	0	100	28.47	18.97
Other Assets	0	100	19.55	14.92

Table 5.5 documents the frequency and percentage of respondents in each band of the allocated proportion of risky assets. The largest group of respondents (25.5%) fall within the range of 20-29% allocation in risky assets, followed by 21.5% of respondents investing 30-39%. It is also reported that about 25.5% of the respondents invest less than 20% while only 8% of them are willing to invest at least 60% in risky assets.

Table 5.5 Extent of Risky Assets Allocation

Risky Assets Allocation (%)	Frequency	Percentage (%)
< 10	38	9.5
10 - 19	64	16.0
20 - 29	102	25.5
30 - 39	86	21.5
40 - 49	31	7.8
50 - 59	47	11.8
60 and above	32	8.0
Total	400	100

The summary statistics shown in Table 5.6 distinguishes the mean of risky assets allocation across the demographic subgroups. It exhibits a substantial mean difference between gender where male respondents tend to hold a higher proportion of risky assets (33.3%) as compared to female (23.8%). Those who aged between 35 to 54 years old also constitute a higher mean of risky assets proportion than those in other age groups. This trend may occur due to the reason that individuals in these age groups have been working for years and thus are able to start accumulating their wealth in risky assets, whereas younger individuals may still be at the stage of wealth creation and elder individuals may be limiting their risky exposure as they are near retirement age. The proportion of risky assets are the highest among those with doctorate degree and lowest for those with secondary school as highest educational level. Likewise, respondents who are self-employed, neither married nor never married, or have three dependents also hold a higher proportion of risky assets.

Table 5.6 Descriptive Statistics for Risky Assets Allocation by Demographics

	Mean	Standard Deviation
Gender		
Male	33.32	21.01
Female	23.81	15.51
Age		
18 - 24 years old	27.21	16.84
25 - 34 years old	27.49	17.88
35 - 44 years old	30.62	22.34
45 - 54 years old	35.69	21.16
55 years old and above	25.00	22.29

Monthly income (RM)		
Less than 2,500	22.81	14.55
2,500 - 3,999	29.58	17.73
4,000 - 5,499	29.33	19.99
5,500 - 6,999	28.70	17.07
7,000 - 8,499	30.58	17.17
8,500 - 9,999	39.50	25.28
10,000 - 12,999	28.89	20.78
13,000 and above	35.97	26.92
Highest educational level		
Secondary school	21.54	13.40
STPM	22.14	11.07
Diploma	29.70	17.42
Bachelor's degree	27.84	18.63
Master's degree	32.07	21.48
Doctorate degree	37.30	26.26
Employment status		
Employed	28.88	18.37
Self- employed	31.06	22.85
Others	24.47	16.57
Marital status		
Married	30.45	21.25
Never married	27.39	17.61
Others	34.20	26.71
Number of Dependents		
No dependents	27.18	17.74
1 dependent	30.08	16.73
2 dependents	28.95	20.58
3 dependents	35.63	25.55
4 or more dependents	28.10	21.15

5.3.3.2 Financial Literacy

Table 5.7 demonstrates the descriptive statistics relating to financial literacy score. The mean score of financial literacy is 5.9 out of a maximum of 10, which indicates a moderate level of financial literacy. This finding is similar to those reported by past studies in the Malaysian context (Boon, Yee and Ting 2011; Atkinson and Messy

2012; Ali, Rahman and Bakar 2015; Sabri and Zakaria 2015; Janor et al. 2016; Khan, Tan and Gan 2019). This shows the current financial literacy level among the Malaysians has not enhanced over the past decade and still has room for further improvement.

To further explore financial literacy and its influence on risky assets (later in the structural model analysis), the financial literacy measure is decomposed into two: basic financial literacy and advanced financial literacy which respectively defined as the basic and advanced financial knowledge. This is to assess if basic financial knowledge alone is sufficient to encourage participation in the risky financial market and also if individuals who involve in risky assets investment understand the financial products they are investing.

Respondents' basic financial literacy recorded a mean of 2.15 out of 3, which is around 72% out of 100%. On the other hand, advanced financial literacy has a mean score of 3.76 out of 7, making up 54% out of 100%, which is relatively lower than the basic financial literacy. The results suggest that respondents are mostly unfamiliar with advanced financial information.

Table 5.7 Descriptive Statistics for Financial Literacy Score

Score	Min	Max	Mean	Standard Deviation
Financial Literacy	0	10	5.90	2.53
Basic Financial Literacy	0	3	2.15	0.90
Advanced Financial Literacy	0	7	3.76	1.97

The distribution of responses to each of the ten financial literacy questions is presented in Table 5.8. The respondents' basic financial literacy is assessed through the first three questions. As shown, the respondents are knowledgeable about interest compounding as demonstrated by the highest correct responses with a huge majority of 84% respondents understanding the benefit of compounding interest on their savings. Besides, 70% of them know that they will have a lower purchasing power if the inflation rate outweighs the interest rate. The third question on diversification

examines one's understanding on the diversification benefit between a single company stock and stock in mutual funds. With 61% correct responses, it is apparent that respondents are less familiar with the diversification benefit of financial products. Overall, the relatively high correct response rates in these three basic financial literacy questions indicate that most respondents are able to understand the basic economics concepts that is relevant to daily activities.

As for advanced financial literacy questions, respondents generally have a better understanding on risk, such as asset risk (72%), risk diversification (67%) and stock or bond risk (67%), suggesting that respondents are aware of the risk aspect of financial products. Meanwhile, there are significant reduction in the correct responses for questions which are related to more complex and sophisticated aspects of the financial products. For instance, more than half of them cannot state the relationship between bond and interest rate (correct percentage = 28%), do not know the function of stock market (correct percentage = 46%) and are unaware that stocks can give the highest return as compared to bonds and savings account in long term (correct percentage = 46%). Additionally, only half (50%) of the respondents correctly responded on mutual fund's product feature. These reflect that Malaysian respondents are not well informed about the financial products such as bonds, stocks and mutual funds.

Table 5.8 Financial Literacy by Question

Question	Correct percentage (%)
Q1. Interest compounding	83.8
Q2. Inflation	70.3
Q3. Diversification (stocks)	60.5
Q4. Stock market function	46.3
Q5. Mutual fund	50.0
Q6. Bond and interest	28.0
Q7. Stock/bond risk	66.8
Q8. Asset return	45.5
Q9. Asset risk	72.0
Q10. Risk diversification	67.3

Table 5.9 provides the summary of financial literacy scores by respondents. About

16% respondents manage to provide six correct responses while 7% respondents correctly answer all ten questions and less than 2% respondents answer all ten questions wrongly. The results also indicate that 41% of respondents have scored less than the average score of 5.9. In general, all these findings reveal that many respondents are not fully equipped with adequate financial knowledge, therefore may not be capable of making informed financial decisions related to asset allocation.

Table 5.9 Distribution of Financial Literacy Score

Financial Literacy Score	Frequency	Percentage (%)
0	7	1.8
1	20	5.0
2	18	4.5
3	29	7.3
4	37	9.3
5	53	13.3
6	62	15.5
7	52	13.0
8	58	14.5
9	35	8.8
10	29	7.3
Total	400	100

The mean score of financial literacy by respondents' socio-demographic characteristics are shown in Table 5.10. The statistics show that financial literacy mean score are highest for the age group of 55 years old and above among all the other age groups. In addition, male respondents are more financially informed than female respondents. Higher financial literacy mean score is also captured in individuals with higher income level and higher education attainment. The results are consistent with most major advanced and emerging economies where financial literacy appears higher among male, the higher income earners and the highly educated (S&P). Each group has an average score within the range of 5.2 to 7.79, except for four subgroups with mean score less than 5.2. Not surprisingly, the five subgroups comprise of those who aged between 18 to 24 years old, monthly income less than RM2,500, have secondary school as highest educational level, or neither employed nor self-employed. It is important to acknowledge the literacy gap among these groups as they are financially

vulnerable and more prone to financial challenges, thus deserving more attention.

Table 5.10 Descriptive Statistics for Financial Literacy Score by Demographics

	Mean	Standard Deviation
Gender		
Male	6.35	2.52
Female	5.48	2.48
Age		
18 - 24 years old	4.62	2.52
25 - 34 years old	5.84	2.41
35 - 44 years old	6.77	2.20
45 - 54 years old	7.28	2.07
55 years old and above	7.75	2.57
Monthly income (RM)		
Less than 2,500	4.42	2.40
2,500 - 3,999	5.87	2.48
4,000 - 5,499	6.22	1.78
5,500 - 6,999	7.04	2.08
7,000 - 8,499	6.92	2.35
8,500 - 9,999	6.85	1.95
10,000 - 12,999	7.46	1.59
13,000 and above	7.79	2.42
Highest educational level		
Secondary school	4.81	2.17
STPM	5.29	3.73
Diploma	5.46	2.35
Bachelor’s degree	5.82	2.57
Master’s degree	7.00	2.10
Doctorate degree	7.50	2.16
Employment status		
Employed	6.28	2.41
Self- employed	5.81	2.54
Others	4.65	2.59
Marital status		
Married	6.85	2.43
Never married	5.44	2.46
Others	5.60	2.70

Number of Dependents		
No dependents	5.74	2.49
1 dependent	5.48	2.84
2 dependents	6.39	2.53
3 dependents	6.96	2.22
4 or more dependents	5.69	2.25

5.3.3.3 Advice-seeking

Table 5.11 displays respondents' advice-seeking behaviour when making investment decision. It is reported that only 15% of respondents decide completely by themselves and the advisor only execute their decision. These individuals do not seek professional advices that are offered by financial institutions. Rather, they make decision based on their own knowledge and judgement. Majority of them (74%) seek for advice before deciding. Only less than 2% of them fully rely on financial advisors and delegate their investment decision making to the professional.

Table 5.11 Extent of Advice-seeking

	Frequency	**Percentage (%)**
1 = Self decide	63	15.8
2 = Inform advisor on decision and seek advisor's advice	146	36.5
3 = Consider advisor's proposal	151	37.8
4 = Rely mainly on advisor's advice	34	8.5
5 = Let advisor decide everything	6	1.5
Total	400	100

5.3.3.4 Personal Values

The descriptive statistics of respondents' personal values, which includes conservation and self-transcendence are listed in Table 5.12. The conservation score has a mean of 89.89, with a minimum of 66.43 and maximum of 115.27. On the other hand, self-transcendence recorded a mean of 74.9. The minimum score is 38.86 while the maximum is 109.8.

Table 5.12 Descriptive Statistics for Personal Values

Construct	Min	Max	Mean	Standard Deviation
Conservation	66.43	115.27	89.89	8.03
Self-transcendence	38.86	109.80	74.90	9.08

Table 5.13 documents the mean score of conservation and self-transcendence by respondents' demographic. As expected, female have a slightly higher mean score than male in both conservation and self-transcendence. This suggests that female place relatively higher importance of conservation values over openness to change values and also self-transcendence over self-enhancement. The statistics also depict that both conservation and self-transcendence increase monotonically with each age groups. These trends are consistent with prior studies in which both values are higher in female and older individuals (Verkasalo et al. 2009). Higher conservation scores are also found among higher-income group, particularly those who earn RM5,500 and above. As for educational level, doctoral graduates are the most conservative while respondents who are secondary school graduate have the highest self-transcendence score. It is also worth noting that conservation scores show a gradually increasing trend with the number of dependents. Put differently, those who have more dependents tend to act more conservatively in daily life. Besides, respondents who are married or own only one dependent appear to score higher in self-transcendence dimension.

Table 5.13 Conservation and Self-Transcendence Mean Score by Demographics

	Conservation		Self-Transcendence	
	Mean	Standard Deviation	Mean	Standard Deviation
Gender				
Male	89.36	8.12	74.56	9.09
Female	90.40	7.96	75.23	9.10
Age				
18 - 24 years old	89.32	7.86	73.20	8.61
25 - 34 years old	89.36	8.13	74.92	9.44
35 - 44 years old	90.02	7.08	74.29	7.87
45 - 54 years old	91.83	8.98	78.97	10.11
55 years old and above	95.43	8.54	79.70	7.35

Monthly income (RM)				
Less than 2,500	89.47	8.46	74.92	9.83
2,500 - 3,999	88.41	7.14	73.62	7.56
4,000 - 5,499	89.79	6.35	74.78	8.82
5,500 - 6,999	90.23	7.26	76.94	9.84
7,000 - 8,499	92.33	8.73	75.71	11.02
8,500 - 9,999	92.59	7.98	76.08	11.00
10,000 - 12,999	92.09	8.39	74.76	9.81
13,000 and above	90.96	10.22	76.44	7.24
Highest educational level				
Secondary school	88.92	8.40	77.16	11.76
STPM	89.84	9.18	71.15	7.63
Diploma	88.80	6.32	76.09	8.73
Bachelor's degree	89.96	8.21	74.41	8.57
Master's degree	89.35	8.20	76.08	11.27
Doctorate degree	94.03	8.09	74.12	7.90
Employment status				
Employed	90.29	7.74	75.21	8.80
Self- employed	89.39	7.72	73.35	9.00
Others	88.93	9.34	75.32	10.12
Marital status				
Married	91.13	7.25	76.79	9.25
Never married	89.27	8.41	74.09	8.90
Others	90.52	4.45	68.69	6.23
Number of Dependents				
No dependents	89.59	8.52	74.24	8.82
1 dependent	89.71	6.79	76.27	9.54
2 dependents	90.07	7.93	75.77	10.72
3 dependents	90.53	7.68	75.33	6.26
4 or more dependents	91.47	7.26	74.81	7.55

5.4 Measurement Model Assessment

This section presents the assessment of measurement model in this study. Table 5.14 outlines all the constructs and its indicators adopted in this study. Of all eight variables, there are three latent variables measured using observed items and the other five variables are manifest variables. All the latent variables in this study are substantiated

as reflective constructs which include attitude towards investing, financial self-efficacy, and social norm. The validity and reliability of the reflective measurement model is evaluated using three criteria, namely internal consistency, convergent validity and discriminant validity.

Table 5.14 Indicators of All Constructs

Constructs	Indicators of constructs	Number of indicators
Attitude towards Investing	ATT_1 to ATT_6	6
Financial Self-Efficacy	FSE_1 to FSE_5	5
Social Norm	SN_1 to SN_4	4
Financial Literacy	Manifest variable	
Advice-seeking	Manifest variable	
Conservation	Manifest variable	
Self-Transcendence	Manifest variable	
Risky Assets	Manifest variable	

5.4.1 Internal Consistency and Convergent Validity

The results of internal consistency and convergent validity of the constructs are displayed in Table 5.15. These evaluation criteria include composite reliability to assess internal consistency, and indicator loadings and AVE for convergent validity assessment.

The construct of attitude towards investing comprise of six items, in which all the indicator loadings surpass the threshold value of 0.708 except for ATT_6 with an outer loading of 0.381. Similarly, the social norm construct reveals one out of the four indicators, SN_4 with a loading of 0.262, which fail to meet the threshold value for outer loading. Although both constructs surpass their satisfactory level of composite reliability greater than 0.7 and AVE greater than 0.5, guidelines suggest that indicator with loading below 0.4 are very low and should always be removed (Bagozzi, Yi and Phillips 1991; Hair, Ringle and Sarstedt 2011). The two indicators, ATT_6 and SN_4 with a loading below 0.4 are therefore eliminated from the constructs. After removing one item each from attitude towards investing and social norm consecutively, the

analysis is reconducted and results are assessed again. Table 5.15 depicts the increased values for composite reliability and AVE in both constructs.

As shown in the table, most of the indicator loadings are above the satisfactory threshold of 0.708, except for FSE_3R, which has a loading of 0.616. As the values fall within 0.4 to 0.7, they should only be considered elimination if the removal of items would increase the composite reliability or AVE above the recommended threshold value (Hair et al. 2017c). The composite reliability of the constructs ranged from 0.849 to 0.9 while the AVE ranged from 0.588 to 0.709. Given that the composite reliability and AVE of all constructs are above their threshold value of 0.7 and 0.5, the indicators FSE_3R is retained in their respective construct and none of the items are required to be removed thereafter. The final results suggest that the requirement of internal consistency and convergent validity are fulfilled in the measurement model (see Appendix I).

Table 5.15 Internal Consistency and Convergent Validity of Constructs

Construct	Items	Items deleted	Loadings	AVE	CR
Attitude towards Investing	ATT_1	ATT_6	0.821	0.669	0.900
	ATT_2		0.849		
	ATT_3		0.842		
	ATT_4		0.788		
	ATT_5		0.788		
Financial Self-Efficacy	FSE_1		0.889	0.614	0.886
	FSE_2		0.885		
	FSE_3R		0.616		
	FSE_4		0.705		
	FSE_5		0.787		
Social Norm	SN_1	SN_4	0.725	0.709	0.879
	SN_2		0.918		
	SN_3		0.871		
Financial Literacy	Manifest variable		1.000	1.000	1.000

Advice-seeking	Manifest variable	1.000	1.000	1.000
Conservation	Manifest variable	1.000	1.000	1.000
Self-Transcendence	Manifest variable	1.000	1.000	1.000

5.4.2 Discriminant Validity

After substantiating the internal consistency reliability and convergent validity, the subsequent step is to ensure the discriminant validity of the measurement model. By establishing discriminant validity, it implies that a construct is truly different from other constructs and measures phenomena not represented by other constructs (Hair et al. 2017c). Discriminant validity of the construct is examined via three measures, which are the cross-loading test, Fornell-Larcker criterion test and Heterotrait-Monotrait criterion test (HTMT). The discriminant validity output is presented in Appendix I.

5.4.2.1 Cross-loading Test

The cross-loadings of all indicators on the constructs in the proposed model are displayed in Table 5.16, with the bolded figures representing loadings on associated latent variable. As shown, the indicator loadings on its underlying latent variable are substantially greater than its loadings on all other constructs. Besides, the difference of loadings across the constructs have far exceeded the recommended value of 0.1. Hence, the discriminant validity is substantiated in terms of cross-loadings.

5.4.2.2 Fornell-Larcker Criterion Test

After passing the cross-loadings assessment, the succeeding step is to check for discriminant validity using the Fornell-Larcker criterion. The presentation of Fornell-Larcker test results is shown in

Table 5.17. The diagonal elements in bold represent the squared root of AVE values while the nondiagonal elements is the correlations between the latent variables. As can be seen from the table, the squared root of AVE values are greater than the correlations with other constructs on the same columns and rows for all latent variables. Manifest variables, such as conservation, financial literacy, risky assets investment, and self-transcendence, are excluded from the analysis as the AVE value (of 1.00) is not a meaningful criterion for observable or index variables (Hair et al. 2017c). The results suggest that all constructs exhibit satisfactory discriminant validity using the Fornell-Larcker criterion.

5.4.2.3 Heterotrait-Monotrait Criterion Test (HTMT)

Last but not least, the third criterion test, HTMT is utilised to assess discriminant validity. As mentioned earlier in Section, the two means of HTMT analysis are included in this study: (1) using HTMT as criterion; and (2) using HTMT as a statistical test. For assessing the HTMT as a criterion, this study set the cut-off value at the more stringent and conservative value of 0.85, rather than 0.9. This is because the constructs in the model, from a conceptual viewpoint, are distinct with each other (Henseler, Ringle and Sarstedt 2015). As shown in Table 5.18, none of the HTMT values exceed the predetermined threshold, indicating that discriminant validity is present at the HTMT criterion of 0.85. Next, for statistical test, bootstrapping is applied to assess if the HTMT value deviates significantly from 1.00 (Henseler, Ringle and Sarstedt 2015), or a lower threshold of 0.85 or 0.90 (Franke and Sarstedt 2019). Similarly, this study chooses to adopt the lower threshold of 0.85 to prevent the mere possibility of falsely rejecting discriminant validity (Franke and Sarstedt 2019). Table 5.19 demonstrates the inferential test results obtained through bootstrapping with a resample size of 5,000, two-tailed test at 95% confidence interval. As can be seen, none of the bootstrap-based confidence intervals of the HTMT contain the value of 0.85, which ascertains the discriminant validity of the constructs.

Table 5.16 Discriminant Validity using Cross-loadings

	Advice-seeking	Attitude towards Investing	Conservation	Financial Literacy	Financial Self-Efficacy	Risky Assets	Social Norm	Self-Transcendence
ADV	**1.000**	0.017	0.136	-0.074	-0.232	-0.152	-0.044	0.077
ATT_1	0.007	**0.823**	-0.055	0.142	0.262	0.225	0.355	-0.040
ATT_2	-0.008	**0.850**	-0.080	0.126	0.324	0.253	0.410	-0.069
ATT_3	0.071	**0.838**	-0.012	0.112	0.208	0.247	0.344	0.041
ATT_4	0.014	**0.786**	-0.101	0.181	0.192	0.218	0.344	-0.045
ATT_5	-0.001	**0.791**	-0.099	0.112	0.264	0.256	0.391	-0.043
CONS	0.136	-0.086	**1.000**	0.055	-0.140	-0.191	-0.118	-0.120
FL	-0.074	0.162	0.055	**1.000**	0.313	0.349	-0.033	0.080
FSE_1	-0.205	0.250	-0.098	0.277	**0.887**	0.457	0.239	-0.153
FSE_2	-0.208	0.281	-0.159	0.265	**0.885**	0.389	0.256	-0.148
FSE_3R	-0.188	0.165	-0.065	0.256	**0.612**	0.288	0.085	-0.140
FSE_4	-0.136	0.226	-0.143	0.177	**0.708**	0.325	0.184	-0.123
FSE_5	-0.170	0.289	-0.083	0.249	**0.790**	0.360	0.223	-0.185
RA	-0.152	0.294	-0.191	0.349	0.470	**1.000**	0.172	-0.051
SN_1	0.023	0.312	-0.076	-0.045	0.102	0.107	**0.761**	-0.022
SN_2	-0.051	0.416	-0.100	-0.002	0.270	0.181	**0.913**	-0.124
SN_3	-0.064	0.412	-0.120	-0.048	0.250	0.136	**0.855**	-0.106
TRANS	0.077	-0.042	-0.120	0.080	-0.191	-0.051	-0.108	**1.000**

Table 5.17 Discriminant Validity using Fornell-Larcker Criterion

	ADV	ATT	CONS	FL	FSE	RA	SN	TRANS
Advice-seeking	**1.000**							
Attitude towards Investing	0.018	**0.818**						
Conservation	0.099	-0.079	**1.000**					
Financial Literacy	-0.074	0.162	0.099	**1.000**				
Financial Self-Efficacy	-0.232	0.311	-0.102	0.313	**0.783**			
Risky Assets	-0.152	0.294	-0.158	0.349	0.470	**1.000**		
Social Norm	-0.048	0.456	-0.095	-0.032	0.267	0.174	**0.842**	
Self-Transcendence	0.029	-0.020	-0.092	0.119	-0.153	-0.020	-0.092	**1.000**

Table 5.18 Discriminant Validity of Constructs using HTMT Criterion

	ADV	ATT	CONS	FL	FSE	RA	SN	TRANS
Advice-seeking								
Attitude towards Investing	0.026							
Conservation	0.099	0.083						
Financial Literacy	0.074	0.176	0.099					
Financial Self-Efficacy	0.255	0.355	0.111	0.344				
Risky Assets	0.152	0.313	0.158	0.349	0.512			
Social Norm	0.061	0.530	0.106	0.042	0.294	0.186		
Self-Transcendence	0.029	0.041	0.092	0.119	0.167	0.020	0.091	

Table 5.19 Confidence Intervals for HTMT

	Confidence Interval			Confidence Interval	
	95% LL	95% UL		95% LL	95% UL
ATT -> ADV	0.005	0.023	SN -> ADV	0.015	0.104
CONS -> ADV	0.016	0.187	SN -> ATT	0.442	0.612
CONS -> ATT	0.034	0.153	SN -> CONS	0.033	0.199
FL -> ADV	0.011	0.151	SN -> FL	0.006	0.072
FL -> ATT	0.082	0.265	SN -> FSE	0.197	0.387
FL -> CONS	0.021	0.182	SN -> RA	0.089	0.285
FSE -> ADV	0.164	0.339	TRANS -> ADV	0.001	0.083
FSE -> ATT	0.253	0.453	TRANS -> ATT	0.011	0.047
FSE -> CONS	0.043	0.195	TRANS -> CONS	0.012	0.190
FSE -> FL	0.261	0.420	TRANS -> FL	0.032	0.207
RA -> ADV	0.049	0.246	TRANS -> FSE	0.072	0.262
RA -> ATT	0.219	0.402	TRANS -> RA	0.000	0.056
RA -> CONS	0.067	0.246	TRANS -> SN	0.024	0.158
RA -> FL	0.253	0.421			
RA -> FSE	0.444	0.576			

5.5 Structural Model Assessment

After the measurement model meets all the prerequisite examination, the PLS-SEM assessment of the structural model is conducted. The following subsections discuss the evaluation of structural model through several tests. Specifically, the structural model assessment includes evaluating the collinearity within the model, followed by the coefficient of determination (R^2), effect size (f^2) and predictive relevance (Q^2). Last but not least, the statistical significance and relevance of the relationship in the structural model are assessed as a final step. The structural model output from SmartPLS is presented in Appendix J.

5.5.1 Collinearity

Before evaluating the structural model, it is mandatory to examine collinearity in the predictor constructs within the model. It is done by checking if there exist substantial levels of collinearity between each set of predictor variables. According to the VIF guidelines, a VIF value above three (Hair et al. 2019) or above five (Hair et al. 2017c)

would be a concern, as they are indicative of possible collinearity problems. This study adopts the threshold value of VIF at the more stringent and conservative value of 3 in order to identify any probable collinearity issue.

Table 5.20 depicts the outcome of collinearity test. The VIF values of all combinations of endogenous constructs (financial self-efficacy and risky assets) are shown in the columns and their corresponding predictor variables are shown in the rows. Specifically, this study examines the collinearity between the set of predictors - financial literacy, advice-seeking, attitude towards investing, conservation, self-transcendence and social norm as predictors of financial self-efficacy. Likewise, the collinearity between the set of predictors for risky assets investment are also examined. As illustrated in table, all the VIF values for the predictor constructs of financial self-efficacy are well below the cut-off value of 3, indicating no critical issue of lateral collinearity in the structural model. The same approach is applied for risky assets investment, with results showing VIF values that range between 1.098 and 1.851. Hence, it can be concluded that multicollinearity issue is not a threat to this study.

Table 5.20 Lateral Collinearity Assessment

Construct	Financial Self-Efficacy (VIF)	Risky Assets (VIF)
Financial Literacy	1.083	1.397
Advice-seeking	1.026	1.098
Attitude towards Investing	1.326	1.417
Conservation	1.049	1.109
Self-Transcendence	1.038	1.121
Social Norm	1.299	1.351
Financial Self-Efficacy		1.425
Age		1.697
Dependents		1.218
Education		1.205
Income		1.851

5.5.2 Coefficient of Determination (R^2)

After ensuring the absence of lateral collinearity in the structural model, this study proceeds to assess the predictive ability of the model, which is represented by the

coefficient of determination (R^2 value). While the rule of thumb for an acceptable R^2 value differs according to context and discipline, this study adopts the threshold commonly used in consumer behaviour (Hair et al. 2017c), whereby the R^2 values of 0.26, 0.13 and 0.02 describe substantial, moderate and weak levels of predictive accuracy (Cohen 1988).

There are two endogenous variables in the model, which includes financial self-efficacy and risky assets investment. As illustrated in Table 5.21, the seven variables under financial information, investment motivation and investment behavioural skills explained 31% of variance in risky assets investment. Besides, six variables under financial information and investment motivation accounted for 27.6% of variance in financial self-efficacy. Following the rules of thumb by Cohen (1988), the R^2 values for risky assets investment (0.31) and financial self-efficacy (0.276) can be considered as substantial.

5.5.3 Effect Size (f^2)

Next, this study examines Cohen's f^2 effect size (Cohen 1988), which is referred as the R^2 change on the endogenous constructs when a particular exogenous construct is removed from the model (Hair et al. 2017c). As mentioned in earlier chapter, the redundancy between f^2 effect size and size of path coefficients pose a question about the necessary of f^2 reporting. Despite the similarities of results between the two metrics, reporting f^2 effect size is deemed crucial and especially essential in this study, wherein the rank order of the constructs' relevance differs in terms of f^2 and path coefficients (Hair et al. 2019). To classify the effect size, this study adopts the guidelines by Cohen (1988). The f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects of the exogenous latent variable in explaining the endogenous variable.

Table 5.21 presents the f^2 values for each of the predictor constructs in explaining the endogenous variables. As shown, financial self-efficacy ($f^2 = 0.102$), financial literacy ($f^2 = 0.054$) displays rather weak effect in explaining the variance in risky assets investment. On the other hand, conservation ($f^2 = 0.019$), attitude towards investing

($f^2 = 0.017$), advice-seeking ($f^2 = 0.002$), self-transcendence ($f^2 = 0.00$) and social norm ($f^2 = 0.00$) have negligible f^2 values that are less than 0.02, whereby their removal will have little to no effect on the R^2 value of risky assets investment, indicating their lack of significance in explaining risky assets investment.

In terms of explaining financial self-efficacy, the effect size of the predictor constructs includes financial literacy ($f^2 = 0.119$), advice-seeking ($f^2 = 0.049$), self-transcendence ($f^2 = 0.041$), attitude towards investing ($f^2 = 0.034$) and social norm ($f^2 = 0.027$) with small effect, whereas conservation ($f^2 = 0.013$) with very minimal effect.

5.5.4 Predictive Relevance (Q^2)

In assessing the predictive relevance of the model, the Q^2 value is calculated using the blindfolding technique. This metric is indicative of the in-sample explanatory power and out-of-sample prediction (Shmueli et al. 2019). Thus, having a higher Q^2 value signify that the structural model has a higher predictive accuracy. According to Hair et al. (2017c), the predictive relevance is established for endogenous constructs with Q^2 values of less than zero. This study further adopts the relative measure of predictive relevance by Hair et al. (2019) to interpret the Q^2 values as small (0.00), medium (0.25) and large (0.50) predictive relevance of the PLS-path model. The omission distance is determined based on the requirement that number of observations divided by *D* must not be an integer, where D should range from five to ten (Hair et al. 2017a). With 400 observations, the omission distance is set at $D = 7$.

The results of Q^2 assessment are shown in Table 5.21, whereby the Q^2 values for all endogenous latent variables are substantiated as larger than zero. Thus, it suggests that the proposed model does feature sufficient predictive relevance. More precisely, risky assets investment ($Q^2 = 0.267$) has a medium predictive accuracy, whereas financial self-efficacy ($Q^2 = 0.178$) has a small predictive accuracy.

5.6 Hypothesis Testing

As final step of the structural model assessment, the significance and relevance of the path coefficients is evaluated in order to test the hypothesised direct and indirect

relationships proposed in this study. First, this section examines the direct relationship between all the variables (13 hypotheses). Following that, the indirect (mediating) effect of FSE is tested (6 hypotheses).

5.6.1 Direct Effects

To assess the direct effects between variables, the three methods adopted in examining the significance of the relationship include *t*-value, *p*-value and bootstrap confidence interval. The path coefficient is regarded as statistically significant if the *t*-value is larger than the critical value of 1.65 at 5% significance level, the *p*-value is below 0.05 and its bias-corrected and accelerated (BCa) confidence interval at 95% does not include the value of zero. One-tailed probabilities are used for the tests of the variables since the associated hypotheses are directional. The bootstrapping procedure is performed with resampling of 5,000. The results for the significance of each proposed direct relationship are presented in Table 5.21. The structural model output from SmartPLS is presented in Appendix J. The findings from *t*-value, *p*-value and confidence interval method are consistent as discussed:

X -> Y (path c'): Information and Motivation on Risky Assets (H1a-H6a):

H1a: Financial literacy positively influences risky assets investment.

The results suggest that there is a statistically significant and positive relationship between financial literacy and risky assets investment (H1a, β = 0.229, $p < 0.001$). Adding further, the finding is also ascertained by the adoption of bootstrapping confidence interval method. The results indicate that the acquired 95% bootstrap confidence interval (H1a, $BC_{0.95}$ LL = 0.134, UL= 0.316) does not contain the value of zero. Hence, H1a is supported.

H2a: Advice-seeking positively influences risky assets investment.

The results indicate that the relationship between advice-seeking and risky assets investment is statistically non-significant (H2a, β = -0.038, p = 0.227). The 95% confidence interval (H2a, $BC_{0.95}$ LL = -0.123, UL= 0.046) straddles a zero in between, thereby confirming that the relationship is not significant. Hence, H2a is not supported.

H3a: Attitude towards investing positively influences risky assets investment.

As the results suggest, there is a statistically significant and positive relationship between attitude towards investing and risky assets investment (H3a, $\beta = 0.128$, $p < 0.05$). The 95% confidence interval (H3a, $BC_{0.95}$ LL = 0.034, UL= 0.217) does not include zero. Hence, H3a is supported.

H4a: Preference for conservation over openness to change values negatively influences risky assets investment.

The results reveal that a statistically significant and negative relationship is found between preference for conservation values and risky assets investment (H4a, $\beta = -0.139$, $p < 0.01$). This finding is further validated by the 95% confidence interval (H4a, $BC_{0.95}$ LL = -0.218, UL= -0.062) that does not contain zero, with both the lower and upper bound positioned in the negative zone. Hence, H4a is supported.

H5a: Preference for self-transcendence over self-enhancement values negatively influences risky assets investment.

The results indicate that the relationship between preference for self-transcendence values and risky assets investment is statistically non-significant (H5a, $\beta = -0.005$, $p = 0.460$). The 95% confidence interval (H5a, $BC_{0.95}$ LL = -0.083, UL= 0.071) consists of zero in between, thereby further confirming that the relationship is not significant. Hence, H5a is not supported.

H6a: Social norm positively influences risky assets investment.

As shown, the results reveal that the relationship between social norm and risky assets investment is statistically non-significant (H6a, $\beta = 0.021$, $p = 0.352$). This finding is further validated by the 95% confidence interval (H6a, $BC_{0.95}$ LL = -0.069, UL= 0.117) that contain zero. Hence, H6a is not supported.

In sum, this study hypothesises that financial literacy, advice-seeking, attitude towards investing, social norm and FSE have a positive relationship with risky assets investment, whereas conservation and self-transcendence have a negative effect on risky assets investment (H1a-H6a). The results are in support of H1a, H3a and H4a, whereby there are statistically significant and positive relationships between risky

assets investment and financial literacy (H1a), attitude towards investing (H3a); and a statistically significant and negative relationship between risky assets investment and conservation (H4a). In contrast, the results show no statistical significance between risky assets investment and advice-seeking (H2a), self-transcendence (H5a) and social norm (H6a).

With this, H1a, H3a and H4a are supported; whereas H2a, H5a and H6a are rejected.

M -> Y (b): Behavioural Skills on Risky Assets (H7):

H7: FSE positively influences risky assets investment.

The results indicate that there is a statistically significant and positive relationship between FSE and risky assets investment (H7, $\beta = 0.316$, $p < 0.001$). Similarly, as can be seen, zero does not fall within the 95% confidence interval (H7, $BC_{0.95}$ LL = 0.229, UL= 0.398). As such, H7 is supported.

X -> M (a): Information, Motivation on Behavioural Skills (H1b-H6b):

H1b: Financial literacy positively influences FSE.

As the results show, the relationship between financial literacy and FSE is found to be statistically significant and positive (H1b, $\beta = 0.306$, $p < 0.001$). The 95% confidence interval (H1b, $BC_{0.95}$ LL = 0.231, UL= 0.373) does not contain zero. Hence, H1a is supported.

H2b: Advice-seeking positively influences FSE.

In contrast with the hypothesis, the results reveal that there is a statistically significant yet negative relationship between advice-seeking and FSE (H2b, $\beta = -0.190$, $p < 0.001$). The confidence interval (H2b, $BC_{0.95}$ LL = -0.264, UL= -0.116) does not include zero yet both the lower and upper bound are positioned in the negative zone. This signifies a significant but negative relationship which is against the hypothesised direction. Therefore, H2b is not supported due to the opposing direction of the significant relationship.

H3b: Attitude towards investing positively influences FSE.

The results indicate that there is a statistically significant and positive relationship

between attitude towards investing and FSE (H3b, β = 0.181, p < 0.01). As can be seen, zero does not fall within the 95% confidence interval (H3b, $BC_{0.95}$ LL = 0.086, UL= 0.273). As such, H3b is supported.

H4b: Preference for conservation over openness to change values negatively influences FSE.

The results reveal that a statistically significant and negative relationship is found between conservation and FSE (H4b, β = -0.100, p < 0.05). This finding is further ascertained by the confidence interval (H4b, $BC_{0.95}$ LL = -0.183, UL= -0.013) that does not include zero, with the lower and upper bound straddling in the negative zone. Hence, H4a is supported.

H5b: Preference for self-transcendence over self-enhancement values negatively influences FSE.

The results indicate a statistically significant and negative relationship between self-transcendence and FSE (H5b, β = -0.175, p < 0.001). In the same vein, the confidence interval (H5b, $BC_{0.95}$ LL = -0.249, UL= -0.099) does not contain zero, and both the lower and upper bound are in the negative zone. Hence, H5b is supported.

H6b: Social norm positively influences FSE.

The results suggest that there is a statistically significant and positive relationship between social norm and FSE (H6b, β = 0.159, p < 0.01). This finding is validated as the 95% confidence interval does not consist of zero (H6b, $BC_{0.95}$ LL = 0.069, UL= 0.246). Hence, H6b is supported.

In short, it is hypothesised that financial literacy, advice-seeking, attitude towards investing and social norm are also positively related with FSE, while conservation and self-transcendence are negatively related to FSE (H1b-H6b). The results indicate that FSE has statistically significant path coefficients with all the hypothesised predictors, with advice-seeking showing an opposing direction as hypothesised. Specifically, FSE displays positive significant relationship with financial literacy (H1b), attitude towards investing (H3b) and social norm (H6b). Moreover, negative significant relationship is identified between FSE and advice-seeking (H2b), conservation (H4b) and self-

transcendence (H5b). Therefore, all H1b to H6b are supported, except for H2b where the direction of significant relationship is contrary to predictions.

Table 5.21 Structural Model Assessment

Hypothesis	Relationship	Std. Beta	Std. Error	*t*-value		*p*-value	95% LL	95% UL	Decision	R^2	f^2	Q^2
	AGE -> RA	-0.065	0.060	1.088		0.138	-0.167	0.029	Control variable			
	DEP -> RA	0.019	0.046	0.410		0.341	-0.060	0.092				
	EDU -> RA	0.018	0.048	0.383		0.351	-0.060	0.099				
	INC -> RA	0.069	0.066	1.041		0.149	-0.037	0.182				
H1a	FL -> RA	0.229	0.055	4.143	***	0.000	0.134	0.316	Supported	0.310	0.054	0.256
H2a	ADV -> RA	-0.038	0.051	0.747		0.227	-0.123	0.046	Not supported		0.002	
H3a	ATT -> RA	0.128	0.056	2.281	*	0.011	0.034	0.217	Supported		0.017	
H4a	CONS -> RA	-0.139	0.047	2.951	**	0.002	-0.218	-0.062	Supported		0.025	
H5a	TRANS -> RA	-0.005	0.047	0.101		0.460	-0.083	0.071	Not supported		0.000	
H6a	SN -> RA	0.021	0.057	0.380		0.352	-0.069	0.117	Not supported		0.000	
H7	FSE -> RA	0.316	0.051	6.214	***	0.000	0.229	0.398	Supported		0.102	
H1b	FL -> FSE	0.306	0.043	7.128	***	0.000	0.231	0.373	Supported	0.276	0.119	0.155
H2b	ADV -> FSE	-0.190	0.045	4.235	***	0.000	-0.264	-0.116	Not supported		0.049	
H3b	ATT -> FSE	0.181	0.056	3.228	**	0.001	0.086	0.273	Supported		0.034	
H4b	CONS -> FSE	-0.100	0.052	1.929	*	0.027	-0.183	-0.013	Supported		0.013	
H5b	TRANS -> FSE	-0.175	0.046	3.840	***	0.000	-0.249	-0.099	Supported		0.041	
H6b	SN -> FSE	0.159	0.054	2.974	**	0.001	0.069	0.246	Supported		0.027	

Notes: *p<0.05, **p<0.01, ***p<0.001

5.6.2 Indirect Effects

Other than the direct relationships between variables, this study also hypothesises several indirect relationships in accordance to the extended IMB model. It is proposed that financial information (financial literacy and advice-seeking) and investment motivation (attitude towards investing, conservation, self-transcendence and social norm) are linked to risky assets investment, indirectly through the mediating construct, FSE. As noted in the previous chapter, the significance and relevance of these hypothesised mediating relationships are examined through the mediation analysis procedure (Zhao, Lynch Jr and Chen 2010) using bootstrapping technique (Preacher and Hayes 2004; Preacher and Hayes 2008) to evaluate the six hypothesised mediating relationships (H8-H13). The indirect effect of X to Y through FSE (path a x b) is examined via a bootstrapping procedure with resample of 5,000 and a significance level of 5%. As the associated mediation hypotheses are non-directional, two-tailed probabilities are used.

The findings from bootstrapping analyses are shown in Table 5.22, with the results revealing that the indirect effects are significant for all six constructs (see Appendix K). As such, the mediating role of FSE between the predictors and risky assets investment is thus validated. Following that, to classify the types of mediation (Zhao, Lynch Jr and Chen 2010), the significance of direct effects from X (financial literacy, advice-seeking, attitude towards investing, conservation, self-transcendence and social norm) to Y (risky assets investment), as determined earlier in the Section 5.6, are documented in conjunction with the indirect effects and sign of their products in Table 5.23. The results from *t*-value, *p*-value and confidence interval method are consistent as discussed:

X -> M -> Y (a x b): Behavioural Skills as Mediator (H8-H13):

H8: FSE has a mediating effect on the relationship between financial literacy and risky assets investment.

As illustrated in Table 5.22, the results indicate that the indirect effect from financial literacy to risky assets investment, through FSE is statistically significant (H8, β = 0.097, $p < 0.001$). Moreover, the 95% confidence interval does not straddle a zero in

between the upper and lower bound (H8, $BC_{0.95}$ LL = 0.065 and UL = 0.133), thereby confirming the presence of mediation. Hence, H8 is supported.

As for the types of mediation, referring to Table 5.23, financial literacy exerts significant direct effect on risky assets investment. With both indirect and direct effect found significant, it indicates that there is a partial mediation between the relationship. To further classify the types of partial mediation, the sign of the product for indirect and direct effect are assessed. The results show both indirect and direct effect are positive, yielding a positive sign for the product. Thus, it signifies that the relationship between financial literacy and risky assets investment as mediated by FSE constitutes a case of complementary mediation.

H9: FSE has a mediating effect on the relationship between advice-seeking and risky assets investment.

The results suggest that the indirect pathway that runs from advice-seeking to risky assets investment, through FSE is statistically significant (H9, β = -0.06, $p < 0.001$, $BC_{0.95}$ LL = -0.093 and UL = -0.035). Hence, H9 is supported.

The direct effect between advice-seeking and risky assets investment is statistically non-significant. Since the indirect effects are significant yet the indirect effects are non-significant, it is categorised under indirect-only mediation, whereby it substantiates that FSE fully mediates the relationship.

H10: FSE has a mediating effect on the relationship between attitude towards investing and risky assets investment.

The results reveal that the indirect effect from attitude towards investing to risky assets investment, through FSE is statistically significant (H10, β = 0.057, $p < 0.01$, $BC_{0.95}$ LL = 0.028 and UL = 0.095). Hence, H10 is supported.

The direct relationship between attitude towards investing and risky assets investment is statistically significant and positive. A partial mediation is indicated as both indirect and direct effect are found significant. The product of the direct effect and indirect effect is positive, thus providing support for the case of complementary mediation.

H11: FSE has a mediating effect on the relationship between preference for conservation values and risky assets investment.

The results indicate that the indirect effect from conservation to risky assets investment, through FSE is statistically significant (H11, β = -0.032, $p < 0.05$, $BC_{0.95}$ LL = -0.062 and UL = -0.006). Hence, H11 is supported.

The direct relationship between preference for conservation values and risky assets investment is statistically significant and negative. A partial mediation is indicated as both indirect and direct effect are found significant. The product of the direct effect and indirect effect is positive. Therefore, it is a case of complementary mediation.

H12: FSE has a mediating effect on the relationship between preference for self-transcendence values and risky assets investment.

As shown, the indirect effect from self-transcendence to risky assets investment, through FSE is found to be statistically significant (H12, β = -0.055, $p < 0.01$, $BC_{0.95}$ LL = -0.087 and UL = -0.029). Hence, H12 is supported.

The direct relationship from self-transcendence to risky assets investment is statistically non-significant. With significant indirect effect and non-significant direct effect, it can be concluded as a situation of indirect-only mediation, which also referred to as full mediation.

H13: FSE has a mediating effect on the relationship between social norm and risky assets investment.

Similarly, for H13, the indirect pathway from social norm to risky assets investment, through FSE is statistically significant (H13, β = 0.05, $p < 0.01$, $BC_{0.95}$ LL = 0.021 and UL = 0.086). Hence, H13 is supported.

The direct effect between social norm and risky assets investment is statistically non-significant. Given that the indirect effect is significant and direct effect is non-significant, a case of indirect-only (full) mediation is identified.

In brief, all the indirect effects do not overlap zero in between their 95% confidence intervals, which ascertain that FSE has a mediating effect on the relationship between risky assets investment and financial literacy (H8), advice-seeking (H9), attitude towards investing (H10), conservation (H11), self-transcendence (H12) and social norm (H13) respectively. Additionally, the findings from *t*-values and *p*-values are also consistent with the bootstrap confidence intervals. Hence, it can be concluded that the mediating role of FSE in the model is confirmed, rendering H8 to H13 as supported. Adding further, FSE fully mediates the relationship from advice-seeking, self-transcendence and social norm to risky assets investment (H9, H12 and H13) and partially mediates the relationship from financial literacy, attitude towards investing and conservation to risky assets investment (H8, H10, H11).

Table 5.22 Mediation Analysis

Hypothesis	Relationship	Std. Beta	Std. Error	*t*-value	*p*-value	95% LL	95% UL	Decision
H8	FL -> FSE -> RA	0.097	0.021	4.706 ***	0.000	0.065	0.133	Supported
H9	ADV -> FSE -> RA	-0.060	0.018	3.365 ***	0.000	-0.093	-0.035	Supported
H10	ATT -> FSE -> RA	0.057	0.020	2.887 **	0.002	0.028	0.095	Supported
H11	CONS -> FSE -> RA	-0.032	0.017	1.854 *	0.032	-0.062	-0.006	Supported
H12	TRANS -> FSE -> RA	-0.055	0.018	3.102 **	0.001	-0.087	-0.029	Supported
H13	SN -> FSE -> RA	0.050	0.020	2.540 **	0.006	0.021	0.086	Supported

Notes: *p<0.05, **p<0.01, ***p<0.001

Table 5.23 Categorisation of Mediation Type

Hypothesis	Relationship	Step 1: Indirect Effect X -> M -> Y (a x b)	Step 2: Direct Effect X -> Y (c')	Step 3: Sign of Product (a x b x c')	Mediation Type
H8	FL -> FSE -> RA	Significant	Significant	Positive	Complementary (partial)
H9	ADV -> FSE -> RA	Significant	Non-significant	Not applicable	Indirect only (full)
H10	ATT -> FSE -> RA	Significant	Significant	Positive	Complementary (partial)
H11	CONS -> FSE -> RA	Significant	Significant	Positive	Complementary (partial)
H12	TRANS -> FSE -> RA	Significant	Non-significant	Not applicable	Indirect only (full)
H13	SN -> FSE -> RA	Significant	Non-significant	Not applicable	Indirect only (full)

5.7 Summary of Findings

The proposed conceptual model, which comprises of measurement model and structural model, are assessed using PLS-SEM technique.

The measurement model indicates satisfactory validity and reliability through the assessment on internal consistency, convergent validity and discriminant validity. Two items with loading below 0.4 are eliminated. The composite reliability of the constructs ranged from 0.849 to 0.900 while the AVE ranged from 0.588 to 0.709. With that, all the variables have achieved the acceptable threshold where the composite reliability score are at least 0.70 and AVE are more than 0.50. Furthermore, the cross-loading test, Fornell-Larcker criterion test and Heterotrait-Monotrait criterion test (HTMT) consistently indicate that the variables exhibit satisfactory discriminant validity. Specifically, the indicator loadings on its underlying latent variable are greater than its loadings on all other constructs; the squared root of AVE values at diagonal are larger than the correlations at off-diagonal for all latent variables; none of the HTMT criterion values exceed 0.85 and none of the bootstrap-based HTMT confidence intervals contain the value of 0.85.

The assessment of structural model yields findings with relatively substantial R^2 for risky assets investment ($R^2 = 0.31$) and financial self-efficacy ($R^2 = 0.276$). The effect size calculation (f^2) for each predictor variables document their distinct impact in explaining the endogenous variables, ranging from no effect to medium effect. Meanwhile, the predictive relevance (Q^2) assessment reveals that the proposed model provides sufficient predictive relevance.

Collectively with path coefficients assessment, this study proposes 19 hypotheses in total. The findings are in support with 15 hypotheses while 4 others are not supported. Based on the results, the proportion of risky assets investment is positively influenced by financial literacy, attitude towards investing in risky assets, and FSE; negatively influenced by conservation. The results further demonstrate that FSE is positively influenced by financial literacy, attitude towards investing and social norm; negatively influenced by conservation and self-transcendence. Lastly, the role of FSE as mediator

is validated, as the results indicate that all proposed predictors are related to risky assets investment indirectly through FSE. The discussions and implications on these findings are presented in the subsequent chapter.

5.8 Chapter Summary

In summary, this chapter presents the results of data preparation, descriptive analysis and PLS-SEM analysis. To ensure the quality and validity of the data, issues involving missing values, insufficient effort responding, presence of potential outliers, common method variance and normality are identified and treated during preliminary data screening stage, resulting in 400 valid responses. The distribution of respondents in terms of gender, age and income is relatively comparable to the pre-determined population distribution, indicating a reasonably representative sample. In PLS-SEM analysis, the measurement model is first assessed using criteria including internal consistency, convergent validity and discriminant validity, with results validating the reliability and validity of the measurement models. Following that, structural model assessment and mediation analysis are performed to test the proposed hypotheses. Among 19 proposed hypotheses, 15 hypotheses are supported while 4 others are not supported. A detailed discussion on the findings and the implication of the study are presented in the subsequent chapter.

CHAPTER 6
DISCUSSION AND CONCLUSION

6.1 Chapter Overview

This chapter presents the discussion of the findings derived in Chapter 5, at the same time to discuss the implication and conclusion of the study. More precisely, this chapter commences with the recapitulation of the study, where the objective and hypotheses elucidated in earlier chapters are summarised. With that, the discussion of the research findings is presented, followed by the implication of the study. The subsequent sections highlight the limitation of the study and further provide recommendations for future research. Lastly, this chapter ends with a brief conclusion for the study.

6.2 Recapitulation of the Study

This section recapitulates the objectives and the main findings of the study.

6.2.1 Research Objective

The low level of risky assets investment has captured the public attention and germinated voluminous scholarly studies. The central target of this study is to examine the determinants of individuals' risky assets investment. As such, this study proposes an integrative model that combines personal value dimensions from theory of basic values with components from information-motivation-behavioural skills (IMB) model to achieve the following research objectives:

1. the influence of financial information, investment motivation and investment behavioural skills on individuals' risky assets investment.

2. the influence of financial information, investment motivation on investment behavioural skills

3. the role of investment behavioural skills as a mediator on the relationship between financial information, investment motivation and risky assets investment.

6.2.2 Research Findings

Based on the research objectives and the research questions of this study, 19 hypotheses are formulated. In this study, the concept of financial information includes the components of financial literacy and advice-seeking; investment motivation is represented by attitude towards investing, personal values (conservation, self-transcendence), and social norm; and investment behavioural skills is conceptualised by FSE. The data are collected from 400 Malaysians who aged 18 years old and above, and later are analysed using PLS-SEM technique. A summary of the hypotheses and their respective results are documented in Table 6.1.

Table 6.1 Summary of Hypotheses Testing

	Hypothesis	Results
RQ 1: What are the influences of financial information, investment motivation and investment behavioural skills on individuals' risky assets investment?		
Financial Information on Risky Assets		
H1a	Financial literacy positively influences risky assets investment.	Supported
H2a	Advice-seeking positively influences risky assets investment.	Not supported
Investment Motivation on Risky Assets		
H3a	Attitude towards investing positively influences risky assets investment.	Supported
H4a	Preference for conservation over openness to change values negatively influences risky assets investment.	Supported
H5a	Preference for self-transcendence over self-enhancement values negatively influences risky assets investment.	Not supported
H6a	Social norm positively influences risky assets investment.	Not supported

Investment Behavioural Skills on Risky Assets

H7	Financial self-efficacy positively influences risky assets investment.	Supported

RQ2: What are the influences of financial information and investment motivation on investment behavioural skills?

Financial Information on Investment Behavioural Skills

H1b	Financial literacy positively influences financial self-efficacy.	Supported
H2b	Advice-seeking positively influences financial self-efficacy.	Not supported

Investment Motivation on Investment Behavioural Skills

H3b	Attitude towards investing positively influences financial self-efficacy.	Supported
H4b	Preference for conservation over openness to change values negatively influences financial self-efficacy.	Supported
H5b	Preference for self-transcendence over self-enhancement values negatively influences financial self-efficacy.	Supported
H6b	Social norm positively influences financial self-efficacy.	Supported

RQ3: How does investment behavioural skills mediate the relationships between financial information, investment motivation and risky assets investment?

Investment Behavioural Skills as Mediator between Financial Information and Risky Assets Investment

H8	Financial self-efficacy has a mediating effect on the relationship between financial literacy and risky assets investment.	Supported
H9	Financial self-efficacy has a mediating effect on the relationship between advice-seeking and risky assets investment.	Supported
Investment Behavioural Skills as a Mediator between Investment Motivation and Risky Assets Investment		
H10	Financial self-efficacy has a mediating effect on the relationship between attitude towards investing and risky assets investment.	Supported
H11	Financial self-efficacy has a mediating effect on the relationship between preference for conservation values and risky assets investment.	Supported
H12	Financial self-efficacy has a mediating effect on the relationship between preference for self-transcendence values and risky assets investment.	Supported
H13	Financial self-efficacy has a mediating effect on the relationship between social norm and risky assets investment.	Supported

6.3 Discussion of the Findings

This section presents the discussion on the research findings. The outcome of each research objectives and the underlying research question are discussed in relation to the hypotheses, where the theoretical justification and empirical evidence are also revisited respectively.

6.3.1 Research Objective 1

Research Objective 1: To examine the influence of financial information, investment motivation and investment behavioural skills on individuals' risky assets investment.

The first research objective of the study involves investigating the direct influence of the constructs in IMB model and theory of basic values on individuals' risky assets investment. As such, 7 hypotheses are formed, whereby two hypotheses (H1a and H2a) are to test the influence of financial information on risky assets investment; four hypotheses (H3a to 6a) are to test the influence of investment motivation on risky assets investment; and one hypothesis (H7) is articulated to test the influence of investment behavioural skills on risky assets investment.

The summary of results with the related research question are depicted in Table 6.1. Among the 7 hypotheses, 4 hypotheses are supported while the other 3 are not supported. The findings reveal that financial literacy, attitude towards investing in risky assets, and FSE have a significant and positive influence on individuals' risky assets investment; whereas conservation exerts a significant and negative influence. The results do not have sufficient evidence to support the hypothesised influence of advice-seeking, self-transcendence and social norm on risky assets investment. The findings of each hypothesis of RQ1 are discussed in the following subsections.

Financial Information and Risky Assets Investment

Hypothesis 1a proposes a positive relationship between financial literacy and risky assets investment. Controlling for demographic characteristics, the findings offer support for the hypothesis, whereby a statistically significant and positive relationship is found between the two variables, hence validating the initial postulation. That is, the extent to which one understands and uses personal finance-related information is positively related to the proportion of their risky assets investment. This is an indication that individuals who are equipped with a higher level of financial literacy tend to invest a higher proportion of risky assets.

The result is in agreement with the IMB model. According to the model, information relevant to the participation of a targeted behaviour is influential on the performance of such behaviour (Fisher and Fisher 1992), which infer that a higher level of financial literacy should result in greater engagement of risky assets investment. Furthermore, the findings of this study is also in line with past studies that document a significant

and positive relationship between financial literacy and the proportion of risky assets investment (Balloch, Nicolae and Philip 2014; Liao et al. 2017; Sivaramakrishnan, Srivastava and Rastogi 2017; Jia et al. 2019).

On the other hand, the results contradict some of the earlier studies highlighting financial literacy as non-significant in affecting risky assets investment (Arrondel, Debbich and Savignac 2015; Grohmann 2018). It also refutes the perspective of "the more wit, the less courage" (Chu et al. 2017) which predicts that individuals who know better about risky assets shy away from investing due to their high awareness of the risk involved. That is to say, people invest because they are unaware of the risk involved. From the findings, however, it appears that those who invest in risky assets do not just invest naively. They understand the financial products that they invest in, and also the risk and return associated with the assets as they invest. It shows that individuals who have difficulty understanding the financial market tend to hold less or even avoid holding complicated, risky financial products. Whereas for those with better understanding on investment-related knowledge such as interest compounding or stock market function, they are well informed about the benefits of investing, thus tend to have higher proportion invested in the stock market. The finding further implies the effectiveness of improving one's financial literacy pertaining to encouraging individuals to invest.

In terms of the role of advice-seeking, professional financial advisors may act as an important information channel whereby individuals without adequate financial knowledge can receive reliable and accurate information. Hypothesis 2a proposes a positive relationship between advice-seeking and risky assets investment. However, the results reveal that the relationship between advice-seeking and risky assets investment is statistically non-significant, thereby negating the hypothesis. It suggests that acquiring advices from financial advisors upon making investment decision do not influence the proportion one invests in risky assets.

Based on the results, it shows that advice-seeking do not have a direct effect on risky assets investment. This finding diverges from the prior empirical studies (Mullainathan, Noeth and Schoar 2012; Zhang 2014; Bachmann and Hens 2015).

From the theoretical perspective, the IMB model offers conceptual explanation for failure to establish relationship between information and behaviour wherein information is a necessary yet often insufficient condition for promoting actions (Fisher and Fisher 1992). Although the IMB model posits the existence of direct path between information and behaviour, the model also predicts that indirect-only relationship can happen in cases where the behaviour is particularly complex and requires behavioural skills to perform (Fisher and Fisher 1992). Similarly, in this study, financial advice as part of the information component, is insufficient to foster the complex behaviour which is risky assets investment. As presented in the latter section in this chapter, the findings regarding the indirect effect of advice-seeking on risky assets investment through FSE once again validates the above explanation. Hence, it is likely that advice-seeking is an important determinant in explaining risky assets investment, but that the effect of advice-seeking is fully mediated by FSE as the action of investing requires FSE to perform. The findings align with studies that adopted the IMB model and found non-significant direct relationship yet significant indirect relationship, such as recycling information and recycling behaviour (Seacat and Northrup 2010). Similarly, concerns have also been raised regarding the extent to which financial advice is directly influential on portfolio or investment (Abreu and Mendes 2010; Mishra and Kumar 2012; Zhang et al. 2018; Pan, Wu and Zhang 2020) and this study validates those concerns whereby financial advice has negligible direct effect . Apart from the theoretical explanation, some other plausible explanations for documenting such relationship in a developing country may be that individuals have inadequate financial literacy to understand the financial advice provided, trust issue between advisor and investors, financial advice is of low quality or fail to foster preference for asset diversification (Pan, Wu and Zhang 2020).

In this regard, this study adds value to the inconclusive findings on the role of financial literacy in prior literature by providing additional evidence of its significant and positive linkage with risky assets investment. More importantly, it adds new evidence to the relationship between financial literacy and risky assets investment as other key psychological factors such as FSE, attitudes and values are accounted for simultaneously with financial literacy. In light of the outcome, the role of financial literacy as one of the predictors for risky assets investment is reaffirmed, validating

that having financial literacy is essential in promoting investment in stocks and mutual funds.

Additionally, this study also contributes to the inconclusive findings pertaining to the role of financial advisors and its relationship with investment behaviour. Besides, when viewed in combination with the positive significant direct effect of financial literacy, it appears that financial literacy and financial advisors have a different direct effect on risky assets investment. The investment behaviour of individuals who primarily rely on their own financial literacy differs from those who rely on financial advisors. Having that being said, financial advice fails to act as a substitute to financial literacy. As such, it provides support to prior studies which claim that financial advice cannot substitute for one's financial literacy (Bhattacharya et al. 2012; Collins 2012; Hackethal, Haliassos and Jappelli 2012; Bachmann and Hens 2015; Calcagno and Monticone 2015; Chauhan and Dey 2020; Pan, Wu and Zhang 2020).

Investment Motivation and Risky Assets Investment

The third hypothesis, H3a, examines the relationship between attitude towards investing and risky assets investment, whereby a significantly positive relationship is posited. The findings suggest a statistically significant and positive relationship between the two variables. Thus, the hypothesis is supported. It suggests that individuals with positive attitude towards investing in risky assets tend to invest a higher proportion of risky assets. The findings are in consistent with the IMB model. Particularly, attitude towards engaging in the targeted behaviour is influential towards the consistent performance of such behaviour (Fisher and Fisher 1992), which infer that more positive attitude towards investing in risky assets should result in the engagement of risky assets investment. By definition, attitude towards investing in risky assets refers to the perceptions of the outcome of investing in risky assets and evaluation of these outcome (Fisher, Fisher and Harman 2003). Thus, it could be that individuals with positive attitude choose to invest as they view investing in risky assets as beneficial and rewarding to their wealth, social status or reputation. As such, these assets appear particularly attractive that they are willing to devote the time, effort and money to invest. In addition, the results align with past studies that similarly substantiate a significant and positive relationship between attitude-related construct

and financial behaviour (Muradoglu and Harvey 2012; Arceo-Gomez and Villagomez 2017; Khan, Tan and Chong 2017; Sivaramakrishnan, Srivastava and Rastogi 2017; Lim et al. 2018). Such similarities to the results of existing studies validate the attitude – behaviour link (Fishbein and Ajzen 2011) even when domain-specific measures are adopted. In essence, upon perceiving the outcome of investing in risky assets as rewarding and beneficial to oneself, individuals would form a positive and favourable attitude which consequently translates into the engagement in risky assets investment.

As for personal values, this study focuses on the two broad bipolar value dimensions, which are Openness to change versus Conservation and Self-enhancement versus Self-transcendence dimension. Two hypotheses (H4a and H5a) are formed to test the influence of these personal values on risky assets investment. Hypothesis 4a proposes a negative relationship between preference for conservation over openness to change values and risky assets investment. As expected, the findings reveal a statistically significant and negative relationship between preference for conservation values and risky assets investment. Hence, H4a is supported. It suggests that those with high conservation values invest lesser in risky assets investment, whereas those who have high openness to change values invest a higher proportion of risky assets investment. With the above findings, it appears that there is a tendency for individuals who invest a higher proportion of risky assets to score higher in conservation values or lower in openness values, as compared to those who invest less. The result is in congruent with the extended IMB model. Being integrated as part of the motivation component, openness to change represents the underlying motivational goals of independent actions, novelty, challenge and pleasure (Schwartz 1992; Schwartz 2012). Investing in risky assets signifies a higher risk accompanied by higher potential financial returns, which is opposing to conventional and low-risk financial assets. For individuals with high openness to change, the high risk and high return components may be perceived as a form of challenges or novelty, thereby giving them a sense of pleasure and excitement. As their underlying motivational goals align with risky assets investment, they are more willing to take the financial risk and invest. In contrast, conservative individuals who prioritise tradition, stability and security in life will rather not take the risk to invest. One possible explanation is that individuals who are conservation orientated may view investing in risky assets as a threat to their security and stability.

Hence, they may be reluctant to invest so as to maintain their financial status quo and current standard of living.

On the other hand, hypothesis 5a examines the influence of preference for self-transcendence values on risky assets investment, whereby a negative relationship is postulated. However, the findings report that the relationship between self-transcendence and risky assets investment is statistically non-significant, thereby disconfirming H5a. The findings do not support the notion that self-transcendence individuals tend to invest a higher proportion of risky assets. That is, placing higher importance in either self-transcendence or self-enhancement values do not directly affect the proportion of risky assets one invests in. Similarly, for social norm, hypothesis 6a proposes that social norm has a positive influence on risky assets investment. Nevertheless, the findings indicate that the relationship between social norm and risky assets investment is statistically non-significant. Hence, H6a is also not supported. The non-significant relationship implies that whether or not individual perceive receiving social support do not influence the proportion one invests in risky assets. On this basis, the findings suggest that social norm do not have a direct influence on risky assets investment. Such results are in contrary with empirical studies related to the substantial role of social factors comprising household, workplace, and neighbourhood effects in predicting assets allocation (Duflo and Saez 2002; Hong, Kubik and Stein 2004; Brown et al. 2008; Bursztyn et al. 2014; Li 2014; Pool, Stoffman and Yonker 2015; Brounen, Koedijk and Pownall 2016; Brown and Taylor 2016; Yew et al. 2017; Zhang et al. 2018).

Nevertheless, the non-significant direct relationship is justifiable using the IMB model, just as the case of the direct effect of advice-seeking on risky assets alike. As highlighted by Fisher and Fisher (1992), failure to substantiate direct relationship between motivation and behaviour implies that motivation is a necessary yet often inadequate condition for promoting behaviours. In situation where direct path is not significant yet indirect path exists, it indicates that the targeted behaviour is complicated and requires behavioural skills to perform (Fisher and Fisher 1992). The latter section in this chapter once again confirms the above explanation as the findings reveal a significant indirect effect of self-transcendence and social norm on risky assets

investment through FSE. In other words, self-transcendence and social norm are not directly related to risky assets investment because the effect of self-transcendence and social norm is fully mediated by FSE as the action of investing requires FSE to perform. In fact, several prior studies that applied the IMB model also found non-significant direct relationship yet significant indirect relationship between motivation and a variety of behaviours (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; Sinley and Albrecht 2016; Limbu 2017). Likewise, these findings are in line with studies that fail to establish a relationship where social norm is directly significant towards investment decision (Balloch, Nicolae and Philip 2014; Brown and Taylor 2016; Lieber and Skimmyhorn 2018). In addition to the theoretical explanation, another potential reason for the non-significant direct effect could be attributed to the observability of social group's decisions which is effective only in encouraging individuals to invest but does not provide explicit guidance for individual to act accordingly. Whereas for the non-significant direct effect of self-transcendence, it is possible that the underlying motivational values are irrelevant to the context of investing, therefore the values are not activated (Schwartz 2012). However, these concerns cannot satisfactorily explain the non-significant direct relationship because the findings later reveal a full mediation through FSE.

As such, this study provides new evidence regarding the role of attitude within the risky assets investment context, demonstrating that the hitherto unexplored construct – attitude towards investing in risky assets being one of the direct predictors of such behaviour. Likewise, this study is one of the first to explore the robust and comprehensive value theory – theory of basic value and its direct relationship with financial behaviour. To reiterate, of the four motivational constructs, only attitude towards investing and conservation values are directly influential towards one's risky assets investment. Self-transcendence and social norm do not provide direct motivation to drive individuals' risky assets investment.

Investment Behavioural Skills and Risky Assets

Hypothesis 7 is proposed to examine the positive relationship between FSE and risky assets investment. From the findings, it indicates that there is a statistically significant and positive relationship between FSE and risky assets investment. The initial

postulation is confirmed, therefore H7 is supported. The findings set forth that individuals' beliefs in their capability to invest in risky assets are positively related to the extent to which they invest in risky assets. That is to say, individuals with a higher level of FSE tend to invest a higher proportion of risky assets.

The finding aligns with the IMB model, whereby behavioural skills relating to the engagement of risky assets investment are one of the critical determinants as to whether well-informed and well-motivated individuals will be capable of investing in risky assets. It is also consistent with the self-efficacy concept (Bandura 1986), which theorised that people are more likely to engage in behaviour that they deem themselves as capable and confident. As previously argued, a possible explanation for the findings is that individuals with higher FSE often focus on potential success rather than failure when they invest in risky assets. They tend to have positive valuation about investing in risky assets, at the same time, are more optimistic about the outcome. Moreover, they are better at managing anxiety and emotions induced by variation in the stock market performance. As a result, they are more receptive about assets with volatile returns and higher risk, and tend to invest a higher proportion of risky assets. The finding is also in agreement with prior literature that suggests a significant and positive relationship between FSE and financial behaviour (Xiao, Chen and Chen 2014; Limbu 2017; Mindra et al. 2017; Topa, Lunceford and Boyatzis 2018; Asebedo and Payne 2019; Shim, Serido and Lee 2019). Taken together, this study adds value to the inconclusive findings on the role of FSE in prior literature by providing additional evidence of its significant and positive linkage with financial behaviour.

Interestingly, upon comparison with the results from hypothesis 1a, the path coefficient from FSE to risky assets investment is stronger (H7, $\beta = 0.316$) than that from financial literacy to risky assets investment (H1a, $\beta = 0.229$). In the same manner, the effect size from FSE to risky assets investment is greater ($f^2 = 0.102$), whereas the effect size from financial literacy to risky assets investment is relatively smaller ($f^2 = 0.054$). Besides, it is also noteworthy that FSE has the highest path coefficient and effect size among all other exogenous constructs for risky assets investment.

While financial literacy has been regarded as the most significant predictor of a wide

diverse range of financial behaviour including investing (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017), the finding elucidates the superior importance of FSE in relation to financial literacy. It signifies that although financial literacy could alleviate low participation in risky assets investment, its effectiveness is weaker as compared to the effect of FSE. That is to say, even if individuals are equipped with sufficient information about risky assets investment, they are likely to withdraw from investing due to low level of FSE in investing. In this regard, the finding provides novel explanation as to why individuals avoid risky assets despite possessing high level of financial literacy. It also reveals the absence of FSE as one of the possibilities to the limited success of existing intervention heavily focused on financial literacy.

To the best of this study's knowledge, discussions on FSE and risky assets investment are largely sparse. To date, there are only three studies that assess the association of the two specific constructs. The significant and positive relationship as shown in the result corroborates those from Farrell, Fry, and Risse (2016) for women's FSE and ownership of different financial products; Chatterjee, Finke, and Harness (2011) who find linkage between general self-efficacy and ownership of financial assets; and Montford and Goldsmith (2016) who also similarly establish the relationship between students' FSE and their risky assets investment. By adopting a domain specific self-efficacy among a more representative population, the present study further validates the relationship by providing more accurate estimate in the current context. Despite the dissimilarity between target sample of this study and the three existing studies, these studies consistently yield similar findings, thereby indicates that the relationship persists among different sample group. Hence, this study adds value to the limited literature by drawing relationship between FSE and risky assets investment, which also enriches one's understanding regarding the role of FSE in explaining financial behaviour. It reaffirms the relationship, particularly in view of evidence displaying that the effect of FSE on investment behaviour is similar across varied target sample.

6.3.2 Research Objective 2

Research Objective 2: To examine the influence of financial information and investment motivation on investment behavioural skills.

The second research objective, which is formulated based on the second research question, targets at addressing the direct influence of financial information and investment motivation on one's investment behavioural skills. With that, two hypotheses (H1b and H2b) are developed to test the influence of financial information on FSE; while four other hypotheses (H3b to H6b) are formulated to test the influence of investment motivation on FSE.

Table 6.1 presents the summary of the results with the research question. Of the 6 proposed relationship, five hypotheses are supported and one is not supported. The findings indicate that all the tested relationships are statistically significant. However, the results show a statistically significant relationship between advice-seeking and FSE yet the direction is negative, thereby negating the hypothesis that proposes a positive direction. To answer RQ2, it can be concluded that all the constructs under financial information and investment motivation have a significant influence on investment behavioural skills. Financial literacy, attitude towards investing in risky assets, and social norm have a significant and positive influence on FSE; whereas advice-seeking, conservation, and self-transcendence have a significant and negative influence on FSE. The results of each hypothesis of RQ2 are further discussed in the following subsections.

Financial Information and Investment Behavioural Skills (H1b-H2b)

Hypothesis 1b proposes a positive relationship between financial literacy and FSE. Controlling for demographic characteristics, the findings show that the relationship between financial literacy and FSE is statistically significant and positive, thereby confirming H1b. From the results, it shows that individuals who better understand and use personal finance-related information display a greater sense of self-belief in own capability of investing in risky assets.

Such a phenomenon is justifiable using the IMB model. Based upon the IMB model, information relevant to the participation of a targeted behaviour is influential on the behavioural skills of such behaviour. Financial decision-making is inevitably complex and risky in nature (Lim et al. 2018). Coupled with the availability of a wide variety of financial products and volatility of stock market performance, the lack of understanding on risky assets would translate to low FSE associated with investing in risky assets. Without such knowledge, one would perceive themselves as having inadequate ability and skills to invest in risky assets. This finding is also in alignment with Limbu (2017) who reveal that credit card knowledge is significantly and positively associated with credit card self-efficacy.

Upon comparison with the findings obtained from H2b to H6b, it can be seen that the path coefficient of financial literacy to FSE is the strongest (H1b, β = 0.306), as compared to all other exogenous variables for FSE (ranges from β = -0.100 to β = -0.190). Similarly, financial literacy demonstrates the largest effect size (f^2 = 0.119) on FSE among all other variables. These findings collectively reveal that although all exogenous variables are statistically significantly related to FSE, financial literacy emerges as the single most influential predictor of FSE. As such, it seems that the effectiveness of financial literacy in instilling greater FSE in risky assets investment, is among the highest.

Hypothesis 2b examines the influence of advice-seeking on FSE, whereby a positive relationship is postulated. Surprisingly, the results reveal a statistically significant yet negative relationship between advice-seeking and FSE. With that, H2b is not supported. The results indicate that those who acquire advice from financial advisors tend to display a lower sense of self-belief towards own capability of investing in risky assets.

This finding diverges from the original IMB model. As information is theorised to positively influence behavioural skills, seeking advice from financial advisor in investment-related matters is expected to have a positive influence on FSE. A possible explanation for the negative relationship is that the construct of advice-seeking may not be a good proxy for financial information in the context of risky assets investment.

Generally, financial advisors can offer information on a variety of financial products other than risky assets, including insurance, bonds or fixed income securities (Taylor 2017). It indicates that the information provided by financial advisors may not be specifically related to only risky assets. Other than risky assets, studies also show that financial advice significantly and positively influences the demand of other financial assets such as insurance (Lin, Hsiao and Yeh 2017), fixed income allocation (Mishra and Kumar 2012) and retirement planning (Marsden, Zick and Mayer 2011). Financial advisors can give information based upon his or her interests in these assets (Krausz and Paroush 2002), which eventually influence the types of financial information individuals receive when making an allocation decision between risky and riskless assets. The investment advice can be influenced by the background of the advisor, whether the background is investment, insurance or financial planning (Halstead et al. 2016). Unlike developed countries, where the financial advisory system is mature and advanced, most financial advisors in Malaysia specialise in one asset category and often market for one financial institution. As such, the financial advice provided can be innately biased towards their underwritten products (Pan, Wu and Zhang 2020). If advisors focus on other financial products based on their own preference, expertise or even incentives, individuals who rely heavily on advisor are likely to only receive information regarding that particular assets. For instance, if an advisor recommends insurance endowment plan, the financial information provided is likely to revolve around insurance, which is averse to risky assets. They may have negative valuation about risky assets, might feel less optimistic about the outcome and less receptive regarding the volatility of stock market performance. Given the lack of specificity and relevance in the information provided, one can thus expect that improvement on FSE might not take place. As a result, individuals who rely more on financial advisors for investment advice tend to have lower FSE in investing in risky assets.

From the theoretical point of view, failure to capture consistent relationship between information and behaviour in IMB model may be attributed to methodological reasons where both constructs are not measured on the same level of specificity and with respect to a similar domain (Fisher and Fisher 1992; Fisher, Fisher and Harman 2003). As the information construct of the IMB model refers to highly specific and relevant knowledge regarding the behaviour of interest (Fisher and Fisher 1992), it appears that

the broadness of financial information provided by financial advisors may be too general. Additionally, when considering in combination with the significant and positive relationship of financial literacy on FSE, it further validates that the financial information required for investing in risky assets is indeed highly specific and relevant to risky assets investment. Nevertheless, it is crucial to note that the importance of financial advice should not be underestimated by merely looking at its role in risky assets investment. This is because financial advisors have shown significant and positive influence to individuals' financial decisions in other asset classes or in other countries as indicated by prior studies.

Investment Motivation and Investment Behavioural Skills (H3b-H6b)

Hypotheses 3b, 4b, 5b and 6b are proposed to assess the relationship between the components of investment motivation and investment behavioural skills. Comprising the investment motivation are the four components of personal and social motivation, namely attitude towards investing, two-dimensional personal values (conservation and self-transcendence) and social norm. Overall, the results indicate that all four components have a significant relationship with FSE and are in line with the proposed direction, therefore all four hypotheses are supported.

These findings collectively show that investment motivation is important in explaining behavioural skills for investing in risky assets. A greater amount of personal and social motivation associated with investing in risky assets are related to a greater belief in one's own capability to invest in risky assets. The results are in agreement with the IMB model. Based on the theoretical model, motivation to perform a behaviour is expected to positively influence the behavioural skills of such behaviour (Fisher and Fisher 1992). Moreover, the findings of this study are also in line with past studies which establish a positive linkage between motivation and behavioural skills in different domains of behaviour (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; Sinley and Albrecht 2016; John, Walsh and Weinhardt 2017).

In detail, H3b proposes that attitude towards investing has a positive influence on FSE. H3b is supported as the findings show that a statistically significant and positive relationship exists between attitude towards investing and FSE. From the results, it

indicates that favourable attitude towards investing in risky assets is positively related to one's FSE in investing in risky assets. This is congruent with prior studies that document a positive relationship between attitude and self-efficacy for other desirable behaviours such as exercise, self-care and cancer screening (Osborn et al. 2010; Kim, Jo and Lee 2015; Chang et al. 2018).

For personal values, two hypotheses (H4b and H5b) are developed to examine the influence of the two personal value dimensions on FSE. Hypothesis 4b proposes a negative relationship between preference for conservation over openness to change values and FSE. The findings offer support for the hypothesis as a statistically significant and negative relationship is found between conservation and FSE. Hence, H4b is supported. Hypothesis 5b examines the influence of preference for self-transcendence over self-enhancement values on FSE, where a negative relationship is posited. The results suggest that there exists a statistically significant and negative relationship between self-transcendence and FSE. Thus, H5b is also supported.

These results indicate that personal values are important in explaining FSE. Individuals prioritising openness to change and self-enhancement values rather than conservation and self-transcendence values, tend to exhibit a higher degree of self-belief in their capability of investing in risky assets. Individuals with high conservation score focus on avoiding changes and preserving status quo whereas those with high self-transcendence score recognise the importance of welfare of in-group members, tolerance, and social justice. As expected, these motivational goals collide with those of FSE such as coping with adversity or seeking innovative solutions in investing. Individuals with high openness to change and self-enhancement values are highly motivated to pursue their underlying motivational goals such as challenges, excitement, wealth, and personal success. Given that investing in risky assets aligns with their personal goals, they are more likely to develop relevant skills and competencies to perform well in investing. Hence, they are more confident about their ability to invest and demonstrate a higher level of FSE. These results confirm prior studies which document two-dimensional personal values to be positively related to self-efficacy in other domains (Sousa, Coelho and Guillamon‐Saorin 2012; Gorgievski et al. 2018; Barni, Danioni and Benevene 2019; Francescato et al. 2020).

As for social motivation, hypothesis 6a proposes that social norm has a positive influence on FSE. Expectedly, the results provide support for H6a that a statistically significant and positive relationship exists between social norm and FSE. It indicates that individuals who perceive a greater social support to invest in risky assets tend to display a greater sense of self-efficacy in investing in risky assets. The results are in line with prior studies that similarly demonstrate a positive link between social motivation and self-efficacy (Nelson 2001; Limbu 2017). As mentioned earlier, a possible explanation for social motivation to play a significant direct effect may be rooted in the cultural aspect. Considering that the Malaysian culture is high in collectivism (Hofstede Insight 2018), social norm and one's ability to comply with these norms are often highly valued (Ramayah et al. 2009). Also, individuals may feel more confident and receptive as they receive support and learn from their significant others regarding the benefits of investing in these assets. In essence, social environments where risky assets investment is perceived as high in prevalence and approval, are likely to increase one's confidence in his/her ability to invest in risky assets. As such, social support and encouragement play a crucial role in bolstering individuals' FSE.

In prior literature, many studies opt to adopt a combined score whereby motivation is treated as a unidimensional construct. In such case, the distinctive influence of respective aspects of motivation may be disguised. As such, this study adds value to the existing literature by decomposing the motivation constructs and measure the three components separately. That is, all elements are considered independent representations of diverse aspects of the motivation construct. The findings reveal that every aspects of motivation contributes to explaining risky assets investment. These results are in congruent with prior studies (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; Sinley and Albrecht 2016; John, Walsh and Weinhardt 2017). Taken together, these findings elucidate the importance of motivation within the domain of risky assets investment as all different aspects of motivation are significant in influencing one's FSE. It requires one to have positive attitude towards investing in risky assets, place relatively higher importance on personal values such as openness to change and self-enhancement, and are surrounded by social environment

that is supportive of investing in risky assets. As such, it could be inferred that having favourable attitude, relevant personal values and social pressure is effective in enhancing one's FSE towards investing in risky assets.

6.3.3 Research Objective 3

Research Objective 3: To examine the role of investment behavioural skills as mediator in the relationship between financial information, investment motivation and risky assets investment.

The final research objective aims to assess the mediating role (indirect effect) of investment behavioural skills, whereby 6 hypotheses are then formulated. Specifically, two hypotheses (H8 and H9) postulate that FSE mediates the relationship between financial information and risky assets investment; whereas four hypotheses (H10 to H13) postulate that FSE mediates the relationship between investment motivation and risky assets investment.

The hypotheses and summary of the findings are depicted in Table 6.1. Based on the findings, all the six hypotheses are supported. Hence, in response to RQ3, it can be concluded that financial literacy, advice-seeking, attitude towards investing, conservation, self-transcendence and social norm have an indirect effect on risky assets investment through FSE, thereby validating the mediating role of FSE. Overall, the findings reveal that all hypotheses associated with RQ3 are supported by the data and are in line with the expected relationship.

Investment Behavioural Skills as a Mediator (H8-H13)

To examine the role of FSE as a mediator, six hypotheses are developed. Hypotheses 8 and 9 propose that FSE mediates the relationship between the two components of financial information and risky assets investment, whereby financial literacy and advice-seeking are indirectly related to risky assets investment via FSE. Likewise, hypotheses 10, 11, 12 and 13 are posited to assess if FSE mediates the relationship between the four components of investment motivation and risky assets investment, whereby attitude towards investing, conservation, self-transcendence and social norm

are indirectly linked to risky assets investment through FSE as mediator. Overall, the results indicate that all six information and motivation components exhibit a significant indirect influence towards risky assets investment through the mediating role of FSE. These findings are in line with the postulation of FSE's mediating effect, therefore all six hypotheses are supported.

These results are in congruent with the IMB model that posits behavioural skills (FSE) mediates the relationship between information (financial literacy, advice-seeking) and behaviour (investing in risky assets); and also, between motivation (attitude, conservation, self-transcendence, social norm) and behaviour (investing in risky assets). Particularly, higher level of financial information and motivation drive and enhance individuals' beliefs in their capability to invest in risky assets, and consequently the high level of FSE is translated into higher proportion of risky assets investment. The findings are also in alignment with empirical studies that also position behavioural skills as a mediator for the influence from information and motivation to different form of behaviour (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; John, Walsh and Weinhardt 2017; Limbu 2017; Chang et al. 2018). Additionally, the results are also in line with financial behaviour studies that also positioned FSE as a mediator (Perry and Morris 2005; Lapp 2010; Rothwell, Khan and Cherney 2016; Mindra and Moya 2017).

The results lend support that FSE is the missing link between financial knowledge and financial behaviour. Although prior studies clearly indicate that the key predictor for investing revolves around financial literacy (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017), intervention heavily-focused on financial literacy alone appears ineffective in stimulating desirable financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Holzmann 2010; Hira 2012; Remmele and Seeber 2012). The results also echo Lapp (2010)'s opinion that FSE is the missing piece between knowledge and effective action. When individuals possess a reasonable level of financial information about risky assets, they are capable of understanding financial products and the financial market, thereby enhances their financial competency. Such condition is likely to boost individuals confident and self-efficacy in their abilities to

make investment decisions, which ultimately increase their risky assets investment. On a side note, although advice-seeking remains negatively related to risky assets via FSE, the result is expected considering its significant and negative direct relationship with FSE (H2b).

The same applies to motivational constructs. Upon having positive attitude towards investing in risky assets, individuals perceive such behaviour as rewarding and are optimistic about the investment outcome. They focus on the potential success rather than failure in risky assets investment. These positive evaluations are likely to enhance one's belief in their own capability of investing in risky assets and that the outcome of investing will be rewarding to themselves. As such, their FSE is broaden and built on, which in turn translate to increment in risky assets investment. In the same vein, individuals with high conservation score or low openness to change value score prioritise stability and certainty in life, where their motivation revolves around preserving the status quo, traditions and customs (Schwartz 1992; Schwartz 2012). Conservative individuals avoid taking risks and trying new things as they emphasise on safe and predictable outcome. Hence, high conservation individuals are likely to be pessimistic about the investment outcome and easily triggered by the fluctuations of stock market performance, exhibiting the characteristic of low FSE, and ultimately withdraw from investing in risky assets. Similarly, individuals with high self-enhancement score emphasise on gaining wealth, social status, personal success, power and dominance (Schwartz 1992). Such individuals are more motivated to perform highly on their finances in order to achieve their financial goals. These values consistent with investing will motivate the acquisition of investing-related skills, which are reflected in higher confidence and self-efficacy in their investing skills and consequently translating into higher risky assets investment. This study argues that personal value is a form of personal motivation, where the strong motivational function of values (Gorgievski et al. 2018)will build up self-efficacy and ultimately guide behaviour in value-congruent domains.

In addition, these findings corroborate the argument of this study that FSE acts as a mediator for the relationship between social norm and risky assets investment. A possible explanation for this result is that in the presence of high social norm,

individuals perceive that investing in risky assets is well-received in their social groups and may display higher receptiveness towards investing in these assets. This heightened normative level gives rise to their belief in their own ability to act accordingly as they are assured that risky assets investment is likely to yield favourable outcome. Taken together, these findings collectively highlight the importance of FSE as a mediator. In line with Bandura (1997)'s argument, self-efficacy serves as the final common pathway for the effects of various personal and social influences on behaviour.

It is noteworthy that upon comparison with the direct effects of financial information (H1a and H2a) and investment motivation (H3a to H6a) on risky assets investment, three constructs namely advice-seeking (H2a), self-transcendence (H5a) and social norm (H6a) do not have a significant direct relationship with risky assets investment. Yet when FSE is included as a mediator, the significant indirect relationship emerges. This is an indication that advice-seeking, self-transcendence and social norm can only be indirectly related to risky assets investment by going through FSE. In other words, FSE fully mediates the effect of advice-seeking, self-transcendence and social norm on risky assets investment. Such results could be explained using the IMB model, whereby indirect-only relationship (full mediation) happens in cases where the behaviour is particularly complex and requires behavioural skills to perform (Fisher and Fisher 1992). In such cases, information and motivation are necessary yet often inadequate condition for promoting actions (Fisher and Fisher 1992). As investing in risky assets is rather complicated (Lim et al. 2018), the action of investing requires FSE to perform. This is in consistent with prior studies in the IMB literature whereby non-significant direct relationship yet significant indirect relationship emerge between information, motivation and different behaviours (Osborn et al. 2010; Seacat and Northrup 2010; Goodell et al. 2012; Sinley and Albrecht 2016; Limbu 2017).

Meanwhile, another three information and motivation constructs including financial literacy (H1a), attitude towards investing (H3a) and conservation (H4a) are found to significantly influence risky assets investment both directly and indirectly via FSE. This is an indication that changes in financial literacy, attitude and conservation can be directly and indirectly associated with changes in the extent of risky assets

investment. That is, FSE partially mediates the effect of financial literacy, attitude and conservation on risky assets investment. The effect of financial literacy, attitude and conservation on risky assets investment are mediated through FSE, but these predictors still explain a portion of risky assets investment that is independent of FSE (Ramayah et al. 2018).

In light of the above, it is evident that FSE plays a crucial and pervasive role within financial decision-making. Individuals tend to feel greater sense of self-belief and empowerment in investing in risky assets when they have high level of relevant financial information, positive attitude towards investing, prioritise openness to change and self-enhancement values, and perceive receiving social support to invest, which resultantly lead to a higher proportion of risky assets investment. The whole process is stimulated by the level of FSE one has in making investment decision regarding risky assets.

Theoretically, the result also confirms the unique conceptualisation of IMB model through the inclusion of self-efficacy as behavioural skills construct. Additionally, it validates the core and central role of behavioural skills as specified in the IMB model. Once again, the findings collectively confirm the extended IMB model as an appropriate theoretical underpinning for risky assets investment.

6.4 Contributions to Research

From a theoretical point of view, this study contributes significantly to the existing body of knowledge. In precise, this study extends the research on financial decisions related to risky assets investment by assessing the influence of personal values alongside the core constructs of the IMB model. The theoretical and empirical contributions are discussed in this section.

6.4.1 Adoption of Cross-Disciplinary Theories

First, this study provides novel evidence showing that the adoption of theories and perspectives from social psychological field is useful in explaining SMP, thereby offering theoretical framework for future personal finance research. Most prior studies

are not guided by a priori theoretical or conceptual grounding in understanding risky assets investment. Particularly in the personal finance literature, studies are largely empirically-based without clear theoretical underpinning (Kliger and Levy 2009; Danes and Yang 2014). Besides, there is a lack of complete and integrated theory of behavioural finance (Fromlet 2001) that focus on individuals rather than the market as an aggregate (Durand et al. 2013).

Nevertheless, empirical analyses should always be built upon theoretical foundation (Hair et al. 2017c; Ramayah et al. 2018) and interventions based on theoretical grounding are also shown to be more effective in promoting behaviours than interventions that are not theoretically-based (Glanz and Bishop 2010; Rothman, Klein and Cameron 2013; Klein et al. 2015; Kelly and Barker 2016; Sheeran, Klein and Rothman 2017; Johnson and Acabchuk 2018; Michie et al. 2018). In view of this, the results of this study validate that the two cross-disciplinary theories from social psychological field, namely the IMB model and theory of basic values, are appropriate and rigor in understanding the limited SMP phenomenon.

As such, the first contribution of this study is rooted in offering fresh understanding on risky assets investment from the social psychological perspective that focuses on individual-level factors. These findings reveal that individuals' financial behaviour can be better understood by deeply assessing the social and psychological predictors at personal level. As highlighted by scholars, such adoption of theories outside disciplines constitutes a theoretical contribution (Crane et al. 2016) and is recommended in cases where phenomena are inexplicable with extant theory in its own field (Shaw et al. 2018). Besides, it also enriches the behavioural finance discourse by importing well-established social psychological theories to develop a theoretical explanation for financial behaviour, thereby overcoming the limited theoretical groundings in the behavioural finance field.

6.4.2 Integration of Theories

Second, this study offers novel theoretical contribution by integrating theory of basic values with the IMB model to holistically explain the low SMP phenomenon. To

recapitulate, the conceptualisation of the motivational construct in the IMB model is adopted from TRA, namely attitude towards behaviour (representing personal motivation) and behaviour-related social norm (representing social motivation). This approach is taken due to the absence of a unified conceptual framework on motivational determinants, wherein the adoption of a well-articulated social psychological conceptualisation from TRA can remedy (Fisher and Fisher 1992). Leveraging on that, this study proposes an additional element to complement for the motivation construct: the unifying theory of human motivation (Schwartz 2012), referred to as theory of basic values, which similarly embraces both social and psychological perspective (Giménez and Tamajón 2019).

The results obtained reveal that personal values succinctly fitted the IMB model as part of the motivational component. Conservation and self-transcendence values behave such as other motivational constructs, where they manifest direct influence on FSE and either direct or indirect influence on risky asset investment. Hence, the findings collectively validate that personal value can play a motivational role in alleviating the issue of low SMP as it displays ability in enhancing FSE and risky assets investment. As such, this study lends credence to the integrated theories and offers new ways of seeing a long-standing investment phenomenon from the combined perspective of these two theories. This study provides evidence that the inclusion of personal values can contribute significantly to the extension of the IMB model. Notably, such integration of theories leverage on multiple theoretical lenses to understand a single phenomenon indeed constitutes a theoretical contribution (Crane et al. 2016; Shaw et al. 2018).

To date, this study serves as one of the first to: (1) apply the IMB model in exploring risky assets investment; (2) examine the previously unexplored relationship between theory of basic values and financial behaviour; and (3) adapt the combined perspective of these two theories. As a result, this study also extends each theory independently of the interactive approach. In respect to the paucity of studies that apply IMB model to investment decision, the findings offer novel evidence that the IMB model developed in health context, can also be extended to predict financial behaviour, thereby validating the IMB model as parsimonious, conceptually based and highly

generalisable (Fisher and Fisher 1992). Similarly, for theory of basic values, the results highlight the importance of personal values in understanding financial behaviour, particularly in the context of risky assets investment. This multi-theory approach enhances the weaknesses of one theory with the strengths of another theory (Mindra and Moya 2017).

6.4.3 Mediating Role of FSE

This study also concretely contributes to the existing body of knowledge by filling in the literature gap identified pertaining to the role of FSE as a mediator and key predictor. In previous studies, the key construct that could affect financial behaviour typically revolves around financial literacy (Cardak and Wilkins 2009; Van Rooij, Lusardi and Alessie 2011; Balloch, Nicolae and Philip 2014; Sivaramakrishnan, Srivastava and Rastogi 2017). However, scholarly research also reveal that intervention targeting at improving financial literacy alone often lead to mediocre outcome in changing financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Holzmann 2010; Hira 2012; Remmele and Seeber 2012), thereby signifying that financial knowledge is not sufficient to promote financial behaviour. Similarly, the IMB model proposes that information is necessary but insufficient by itself. More importantly, the theoretical model further hints at the mediating effect of behavioural skills being the possible missing piece within the extant financial behaviour literature. Leveraging on prior studies, it allows this study to examine the mediating effect of FSE as being the potential missing piece in risky assets investment decisions.

This is a relatively new study that explores FSE as a mediating variable between various information, motivation constructs and investment decision. As demonstrated in the findings, the mediation analysis confirms that FSE's mediational role. It reveals how an individual can translate financial information and investment motivation into higher proportion of risky assets investment by elevating one's self-efficacy in investing. With that, it unveils the "true" relationship between these constructs that are not explicitly hypothesised previously, and explains the underlying mechanism of the effect of information and motivation on risky assets investment.

Furthermore, the results also indicate that FSE is the single most important predictor for risky assets investment. With that, this study provides novel evidence as to the limited literature by establishing relationship between FSE and risky assets investment. More importantly, this study has challenged the prevalent propositions that financial literacy is the key to foster all form of desirable financial behaviour. The findings imply that FSE not only surpasses financial literacy in promoting risky assets investment directly, it provides evidence to support FSE as the pivotal predictor that bridges all the predictors to the behaviour under investigation. As such, it is revealed that financial literacy is not the silver bullet towards promoting desirable financial behaviour, particularly in the context of risky assets investment. Taken together, this study extends the understanding that financial literacy alone has limited influence on alleviating the issue of low SMP. Additionally, it reveals FSE as the missing link between financial knowledge and financial behaviour. Correspond with Bandura (1997)'s claim, self-efficacy is the final common pathway for the effects of various personal and social influences on behaviour.

For a theoretical point of view, the result validates the unique conceptualisation of IMB model through the inclusion of self-efficacy as behavioural skills construct. Being one of the first studies that jointly explore such mediation model, it sheds light to the mediating mechanisms through which these information and motivation constructs relate to risky assets investment, thereby validating the core and central role of behavioural skills as specified by the IMB model. As such, it confirms the suitability of IMB model as a theoretical grounding in comparison to other theories previously explored. These findings collectively support the pervasive and crucial role of FSE as the determinants of risky assets investment.

6.4.4 Determinants of FSE

Another contribution of this study leverages on the results revealing the determinants of FSE. As shown in the findings, FSE is evidently the core and central variable of the whole model, whereby it acts as the most significant explanatory variable and a mediator that bridges all the predictors to risky assets investment. As studies regarding the determinants of individuals' FSE are largely sparse, this study contributes to the

FSE literature in several ways.

Precisely, there is almost no published literature pertaining to the combined influence of financial literacy and financial advisors in affecting one's FSE. This study is among the first to explore and document statistically significant and positive relationship between financial literacy and FSE. In view of the emerging importance of both financial literacy and FSE in the current literature, revealing the interplay between these variables unveils promising avenues for further exploration in this area. Similarly, studies regarding the role of attitude, personal values and social norm in influencing individuals' FSE are not found especially in the context of financial behaviour. Thus, this study is one of the first to explore and validate the significant direct effect of attitude towards investing, two-dimensional personal values and social norm on FSE in risky assets investment. As the self-efficacy concept is a domain-specific construct, the determinants of self-efficacy in the investing domain would vastly differ from those of other contexts (Bandura 2006). Besides, this study also contributes to the inconclusive findings on the general role of social motivation in influencing self-efficacy as the findings demonstrate evidence of a significant relationship between the two constructs, especially in a collectivist culture.

In view of the above, the findings elucidate through theoretical and statistical evidence that the collaborated efforts of these informational and motivational factors are significant in boosting individuals' FSE. The results subsequently respond to Farrell, Fry, and Risse (2016)'s call for future research to identify the antecedents of FSE and also to differentiate the significance of FSE from that of financial literacy.

6.4.5 Enrich the SMP Literature

Another theoretical contribute revolves around enriching the existing literature of SMP or risky assets investment. Prior studies indicate that psychological predictors are influential on behaviour (Bardi and Schwartz 2003; Borg, Hermann and Bilsky 2017; Lopes, Sela and Shackelford 2017; Sharma and Jha 2017). In the context of this study, scholars collectively echo the need to account for psychological factors alongside knowledge, in order to effectively drive behaviour change (Greenberg 2001; Hira

2012). Some authors even assert the superiority of psychological attributes over informational differences as the key driver for financial behaviour (De Meza, Irlenbusch and Reyniers 2008; Kliger and Levy 2009; Fernandes, Lynch Jr and Netemeyer 2014). Despite the importance of psychological factors, there is a dearth of studies that consider these psychological traits simultaneously with financial literacy.

Through examining the influence of FSE, personal values and attitude towards investing in risky assets, this study helps to understand how these psychological factors is crucial in explaining one's financial behaviour. Evidently, the findings reveal that FSE is indeed the single most important predictor in promoting risky assets investment. Likewise, individuals' investment behaviour is also well explained directly and indirectly by attitudes and personal values. As a result, it provides support for Agyemang and Ansong (2016) where traditional methods focusing merely on wealth-maximisation have neglected the significance of personal values, thus ruling out germane determinants of investment decision. Hence, by assessing these hitherto unexplored constructs as new predictors, this study successfully enriches the SMP literature of solving the stock holding puzzle (Haliassos and Bertaut 1995).

Furthermore, to the best of this study's knowledge, this study is also the first to empirically examine the joint influence of personal values alongside the core constructs of IMB model on individuals' risky assets investment. As such, it contributes to the exploration of the interplay between information, motivation, personal values as part of the motivation constructs and behavioural skills within a single model using the SEM approach. The results demonstrate the combined influence of various behavioural mechanisms on individuals' risky assets investment, thereby provides a more holistic picture of SMP. Resultantly, this study advances the body of knowledge in two ways: (1) offers novel evidence to the personal finance literature on investment behaviour by providing empirical evidence; and (2) contributes in solving the stock holding puzzle.

6.4.6 New Geographical Context

This study extends theories and empirical research in a new geographical region and

different cultural orientation. Particularly, the current study has successfully integrated two theories developed in the western context (IMB model and theory of basic values) to understand the behaviour in a non-western context of Malaysia. Based on the findings, these theories are generalisable and applicable in a non-western or emerging context. Therefore, it offers a new avenue for future research to adopt these theories in the assessing behaviours.

In addition, this study expands the SMP research in a new research context to shed light on what influences individuals to invest in risky assets in emerging countries. As prior studies generally reflect the case of a western countries with well-developed financial system and individualist culture, this study contributes in providing evidence from a non-western context or emerging countries where the culture is characterised as collectivistic and high in power distance (Hofstede Insight 2018).

6.4.7 Financial Literacy versus Financial Advisors

Last but not least, this study provides further theoretical implication in unveiling the varied effects of financial information components. In prior literature, the role of financial advice to act as a substitute of financial literacy in affecting financial decisions remains inconclusive. Some scholarly studies assert that financial literacy and financial advice are substitutes (Hung and Yoong 2010; Chalmers and Reuter 2012; Disney, Gathergood and Weber 2015) whereas others support the strand of a complementarily relationship between the two informational factors (Hackethal, Haliassos and Jappelli 2012; Bachmann and Hens 2015; Calcagno and Monticone 2015; Chauhan and Dey 2020; Pan, Wu and Zhang 2020). Apart from the inconclusive findings, studies linked to the influence of financial advisors remains under-researched in the context of Asian developing countries where the advisory system is less matured.

The current study unravels the two informational factors, financial literacy and financial advisors, as the findings indicate their varied effect not only on risky assets, but also on FSE. In particular, financial literacy is one of the major contributors to FSE and risky assets investment. In contrasts, seeking advice from financial advisors do

not have any direct influence on risky assets investment and is negatively related to FSE. The opposing effects of financial literacy and advice-seeking refutes both the substitutability and complementarity of financial literacy and financial advice as it is found that financial advice adds little to one's investment in the stock market. The findings further highlight the importance of relevant and specific information dissemination as a potentially crucial factor. As financial advisors may have a diverse product focus which deviate individuals away from investment, it seems that the advisory system in Malaysia is not able to alleviate the issue of low financial literacy in risky assets investment. The underperformance of advice-seeking also implies that financial advisors may fail to inculcate a preference for asset diversification in Malaysia. When individuals are unaware of the need for diversification, they tend to concentrate their funds into low risk assets (Pan, Wu and Zhang 2020). Overall, the negative effect of advisory intervention signifies the importance of equipping oneself with financial knowledge. The findings that financial literacy plays a significant role in influencing one's FSE and risky assets investment bears crucial policy implication for intervention efforts targeted at promoting both FSE and investing. While other predictors are also significant in explaining FSE, the findings clearly indicate that financial literacy serves as the key factor to address low FSE issue, and hence it should not be overlooked and must not be substituted with financial advice.

6.5 Implication for Practice

This study focuses on the behavioural dimensions of individuals by assessing their financial behaviour in relation to risky assets investment. Thus, the findings of this study go beyond research contributions and offer valuable implications for practice.

As previously discussed, it is crucial for individuals to invest in risky assets and for the nation to increase retail investors' participation in the stock market. From the practical viewpoint, this study identifies the major contributor that influence individuals' financial decision-making in risky asset investment. Guided by the findings, the extended IMB model of investing behaviour necessitates not merely information that has to be enhanced, but also motivation and behavioural skills as the core components of any initiates targeted to increase retail participation in the stock

market. As such, any intervention effort implemented to entice SMP must communicate the behaviour-specific information, motivation and behavioural skills. As such, this study identifies several key areas that could implicate different stakeholders including government agencies, regulatory bodies, financial institutions and the local communities.

At present, there is a great deal of initiatives implemented by the government as detailed in Chapter 2, in order to increase retail participation. A majority of these initiatives are devoted to educate the public including investment seminars, campaigns and digital platforms as an education and information hub. Even so, the findings accentuate existing gaps in the current initiatives which are heavily focused on improving financial knowledge only. As illustrated in this study, financial literacy is important yet inadequate to improve risky assets investment. The findings can inform Bursa Malaysia and SC on other factors that jointly affect individuals' investment decision, which includes FSE, attitudes, personal values and social norm.

One of the key findings of this study is that financial literacy remains a vital cornerstone for boosting retail participation. Hence, it provides solid rationale for all education initiatives that aims to enhance financial literacy. It is imperative to note that the information disseminated must be highly specific to investing in risky assets. Individuals must be able to understand more advanced financial concept involving stocks, mutual funds and the function of stock market rather than just the basic financial knowledge. More importantly, the ultimate goal of these education programmes should not only enhance one's financial literacy, but also to heighten individuals' self-belief in their skills to invest and also instil positive attitude towards investing. Universities or colleges may offer units related to personal finance as part of their diploma or undergraduate degree courses. The Bursa Malaysia and SC may provide practical investing guidance or interactive counselling that offers hands-on learning opportunity and boost one's FSE, thereby bridging the gap between knowledge and application.

In addition, the findings may be useful for financial service providers including banks, brokerage firms, mutual funds companies, financial advisory companies and insurance

companies, especially if they have difficulties in selling risky financial products. Marketing materials can also be better designed as a strategy to disseminate pertinent financial information, enhance motivation and build self-efficacy to invest in risky assets. Financial institutions that offer risky assets may also develop favourable attitude among the public via advertising the advantages of investing in risky assets. These benefits may include greater asset diversification, wealth accumulation and financial remuneration in the long-run, as compared to holding low risk assets. Besides, emphasis can be placed on building a culture of investing in the local community through featuring social proofs in social media sponsored stories, testimonials sharing or public forums. By doing so, individuals may perceive stronger normative pressure to also engage in investing. These marketing strategies not only help raise public awareness of risky assets, but also create interest and excitement about the products by communicating how individuals can achieve their financial goals when investing in risky assets. As a result, it may foster individuals' personal initiatives to learn more about investing and encourage members of their social group to also participate in the risky financial market.

Another key practical implication leverages on the results indicating the ineffectiveness of financial advisors in enhancing risky assets investment. The insights suggest financial institutions to identify and tailor appropriate training programme directed at educating the financial advisors with more advanced financial knowledge and increasing their confidence in promoting these financial products. It is also recommended that financial advisors should not focus solely on selling certain financial products but to prioritise educating customers on financial concepts and developing a diversification preference. These initiatives can possibly help convey financial information more effectively and to deliver financial services that can accommodate the local needs. Furthermore, this finding further supports that the Bursa Malaysia and SC should enhance financial literacy through formal education or public seminars, rather than relying on financial advisors.

Last but not least, practitioners can also benefit from the novel evidence that reveal how personal values is related to investment decision in several ways. As demonstrated in the findings, individuals who emphasise conservation or self-transcendence are less

likely to invest in risky assets investment, as compared to those who score higher in openness to change or self-enhancement values. Considering the above, Bursa Malaysia and SC may attempt to reframe public perceptions of risky assets investment which could possibly help in addressing the prejudice against these assets. For instance, these government agencies or financial service providers can investigate which perceptions about the adverse consequences of risky assets investment are exaggerated and which advantages are underrated (Vecchione et al. 2012). This could subsequently guide information dissemination pertaining to risky assets investment that reduce beliefs that risky assets investment threatens security or universalism (part of conservation or self-transcendence) values.

Moreover, the findings can inform the authorities that investment decision are not purely based on financial gain. Individuals who place higher priorities on conservative or self-transcendence values are less interested in gaining wealth or power as they are more social-focused rather than personal-focused (Schwartz 2012). In such case, Bursa Malaysia, SC and financial institutions should highlight the availability of a wide range of risky assets that are socially responsible or Shariah-compliant. Socially responsible investment generally incorporates social, ethical and environmental issues (Sparkes 2008) whereas Islamic investment refrains from investing in alcohol, gambling or other harmful activities to human and environment (Ghoul and Karam 2007). Since the underlying investment concept in these stocks and funds place greater emphasis on social concerns while achieving financial gains, they are congruent with the goals of those who are social-focused. As such, these risky assets may appear more attractive to individuals who are conservation or self-transcendence orientated. It also provides greater rationale and motivation for them to invest in risky assets. Resultantly, financial institutions are able to actively attract a large and so far, untapped group of potential investors. Besides, personal value may serve as a good indicator for financial service providers to recommend customers on suitable investment products. Different types of investment products should be made available to cater for individuals with different value priorities.

6.6 Limitations and Recommendations for Future Research

Despite the contributions of this study, there are some limitations that need to be considered when interpreting or generalising the findings. These shortcomings offer opportunities for future researchers to extend the topic of study in several ways.

First, this study acknowledges its cross-sectional nature which poses limitation to draw causality among the variables. As the data is collected only at a certain point in time, it is representative only of the respondents' current proportion of risky assets. It does not provide sufficient information to document for variables change over time. Irrespective that this is a common practice within the SMP literature, investing in the stock market is inevitably a dynamic process that fluctuates from time to time. It is believed that current investment does not necessarily lead to continuous participation in the stock market. As highlighted by Bhattacherjee (2001), current behaviour does not mean on-going behaviour. Following that, this study encourages future research to employ longitudinal studies in order to shed light about the cause and effect association between the variables. The panel data that document individuals' investment behaviour over several periods can also provide insights to ascertain if there are changes in these variables and their association with the degree of change in individuals' investment portfolio. It may further reveal information on the stability and change of psychological traits such as personal values, attitudes or self-efficacy over time, especially with the often-dramatic stock market fluctuations.

Second, personal value is measured using the shortened PVQ-21 questionnaire as a two-dimensional structure of personal values. Based on the theory of basic values, the two-dimensional values can be decomposed into 10 different basic values or even further refined into 19 values by using a more detailed questionnaire (Lee et al. 2019). As such, adopting the two-dimensional values signifies a potential loss of information whereby the detailed composition of these values and their influence on financial behaviour are largely ignored. As such, future studies may examine the role of personal values on financial behaviour by further decomposing the two value dimensions from theory of basic values into sub-values. This can be done by selecting a longer version of questionnaire developed by the theorist. In precise, studies can adopt the 40-item PVQ to examine the 10 board, distinct values. Alternatively, studies may consider

assessing the 19 refined values by adopting the PVQ-R consisting of 57 items (Lee et al. 2019). These can facilitate a more in-depth understanding as to why and how these values are related to financial decisions.

Third, the scope of the present study is confined to risky assets investment, which includes stocks and mutual funds only. Therefore, the results from this study cannot be generalised to other financial products such as derivatives or insurance. Thus, this study recommends future explorations on the interplay between personal values and components of IMB model in explaining financial decisions on product categories. Likewise, it is also unclear as to whether the extended IMB model is applicable to different types of financial behaviour. Leveraging on the findings, this study opens a new avenue for future studies to examine the extended IMB model on a wide array of financial behaviour and non-health related behaviours, thereby further confirming its applicability to a broader scope of behaviours. Pursuing these lines of inquiry may generate further insights into the role of personal values and IMB mode in different behaviour domains.

Lastly, this study focuses specifically on individuals from an emerging, Asian economy. Evidently, the financial market sophistication, financial advisory system and pension system vary across countries. These environmental factors may affect how the variables are related to each other. Similarly, some predictors such as social norm may be highly reliant on cultural contexts. Considering the relatively high collectivism and power distance in the Malaysian culture, the way individuals perceive normative pressure or social support may differs from individualist cultures. The influence of psychological attributes on behaviour may be responsive to contextual characteristics too. Therefore, caution should be exercised in generalising the results and implication beyond the context of this study. Researchers may replicate this study across different geographical and cultural context in order to further validate the generalisability of the findings.

6.7 Conclusions

The main objective of this study is to investigate the determinants of individuals' risky

assets investment through integrating the theoretical lens of IMB and theory of basic values. By jointly assessing information, motivation (with personal values as part of the construct) and behavioural skills within a single model, this study addresses all three research questions. In precise, apart from the core constructs of the IMB model, personal value dimensions are also included in the proposed conceptual framework to extend the IMB model.

The findings of this study demonstrate that financial literacy is not the silver bullet towards promoting desirable financial behaviour, especially for risky assets investment. Rather, FSE emerges as the single most crucial predictor for directly influencing one's risky assets investment. This study also successfully answers the second research question by establishing all the components of financial information (financial literacy, advice-seeking) and investment motivation (attitude towards investing, personal values including conservation and self-transcendence, social norm) as the determinants of FSE. Moreover, this study offers novel evidence to the role of FSE as a mediator for the relationship between financial information, investment motivation and risky assets investment. As such, it divulges FSE as the prime predictor that bridges information and motivation components to risky assets investment. Lastly, the results show that personal values succinctly fitted the IMB model as part of the motivational component. As a whole, the results collectively validate the extended IMB model as an appropriate theoretical underpinning for explaining risky assets investment.

Following these findings, the present study underlines the need for various stakeholders such as government agencies or financial institutions to formulate effective strategies based on the extended IMB model. These findings necessitate not only information, but also motivation and behavioural skills as the core components of any initiates targeted to increase retail participation in the stock market. Considering the limitations presented, future research should be sustained to gain more comprehensive knowledge about this area of study.

In conclusion, the importance of individuals' risky assets investment cannot be further emphasised. Individuals' participation in the stock market either directly or indirectly

through mutual funds is crucial not only to enhance the financial well-being of individuals, but also to support a country's financial market development. There is a relevant quote by Warren Buffet, "Never depend on single income. Make investment to create a second source" and another from his mentor, Benjamin Graham, "Successful investing is about managing risk, not avoiding it".

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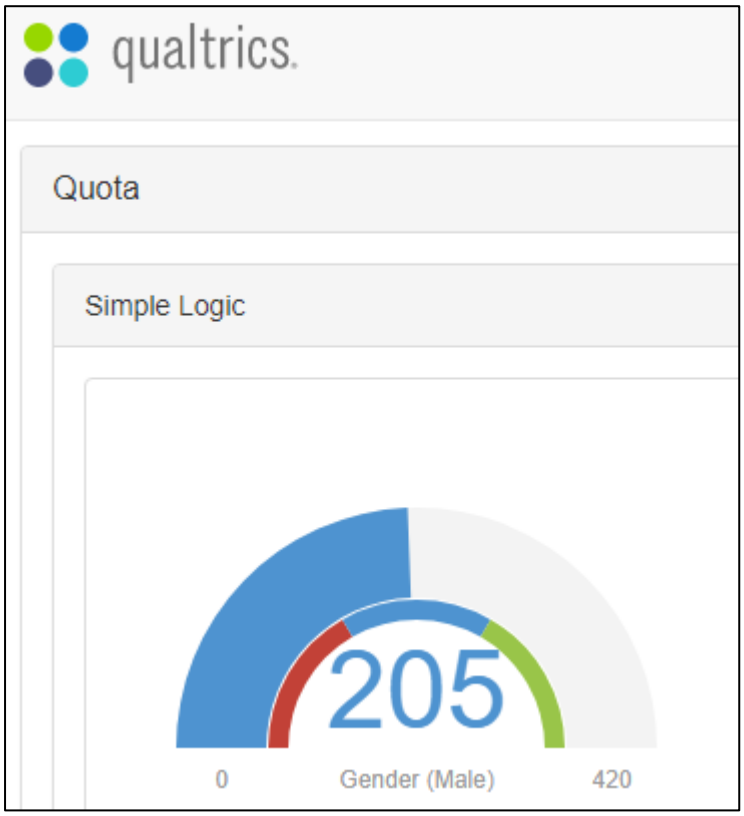
APPENDIX A: Quota Tracking for Survey

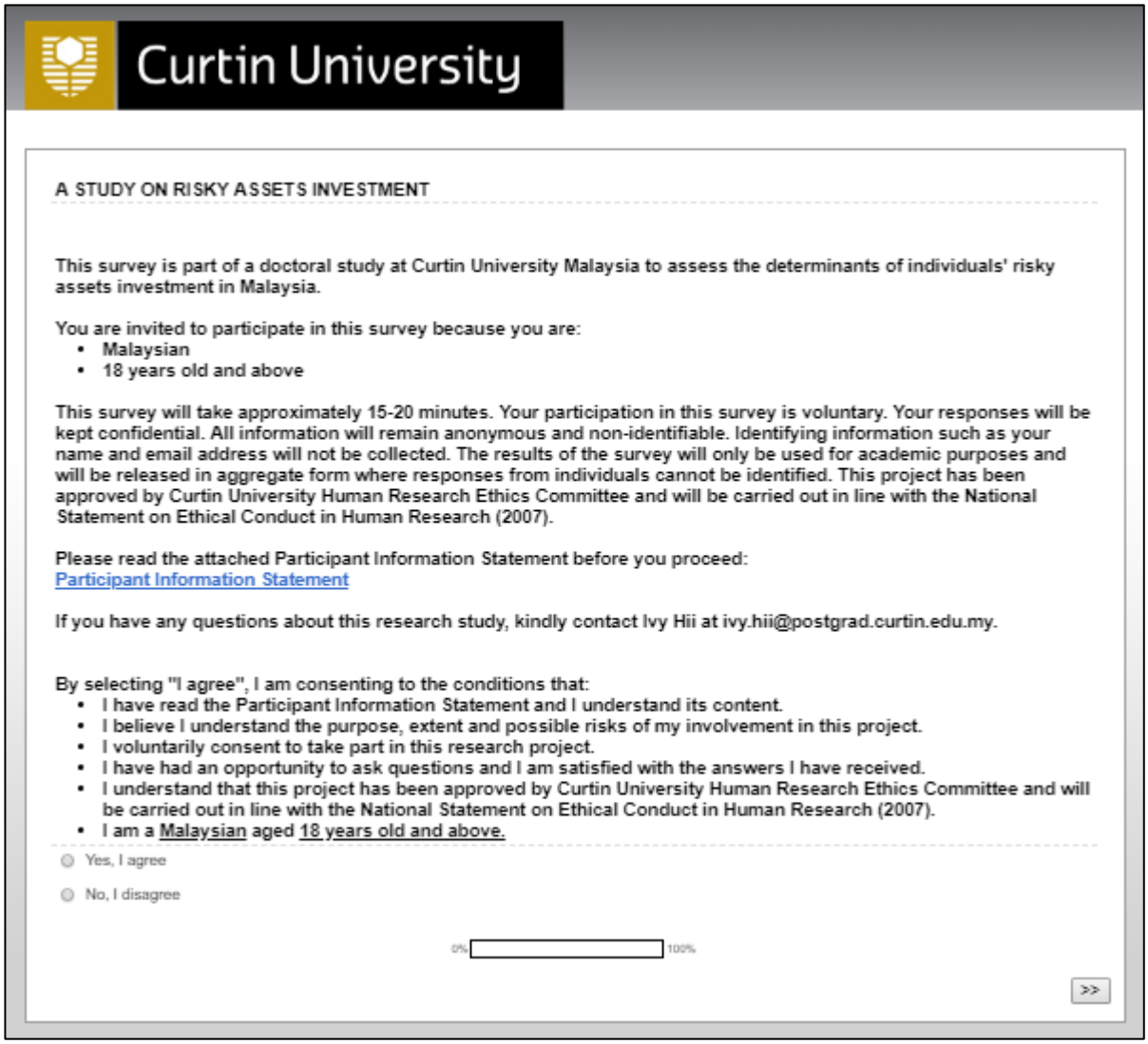


APPENDIX B:

Weights for Computing Two Value Dimension from PVQ-21

Item	Conservation	Self-transcendence
Constant	90.5531	67.3577
1	-1.1031	0.4871
2	0.5736	-2.0283
3	-0.3955	1.6101
4	0.3430	-1.5345
5	1.8516	0.0781
6	-1.3589	0.1803
7	1.4490	-0.0952
8	-0.9353	2.1805
9	0.8867	0.8088
10	-0.9702	-0.3864
11	-0.9665	0.6436
12	-0.3883	2.2422
13	0.3336	-1.8321
14	1.4640	0.2620
15	-1.3850	-0.8482
16	2.3203	0.1396
17	1.0024	-1.1128
18	-0.4133	1.9057
19	-0.3065	2.1328
20	1.1249	0.3330
21	-0.7511	-0.3541

APPENDIX C: Questionnaire Survey



Curtin University

A STUDY ON RISKY ASSETS INVESTMENT

This survey is part of a doctoral study at Curtin University Malaysia to assess the determinants of individuals' risky assets investment in Malaysia.

You are invited to participate in this survey because you are:

- Malaysian
- 18 years old and above

This survey will take approximately 15-20 minutes. Your participation in this survey is voluntary. Your responses will be kept confidential. All information will remain anonymous and non-identifiable. Identifying information such as your name and email address will not be collected. The results of the survey will only be used for academic purposes and will be released in aggregate form where responses from individuals cannot be identified. This project has been approved by Curtin University Human Research Ethics Committee and will be carried out in line with the National Statement on Ethical Conduct in Human Research (2007).

Please read the attached Participant Information Statement before you proceed:
Participant Information Statement

If you have any questions about this research study, kindly contact Ivy Hii at ivy.hii@postgrad.curtin.edu.my.

By selecting "I agree", I am consenting to the conditions that:

- I have read the Participant Information Statement and I understand its content.
- I believe I understand the purpose, extent and possible risks of my involvement in this project.
- I voluntarily consent to take part in this research project.
- I have had an opportunity to ask questions and I am satisfied with the answers I have received.
- I understand that this project has been approved by Curtin University Human Research Ethics Committee and will be carried out in line with the National Statement on Ethical Conduct in Human Research (2007).
- I am a Malaysian aged 18 years old and above.

Yes, I agree

No, I disagree

0% 100%

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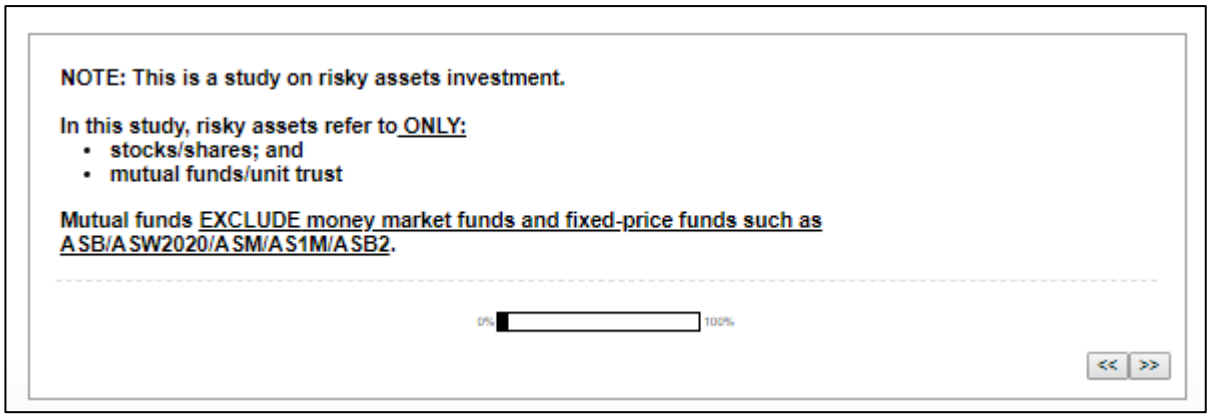

NOTE: This is a study on risky assets investment.

In this study, risky assets refer to ONLY:

- stocks/shares; and
- mutual funds/unit trust

Mutual funds EXCLUDE money market funds and fixed-price funds such as ASB/ASW2020/ASM/AS1M/ASB2.

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Please rate the statements below on your attitude towards investing.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Investing in risky assets is **wise**.	○	○	○	○	○
Investing in risky assets is **good**.	○	○	○	○	○
Investing in risky assets is **beneficial**.	○	○	○	○	○
Investing in risky assets is **rewarding**.	○	○	○	○	○
Investing in risky assets would **improve my wealth**.	○	○	○	○	○
Wealth accumulation is **important** to me.	○	○	○	○	○

Please rate the statements below on your social motivation to invest.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Most people who are important to me (e.g. friends/family) invest in risky assets.	○	○	○	○	○
Most people who are important to me think I should invest in risky assets.	○	○	○	○	○
Most people who are important to me would support my investment in risky assets.	○	○	○	○	○
When it comes to risky assets investment, I want to do what most people who are important to me think I should do.	○	○	○	○	○

0% 100%

<< >>

Please rate the statements below on your self-efficacy to invest.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I am fully capable of making risky assets investment decisions.	○	○	○	○	○
I am confident in my ability to make risky assets investment decisions.	○	○	○	○	○
I do NOT feel I am qualified for the task of making risky assets investment decisions.	○	○	○	○	○
Using investment information available is well within the scope of my abilities.	○	○	○	○	○
My past experiences increase my confidence that I will be able to successfully make risky assets investment decisions.	○	○	○	○	○

0% 100%

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Which of these statements best describes your behaviour in consulting financial advisors when deciding how to invest in risky assets?

- ○ I decide completely by myself, and the advisors simply execute my decisions.
- ○ I tell the advisors how I intend to invest and ask their opinion before deciding.
- ○ I consider advisors' proposals before deciding.
- ○ I rely mainly on advisors for my investment decisions.
- ○ I let my advisors decide everything.

0% 100%

<< >>

ASSET ALLOCATION

Assume you have RM 100,000 to invest into different types of financial assets. How would you allocate this money between safe assets, risky assets and other assets? Please allocate the RM 100,000 in percentage (%), the total must be 100%.

Safe assets (e.g. savings or current account/ Fixed deposit etc.)	0
Risky assets (**stocks/ mutual funds**)	0
Other assets (e.g. bonds/ derivatives etc.)	0
Total	0

0% 100%

<< >>

FINANCIAL LITERACY

Suppose you had RM100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- More than RM102
- Exactly RM102
- Less than RM102
- Do not know

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, you would be able to buy _____.

- More than today
- Exactly the same
- Less than today
- Do not know

Do you think the following statement is true or false: Buying a single company stock usually provides a safer return than a stock mutual fund?

- True
- False
- Do not know

Which of the following statements describes the main function of the stock market?

- The stock market helps to predict stock earnings
- The stock market results in an increase in the price of stocks
- The stock market brings people who want to buy stocks together with those who want to sell stocks
- None of the above
- Do not know

Which of the following statements is correct?

- Once one invests in a mutual fund, one cannot withdraw the money in the first year
- Mutual funds can invest in several assets, for example invest in both stocks and bonds
- Mutual funds pay a guaranteed rate of return which depends on their past performance
- None of the above
- Do not know

If the interest rate falls, what should happen to bond prices?

- Rise
- Fall
- Stay the same
- None of the above
- Do not know

True or false? Stocks are normally riskier than bonds.

- True
- False
- Do not know

Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?

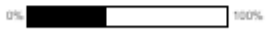
- Savings accounts
- Bonds
- Stocks
- Do not know

Normally, which asset displays the highest fluctuations over time?

- Savings accounts
- Bonds
- Stocks
- Do not know

When an investor spreads his money among different assets, does the risk of losing money:

- Increase
- Decrease
- Stay the same
- Do not know



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PERSONAL VALUES

Please read each description and think about how much each person is like you. Choose the responses that show how much the person in the description is like you.

	Very much like me	Like me	Somewhat like me	A little like me	Not like me	Not like me at all
Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.	○	○	○	○	○	○
It is important to him to be rich. He wants to have a lot of money and expensive things.	○	○	○	○	○	○
He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.	○	○	○	○	○	○
It's important to him to show his abilities. He wants people to admire what he does.	○	○	○	○	○	○
It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.	○	○	○	○	○	○
He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.	○	○	○	○	○	○
	Very much like me	Like me	Somewhat like me	A little like me	Not like me	Not like me at all
He believes that people should do what they are told. He thinks people should follow rules at all times, even when no one is watching.	○	○	○	○	○	○
It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.	○	○	○	○	○	○
It is important to him to be humble and modest. He tries not to draw attention to himself.	○	○	○	○	○	○
Having a good time is important to him. He likes to "spoil" himself.	○	○	○	○	○	○
It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.	○	○	○	○	○	○
It's very important to him to help the people around him. He wants to care for their well-being.	○	○	○	○	○	○

	Very much like me	Like me	Somewhat like me	A little like me	Not like me	Not like me at all
Being very successful is important to him. He hopes people will recognise his achievements.	○	○	○	○	○	○
It is important to him that the government ensures his safety against all threats. He wants the country to be strong so it can defend its citizens.	○	○	○	○	○	○
He looks for adventures and likes to take risks. He wants to have an exciting life.	○	○	○	○	○	○
It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.	○	○	○	○	○	○
It is important to him to get respect from others. He wants people to do what he says.	○	○	○	○	○	○
It is important to him to be loyal to his friends. He wants to devote himself to people close to him.	○	○	○	○	○	○
	Very much like me	Like me	Somewhat like me	A little like me	Not like me	Not like me at all
He strongly believes that people should care for nature. Looking after the environment is important to him.	○	○	○	○	○	○
Tradition is important to him. He tries to follow the customs handed down by his religion or his family.	○	○	○	○	○	○
He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.	○	○	○	○	○	○

<< >>

PERSONAL INFORMATION (LAST SECTION)

Age

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 and above

Gender

- Male
- Female

Monthly income

- Less than RM2,500
- RM2,500- 3,999
- RM4,000- 5,499
- RM5,500- 6,999
- RM7,000- 8,499
- RM8,500- 9,999
- RM10,000- 12,999
- RM13,000 & above

Employment status

- Employed
- Self- employed
- Others:

Marital status

- Married
- Widowed
- Divorced
- Separated
- Never married

Number of dependents

- None
- 1
- 2
- 3
- 4 & above

Highest educational level

- Primary school and below
- Secondary school
- STPM
- Diploma
- Bachelor's degree
- Master's degree
- Doctorate degree


Curtin University
We thank you for your time spent taking this survey.
Your response has been recorded.
0%
100%

APPENDIX D: Ethical Clearance Documents

(i) Participant Information Statement

Curtin University

Determinants of Individuals' Risky Assets Investment:
An Extended Information-Motivation-Behavioural Skills Model

PARTICIPANT INFORMATION STATEMENT

HREC Project Number:	HRE2017-0631
Project Title:	Determinants of Risky Assets Investment: An Extended Information-Motivation-Behavioural Skills Model
Principal Investigator:	Dr. Yap Ching Seng
Student researcher:	Ivy Hii Siaw Hung
Version Number:	2
Version Date:	01/11/2018

What is the Project About?

- **The background to the research project**
  The rapid development of financial market and the innovative financial products have given households ample choices in allocating varied portions of their income into different financial assets to enhance their wealth. This is in line with Malaysia's vision of improving well-being of an individual and transforming the country into a high-income nation with inclusive economy. However, the low level of awareness on the advantages of investment amongst Malaysians is of major concern.

- **Aspects of project**
  The purpose of this study is to empirically examine the determinants that affect individuals' risky assets investment in Malaysia.

- **Aims**
  The research will seek to investigate the determinants of individuals' risky assets investment in Malaysia.

- **Contributions**
  This study is expected to have theoretical contribution in shedding light on the two theories combined to explain individuals' financial behaviour. As for practical contribution, the research findings should be of significant interest to the policy makers, particularly the Ministry of Finance to allow for evaluation and innovation of the public policies; as well as financial intermediaries to convey financial information more effectively and to deliver financial services that can accommodate the local needs.

- **Participants**
  Participants must be a Malaysian who aged 18 years old and above.

Who is doing the Research?

- The project is being conducted by Associate Professor Dr. Yap Ching Seng, Associate Professor Dr. Pauline Ho Poh-Ling, Dr. Abey P. Philip and Ivy Hii Siaw Hung.
- The results of this research project will be used by Ivy Hii Siaw Hung to obtain a Doctor of Philosophy at Curtin University and is funded by the Curtin Malaysia Postgraduate Research Scholarship.

- There will be no costs to you and you will not be paid for participating in this project.

Why am I being asked to take part and what will I have to do?

- You have been asked to take part because you have the condition we are researching, which are: (1) a Malaysian; (2) aged 18 and above. This survey contains 12 sections: (1) attitude towards investing; (2) objective skills; (3) financial self-efficacy; (4) social influence; (5) sources of financial information; (6) financial advice; (7) asset allocation; (8) financial literacy; (9) financial satisfaction; (10) risky assets investment; (11) personal values; and (12) personal information. It takes about 15-20 minutes to complete. There will be no cost to you for taking part in this research and you will not be paid for taking part.

Are there any benefits' to being in the research project?

- There may be no direct benefit to you from participating in this research. We hope the results of this research will allow us to develop financial education programs, promote and improve financial well-being.

Are there any risks, side-effects, discomforts or inconveniences from being in the research project?

- Apart from giving up your time, we do not expect that there will be any risks or inconveniences associated with taking part in this study.

Who will have access to my information?

- The information collected in this research will be non-identifiable. The information is anonymous and will not include a code number or name. No one, not even the research team will be able to identify your information. Any information we collect and use during this research will be treated as confidential. The following people will have access to the information we collect in this research: the research team and the Curtin University Ethics Committee. The information we collect in this study will be kept under secure conditions at Curtin University for 7 years after the research has ended. The results of this research may be presented at conferences or published in professional journals. You will not be identified in any results that are published or presented.

Will you tell me the results of the research?

- We are not able to send you any results from this research, as we do not collect any personal information to be able to contact you. The results of this research may be presented at conferences or published in professional journals.

Do I have to take part in the research project?

- Taking part in this research project is voluntary. You can also decide to withdraw your participation in this research as and when you want to.

What happens next and who can I contact about the research?

- If you decide to take part in this research we will ask you to sign the consent form. By signing it is telling us that you understand what you have read and what has been discussed. Signing the consent indicates that you agree to be in the research project and have your information used as described. As for electronic survey, at the start of the questionnaire, there is a checkbox to indicate you have understood the information provided here in the information sheet.

- For further information about this search, please contact either: Associate Professor Dr. Yap Ching Seng (*yapchingseng@curtin.edu.my*) or Ms. Ivy Hii Siaw Hung (*ivy.hii@postgrad.curtin.edu.my*)

The following statement must be included in every information sheet:
Curtin University Human Research Ethics Committee (HREC) has approved this study (HREC number HRE2017-0631). Should you wish to discuss the study with someone not directly involved, in particular, any matters concerning the conduct of the study or your rights as a participant, or you wish to make a confidential complaint, you may contact the Ethics Officer on (08) 9266 9223 or the Manager, Research Integrity on (08) 9266 7093 or email hrec@curtin.edu.au.

(ii) Consent Form

Curtin University

Determinants of Individuals' Risky Assets Investment:
An Extended Information-Motivation-Behavioural Skills Model

CONSENT FORM

HREC Project Number:	HRE2017-0631
Project Title:	Determinants of Individuals' Risky Assets Investment: An Extended Information-Motivation-Behavioural Skills Model
Chief Investigator:	Dr. Yap Ching Seng
Student researcher:	Ivy Hii Siaw Hung
Version Number:	2
Version Date:	01/11/2018

- I have read, the information statement version listed above and I understand its contents.
- I believe I understand the purpose, extent and possible risks of my involvement in this project.
- I voluntarily consent to take part in this research project.
- I have had an opportunity to ask questions and I am satisfied with the answers I have received.
- I understand that this project has been approved by Curtin University Human Research Ethics Committee and will be carried out in line with the National Statement on Ethical Conduct in Human Research (2007).
- I understand I will receive a copy of this Information Statement and Consent Form.

Participant Name	
Participant Signature	
Date	

For Researcher Use Only

Declaration by researcher: I have supplied an Information Letter and Consent Form to the participant who has signed above, and believe that they understand the purpose, extent and possible risks of their involvement in this project.

Researcher Name	
Researcher Signature	
Date	

Note: All parties signing the Consent Form must date their own signature.

(iii) Ethics Clearance Approval Letter

Curtin University

Office of Research and Development

GPO Box U1987
Perth Western Australia 6845

Telephone +61 8 9266 7863
Facsimile +61 8 9266 3793
Web research.curtin.edu.au

13-Sep-2017

Name: Pauline Ho
Department/School: CBS International
Email: Pauline.Ho@curtin.edu.au

Dear Pauline Ho

RE: Ethics Office approval
Approval number: HRE2017-0631

Thank you for submitting your application to the Human Research Ethics Office for the project **Determinants of Individual's Asset Allocation in Malaysia**.

Your application was reviewed through the Curtin University Negligible risk review process.

The review outcome is: **Approved**.

Your proposal meets the requirements described in the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*.

Approval is granted for a period of one year from **13-Sep-2017** to **12-Sep-2018**. Continuation of approval will be granted on an annual basis following submission of an annual report.

Personnel authorised to work on this project:

Name	Role
Ho, Pauline	CI
Hii, Ivy Siaw Hung	Student

Approved documents:

Document

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:
   - proposed changes to the approved proposal or conduct of the study

- unanticipated problems that might affect continued ethical acceptability of the project
- major deviations from the approved proposal and/or regulatory guidelines
- serious adverse events

3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an amendment is undertaken to eliminate an immediate risk to participants)
4. An annual progress report must be submitted to the Human Research Ethics Office on or before the anniversary of approval and a completion report submitted on completion of the project
5. Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
6. Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
7. Changes to personnel working on this project must be reported to the Human Research Ethics Office
8. Data and primary materials must be retained and stored in accordance with the Western Australian University Sector Disposal Authority (WAUSDA) and the Curtin University Research Data and Primary Materials policy
9. Where practicable, results of the research should be made available to the research participants in a timely and clear manner
10. Unless prohibited by contractual obligations, results of the research should be disseminated in a manner that will allow public scrutiny; the Human Research Ethics Office must be informed of any constraints on publication
11. Approval is dependent upon ongoing compliance of the research with the Australian Code for the Responsible Conduct of Research, the National Statement on Ethical Conduct in Human Research, applicable legal requirements, and with Curtin University policies, procedures and governance requirements
12. The Human Research Ethics Office may conduct audits on a portion of approved projects.

Special Conditions of Approval

None.

This letter constitutes low risk/negligible risk approval only. This project may not proceed until you have met all of the Curtin University research governance requirements.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

Amy Bowater
Acting Manager, Research Integrity

(iv) Ethics Clearance Extension Approval Letter

Research Office at Curtin

GPO Box U1987
Perth Western Australia 6845

Telephone +61 8 9266 7863
Facsimile +61 8 9266 3793
Web research.curtin.edu.au

31-Oct-2018

Name: CS Yap Yap
Department/School: CBS International
Email: Csyap.Yap@curtin.edu.au

Dear CS Yap Yap

RE: Annual report acknowledgment
Approval number: HRE2017-0631

Thank you for submitting an annual report to the Human Research Ethics Office for the project **Determinants of Individual's Asset Allocation in Malaysia.**

The Human Research Ethics Office acknowledges the project is ongoing and approval will remain current until 11-Sep-2019.

Any special conditions noted in the original approval letter still apply.

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:
   - proposed changes to the approved proposal or conduct of the study
   - unanticipated problems that might affect continued ethical acceptability of the project
   - major deviations from the HREC approved protocol procedures and/or regulatory guidelines
   - serious adverse events
3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an amendment is undertaken to eliminate an immediate risk to participants)
4. An annual progress report must be submitted to the Human Research Ethics Office on or before the anniversary of approval and a completion report submitted on completion of the project
5. Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
6. Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
7. Changes to personnel working on this project must be reported to the Human Research Ethics Office
8. Data and primary materials must be retained and stored in accordance with the Western Australian University Sector Disposal Authority (WAUSDA) and the Curtin University Research Data and Primary Materials policy
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12. The Human Research Ethics Office may conduct audits on a portion of approved projects.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

[redacted]

Amy Bowater
Ethics, Team Lead

APPENDIX E: Mahanalobis distance (D^2) from SPSS

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	79.45	330.38	208.98	44.695	400
Std. Predicted Value	-2.898	2.716	.000	1.000	400
Standard Error of Predicted Value	10.908	50.422	25.367	6.068	400
Adjusted Predicted Value	69.39	354.92	208.94	45.412	400
Residual	-263.917	299.132	.000	110.936	400
Std. Residual	-2.319	2.628	.000	.975	400
Stud. Residual	-2.372	2.699	.000	1.001	400
Deleted Residual	-276.166	315.615	.038	117.045	400
Stud. Deleted Residual	-2.386	2.722	.000	1.002	400
Mahal. Distance	2.667	77.298	19.950	10.386	400
Cook's Distance	.000	.041	.003	.004	400
Centered Leverage Value	.007	.194	.050	.026	400

a. Dependent Variable: Respondent

Note: Largest D^2 is 77.298; df = 20 (number of variables). Hence, $D^2/df = 3.86$, which is below 4.

APPENDIX F: Harman's one-factor Test Results from SPSS

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.390	24.576	24.576	6.390	24.576	24.576
2	3.051	11.734	36.310			
3	1.707	6.567	42.877			
4	1.448	5.570	48.447			
5	1.193	4.589	53.036			
6	1.171	4.502	57.538			
7	1.110	4.269	61.807			
8	.945	3.636	65.444			
9	.881	3.388	68.832			
10	.840	3.229	72.061			
11	.775	2.980	75.041			
12	.696	2.675	77.716			
13	.659	2.533	80.249			
14	.574	2.207	82.456			
15	.541	2.083	84.539			
16	.502	1.931	86.469			
17	.486	1.871	88.340			
18	.456	1.755	90.095			
19	.426	1.640	91.735			
20	.412	1.586	93.321			
21	.358	1.375	94.696			
22	.340	1.306	96.002			
23	.317	1.219	97.221			
24	.280	1.079	98.299			
25	.270	1.038	99.337			
26	.172	.663	100.000			

Extraction Method: Principal Component Analysis.

APPENDIX G: Skewness and Kurtosis Results from Webpower

Output of skewness and kurtosis calculation

```
Sample size:  400
Number of variables:  9

Univariate skewness and kurtosis
         Skewness   SE_skew   Kurtosis   SE_kurt
ADV     0.20390163 0.1220185 -0.1998708 0.2434399
ATT    -0.67882094 0.1220185  0.7609773 0.2434399
CONS   -0.11379855 0.1220185  0.5115928 0.2434399
FL     -0.34550955 0.1220185 -0.5903957 0.2434399
FSE    -0.12699567 0.1220185 -0.5096601 0.2434399
RA      0.95268983 0.1220185  1.1770252 0.2434399
SAT    -0.48356580 0.1220185  0.1389757 0.2434399
SN      0.03919489 0.1220185 -0.5895794 0.2434399
TRANS   0.40308562 0.1220185  1.1060464 0.2434399

Mardia's multivariate skewness and kurtosis
                   b           z p-value
Skewness    5.990118 399.341187       0
Kurtosis  112.054388   9.277349       0
```

APPENDIX H: Descriptive Statistics Results from SPSS and SmartPLS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
FL	400	0	10	5.90	2.534
ADV	400	1	5	2.44	.907
CONS	400	65.841300	114.672782	91.21798577	8.042470674
TRANS	400	24.919680	95.852244	59.81472857	9.088443639
RA	400	0	100	28.47	18.993

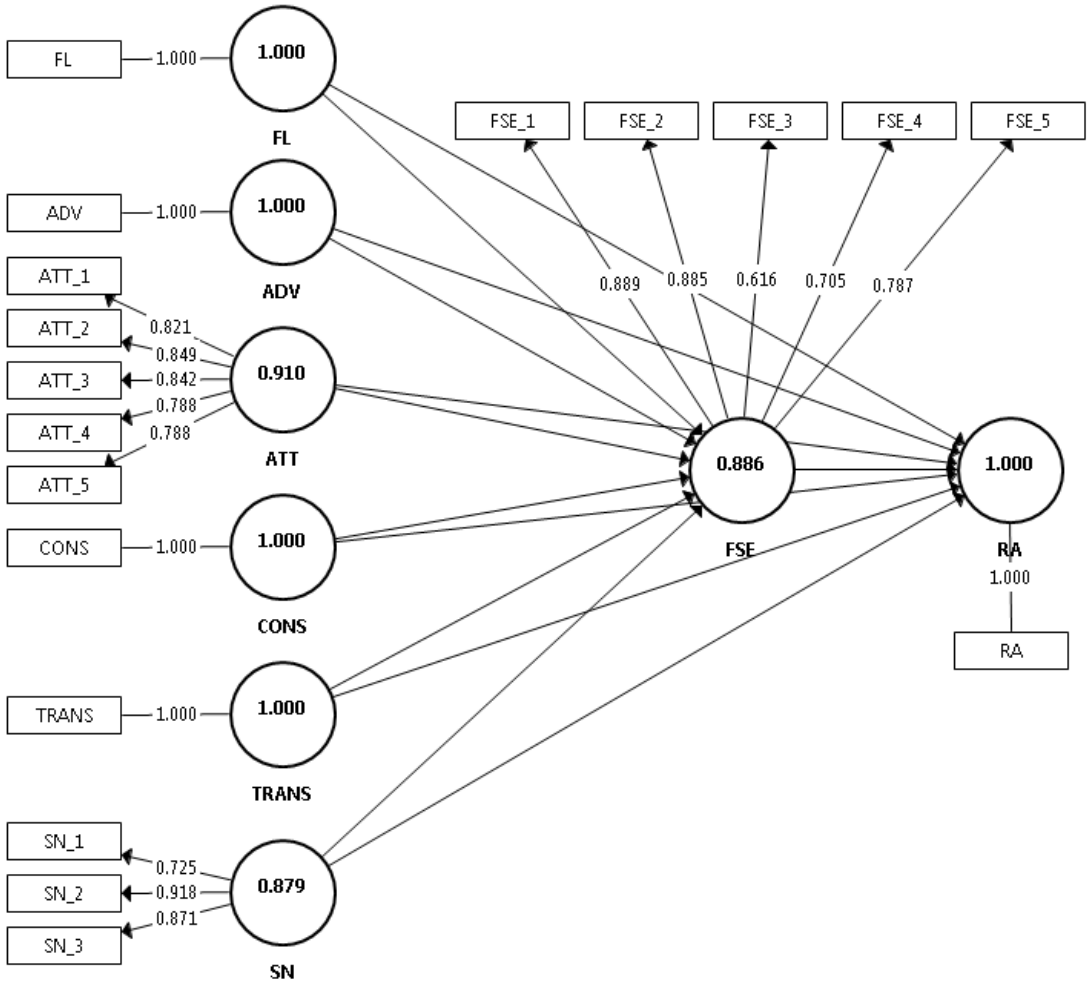
Indicator Data (Original)

Matrix | MV Descriptives | Copy to Clipboard: Excel Format | R Format

	Mean	Median	Min	Max	Standard Devia...	Excess Kurtosis	Skewness	Number of Ob...
ATT_1	3.042	3.000	1.000	5.000	0.990	-0.420	-0.364	400.000
ATT_2	3.138	3.000	1.000	5.000	0.994	-0.413	-0.508	400.000
ATT_3	3.345	4.000	1.000	5.000	0.928	0.298	-0.719	400.000
ATT_4	3.500	4.000	1.000	5.000	1.000	0.094	-0.647	400.000
ATT_5	3.300	3.000	1.000	5.000	1.034	-0.222	-0.463	400.000
CONS	99.265	99.858	74.344	124.766	7.685	0.676	-0.080	400.000
FL_score	5.902	6.000		10.000	2.530	-0.590	-0.345	400.000
FSE_1	2.757	3.000	1.000	5.000	1.153	-0.958	0.071	400.000
FSE_2	2.708	3.000	1.000	5.000	1.130	-1.009	0.103	400.000
FSE_3R	2.772	3.000	1.000	5.000	1.151	-0.865	0.276	400.000
FSE_4	3.223	3.000	1.000	5.000	1.050	-0.421	-0.520	400.000
FSE_5	3.047	3.000	1.000	5.000	1.160	-0.830	-0.334	400.000
RA_risky	28.468	25.000		100.000	18.970	1.177	0.953	400.000
SOC_1	2.840	3.000	1.000	5.000	1.051	-0.906	-0.001	400.000
SOC_2	2.620	3.000	1.000	5.000	1.027	-0.745	0.105	400.000
SOC_3	2.760	3.000	1.000	5.000	1.043	-0.695	0.002	400.000
TRNSD	93.665	93.564	60.614	128.563	9.677	0.646	-0.301	400.000

APPENDIX I: Measurement Model Results from SmartPLS

(i) Measurement Model with Loadings and Composite Reliability



(ii) Composite Reliability and AVE

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE)

	Cronbach's Al...	rho_A	Composite Rel...	Average Varian...
ADV	1.000	1.000	1.000	1.000
ATT	0.877	0.885	0.910	0.669
CONS		1.000		
FL	1.000	1.000	1.000	1.000
FSE	0.837	0.858	0.886	0.614
RA	1.000	1.000	1.000	1.000
SN	0.802	0.884	0.879	0.709
TRANS	1.000	1.000	1.000	1.000

(iii) Cross-loading test

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratio (HTMT) | Copy to Clip

	ADV	ATT	CONS	FL	FSE	RA	SN	TRANS
ADV	1.000	0.018	0.099	-0.074	-0.232	-0.152	-0.048	0.029
ATT_1	0.007	0.821	-0.056	0.142	0.261	0.225	0.355	-0.028
ATT_2	-0.008	0.849	-0.076	0.126	0.324	0.253	0.413	-0.061
ATT_3	0.071	0.842	-0.007	0.112	0.207	0.247	0.345	0.042
ATT_4	0.014	0.788	-0.092	0.181	0.191	0.218	0.346	-0.021
ATT_5	-0.001	0.788	-0.086	0.112	0.263	0.256	0.393	-0.003
CONS	0.099	-0.079	1.000	0.099	-0.102	-0.158	-0.095	-0.092
FL_score	-0.074	0.162	0.099	1.000	0.313	0.349	-0.032	0.119
FSE_1	-0.205	0.249	-0.076	0.277	0.889	0.457	0.246	-0.135
FSE_2	-0.208	0.281	-0.110	0.265	0.885	0.389	0.263	-0.118
FSE_3R	-0.188	0.164	-0.014	0.256	0.616	0.288	0.091	-0.098
FSE_4	-0.136	0.225	-0.134	0.177	0.705	0.325	0.190	-0.093
FSE_5	-0.170	0.288	-0.061	0.249	0.787	0.360	0.227	-0.149
RA_risky	-0.152	0.294	-0.158	0.349	0.470	1.000	0.174	-0.020
SOC_1	0.023	0.311	-0.069	-0.045	0.102	0.107	0.725	-0.022

(iv) Fornell-Larcker criterion test

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratio (HTMT) | Copy to Clipb

	ADV	ATT	CONS	FL	FSE	RA	SN	TRANS
ADV	1.000							
ATT	0.018	0.818						
CONS	0.099	-0.079						
FL	-0.074	0.162	0.099	1.000				
FSE	-0.232	0.311	-0.102	0.313	0.783			
RA	-0.152	0.294	-0.158	0.349	0.470	1.000		
SN	-0.048	0.456	-0.095	-0.032	0.267	0.174	0.842	
TRANS	0.029	-0.020	-0.092	0.119	-0.153	-0.020	-0.092	1.000

(v) HTMT test

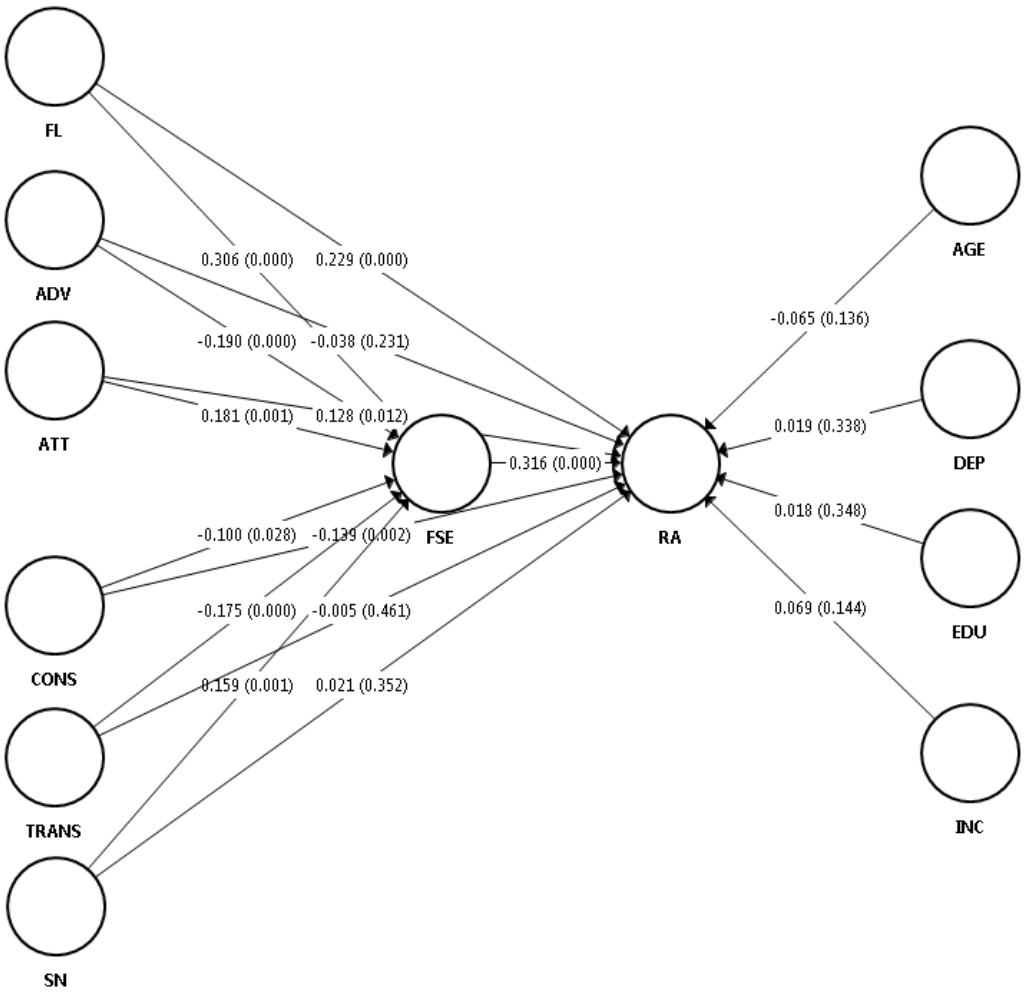
Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratio (HTMT) | Copy to Clipboard: Excel Format | R Format

	ADV	AGE	ATT	CONS	DEP	EDU	FL	FSE	INC	RA
ADV										
AGE	0.001									
ATT	0.026	0.090								
CONS	0.099	0.142	0.083							
DEP	0.085	0.341	0.050	0.085						
EDU	0.066	0.162	0.110	0.097	0.078					
FL	0.074	0.337	0.176	0.099	0.081	0.216				
FSE	0.255	0.134	0.355	0.111	0.122	0.184	0.344			
INC	0.107	0.574	0.042	0.170	0.275	0.329	0.415	0.244		
RA	0.152	0.066	0.313	0.158	0.065	0.137	0.349	0.512	0.191	
SN	0.061	0.080	0.530	0.106	0.048	0.086	0.042	0.294	0.093	0.186
TRANS	0.029	0.170	0.041	0.092	0.061	0.036	0.119	0.167	0.131	0.020

APPENDIX J: Structural Model Results from SmartPLS

(i) Structural Model with Path Coefficients and P-value



(ii) Lateral Collinearity (VIF)

Collinearity Statistics (VIF)

Outer VIF Values | Inner VIF Values | Copy to Clipboard: Excel Format

	ADV	AGE	ATT	CONS	DEP	EDU	FL	FSE	INC	RA
ADV								1.026		1.098
AGE										1.697
ATT								1.326		1.417
CONS								1.049		1.109
DEP										1.218
EDU										1.205
FL								1.083		1.397
FSE										1.425
INC										1.851
RA										
SN								1.299		1.351
TRANS								1.038		1.121

(iii) Coefficient of Determination (R^2)

R Square

Matrix | R Square | R Square Adjusted

	R Square	R Square Adjus...
FSE	0.276	0.265
RA	0.310	0.291

APPENDIX K: Mediation Analysis Results from SmartPLS

Specific Indirect Effects

Mean, STDEV, T-Values, P-Val... | Confidence Intervals | Confidence Intervals Bias Cor... | Samples | Co

	Original Sampl...	Sample Mean (...	Standard Devia...	T Statistics (|O...	P Values
ADV -> FSE -> RA	-0.060	-0.060	0.018	3.410	**0.000**
ATT -> FSE -> RA	0.057	0.058	0.020	2.916	**0.002**
CONS -> FSE -> RA	-0.032	-0.031	0.017	1.855	**0.032**
FL -> FSE -> RA	0.097	0.097	0.021	4.658	**0.000**
SN -> FSE -> RA	0.050	0.052	0.019	2.596	**0.005**
TRANS -> FSE -> RA	-0.055	-0.055	0.018	3.120	**0.001**