Investigating The Form and Determinants of Financial Wellbeing: Evidence from Online Education

Thesis

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INVESTIGATING THE FORM AND DETERMINANTS OF FINANCIAL WELLBEING: EVIDENCE FROM ONLINE EDUCATION

Thesis submitted for the Degree of Doctor of Philosophy in Financial Education and Personal Finance

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ABSTRACT

“Finance, money and debt” are the most common causes of anxiety affecting mental health and wellbeing (Swift et al., 2014). The main purpose of this study is to explore the nature and determinants of financial wellbeing (FWB) in the context of online financial education. This knowledge is needed to identify the intervention strategies that could promote FWB and consider whether these determinants should be focused on simultaneously or individually.

This study uses the recent concepts of FWB which identify desired living standards and financial freedom as the essence of FWB (Brüggen et al., 2017; CFPB, 2015a). These concepts are employed together with an adaptation of the concept of human needs based on Maslow’s hierarchy of needs (1943, 1954). The study examines financial needs satisfaction and perceived financial wellbeing (Perceived FWB) as two components of FWB amongst learners in online financial education who intend to improve their financial capability. A pragmatic approach which uses a mixture of quantitative and qualitative methods, such as survey and interview, is used in the study. Quantitative dominant crossover mixed analysis has been selected.

The study finds that financial capacity – wealth and income – is by far the strongest determinant of FWB. Financial capacity is found to be a key determinant of both Perceived FWB and financial needs satisfaction. The role of financial behaviours is much less significant than financial capacity in determining FWB, though this may be because financial capacity might reflect the outcome of individual financial behaviour. By contrast, financial attitudes and perceived financial capability are only key determinants of Perceived FWB. The study suggests a hierarchy of financial needs satisfaction with four levels: finance for existence, finance for security, finance for enjoyment, and finance for self-actualisation that fit into the hierarchy of Maslow's human needs framework. Finally, the ‘being in control’ financial attitude is identified as the key attitude in terms of its effect on FWB, corroborating the results from Vlaev and Elliott (2014); similarly, ‘savings and investment’ behaviours are found to be a key behavioural factor.
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GLOSSARY OF TERMS

Financial Education
“The process by which people improve their understanding of financial products, services, and concepts, so they are empowered to make informed choices, avoid pitfalls, know where to go for help and take other actions to improve their present and long-term FWB” (President’s Advisory Council on Financial Literacy, 2009, p. 4).

Online Financial Education
The process of financial education occurs in an online environment through the internet (the author’s definition).

Financial Literacy
“The ability to use knowledge and skills to manage financial resources effectively for a lifetime of FWB” (President’s Advisory Council on Financial Literacy, 2009, p. 4).

“Financial literacy can be defined as knowledge of basic financial concepts and the skills, attitudes to translate this knowledge into behaviours that improve financial outcomes” (Sebstad et al., 2006, p. 6).

Financial Capability
The ability to transform financial literacy, financial behaviour, and financial capacity to achieve financial goals and FWB (The author’s definition, adapted from Xiao (2016)).

Financial Capacity
“The ability to borrow and repay debt obligations based on cash flows and assets” (Kavussanos and Visvikis, 2016, p. 163).

Financial Resources
The relative capacity to fulfil economic needs that are determined largely by the requirements of one’s chosen (or imposed) style of life (the author’s definition).
Financial Behaviour
A set of human behaviours in managing their financial resources. This set of behaviours include a cycle of actions including planning, implementing, tracking, and evaluating financial resources and outcomes (the author’s definition, adapted from Dowling et al., (2008); Xiao (2008a)).

Financial Wellbeing
“the perception of being able to sustain current and anticipated desired living standards and financial freedom” (Brüggen et al., 2017, p. 229).

Subjective Wellbeing
SWB refers to the broad concept of happiness/wellbeing that is defined by different facets such as life satisfaction (a cognitive, global evaluation of one’s life), domain satisfaction, and an affective component represented by positive affect and low negative affect (Diener et al., 1999).

Financial Satisfaction
A subjective evaluation of financial status that is closely related to subjective wellbeing (Vera-Toscano et al. 2006).

Financial Efficacy
A person’s perceived capability to control his/her personal finances (Lapp, 2010; Postmus, 2011).

Financial Needs
“Money needs for current and future consumptions are defined as financial needs” (Adapted from Xiao and Noring (1994, p. 29)).

Financial Needs Satisfaction
The perception of being able to fulfil financial needs to sustain a current and anticipated desired living standard and financial freedom (the author’s definition).
Financial goals

“Financial goals are the long-term objectives that one’s financial planning and management efforts are intended to attain” (Garman and Forgue, 1991, p. 60).

Self-efficacy

“Perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations” (Bandura, 1982, p. 122).

Social Marketing

Social Marketing is the use of marketing principles and techniques to promote the adoption of behaviours that improve the health or wellbeing of the target audience or of society as a whole (Nedra Weinreich, 2011).

Social Marketing Product

Idea (belief, attitude, value); practice (act, behaviour) and tangible object are the “product” to be marketed for social goods (Kotler and Roberto, 1989).
I. INTRODUCTION

In an effort to find the solutions to tackle the personal financial crisis, financial wellbeing (FWB) has become an emerging research area (Brüggen et al., 2017). FWB influences various important aspects of individual life, such as quality of life, happiness, general wellbeing, success, physical and mental health and relationship quality (Hubler et al., 2016; Dunn and Mirzaie, 2012). When many citizens have negative FWB, it has an undesirable impact on social development and welfare. For instance, people consume less or rely more on public funds, benefits, and support (Griggs et al., 2013; Sacks et al., 2012). If “change is the end result of all true learning” (Buscaglia cited in Chang, 2006, p. 114) then the question is what needs to be learnt to make a desirable change in FWB? This question drives this study to explore the nature of FWB, its determinants, and how they impact on FWB in the context of online financial education. The chapter sets out the research statements, the gaps in knowledge, research purposes, and reasons why the research is important. Research strategies, questions, and case study are also presented.

1.1 The Gaps in Knowledge

FWB needs a comprehensive conceptual development in relation to its definition, framework, measurement, and practice (Brüggen et al., 2017). There is a gap in knowledge with regard to the nature of FWB and its determinants. A more creative approach is needed for the study of FWB intervention, one that incorporates a combination of different disciplines (Brüggen et al., 2017). For instance, marketing, psychology, behavioural finance, and sociology should be used to explain and solve the complexity of factors that influence FWB and behaviour change (Brüggen et al., 2017). It is important to understand the complex issues involved when seeking to improve both an individual and the public’s FWB. This study addresses and investigates some of the gaps in knowledge of FWB.
The first gap relates to the idea that there is no widely agreed definition of FWB (Brüggen et al., 2017). FWB has been simplified to signify happiness or satisfaction within a financial situation (Porter and Garman, 1993) or a state of being healthy, happy, and free from worry (Zimmerman, 1995). From this perspective, multifaceted aspects of FWB have been generated, in relation to financial behaviour and income flow (Zemtsov and Osipova, 2015) or financial obligations and financial freedom (The Consumer Financial Protection Bureau (CFPB), 2015a, p.18). In addition, some definitions use wellness and wellbeing interchangeably. In fact, wellness typically involves the quality or state of being healthy in body and mind, particularly as the result of deliberate effort (Judge et al., 2010). Some authors argue that FWB is a multi-dimensional construct rather than a unidimensional one (Prawitz et al., 2006).

On the other hand, some authors propose a FWB framework without clarifying how to measure their concepts. For instance, Brüggen et al. (2017) offer a FWB framework that includes interventions, financial behaviour, contextual and personal factors as well as the consequences of FWB. They introduce a ‘new’ concept of FWB: “The perception of being able to sustain current and anticipated desired living standards and financial freedom” (Brüggen et al., 2017, p. 229). This concept stresses: (1) the individual perceives FWB rather than how it is objectively denoted; (2) includes the current and future situation; (3) financial freedom in making choices with regard to his/her necessities or covering his/her baseline expenses (Cazzin, 2011; Choudhry, 2009); (4) Brüggen et al.’s concept (2017) is not the same as satisfaction with the present financial situation as in the previous studies (Joo and Grable, 2004). In fact, their concept is not really “new” as it was inherited from the Consumer Financial Protection Bureau (CFPB) in the United States which the same concept of ‘financial freedom’. They both stress that people perceive themselves to be financially ‘well’ when they can afford what they want (Brüggen et al., 2017).

Despite exposing the gaps in conceptualising and measuring FWB in the literature and introducing a ‘new’ concept of FWB, Brüggen et al. (2017) does not explain how to measure FWB and other elements in their framework. Moreover, their FWB
framework has not been tested. The differences in definition of FWB result from different study approaches when measuring FWB.

Having found disagreement on the concepts of FWB, this study adopts the existing theories of human wellbeing with the two traditions, hedonism and eudaimonism (Nanda and Banerjee, 2021; Diener et al., 2009; Ryan and Deci, 2000) to understand FWB. By examining the determinants of two components of FWB, including Perceived FWB (i.e. hedonism) and financial needs satisfaction (i.e. eudaimonism), this study hopes to shed some light on the nature of multidimensions of financial wellbeing. Perceived FWB relates to the perception of the financial situation through the senses or emotions (Zimmerman, 1995; Porter and Garman, 1993) while financial needs satisfaction reflects desired living standards and financial freedom (Brüggen et al., 2017; CFPB, 2015a). The concept of subjective or perceived FWB has been widely discussed while the concept of financial needs satisfaction has received less treatment. The concept of Perceived FWB can be traced back to the 1970s (Strumpel, 1976). By contrast, studies on the concept of financial needs satisfaction have only recently started to be addressed in studies on personal finance. These studies argue that money can buy happiness if it satisfies a high level of needs (Howell et al., 2013). Brüggen et al. (2017) argue that an individual must be able to meet his or her desired standard of living to be able to perceive FWB. Their concept of FWB reflects Maslow’s hierarchy of needs (1943, 1954) and the importance of needs being satisfied to secure human wellbeing (Howell et al., 2013). Xiao and Noring (1994) also use Maslow’s hierarchy of needs theory, in particular psychological needs that address family financial matters, such as perceived saving motives and hierarchical financial needs. Concepts such as Maslow’s hierarchy of needs (1943, 1954) should be customised for the study of FWB in order to understand consumer behaviour, such as spending, shopping, and saving, as well as satisfaction in relation to financial circumstance (Brüggen et al., 2017). However, few studies have approached the topic of financial needs satisfaction by adapting Maslow’s hierarchy of human needs (1954). Financial needs satisfaction might be a good indicator to represent the measure of desired living standards and financial freedom in recent concepts of FWB (Brüggen et al., 2017; CFPB, 2015a). Therefore, this study explores their concept of FWB in relation to human needs of desired living standards and financial freedom.
(2) Lack of understanding on how people satisfy their financial needs

The second gap identifies that no previous studies have examined financial needs satisfaction as a component of FWB and its determinants. It is important to understand what needs to be intervened to result in an individual’s financial needs satisfaction to enhance their FWB. In addition, it is also useful to understand why people behave in certain ways with their money which may impact on their FWB. This gap has prompted an exploration of financial needs satisfaction with a consideration of the importance of individual needs.

(3) Identifying the key determinants of financial wellbeing

The third gap identifies the determinants of FWB. It is necessary to understand what interventions are needed in order to suggest desirable outcomes. Furthermore, in the case of having limited resources to intervene in relation to individual FWB. There are different variables considered as drivers of FWB, such as financial behaviour (Brüggen et al., 2017; Kim, 2000), attitudes (Rai et al., 2019; Vlaev and Elliott, 2014), capability (Xiao and O’Neill, 2016; Xiao et al., 2014b), capacity (Zemtsov and Osipova, 2015) and literacy (Rai et al., 2019; Organisation for Economic Cooperation and Development (OECD), 2013). However, there are different views on variables that play a significant and important role in defining FWB. To some extent, the scholarly attention has focused on financial behaviour.

Financial behaviour has been linked to financial capability and wellbeing (Shim et al., 2009; Xiao et al., 2009). It is believed that desirable financial behaviour is one of the key elements in promoting FWB, and it is considered as an outcome of financial behaviours (Kim, 2000). Some authors stress the importance of financial behaviour and financial satisfaction, objective status, and subjective perception in shaping individual FWB (Gerrans et al., 2014). Positive financial behaviours tend to reduce financial stress and increase financial satisfaction (Xiao et al., 2006; see Lyons et al., 2008). Negative behaviours have been blamed as the cause of negative FWB, such as low personal savings rates, high levels of consumer debt, and an increase in filings for personal bankruptcy (Lyons et al., 2006; Bell and Lerman, 2005). Van Praag and Frijters (2003), cited in Brüggen et al. (2017), stress
the crucial role of desirable spending and savings in sustaining long-term financial and personal wellbeing. The consequences of unhealthy financial behaviours are overwhelming, particularly with people in low-income and socially disadvantaged groups. Therefore, financial behaviour change has been at the centre of interventional programmes. For example, social marketing has been developing tools that can help promote a change in unhealthy behaviour when managing personal finance. Social marketing involves the adaptation of commercial marketing tools (Kotler and Zaltman, 1971) to build public awareness and change undesirable behaviour (Hastings; 2007), or influence voluntary behaviour (Andreasen, 1994, p.110).

The role of financial behaviour in defining FWB is in doubt, due to a lack of evidence. For example, Brüggen et al. (2017) argue that financial behaviour has a direct impact on FWB without providing clear empirical evidence to support the claim. Instead, Brüggen et al. (2017) suggest an agenda for future research with six research themes and a comprehensive set of research topics on FWB, which include more studies on financial education needs and interventions. For future research, Brüggen et al. (2017) encourage the development of dimensions and scales to describe desired lifestyles and financial freedom of choice. This is one of the reasons why this study uses the concept of financial needs satisfaction to explore FWB in the context of financial education.

The dominant focus of financial behaviour when conceptualising FWB also raises another concern, promoting the question: is it reasonable to focus mainly on financial behaviour to create a positive outcome for FWB? There needs to be a consideration that other drivers might also be equally or more important than financial behaviour in relation to FWB. The literature has not fully addressed this issue. Zemtsov and Osipova (2015) state that financial capital is an objective feature of FWB. Financial attitudes can also affect FWB (Rai et. al, 2019). There are various studies on financial attitudes and how it influences individual financial capability and wellbeing, such as attitudes towards savings, borrowings or debts, investments and so on. Financial behaviour is considered an output of other variables such as financial attitudes (Dolan et al., 2012) and literacy (Xiao et al., 2014; Stuart, 2012). It is believed that a change in individual attitudes, beliefs, and goals might result in
a change behaviour (Dolan et al., 2012). Furthermore, Grinstein-Weiss et al. (2012) suggest that the skills, attitudes, and knowledge transferred to children early in life by parents may be important and have long-term implications for their financial outcomes as adults.

To fill this gap in knowledge, this study goes to the root of the underlying factors that drive individual FWB in order to understand what interventions are needed to achieve a strong impact on FWB. Having selected two components of FWB, this study examines the relationship between them in order to examine Perceived FWB and financial needs satisfaction, along with some potential drivers of FWB, such as financial behaviour (Brüggen et al., 2017; Kim, 2000), attitudes (Vlaev and Elliott, 2014), capability (Xiao and O’Neill, 2016; Xiao et al., 2014b), capacity (Zemtsov and Osipova, 2015) and literacy (Xiao and Neill, 2016; Kim, 2007).

(4) Limited studies on the use of online financial education to promote financial wellbeing

The fourth gap is related to the context of this study, financial education. There are limited studies on online financial education and how it can be used to promote FWB. Previous studies mostly focus on the traditional methods of learning, such as face-to-face learning in a school or university environment. Thus, there is a gap in understanding the role of other forms of education which can potentially expand the research on individual FWB. This study seeks to explore the potential use of online financial educational to promote FWB.

While developing interventional strategies, previous studies found that financial education plays an important role in encouraging financial behaviour change (Cole et al., 2012; Willis, 2011, 2009; Lyons et al., 2006). As a result, financial education has been used as a tool in social marketing to design the programmes that support people in making a change in financial behaviour in order to enhance their FWB (Darnton, 2008). The link between financial education and behaviour change has been endorsed in theories of social marketing and in the best practice of the social marketing industry (Cole, et al., 2012; Dolan et al., 2012; Gutter et al., 2007; Lyons et al., 2006).
There are disagreements on the impact of financial education on FWB which partly involve financial behaviour, one of determinants of FWB. This is because there is a lack of evidence to support the impact of financial education on financial behaviour change in relation to enhancing FWB. Fernandes et al. (2014) conducted a meta-analysis of 168 papers covering 201 prior studies in order to examine the relationship of financial literacy and education on financial behaviour. The authors found that interventions to improve financial literacy explain only 0.1% of the variance in financial behaviours studied, with weaker effects in low-income samples. They suggested that a real but narrower role for “just in time” financial education that aims to influence specific behaviours might be able to help (Fernandes et al., 2014, p. 2). "Just-in-time" financial education focuses on the topics that are of immediate importance to students (Mandell, 2006, p. 7A). By contrast, Kaiser and Menkhoff's (2017), meta-analysis of 126 evaluation studies found that financial education significantly impacts financial behaviour and financial literacy but is less effective for low-income clients and low- and lower-middle income economies. Mandatory financial education appears to be less effective on some behaviours such as debt management which are more difficult to influence. In addition, intervention success depends heavily on increasing the education intensity and offering financial education at a ‘teachable moment’. GAO (2004), cited in Doi et al. (2014), describe a teachable moment is when the information taught is most applicable to an individual’s life. Both studies concluded similar points that offering financial education at a ‘teachable moment’ or ‘just in time’ would create better value to the participants (i.e. positive impacts on financial knowledge, financial behaviours, and savings) but low income is still a challenge that financial education might not be able to overcome (Kaiser and Menkhoff, 2017; Fernandes et al., 2014).

The aim of this study is not to focus on exploring the impact of financial education on financial behaviour change but, instead, to use online financial education as an environment to explore learners’ FWB and its determining factors. Online financial education itself is neither the main focus of the study question nor a variable of interest in the current study. The study selects a population that actively signed up for free online financial education. This specific segment includes the attendees who are considered to be concerned with their financial matters (Ali et al., 2015). By taking part in the course, it could be a ‘teachable moment’ or a ‘just in time’
intervention when people are seeking extra support to manage their finances (Fernandes et al., 2014; Kaiser and Menkhoff, 2017). Their participation suggests that they share a similar intention of making positive progress in managing their finance. Understanding what is going in relation to learners’ FWB is crucial to inform interventional strategies. Which of these drivers, financial behaviour (Brüggen et al., 2017; Kim, 2000), attitudes (Vlaev and Elliott, 2014), capability (Xiao and O’Neill, 2016; Xiao et al., 2014b), capacity (Zemtsov and Osipova, 2015) or literacy (Rai et al., 2019; OECD, 2013), define FWB at the moment participants needed the extra support from online education? In the specific case of financial education intervention, it is not likely to work if the target audience is not inherently prepared to take advice, or if the necessary skills are lacking (Elliott et al., 2010). Hence, understanding the insights of the target audience when they sign up for online learning is essential to inform interventional programmes.

In summary, the knowledge and understanding of what constitutes FWB, and the complicated factors that influence it, directly or indirectly, are vast. There is no guarantee that financial education can promote a desirable change in financial behaviour – one size does not fit all. It is necessary to acknowledge the broad determinant factors that are fundamental to an understanding of FWB. The summary below explains the gaps in existing literature and what this study explores:

(1) There are disagreements in conceptualising FWB, which is seen to be complex with various determinants. The differences in definition of FWB result in different approaches to measure FWB. Recent conceptualisations of FWB stress desired living standards and financial freedom as drivers of FWB (Brüggen et al., 2017; CFPB, 2015a). Brüggen et al. (2017) argues that an individual must be able to meet their desired standard of living to be able to perceive FWB. However, the authors did not provide a clear instruction on how the elements of desired living standards and financial freedom are measured. Hence, this study adapts the theory of Maslow’s hierarchy of needs (1943, 1954) to measure the elements of FWB. There is a lack of studies on financial needs satisfaction that do this in order to explore financial satisfaction and wellbeing. Financial needs satisfaction might be a good indicator to represent FWB. This study is not developing a new conceptualisation of FWB but testing the concept from
Brüggen et al. (2017) and other authors to understand the new perspective of the nature of FWB through financial needs satisfaction. This study expands the conceptualisation of FWB by exploring the measurement of financial needs satisfaction. This study is not attempting to solve the disagreements of measurements of FWB but add additional elements to measure FWB. It is an effort to strengthen the conceptualisation of FWB. Also, as this study aims to inform FWB interventions, Brüggen et al. (2017)’s framework was selected because it was the only framework that includes intervention elements together with some key variables of this study. Furthermore, Brüggen et al.’s definition of FWB is used in some recent studies about FWB (Nanda and Banerjee, 2021; Chatterjee et al., 2019; Hampson et al., 2018; Hampson and McGoldrick, 2017; Losada- Otalora et al., 2018).

(2) There are different views on the variables that play the most significant role in defining FWB. To some extent, there has been too much emphasis on financial behaviour. This situation raises an inquiry to examine whether it is reasonable to focus mainly on financial behaviour to create a positive outcome for FWB. It is necessary to consider that other drivers might be equally or more important than financial behaviour. Hence, this study is going to examine the drivers of FWB such as financial behaviour (Brüggen et al., 2017; Kim, 2000), attitudes (Vlaev and Elliott, 2014), capability (Xiao and O’Neill, 2016; Xiao et al., 2014b), and capacity (Zemtsov and Osipova, 2015) in relation two components of FWB: Perceived FWB and financial needs satisfaction.

(3) Finally, there is still a gap in understanding the role of online financial education, which can potentially make a significant contribution to expand the research on individual FWB. This study seeks to explore the potential use of online financial educational to promote FWB.

1.2 Purposes of the Study and Research Questions

The main purpose of this study is to explore FWB and its determinants in the context of online financial education. An understanding of the determinants of FWB is needed to decide on the focus of intervention strategies to promote FWB and whether these determinants should be focused on simultaneously or individually.
FWB has previously been primarily measured using perceived or self-reported financial wellbeing. Following two major philosophies in human wellbeing, hedonism and eudaimonism, this study conceptualises FWB with two components: perceived FWB and financial needs satisfaction respectively (Nanda and Banerjee, 2021; Diener et al., 2009; Ryan and Deci, 2000).

The research questions are:

1. What is the nature of financial needs satisfaction, as a component of FWB?
   - How can it be measured?
   - How does it compare to concepts of human needs?

2. How do the elements of financial capability relate to the two components of FWB in the context of online financial education?
   - What appear to be the determinants of FWB?
   - How significant are each of these determinants?

In addressing these questions, a population has been selected that intends to make some progress with their personal finances by taking part in an online financial education programme. One of the key reasons for their participation is that they are likely to be concerned with their financial matters (Ali et al., 2015). Understanding what is going on with the learners’ FWB and the determinants is crucial to inform interventional strategies. The knowledge is expected to inform the interested parties who aim to use online financial education to approach the participants that might be at a “teachable moment” or “just in time” (Fernandes et al., 2014; Kaiser and Menkhoff, 2017). They are likely to be prepared to take advice (Elliott et al., 2010).

The discussion on financial education in this study focuses on two aspects. Firstly, financial education is an area of research interest that attracts a specific group of people who are the research subject of this study. This study is interested in exploring the FWB of those who engage with financial education to help them manage their personal finances better. Secondly, this study also discusses the practical implications of research findings on financial education in practice. However, this thesis does not assess the effectiveness of online financial education.
In detail, this research seeks to:

(1) Develop Brüggen et al.’s conceptualisation of FWB (2017) and how it can be measured, advancing the first two elements of their proposed future research agenda for FWB (2017). This study focuses on two components of FWB: perceived FWB and financial needs satisfaction (FNS). These two components are developed based on two major philosophies in human wellbeing, hedonism and eudaimonism (Nanda and Banerjee, 2021; Diener et al., 2009; Ryan and Deci, 2000).

(2) Investigate the nature of FNS: what financial needs people have and how these needs fit together. This study proposes a theoretical framework for FNS, developed from Maslow’s hierarchy of needs (1943, 1954) and the literature in personal finance, following suggestions of a connection and common hierarchical structure between Maslow’s hierarchy of human needs and financial needs in previous studies (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994). Potential measures of FNS are drawn from this literature and explored using exploratory factor analysis, to draw insight about the needs people have, how these fit together, and compare the implications these have for the proposed framework to the structure and contents of Maslow’s hierarchy.

(3) Explore the key factors that appear to determine FWB, measured using both proposed components of perceived FWB and FNS, among people who engage with online financial education. The literature suggests a core set of factors that may have some relationship with FWB to investigate: financial behaviour (Brüggen et al., 2017; Kim, 2000), attitudes (Vlaev and Elliott, 2014), capability (Xiao and O’Neill, 2016; Xiao et al., 2014b), capacity (Zemtsov and Osipova, 2015) and literacy (Rai et al., 2019; OECD, 2013).

Finally, the target audiences of this study are social marketers, financial advisers, counsellors, policy makers, and educators who might find useful findings to help with their interventional development to promote FWB.
1.3 Research Strategies

To achieve the proposed purposes of the study, various research strategies are designed to help understand the gaps in knowledge. Firstly, this study takes the first two steps suggested by Lusardi et al. (2009, p. 5–6) to inform the third step. Lusardi et al.'s first step focuses on a target population who have embarked online financial education: the purpose of this step is to examine FWB and its determinants in relation to the learners. The second step uses multiple data-collection methods, such as pre, post and follow-up surveys, follow-up interviews and quizzes. This step uses a rigorous conceptual framework of FWB to comprehend the target audience. This study does not conduct a third step by designing the intervention itself, but instead, uses a pre-designed intervention to gather data for steps one and two.

This study develops a conceptual framework drawn from literature to test the relationships between individual Perceived FWB, perceived financial capability, subjective financial literacy, attitudes, behaviour, capacity, and financial needs satisfaction (see Error! Reference source not found.). Finally, this study observes the immediate and later changes of participants in three stages of data collection, including before, after, and a follow-up six months after completing the ‘Managing My Money’ course (MMM).

Despite having a strategy with different methods and periods to collect data, this study could not collect adequate data from post and follow-up surveys, follow-up interviews, and quizzes. Due to low response rates and limited access to participants, the main source of data used for analysis has been taken from pre-survey and follow-up interviews. Based on the availability of data the focus of this study changed from an intervention evaluation perspective to the investigation of individual FWB and its determinants in the context of online financial education. The change of the focus of this study means that the discussions of financial education in this thesis is mainly to help understand as to why it is chosen as an environment to investigate an individual’s FWB and its intervention. The review of financial education explains how it links to financial literacy which is one of the key variables to be investigated in the current study. This revised focus is expected to inform the intervention development required to enhance individual FWB.
1.4 Contribution to Knowledge

This thesis hopes to contribute to extending established theories of human wellbeing through the knowledge of FWB. FWB is one type of human wellbeing (Zemtsov and Osipova, 2015). There is a gap in knowledge with regard to the nature of personal financial wellbeing (FWB) and its determinants (Brüggen et al., 2017). This gap echoes the research inquiry that related to human wellbeing theory such as the debates in the hedonic and eudaimonic conceptions of wellbeing or understanding the antecedents of personal wellbeing (Ryan and Deci, 2000). Ryff and Singer (1998) who endorsed the eudaimonic viewpoint of wellbeing challenged the hedonic viewpoint in SWB models of well-being. Their critics focused on the nature of the hedonic viewpoint that has limited scope where positive functioning is involved (Ryan and Deci, 2000). By contrast, Diener et al (1998) who adopted the hedonic viewpoint argued that Ryff and Singer’s eudaimonic criteria lets experts define well-being, whereas SWB research allows people to tell researchers what makes their life good. What is most clear from this clash of paradigms is that these different definitions of human wellbeing have led to quite different types of inquiry concerning the causes, consequences, and dynamics of well-being. This theoretical issue may cause a distraction in an effort to develop the interventions to enhance an individual's FWB in practice.

The purpose of this study is to attempt to respond to the research inquiry on the knowledge of the factors that promote individual wellbeing, particularly FWB (Ryan and Deci, 2000). Responding to these research inquiries, this thesis embraces the hedonic and eudaimonic conceptions of wellbeing in the context of FWB. The origin of the hedonic view of wellbeing is in a larger construct of subjective wellbeing (SWB) which contains life satisfaction and happiness. By contrast, the eudaimonic viewpoint focuses on psychological wellbeing (Ryan and Deci, 2000). This study has adapted these two traditions to construct two components of FWB, Perceived FWB and financial needs satisfaction, to investigate their determinants. Perceived FWB represents the hedonic view while financial needs satisfaction embodies the eudaimonic viewpoint. This study borrows and extends Maslow’s human needs theory (1943) to develop the construct of financial needs satisfaction following the eudaimonic viewpoint in the context of FWB.
By examining the determinants of Perceived FWB and financial needs satisfaction and understanding how significant they are, the findings hope to inform FWB promoters what to focus the resources on while designing the intervention programmes. The findings seek to point the way toward means through which individuals can seek hedonic or eudaimonic outcomes for their FWB to attain fully functioning and life satisfaction (Ryan and Deci, 2000).

This study found that financial capacity is the key determinant of both Perceived FWB and financial needs satisfaction whilst financial attitudes, perceived financial capability, financial behaviour and subjective financial literacy have smaller and less robust direct effects on FWB. The role of financial capacity is so significant that it can play as a mediator in the relationship between all other variables and both Perceived FWB and financial needs satisfaction. This result indicates that having more money or resources is what matters most for a person’s FWB. Furthermore, financial capacity and financial behaviour are the only two variables that have a significant relationship with both Perceived FWB and financial needs satisfaction. Other variables have a significant relationship with either Perceived FWB or financial needs satisfaction. These findings imply that the hedonic and eudaimonic conceptions of wellbeing can be overlapping with shared determinants whilst also having their characteristics influenced by different determinants. It seems that Perceived FWB is a more multifaceted concept than financial needs satisfaction with more determinants that may influence the outcome. However, as financial capacity is the dominant influential factor of both components of FWB, it is likely that an intervention that can increase an individual’s financial capacity can somewhat enhance both Perceived FWB and financial needs satisfaction. Otherwise, financial attitudes, perceived financial capability, financial behaviour are the next inline to be targeted.

This thesis contributes to knowledge in a number of areas in relation to theory and practice which will be discussed in the following sections.
1.4.1 Contribution to Theory

1.4.1.1 The Contribution to Theory of Financial Wellbeing

The first contribution to theory of FWB can be summarised in Figure I-1. The figure is in two parts and demonstrates how the results from this study suggest a granular model that shows the determining factors of two components of FWB. It is a combination of Error! Reference source not found. in the literature review chapter and Figure VI-1 in the findings chapter.

The first part of the figure covers the theoretical insights and assumptions of the relationship between FWB and its two components of Perceived FWB and financial needs satisfaction with other associated variables, such as perceived financial capability, financial attitudes, capacity, behaviours, and subjective financial literacy. This part constructs a research model based on the literature review which establishes a relationship between FWB, its components and the key variables, such as perceived financial capability, financial attitudes, capacity, behaviours, and subjective financial literacy. The relationships between these variables with FWB and its components are either theoretically or empirically anticipated in the literature review. However, the role of these variables in relation to FWB and its components is not included in the literature.

By contrast, the second part of the figure shows what has been found in respect of the role of these variables in relation to FWB and its two components. The findings
shed light on which are the most and the least significant determinants of FWB and its components.

The contribution of this study to theory of FWB can be classified in two aspects:

(1) Providing empirical evidence for what is found in the literature review

- Perceived FWB and financial needs satisfaction were found to be significantly and positively correlated with other associated variables such as perceived financial capability, financial attitudes, capacity, behaviours, and subjective financial literacy (see correlations of key variables in

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>PFWB</th>
<th>FNSI</th>
<th>PFC</th>
<th>SFL</th>
<th>FB</th>
<th>FC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFWB</td>
<td>344</td>
<td>56</td>
<td>1</td>
<td>57</td>
<td>37.43</td>
<td>13.44</td>
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<tr>
<td>FNSI</td>
<td>284</td>
<td>411</td>
<td>9</td>
<td>420</td>
<td>171.5</td>
<td>73.54</td>
<td>.379**</td>
<td></td>
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<tr>
<td>PFC</td>
<td>356</td>
<td>16</td>
<td>3</td>
<td>19</td>
<td>11.4</td>
<td>3.94</td>
<td>.467**</td>
<td>.276**</td>
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<tr>
<td>SFL</td>
<td>356</td>
<td>75</td>
<td>5</td>
<td>80</td>
<td>32.19</td>
<td>16.88</td>
<td>.299**</td>
<td>.339**</td>
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<tr>
<td>FB</td>
<td>334</td>
<td>51</td>
<td>3</td>
<td>54</td>
<td>29.14</td>
<td>10.61</td>
<td>.406**</td>
<td>.350**</td>
<td>.488**</td>
<td>.564**</td>
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<tr>
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<td>.444**</td>
<td>.531**</td>
<td>.405**</td>
<td>.497**</td>
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<tr>
<td>FA</td>
<td>320</td>
<td>69</td>
<td>2</td>
<td>71</td>
<td>46.35</td>
<td>9.8</td>
<td>.457**</td>
<td>.237**</td>
<td>.587**</td>
<td>.477**</td>
<td>.502**</td>
<td>.485**</td>
</tr>
</tbody>
</table>

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

- Table V-28). This result endorsed the research model proposed in Error! Reference source not found. and an overview of literature presented in chapter III.

- This study found ‘being in control’ was the key factor of financial attitudes that determine Perceived FWB. This result is in line with the finding from a previous study carried out by Vlaev and Elliott (2014) but this study adapted different measures of FWB and carried out research on a different population. Therefore, any intervention that focuses on FWB should consider enhancing individual attitudes of ‘being in control’.
This study found that subjective financial literacy is one of the significant determinants of financial needs satisfaction which is a part of financial satisfaction. This finding is in line with a previous study which found that subjective financial literacy contributes positively to financial satisfaction (Xiao and Porto, 2017; Xiao et al., 2014).

On the other hand, subjective financial literacy was found to be the least significant determinant of Perceived FWB, and thus should not be seen as the ultimate measure of success for financial literacy interventions as proposed in literature (CFPB, 2015a). It has been argued that financial literacy training enhances FWB (Osteen et al., 2007). The finding of this study implies that subjective financial literacy might enhance financial needs satisfaction but not so much with Perceived FWB which has multi-dimensional constructs of perception relating to financial status (Xiao and Porto, 2017). The result of this study supports the finding from a previous study carried out by Xiao et al. (2014), who also found that subjective financial literacy contributes positively to financial satisfaction.

(2) Offering new findings

This study finds that perceived financial capability, financial attitudes, capacity, behaviours, and subjective financial literacy do not have similar significant roles on determining Perceived FWB and financial needs satisfaction. This is a new finding, as previous studies did not clarify the links between the five variables – perceived financial capability, financial attitudes, capacity, behaviours, and subjective financial literacy (in any particular order) – in respect of their role in contributing to FWB. Prior to this study, it was unclear which among the five variables play more significant roles in relation to FWB and which of these should be targeted in FWB interventions.

Among these five variables, financial capacity was the key determinant of both Perceived FWB and financial needs satisfaction. By contrast, two key determinants of Perceived FWB are financial attitudes and perceived financial capability. In addition, subjective financial literacy was found to be less important determinant exploratory factor of financial needs satisfaction.

In addition, this study discovered a special relationship between financial behaviour and capacity. Financial behaviour appears as one of the key
predictors of financial needs satisfaction when excluding financial capacity in a stepwise multiple regression. This finding indicates that financial capacity might be able to reflect an individual’s financial behaviour.

- Another key finding is that financial behaviours do not play a significant role as financial attitudes, capacity, and perceived financial capability in determining FWB. This was an unexpected finding, given that in the literature review financial behaviour is identified by certain authors as the core determinant of FWB (e.g. Brüggen et al., 2017; Zemtsov and Osipova, 2015; Bagwell et al., 2014; Gerrans et al., 2014; Lyons et al., 2008). FWB is an outcome of financial behaviours, and desirable financial behaviour is considered as one of the key elements in promoting FWB (Bagwell et al., 2014; Kim, 2000).

- A further contribution is that the ‘saving and investment behaviours’ factor was found to be the key factor of financial behaviours that determined financial needs satisfaction. This may shed light on the relationship between financial behaviours and financial capacity (discussed above), as saving and investment behaviours reflect the financial capacity of people that have extra money to satisfy their financial security needs (e.g. save or invest money) on top of their daily financial commitments and obligations (e.g. living expenses, bills).

- Perceived FWB and financial needs satisfaction represent the two conceptions of wellbeing, hedonic and eudaimonic. Another contribution to theory is finding that the key determinants of two components of Perceived FWB and financial needs satisfaction are not the same, but they have some mutual determinants such as financial capacity and financial behaviour. Perceived financial capability and financial attitudes do not contribute a significant role in shaping financial needs satisfaction. By contrast, subjective financial literacy is not a significant determinant of Perceived FWB. This emphasises the complexity of FWB and its components. This has implications for the intervention strategies such as targeting specific driving factors in order to influence different components of FWB.

- The final contribution to theory is that financial behaviours and financial needs satisfaction are somewhat hierarchical and correlated.

1.4.1.2 The Contribution to Theory of Financial Needs
Following previous studies (Kiymaz and Öztürk, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994), this study adapts Maslow's human needs framework (1943, 1954) to draw insights into financial needs and expand the concept of financial needs satisfaction. This concept of financial needs satisfaction is rooted in eudaimonic viewpoints of human wellbeing and the concept of FWB from various authors such as Salinac et al. (2019), Brüggen et al. (2017), CFPB (2015a), and Vlaev and Elliott (2014). By adapting Maslow's theory to explore one type of human needs, this research makes a contribution to the theory of financial needs and financial needs satisfaction, which is summarised in Figure VII-2 and Figure VII-1. These figures mirror theoretical frameworks based on the literature on human needs (Ng and Diener, 2014; Howell et al., 2013; Xiao and Noring, 1994; Maslow, 1943) and the findings of this study.

The findings of this study suggest a hierarchy of financial needs when attempting to fit the different groups of financial needs into the hierarchy of Maslow's human needs framework. The literature identifies five levels, but this study concentrates on four levels — although the evidence is not conclusive as it does not show a clear distinction between two levels: finance for existence (the first and lowest level) and finance for security (the second level). This study has found a presence of both these lower and higher levels of financial needs among participants. These two levels are placed in one category of the hierarchy of financial needs satisfaction: ‘finance for existence and finance for security’.

- To some extent, the categorisations of financial needs echoes the way many people think about keeping money in ‘pots’ for different purposes, and the government also encourages people to plan daily and ahead for financial security (Atkinson et al., 2006). Elliot et al.’s study (2014) shows that planning ahead or keeping money in pots for different purposes is a statistically significant factor of FWB. The authors found the practice of using different pots as a strategy for managing money appeared to increase financial satisfaction (Vlaev and Elliott, 2014). People establish goals for pots, such as planning for a rainy day or emergency fund.

- In the literature, financial freedom is considered as the top level of FWB (Brüggen et al., 2017). Applying to the theoretical financial needs hierarchy in
This study, financial freedom is hypothesised to be at the same level with "self-actualisation", a top-level in Maslow’s human needs hierarchy (1943). However, the finding from data analysis suggested that financial freedom is not at the top of the hierarchy of financial needs satisfaction. In fact, financial freedom is found to be part of the second level of the hierarchy, ‘finances for security’ as shown in the factor analysis of the satisfaction of financial needs (see Table V-7 Error! Reference source not found.). This finding indicates that it is fundamental for the participants to have lower levels of financial needs satisfied in order to perceive financial freedom. In other words, participants in this study may perceive having financial security as achieving financial freedom.

Another contribution of this study to theory relates to the concept of FWB, which focuses on consumers' lifestyle, needs, and ability to meet their needs and wants (Brüggen et al., 2017; CFPB, 2015a). The concept of human needs, such as Maslow’s hierarchy of needs (1943, 1954), should be applied to the study of FWB in order to understand consumer behaviour, such as spending, shopping around, and saving, as well as their sense of satisfaction in relation to their financial circumstances.

It is important to put these contributions in context, in particular noting the characteristics of the participants. They have chosen to engage with online financial education. The participants are demographically diverse. As active learners, this group should be targeted when designing financial education and other FWB interventions. Furthermore, it is beneficial that future research expands this study to examine other populations to measure against the findings in this study.

1.4.2 Contribution to Practice

This section discusses the implications for personal finance practice of this research. It explains how the findings in the theory of FWB and needs satisfaction might be useful to interventions to promote FWB.

Based on the understanding of key determinants of FWB in this study, it is suggested that an integration of interventions is required to handle the multiple factors that control Perceived FWB and financial needs satisfaction. The key question for designing interventions relates to which factors beyond financial
capacity could be affected by the interventions? Whilst financial capacity appears to be the main determinant of FWB, it is debatable whether it can be altered through financial capability interventions. Consequently, other factors should be targeted by the interventions. For example, financial attitude and perceived financial capability should be targeted in any intervention to promote Perceived FWB. Whilst financial behaviour and subjective financial literacy should be targeted to enhance financial needs satisfaction.

This study found that the advanced level of financial security, which involves in planning ahead for the future (e.g. saving for rainy days, major expenses, pensions), is in the same category with ‘financial freedom’ in the hierarchy of financial needs satisfaction. The finding reflects the current focus of the UK government in encouraging people to plan ahead in terms of their immediate and long term financial security (Atkinson et al., 2006). The results imply that participants in this study have financial needs which is reflected in them having money ‘pots’ for different purposes. Establishing and utilising these pots helps to assure confidence in their financial position. Therefore, it is good practice to encourage people to think of keeping their money in ‘pots’ for different purposes (Elliott et al., 2010) but it is also important to help people achieve this to enhance their FWB. Otherwise, not being able to do so, might have a negative impact on their financial needs satisfaction or wellbeing. This is because when people know they need money to fill these ‘pots’ but cannot, it becomes an unfulfilled need. Therefore, those who run programmes to promote financial capability and wellbeing need to consider this side effects when encouraging good financial practice. The programmes should offer solutions on how people in different financial circumstances can apply the knowledge to practice so that they can achieve the satisfaction of fulfilling their financial needs.

This study offers examples on how financial knowledge might be useful to develop the interventions to promote FWB. Two examples are discussed in this study: online financial education and social marketing. This thesis provides a case study of the FWB of learners in online financial education. Insight is provided in relation to a specific population who have been actively seeking help from online financial education to manage their personal finance in order to potentially achieve better
outcomes for their FWB. Online tools are useful to tackle issues among a wide range of people. However, there are limitations to what online financial education can offer. For instance, this study found subjective financial literacy can enhance financial needs satisfaction. This indicates that online financial education might be able to be used to enhance financial needs satisfaction, a component of FWB. However, the impact that online financial education might have on financial capacity, attitude, behaviour, and perceived financial capability (which collectively) determine Perceived FWB might be limited. This gap of knowledge is for future studies to explore how to use online financial education as a part of the solution for tackling the issues with financial capacity, attitude, behaviour, and perceived financial capability. One of these solutions is social marketing which could focus on tackling financial behaviour change.

An application of this study for social marketing lies in the use of online financial education. This study suggest that social marking should extend the central focus from financial behaviour change to financial attitude and other variables, such as financial capacity and perceived financial capability. Furthermore, online learners in financial education can potentially be targeted audiences for social marketing to intervene in relation to their FWB. Offering free financial education such as the Managing My Money (MMM) course could attract people who are in need of help to voluntarily sign up to improve their financial literacy. This is a good opportunity to intervene and engage with them, as they are actively seeking advice. Free financial education attracts target audiences who might have different financial issues and may need financial literacy at different levels. This is also a good opportunity for the organiser to study targeted audiences to understand their needs and to develop follow-up intervention programmes. These follow-up intervention programmes might go beyond financial education using a mix of tools such as partnership-based approaches to meet different needs of support for participants to enhance their financial capability and wellbeing.

Finally, it should be noted that there are limitations to what any intervention can do to enhance individual financial capacity, income, living standards and other social factors. To create an impact on the material circumstances of those seeking
financial advice, the interventions also require the participation of policy makers to create a strong and large impact at community level.

### 1.5 The Case Study

#### 1.5.1 The Managing My Money Course

The Managing My Money (MMM) course has been chosen for the case study. The course is a form of online education or e-learning where all steps are online. The coursework is completed in the online environment and face-to-face meetings are not required (Mays, 2016). The term ‘e-learning’ refers to online education and web-based training (Oye et al., 2010). The MMM course uses information and communication technology for the teaching of educators and learners.

The organisers designed the MMM course to educate people, giving them knowledge and skills in managing their personal finance (Future Learn, 2018). The MMM course is run on two online learning platforms at the Open University – FutureLearn and OpenLearn – with different features. On the FutureLearn platform, the MMM is an eight-week course that runs with the support from mentors. Learners can engage with mentors and other learners through an online discussion platform. Whilst on OpenLearn, the MMM course is continuously available and without the support of mentors. The participants can complete the course at their own pace. There are seven major steps that are run over 8 weeks: (1) financial planning; (2) household budgeting; (3) consumer credit and borrowing; (4) mortgages/home loans; (5) saving; (6) pensions; and (7) insurance. These steps are designed to support and encourage changes to unhealthy behaviours, such as over-borrowing, over-spending, under-saving, a lack of forward planning, and irrational choices in relation to financial products. The course provides a certificate for learners who complete the course.

This course was produced by The True Potential Centre for the Public Understanding of Finance (PUFin). The MMM course is one of the free educational programmes founded by a collaboration between The Open University Business School and True Potential.
1.5.2 Why “Managing My Money” Course?

The MMM course has been chosen for the following reasons:

- Firstly, this course is designed to support people in managing their finance. Therefore, it is a good case study to examine learners' wellbeing and its influential factors.
- Secondly, e-learning has rapidly become a popular learning approach, in particular in higher educational institutions thanks to the rapid growth of internet technology (Saleem and Rasheed, 2014). E-learning has been found to have an impact on improving a learner’s performance or GPA (Rogers, 2008). However, there is limited research on online learners’ FWB. Therefore, this field is fruitful for further study.
- Thirdly, this study adopts a quantitative approach, so the availability of a large sample size (at least in respect of the pre-study survey) is another good reason to choose the MMM course.
- Lastly, as this study is sponsored by PUFin, gaining access to the sample is an advantage in implementing this study.

1.6 Conclusions

This chapter presents an introduction to the thesis, setting out the purposes of the study, the research strategies, and the research questions. The gaps in knowledge about FWB theory are explored and the need for further understanding of the determinants of FWB explained.

This thesis has eight chapters that include: (1) Introduction; (2) Literature Review; (3) Research Frameworks, (4) Methodology, (5) Data Analysis, (6) Findings (7) Discussions and Implications, and (8) Conclusions. The conclusions are summarised as follows:

- Chapter 2 – Literature Review – explores the terminologies, theories, and empirical studies on FWB, financial capability, literacy, behaviour, capacity, and attitudes. It also examines the limitations of previous studies, and then suggests research questions and related hypotheses to be tested in this study.
Chapter 3 – Research Frameworks – proposes two research frameworks to explore: a theoretical framework of a financial needs hierarchy and a FWB conceptual framework, based on the findings from the literature review.

Chapter 4 – Methodology – discusses the research approach, the research, and data collection methods, and the design of the questionnaires.

Chapter 5 – Data Analysis – presents the data collected and key data analysis to test hypotheses.

Chapter 6 – Findings – interprets the findings from its analysis. It also sets out the key findings from this study.

Chapter 7 – Discussions and Implications – explores some key findings and how they compare with earlier research set out in the literature review. The chapter also sets out the research limitations and recommendations of the study.

The final chapter – Conclusions – summarises this research and makes suggestions about possible future research.

II. LITERATURE REVIEW CHAPTER

2.1 Introduction

The focus of this study is FWB, its components, and determinants. This chapter reviews the literature of FWB and its frameworks that are most relevant to this thesis. As a result of the review, this chapter justifies the choices of FWB conceptualisation, its components and determinants with measurements to explore further in this empirical study.

In the literature review, the two components of FWB are defined as Perceived FWB and financial needs satisfaction. Furthermore, based on the literature, this chapter also conceptualises the determinants of FWB, which are financial capability and its four components, including financial capacity, financial behaviour, financial literacy, and financial attitude. The review of the literature explores how these variables are defined and measured in previous studies.
The central theme of this thesis is to understand FWB and its determinants within the context of online financial education. As this study aims to inform FWB intervention programmes, this chapter explores the financial capability interventions that make use of financial education to enhance FWB. Financial education is not the focus of this research, but the review of financial education explains the context of this study.

The structure of this chapter can be summarised as follows (see Figure II-1):

(2.2) The chapter draws attention to FWB and the interventions to improve such wellbeing. The complexity of FWB definitions are explored and the different approaches to measure it. The framework of FWB in the literature is reviewed to explain why research into FWB is important for informing educational intervention programmes. Gaps in the literature are identified, and a proposed concept of FWB is justified, with its two subjective components, which are investigated later in this study. These two subjective components of FWB are conceptualised – Perceived FWB and financial satisfaction – together with the theories underpinning them and the methods that can be used to measure them. Human needs theory is examined as an underpinning theory of financial needs satisfaction, and it is explained why financial needs satisfaction is considered as a component of FWB in this study.

(2.3) An overview of determinants in previous studies is offered. Financial capability is endorsed as one of key determinants of FWB in various studies. Then, the associations between financial capability and FWB are reviewed to explain why financial capability and its components are considered as determinants of FWB. In so doing, financial capability is conceptualised with a focus on four components: financial capacity, behaviour, literacy, and attitude, to be investigated in this study. Then the four components of financial capability are explored in-depth in relation to their definitions and how they are measured. The relationship between each component of financial capability with FWB is also clarified to understand how they determine FWB. Furthermore, this section explores the relationships between these four components to comprehend how the variables combine
to determine FWB. This provides an explanation of why previous studies and interventions in FWB have investigated these variables together.

(2.4) Financial capability interventions are explored to understand how they have been used to enhance FWB. Financial education is a key tool of financial capability interventions to promote FWB. The gap in the research on FWB is identified in the context of online financial education. Examining the knowledge gap explains why investigating FWB among online financial education learners has been chosen for this study.

(2.5) The chapter summarises the key findings of the literature review.

2.2 Financial Wellbeing Frameworks

This section examines the literature to understand what FWB is and explain why it is important to do research on FWB. Accordingly, the concepts and frameworks of FWB are explored. After reviewing the literature, the selection of FWB conceptualisation and its two components – subjective wellbeing and financial needs satisfaction – are then rationalised.
2.2.1 What Is Financial Wellbeing?

There are two main approaches to assess the state of household finances (Bialowolski et al., 2021). The first approach focuses on the positive perspective by examining financial well-being, financial wellness and financial capability (Bialowolski et al., 2021; Białowolski and Węziak-Białowolska 2014; Brüggen et al. 2017; Gerrans et al. 2014; Joo 2008; Prawitz et al. 2006). The second approach emphasises the negative aspects such as financial stress, financial distress, financial fragility, financial hardship, or financial vulnerability (Bialowolski et al., 2021; Anderloni et al., 2012; Brunetti et al., 2012; Lusardi et al., 2011; Worthington, 2006). Similarly, when measuring the construct of FWB, there are positive and negative labels that have been used to capture this concept in the literature. For example, perceived FWB, perceived economic wellbeing, financial satisfaction, and financial wellness are positive labels; whilst financial stress and financial strain are negative labels (Netemeyer et. al., 2018; Gerrans et al., 2014; Prawitz et al., 2006).

Different approaches in the literature have been used to capture the multidimensional concept of FWB. These approaches are rooted in different theories and disciplines and can be categorised into four major themes as seen in Table II-1:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personal characteristics and attributes (Kim, et al., 2003; Kim, 2000; Porter and Garman, 1992);</td>
</tr>
<tr>
<td>2</td>
<td>Financial behaviour and financial knowledge (Brüggen et al., 2017; Zemtsov and Osipova, 2015; Gerrans et al., 2014);</td>
</tr>
<tr>
<td>3</td>
<td>Individual perception of the current financial situation (Vosloo et al., 2014; Kim et al., 2003);</td>
</tr>
<tr>
<td>4</td>
<td>The current and future financial situation with the ability to meet human needs and wants (Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014).</td>
</tr>
</tbody>
</table>

*Table II-1: Four major themes of financial wellbeing in the literature*
This section reviews the above approaches and highlights the disagreements and overlapping concepts of FWB. This process is not going to identify a ‘perfect’ definition but is used to justify the research approach adopted in this thesis. This is seen to be the most relevant approach for the context of this study. This study also develops a concept of FWB based on the findings of the research at the end of this process. It is worth to clarify some terms are used interchangeably in this study while discussing drivers and determinants or components and elements of FWB. According to the Cambridge dictionary driver is “something that makes other things progress, develop, or grow stronger” (Cambridge Dictionary, n.d) while a determinant is “something that controls or affects what happens in a particular situation”. The terms “driver” and “determinant” are often used interchangeably in research. A determinant is an independent variable or a factor that influences, controls or affects a dependent variable (Joo and Grable, 2004). These terms describe independent variable(s) that has/have a relative impact on a dependent variable (Vlaev and Elliott, 2014). This impact is not necessarily a causal relationship. Likewise, Cambridge dictionary defines an element as “a part of something” or “one of the parts of something that makes it work, or a quality that makes someone or something effective” while a component is “a part that combines with other parts to form something bigger” (Cambridge Dictionary, n.d). In research, component is part of the definition of a variable (Brüggen et al., 2017) and also are often used interchangeably (Dolan et al., 2012).

The concept of FWB might initially be defined simply as individual happiness or satisfaction with the financial situation (Porter and Garman, 1993). However, the multifaceted aspects that define individual FWB have been developed in accordance with the four themes set out above. These aspects are set out below:

(1) The first theme of FWB focuses on personal characteristics and attributes. In this category, Porter and Garman (1992) and Kim et al. (2003) consider the influence of personal characteristics on FWB. Porter and Garman (1992, p.135) describe FWB as “a function of personal characteristics, objective attributes, perceived attributes, and evaluated attributes of the financial domain”. This concept was then extended by Kim et al. (2003, p. 76) with the addition of
financial behaviours: “A function of individual characteristics, financial behaviours, and financial stressor events”.

(2) The second theme places financial behaviour at the centre of its framework with an addition of other key elements, such as financial knowledge, and financial attitude (Brüggen et al., 2017; Zemtsov and Osipova, 2015; Gerrans et al., 2014). These concepts often describe FWB as an outcome of financial behaviours, or it is defined by financial behaviour (Kim, 2000). Gerrans et al. (2014) also considers financial behaviour to be the determining factor in the concept of FWB with the inclusion of financial satisfaction, objective status, and subjective perception. At the centre of their model, Zemtsov and Osipova (2015) introduce a new perspective using human capital to define FWB and financial behaviour. Human capital is defined as “a set of knowledge, skills and experience of the person, his character, personal qualities” (Zemtsov and Osipova, 2015, p. 388). They identify the basic assets (i.e. physical health, human and social capital) and other elements of personal finance (i.e. financial literacy and knowledge, financial attitudes, financial management, and financial behaviour) that produce income and financial capital that result in FWB.

(3) In the third theme, FWB is conceptualised as an individual’s perception of their financial situation (Kim et al., 2003). FWB is defined in terms of objective and subjective aspects that contribute to a person’s assessment of his/her current financial situation (Vosloo, et al., 2014, p.1457). Vosloo et al. (2014) focus on the current financial situation rather than the future financial situation.

(4) The fourth theme goes a step further than the previous one by anticipating the current and future financial situation with a focus on living standards and enjoyment in life. This is explored by various authors such as Salignac et al. (2019), Brüggen et al. (2017), CFPB (2015a), and Vlaev and Elliott (2014). This fourth category stresses the role of financial satisfaction as an important driver of FWB. This is in line with Campbell et al. (1976) who suggest that financial needs satisfaction is a part of FWB.
CFPB (2015a, p.18) describes FWB as “a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and is able to make choices that allow enjoyment of life”. This concept of FWB takes into account the consumer’s perspective with consumption demands needing to be satisfied. Similarly, based on CFPB’s (2015a) concept, a recent concept of FWB has been introduced by Salignac et al. (2019) which places an emphasis on the ability to control finances. Salignac et al. (2019, p.16) describe FWB as “when a person is able to meet expenses and has some money left over, is in control of their finances and feels financially secure, now and in the future”. It is believed that people perceive FWB when they have a sense of material security such as feeling satisfied with their income and savings (Strumpel, 1976).

To some extent the concept of FWB proposed by Salignac et al. (2019) includes similar elements to Vlaev and Elliott's concept (2014), and the model set out by CFPB (2015a), such as: (1) the ability to meet expenses and having some money left over; (2) being in control, and (3) feeling financially secure. Feeling financially secure is comprised of two sub-dimensions: (a) having limited financial worries in the present and for the future, and (b) how satisfied one feels about their financial situation. Furthermore, these authors agree the important role of ‘being in control’ of finances and the ability to meet human needs and wants as drivers of individual FWB (Salignac et al., 2019; CFPB, 2015a; Vlaev and Elliott, 2014).

The concept of FWB introduced by Brüggen et al. (2017) is similar to Vlaev and Elliott (2014) and Salignac et al., (2019) with an addition of financial freedom and FWB interventions. The additional element of financial freedom to make choices to enjoy life is similar to CFPB’s (2015a) concept. Likewise, the main difference between Brüggen et al. (2017) with the above concepts (Salignac et al., 2019; CFPB, 2015a; Vlaev and Elliott, 2014) is an inclusion of FWB interventions. Brüggen et al. (2017) expands the concept of FWB by placing attention on FWB interventions. Salignac et al.’s conceptual model of FWB (2019) clarifies the influencing factors of FWB. However, their model does not include FWB interventions.
Brüggen et al., 2017 (p. 229) define FWB as ‘the perception of being able to sustain a current and anticipated desired living standard and financial freedom’. Their FWB framework includes contextual and personal factors, financial behaviour, consequences of FWB, and interventions (Brüggen et al., 2017). Financial behaviour is again at the heart of this model in which Brüggen et al. (2017) argue it has a direct impact on FWB. The model also shows how contextual and personal factors can influence FWB (see Figure II-2). This model covers the multifaceted factors that influence FWB, but it does not take into account individual financial needs and how satisfaction of financial needs determines individual FWB.

<table>
<thead>
<tr>
<th>Contextual Factors</th>
<th>Financial Behaviour</th>
<th>Consequences of Financial Wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Factors</td>
<td>Breaking financially destructive behaviors and habits</td>
<td>- Quality of life/happiness</td>
</tr>
<tr>
<td>(e.g. economic development, economic growth rates, level of employment, interest rates, inflation rates)</td>
<td>- Stimulating financially sound behavior</td>
<td>- General wellbeing and mental health</td>
</tr>
<tr>
<td>Legal Factors</td>
<td>- Stabilizing critical/vulnerable life situations</td>
<td>- Interpersonal relationship quality</td>
</tr>
<tr>
<td>(e.g. consumer protection)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Factors</td>
<td></td>
<td>Organizational:</td>
</tr>
<tr>
<td>(e.g. political stability, tax policies)</td>
<td></td>
<td>- Reputation/trademark</td>
</tr>
<tr>
<td>Socio-Cultural Factors</td>
<td></td>
<td>Societal:</td>
</tr>
<tr>
<td>(e.g. culture, demographic distribution, population growth)</td>
<td></td>
<td>- Welfare, economic growth</td>
</tr>
<tr>
<td>Technological Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g. level of digitalisation, state of technology)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g. available/accessible financial solutions, support and advice, marketing/communications/sales efforts)</td>
<td></td>
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</tr>
</tbody>
</table>

**Figure II-2: FWB framework (Brüggen et al., 2017, p. 231)**

Having examined various concepts and definitions of FWB in four categories, a complexity and overlapping can be seen. An example of overlapping is that both category 1 (personal characteristics and attributes) and category 2 (financial behaviour and knowledge orientation) include a behavioural aspect in the FWB concept. The four categories of definitions of FWB show its development and its complexity. The first category shows the focus on personal factors in defining FWB, such as personal characteristics and attributes (Porter and Garman, 1992; Kim et al., 2003). Subsequent additions to the frameworks, show that the personal factors are expanded to personal financial knowledge and practice, such as behaviour,
financial knowledge, and financial attitude, with financial behaviour being considered the most important driving factor of FWB (Brüggen et al., 2017; Zemtsov and Osipova, 2015; Gerrans et al., 2014).

While there has been much development in the concepts of FWB, an individual's perception of their financial situation is an important element in conceptualising FWB. The concept of FWB has been initially perceived as simple individual happiness or satisfaction with the financial situation (Porter and Garman, 1993). Vosloo et al. (2014) suggest that the individual's assessment of their current financial situation defines their FWB with a focus on the present. Other authors take a step further to include the individual's perception of their future financial situation, taking into account living standards and enjoyment in life (Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014).

Among these concepts of FWB, the FWB theory proposed by Brüggen et al. (2017) appears to be the most relevant approach to this study. Firstly, it covers all comprehensive aspects of FWB personal factors (category 1 and 2) and includes personal perception of the current and future financial situation, along with elements of living standards and enjoyment in life (category 3 and 4) as discussed in the four categories above. Secondly, only Brüggen et al. (2017) include FWB interventions in their FWB framework. The elements of FWB interventions in their model (see Figure II-2), such as financial education, make it relevant to the context of this study, online financial education. Since the aim of this study is to inform FWB intervention, Brüggen et al.’s FWB framework (2017) has been adopted to further explore the research topic.

However, Brüggen et al.’s theoretical framework (2017) has not been tested empirically. Furthermore, the framework does not offer an underpinning theory to measure the elements of desired living standards and financial freedom. Therefore, the next section is going to examine why FWB matters and how the concepts of FWB are measured in previous studies. The section also examines an approach that is useful in order to measure the elements of desired living standards and financial freedom in the FWB framework of Brüggen et al. (2017).
2.2.2 Why does Financial Wellbeing Matter?

Understanding FWB is important as it influences various crucial aspects of individual life, such as the quality of life, happiness, relationship quality, wellbeing, success, and physical and mental health (Hubler et al., 2016; Dunn and Mirzaei, 2012). FWB is a part of personal wellbeing which is a necessary condition of existence (Brüggen et al., 2017, p. 229; Guo et al., 2013). Personal wellbeing consists of psychological (emotional and mental), physical, social, and FWB (Zemtsov and Osipova, 2015). When many citizens have negative FWB, it has a largely negative impact on social development and welfare. For instance, people consume less or rely more on state benefits and support (Griggs et al., 2013; Sacks et al., 2012). High levels of financial stress have a negative impact on perceived FWB and health (Kim et al., 2003; Weisman, 2002).

Arber et al. (2014) conducted a study to investigate the relationship between income, Perceived FWB, and health in mid-life and later life in Britain. They found that both income and Perceived FWB are independently associated with health in mid-life. People who have lower incomes and greater subjective financial difficulties tend to have 'less than good' health. The study indicates that in later life, there is an association between Perceived FWB and health.

FWB has been widely studied in various disciplines, such as human behaviour, economics, financial counselling and planning, psychology, consumer decision making, and services marketing. However, there is no universally agreed definition, conceptualisation, components of measurement (Brüggen et al., 2017). In the United States, the Consumer Financial Protection Bureau (CFPB) claim that from the consumer perspective, FWB has not been well defined (CFPB, 2015). Therefore, this study aims to explore the concept of FWB and its key determinants to inform the intervention programmes needed to create a positive impact on social development and welfare.

2.2.3 How to Measure Financial Wellbeing?
There are different methods to measure FWB. FWB can be measured objectively, subjectively, or by a mixture of these approaches. This section reviews these approaches to inform how to examine Brüggen et al.’s FWB framework (2017) with the focus on consumers’ lifestyle, needs, and the ability to meet their needs and wants. The differences in definition of FWB result from variations in how FWB is measured and evaluated. In some studies, FWB has been distinguished as having objective and subjective attributes while other studies do not make such a distinction.

The different ways to measure the perceptions of FWB can be seen in the literature (Tenney and Kalenkoski, 2019). Perception of FWB is considered as a subjective measure of FWB (Tenney and Kalenkoski, 2019). Subjective measures are more closely related to financial satisfaction than FWB, since they involve personal perceptions of an individual financial condition (Tenney and Kalenkoski, 2019; Gerrans et al., 2014). For instance, Shim et al. (2009), cited in Salignac et al. (2019), include satisfaction with income, financial situation, and standards of living.

By contrast, objective measures quantify the perception of FWB using quantifiable measures (Tenney and Kalenkoski, 2019). Income, remuneration, and net worth are the most popular selected objective indicators (Brüggen et al., 2017; Gerrans et al., 2014; Vosloo et al., 2014; Kahneman and Deaton, 2010; Porter and Garman, 1992). Socioeconomic status, demographic characteristics, and consumption of durable goods are also considered as objective measures of FWB (Williams, 1985; Hefferan, 1982; Foster and Metzen, 1981). Other measures include the number of credit card accounts, financial ratios such as debt-to-income and total debt (Shim et al., 2009; Xiao et al., 2009; Kim, Garman and Sorhaindo, 2003; Weisman, 2002), the ability to pay bills on time (Bagwell et al., 2014), and level of savings (Salignac et al., 2019; Bagwell et al., 2014; Cummins, 2010).

It is important to measure both objective and subjective aspects of FWB (Xiao and Porto, 2017). Conceptualising FWB with objective and subjective elements can capture a more complete picture of people’s experiences (Gerrans et al., 2014; see Salignac et al., 2019). Objective FWB is often measured by income, debt, savings, and other wealth-related factors (Xiao and Porto, 2017, p. 807; Xiao, 2015).
However, measuring the amount of income alone does not capture the meaning of income to individuals, or measure how they feel about their financial condition or reaction to their situation (Prawitz et al., 2006; Mirowsky and Ross, 1999). Some people are on a low income, but they may not feel financially stressed as their experiences are influenced by different factors (Prawitz et al., 2006). Relating to financial planning, Tenney and Kalenkoski (2019) argue that there is a lack of alignment between objective measures and individual perceptions of FWB among older people. For instance, some people may perceive their financial situation positively, but objective measures would indicate otherwise. Other people may be overly concerned about their finances (Tenney and Kalenkoski, 2019, p. 231). Hence, these authors endorse the approach to measure both objective and subjective aspects in order to assess individual FWB.

Porter and Garman (1993) go a further step by including evaluated attributes to measure FWB. The authors argue that objective and subjective measures of the financial situation are not adequate to capture a sense of FWB. This is because they fail to understand how a person perceives the objective attributes of their financial situation which depend on their standards of comparison in relation to such things as aspirations, expectations, reference group levels, and past financial experiences (Porter and Garman, 1993, p. 137). Porter and Garman (1993) add evaluated attributes which adopt the theoretical ‘Model of Life Satisfaction’ from Campbell et al (1976). This model is incorporated in Porter and Garman’s conceptual model of FWB with four elements: objective attributes, perceived attributes, evaluated attributes, and FWB.

Reviewing various measures of FWB demonstrates a wide range of concepts. There are some overlapping features with these concepts and its measures. For example, income or net worth are objective indicators but are also used as subjective measures of subjective FWB by Porter and Garman (1993). The authors of Perceived Attributes of the Financial Domain Attribute (PAFDA) from Porter and Garman (1993) which include ‘perceived adequacy of family income’ and ‘perceived net worth’. Furthermore, perceiving the ability to make ends meet is an important component in measuring financial capability (FSA, 2006), which has been used by
some authors (Arber et al., 2014; Whelan and Maitre, 2013; Whelan et al., 2001) to measure subjective FWB.

In respect of this study, in order to capture the FWB framework of Brüggen et al.’s (2017), a subjective measure of FWB appears to be the most appropriate approach. This is because a subjective approach involves personal perceptions of individual financial conditions (Tenney and Kalenkoski, 2019; Gerrans et al., 2014). A subjective approach is useful to explore the personal perceptions of an individual’s current and future financial situation with elements of their living standards, enjoyment in life, and financial freedom, which are included in most recent definitions of FWB (Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014).

As a result, this study examines the relevant subjective components of FWB to capture the elements of living standards, enjoyment of life, and financial freedom. However, this is challenging because the existing subjective measures of FWB in the literature do not offer a solution as to how to capture these elements. This gap promotes the motivation to explore the concept from other disciplines, such as Maslow’s hierarchy of human needs (1954) in order to understand individual needs in relation to living standards, and what is required in order to perceive enjoyment of life and financial freedom. Exploring the satisfaction of financial needs can potentially shed some light on the undefined aspects of FWB that has been explored by various authors (Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014).

The following section explores two subjective components of FWB. The first component of general Perceived FWB focuses on positive and negative perceptions of their financial situation (Tay and Diener, 2011). The second component examines Maslow’s hierarchy of human needs (1954) to conceptualise the satisfaction of financial needs as a new approach to assess FWB. Using both components to identify the subjective aspects of FWB also contributes to the measurement of perceptions of FWB which are not clearly defined in the literature (Tenney and Kalenkoski, 2019).
2.2.4 Two Subjective Components of Financial Wellbeing in this Research

Research on human wellbeing had tended to fall into two traditions, based on what defines wellbeing (Ryan and Deci, 2000). This section explores two components of FWB – Perceived FWB and financial needs satisfaction following these two traditions in human wellbeing theory (Ryan and Deci, 2000) (see Figure II-3). The two traditions are the hedonic and eudaimonic viewpoints. The hedonic viewpoint focuses on subjective wellbeing in the form of happiness with three key elements of life satisfaction, the presence of positive mood, and the absence of negative mood (Ryan and Deci, 2000; Diener and Lucas, 1999; Rogers, 1963). By contrast, the eudaimonic viewpoint focuses on psychological wellbeing (Ryan and Deci, 2000). The eudaimonic viewpoint emphasises the fully functioning person with different elements or a set of wellness variables such as self-actualisation and vitality (Ryan and Deci, 2000) or happiness plus meaningfulness (Ryan and Deci, 2000; McGregor and Little; 1998), or a set of six dimensions including autonomy, personal growth, self-acceptance, life purpose, mastery, and positive relatedness (Ryan and Deci, 2000; Ryff, 1989a). These two approaches are reflected in the two components of FWB in this study. By using two views of wellbeing to capture the concept of FWB, this study hopes to understand the nature of FWB in different perspectives. The two components, Perceived FWB and financial needs satisfaction, are examined in order to explore new aspects that have not been fully addressed by the literature, such as living standards, enjoyment in life, and financial freedom (Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014). This examination will help to understand the determinants of the two components of FWB. The findings are expected to inform the interested parties regarding the factors that may influence individual FWB from different perspectives. The study of Perceived FWB focuses on the perception of financial circumstance as a whole while financial needs satisfaction pays close attention to human needs of consumption, living standards, financial security, and financial freedom.
2.2.4.1 Perceived Financial Wellbeing

The concept of subjective/perceived FWB is rooted in subjective wellbeing as part of human wellbeing theory (Nanda and Banerjee, 2021; Diener et al., 2009). According to Nanda and Banerjee (2021), the definitions and theoretical frameworks of FWB are rooted in two views of wellbeing. These are the hedonic and eudaimonic views. These two views are drawn from the positive psychology literature (Nanda and Banerjee, 2021). In the current study, the Perceived FWB component of FWB adopts Diener's hedonic view of SWB (Nanda and Banerjee, 2021) which evaluate a person’s feelings about their overall financial circumstances while the financial needs satisfaction component uses eudaimonic view. This section explores in-depth different concepts of subjective/perceived FWB.

The origin of the hedonic view of wellbeing is in a larger construct of subjective wellbeing (SWB) which contains life satisfaction and happiness. The concept of hedonic pleasure or happiness can trace back to the fourth century B.C with Aristippus, a Greek philosopher taught that ‘the goal of life is to experience the

Figure II-3: Two components of FWB are used in this study
maximum amount of pleasure, and that happiness is the totality of one’s hedonic moments’ (Ryan and Deci, 2000, p.143). Hedonic concept has been adopted in psychology. Hedonic psychologists described wellbeing in terms of pleasure versus pain and focused on how to maximise human happiness (Ryan and Deci, 2000).

Diener et al. (2009, p.187), cited in Nanda and Banerjee, 2021, defined SWB as “a person’s cognitive and affective evaluations of his or her life as a whole”. Whilst the subjective FWB focus on a person’s self-assessment of his/her disposition, attitude, belief, and behaviours related to money management (Nanda and Banerjee, 2021, p.1; Netemeyer et al., 2018; Brüggen et al., 2017). Diener’s wellbeing conceptualisation is considered the hedonic view of SWB (Nanda and Banerjee, 2021; Diener et al., 2009). The concept of financial satisfaction and the Consumer Financial Protection Bureau’s FWB concept, are rooted in Diener’s hedonic view of SWB (Nanda and Banerjee, 2021).

Perceived FWB encapsulates a broad concept of happiness or wellbeing. It is defined by different facets such as life satisfaction (a cognitive, global evaluation of individual life), domain satisfaction with an addition of an affective component represented by positive affect and low negative affect (Ng and Diener, 2014, p. 326; Diener et al., 1999). Subjective or perceived FWB consists of: (1) having positive feelings and (2) not having negative feelings with overall financial circumstances (Strumpel, 1976; Porter and Garman, 1993; Shim et al., 2009, Vlaev and Elliott, 2014). Previous studies that assessed subjective wellbeing examined both positive and negative feelings (Tay and Diener, 2011), such as how frequently a person worries about money and how positive they feel about their current and future financial situation (Bagwell et al., 2014). In addition, two sub-dimensions have been used to measure perception of financial security: (a) having limited financial worry, and (b) satisfaction with the financial situation (Salignac et al., 2019).

The measure of Perceived FWB is complicated by intangible and personal components. There are three approaches to measure Perceived FWB as set out below.

*Approach one: Perceptions and Evaluations of Financial Status*
The first approach focuses on perceptions and evaluations of financial status (Xiao and Porto, 2017, p. 807; Xiao, 2015; Porter and Garman, 1993). Perceived attributes are value-related indicators of the objective attributes such as the satisfaction with the standard of living, savings, and investments (Porter and Garman, 1993). By contrast, evaluated attributes are an individual's self-assessment of their financial attributes such as expectations, aspirations, reference group levels, or their past financial experiences (Porter and Garman, 1993). Some major measures of the first approach can be summarised as follows:

- Perceived economic wellbeing is predicted by satisfaction with resources and with the standard of living (Walson and Fitzsimmons, 1993). Financial satisfaction can be measured by either a one-item indicator or multiple indicators (Joo and Grable, 2004). According to Xiao and Porto (2017) various associated factors with financial satisfaction have been found, such as the potential effects of various income definitions (Hsieh, 2004), income expectation (Vera-Toscano et al., 2006), household characteristics (Seghieri et al., 2006), assets and debts (Hansen et al., 2008), and perceived income adequacy to meet general needs (Arber et al., 2014; Grable et al., 2013).

- Satisfaction with consumption, family financial management, and household situations have been used to measure individual perceptions of the financial situation on wellbeing (Porter and Garman, 1993, p.136; Wilhelm et al., 1987; Hira, 1986; Jeries and Allen, 1986; Hafstrom and Dunsing, 1973; Godwin and Carroll, 1985).

- Evaluations of financial status can also be measured by intuitive and subjective assessments of an individual's financial resources that may be adequate, inadequate, satisfactory or unsatisfactory (Moeinaddin et al., 2013). Subjective satisfaction is measured by three single-items: 1) income satisfaction; 2) financial status satisfaction, and 3) satisfaction with the standard of living. In addition, self-assessment of the satisfaction with financial management and situation, and of consumption has been used to evaluate individual wellbeing perceptions (Wilhelm et al., 1987; Hira, 1986; Jeries and Allen, 1986).

**Approach two: Psychologically Driven Emotions**

The second approach focuses on psychologically driven emotions such as financial satisfaction or distress. Financial satisfaction is commonly used as a subjective
measure of FWB (Xiao and Porto, 2017) while financial distress is used as a key indicator of FWB (Prawitz et al., 2006). Perceived financial distress is a multi-dimensional construct rather than a unidimensional one (Prawitz et al., 2006). Some leading measures of the second approach can be summarised as follows:

- Combined measures of anxiety related to financial decisions and perceived security in an individual’s current and future financial situation have been used by some authors (Strömbäck et al., 2017)
- Four categories are used to measure an individual’s perception of their financial situation: ‘satisfaction with personal financial situation’, ‘perceived financial wellness’, ‘feeling about current financial situation’, and ‘level of stress about personal finance’. These categories were adapted from Porter (1990) and Joo (1998) by Kim, et al. (2003, p. 80).
- Other authors measure financial satisfaction and coping with the financial strain (Sabri and Zakaria, 2015; Shim et al., 2009; Taylor, 2009).

*Combination of approach one and approach two*

Some major measures of the mixed approach can be summarised as follows:

- The subjective measure of ‘economic/financial strain’ (a household’s ‘ability to make ends meet’) and ‘perceived material deprivation’ (problems with household expenditure) (Arber et al., 2014, p. 19; Whelan and Maitre, 2013; Whelan et al., 2001).
- The Subjective FWB index created from a five-item questionnaire: ‘general perceived FWB’, ‘feelings about current financial situation’, ‘financial stress’, ‘retirement income security’, and ‘satisfaction with present financial situation’. The index was adapted from Garman et al. (1999) by Kim (2007, p. 3).

In summary, approach one is more focused on the standards of the comparison of financial status while approach two concentrates on emotional aspects of Perceived FWB. The similarity between the two approaches relates to them having common elements such as financial satisfaction. A combination of approach one and approach two is an ideal option to make use of the strengths of both approaches. It can be seen that financial satisfaction is considered to be a key component of Perceived FWB and that it plays an important role in an individual’s overall life satisfaction (Easterlin, 2006; Van Praag and Ferrer-i-Carbonell, 2004). Financial
satisfaction is described as a subjective evaluation of financial status (Xiao et al., 2014). Financial satisfaction is a sub-construct of general wellbeing (Ali et al., 2015, p.139; Campbell, 1981) where people are in a state of being healthy, happy, and free from financial worry (Ali et al, 2015, p.139; Zimmerman, 1995). Financial satisfaction is closely related to subjective wellbeing (Xiao et al., 2014; Vera-Toscano et al. 2006).

Financial satisfaction is often used to assess the FWB of consumers (Xiao et al., 2014). An individual personal financial condition such as assets, debts, and savings, are taken into account when assessing individual financial satisfaction (Xiao et al., 2014). Financial satisfaction is described as “an individual’s perception concerning his/her current financial situation” (Ali et al., 2015, p.137). Furthermore, perceived financial needs and objective financial circumstances such as income and wealth are also associated with financial satisfaction (Plagnol, 2011).

People with higher incomes often report higher living standards and expectations (Ng and Diener, 2014). However, a study by Stuart (2012) found that the participants in both treatment and comparison groups emphasised the importance of being able to meet their needs, plan, budget, save, or invest when assessing satisfaction with their money management. These actions were seen to be even more important than income or earnings.

Financial satisfaction is one of the measures of subjective evaluations of individual FWB, such as financial adequacy, economic wellbeing, and satisfaction with living standards (Draughn et al., 1994). Measuring financial satisfaction itself has different approaches. According to Ali et al. (2015) previous studies have measured financial satisfaction using both single- and multi-scales. For instance, a single question is used as a single measure, such as ‘how satisfied are you with your financial situation?’ (Morgan, 1992) or ‘how comfortable and well-off are you financially?’ (Greenley et al. 1997). Elsewhere, one Likert scale question about the individual level of living was used to measure financial satisfaction (World Values Survey Association, 2009; Plagnol, 2011). Hira and Mugenda (1998), cited in Ali et al. (2015, p.139) measure financial satisfaction using six indicators: “the amount of savings, money owed, current financial situation, ability to meet long-term goals,
preparedness to meet emergencies, and financial management skills”. By contrast, Joo and Grable (2004) replicate the measures from Porter and Garman’s study (1993) by using a self-anchoring 10-point stair-step question to ask respondents to mark how satisfied they are with their present financial situation (Joo and Grable, 2004).

Financial needs satisfaction is a part of financial satisfaction. Thus, it is considered as a component of FWB in this study. Financial needs satisfaction focuses on the needs of financial resources to satisfy their human needs, while also maintaining their living standards and obtaining financial freedom. The following section reviews the theory of human needs and how this current study develops and examines the confinancial needs satisfaction.

2.2.4.2 Financial Needs Satisfaction

As mentioned in the previous section, the financial needs satisfaction component adopts eudaimonic view of human wellbeing. When conceptualising wellbeing, the eudaimonic view of wellbeing has “more enduring life challenges such as having a sense of purpose and direction, achieving satisfying relationships with others, and gaining a sense of self-realisation” (Nanda and Banerjee, 2021; Ryff, 1989, p.1,077). Following the eudaimonic view of SWB, the concepts of financial capability and emerging definitions of FWB include other elements such as living standards or financial freedom (Nanda and Banerjee, 2021). Previous studies use Maslow’s human need theory to examine personal wellbeing through the aspects of satisfaction with wealth and life satisfaction (Ryan and Deci, 2000).

This study uses financial needs satisfaction as a measure of financial satisfaction in order to understand the importance of financial needs satisfaction and its contribution to FWB. Previous studies found people who had higher financial satisfaction and fulfilment of materialist or financial needs were associated with positive SWB (Ng and Diener, 2014). People who manage their current and future financial needs efficiently are better at managing credit risks, contribute to a healthier economy (Netemeyer et. al., 2018; Diener, 2000). This section explores human needs theory and explains why financial needs satisfaction is considered a
component of FWB. The section also explores how financial needs satisfaction can be used to assess individual FWB in this study.

Western culture has a tendency to assume that money buys happiness, and the accumulation of wealth is one of the strongest motivations that people have in modern society (Diener and Oishi, 2000; Furnham and Cheng, 2000). It was found that money can buy happiness if it satisfies a higher level of need (Howell et al., 2013). Money can also help one obtain financial security and psychological needs satisfaction (Howell, 2013). Previous studies found a significant correlation between money and subjective wellbeing (SWB), in particular at lower income levels (Howell et al., 2013; Howell and Howell, 2008; Diener and Biswas-Diener, 2002; Veenhoven, 1991). Maslow’s hierarchy of human needs (1943, 1954) has been examined in studies on subjective wellbeing and financial satisfaction which offers a justification on why income impacts on SWB.

Taormina and Gao (2013, p. 156) describe a “need” as “a lack of something that is essential to an organism’s (a person’s) existence or well-being”. The association between human needs, money, needs fulfilment and subjective wellbeing is endorsed by many authors (Tay and Diener, 2011; Howell and Howell, 2008; Konner, 2002). Their views are strongly influenced by Maslow’s (1954) motivational theory or hierarchy of needs with its five-stage model (Tay and Diener, 2011). More recently, Tay and Diener (2011) examined the theory of needs based on the work of Maslow (1954).

In their study, Tay and Diener (2011, p. 355) tested the six needs in relation to human subjective wellbeing: (1) ‘basic needs for food and shelter’; (2) ‘safety and security’; (3) ‘social support and love’; (4) ‘feeling respected and pride in activities’; (5) ‘mastery’, and (6) ‘self-direction and autonomy’. However, in this study, Tay and Diener (2011) do not consider that an individual might have different priorities in relation to their needs, especially when it comes to money they spend on these needs. Other scholars see immediate consumption as a low-level need (e.g. physiological needs) while future consumption is seen as a high-level need (e.g. needs relating to perceptions of security) (Howell et al., 2013; Xiao and Noring, 1994). Howell et al. (2013) suggest that the perception of financial security reflects
individual economic standing. Financial security is an important outcome of individual socio-economic status (income, wealth, savings, lack of debt). Financial security might influence subjective wellbeing in particular amongst people who have their basic needs met. The need for financial security is important in order to cope with changing circumstances (e.g. losing a job). In such circumstances an individual would not only want to meet their basic needs but also hope to maintain their lifestyle as much as possible. An individual’s current economic situation has an impact on their ability to purchase what they need, and is likely to be an important determinant of wealth and subjective wellbeing (Howell et al., 2013).

The needs theory proposes that money is most prominently – and perhaps exclusively – associated with wellbeing when it involves basic needs satisfaction (e.g. food, clothes, clean water) (Maslow, 1943). Maslow (1943) also suggests that needs satisfaction progresses in a hierarchical order with the most basic physical needs at the foundation and growing towards higher levels of psychological needs. Money satisfies certain higher-order needs such as financial safety and social needs when it is spent wisely (Howell and Howell, 2008). This explains why income matters to an individual’s SWB, as it is a means to satisfy human needs relating to both existence and enjoyment.

![Maslow's hierarchy of human needs](Oleson, 2004, p. 84)
Maslow’s hierarchy of human needs is summarised in Figure II-4. Five levels are introduced by Maslow (Taormina and Gao, 2013; Maslow, 1943) as follows:

- **Physiological needs** are presented as the lowest-level need with financial needs related to immediate consumption (Howell et al., 2013; Xiao and Noring, 1994). These needs relate to sleep, food, water, sex, physical health, and so on. People do not consider higher needs until these basic needs are fulfilled (Clarke et al., 2006). Consideration moves up to the next level of needs once these needs are satisfied.

- **Safety and security needs** are the second lowest level of need for future consumption. These needs relate to having a safe and secure place to live, to being protected from dangers in the environment, for financial security (e.g. having a savings account) and for a stable life (Taormina and Gao, 2013; Maslow, 1987; Maslow, 1943). These needs are psychological which involve the home and family such as a sense of belonging, safety, and happiness (Clarke et al., 2006). Surprisingly, the attainment of safety needs is not specifically dependent on income. Income levels are more important to satisfy basic needs but are not specifically important in increasing wellbeing within this hierarchical needs fulfilment approach (Clarke et al., 2006).

- **Love and belonging needs** relate to having affectionate relations with people (Maslow, 1943). These needs focus on receiving love, support, warmth, and affection from a wide-ranging social circle, such as family members, friends, associates, and colleagues.

- **Esteem needs** can be classified into two categories: self-esteem and esteem from other people (Taormina and Gao, 2013; Maslow, 1943). Taormina and Gao (2013) use 15 categories that they categorised into two facets. The two facets are combined into a single measure to explore esteem needs satisfaction. The first facet focuses on satisfaction with individual feelings of self-esteem, self-worth, self-respect, and positive self-regard while the second facet examines satisfaction with regard to the prestige, respect, esteem, recognition, and positive regard or appreciation received from other people. People tend to seek to be admired by others in their groups. Self-esteem can be seen as the mastery of skills or attention and recognition from others (Clarke et al., 2006).

- **Self-actualisation** is the top level of the hierarchy. Self-actualisation is an ongoing process to satisfy the need to fulfil one’s potential (Clarke et al., 2006).
Self-actualisation relates to self-fulfilment (Maslow, 1943), self-acceptance, enjoying life, living life fully, doing what you want, and satisfying your own desires (Taormina and Gao, 2013; Maslow, 1962). All behaviour is therefore motivated by the ultimate desire to fulfil one’s own potential (Clarke et al., 2006). A person can become self-actualised once the four lower levels of needs have been satisfied. Self-actualisation is related to capability (Nussbaum, 2000; Sen, 1985, 1987a, b) and social and critical participation (Doyal and Gough, 1991).

Clarke et al. (2006) argue that fundamental needs are universal, whereas daily desires differ both intertemporally and interspatially. For example, the satisfaction of fundamental needs has been used as a measure of wellbeing can be applied across societies and time. By contrast, for daily desires, ‘satisfiers’ who change their needs in accordance with the prevailing culture and even differ within cultures (Clarke et al., 2006; Max-Neef, 1991). Clarke et al. (2006) suggest hierarchical needs fulfilment can be applied to national wellbeing measures, as it reflects how society enhances or prevents people from reaching self-actualisation. Societies have higher levels of social wellbeing when they enable their people to achieve each level of this hierarchy.

The relationships between the satisfaction of psychological and physical needs, self-efficacy, money attitudes, and mental health, are found in previous studies. However, there is limited study in relation to how self-efficacy and money attitudes can affect mental health through the satisfaction of needs (Howell et al., 2013). In research on a total of 296 participants who were randomly selected through cluster sampling, Howell et al. (2013) found that self-efficacy and money attitudes are related to mental health through needs satisfaction. Those who had higher self-efficacy and were less worried about money tended to have a higher level of needs satisfaction. The authors concluded that individual mental health will improve if needs are fulfilled at the right time and place (Howell et al., 2013).

The concept of human needs hierarchy has been adapted in studies on personal finance. Previous studies endorse a connection between Maslow’s hierarchy of human needs and financial needs (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994). Xiao and Noring (1994) use Maslow's
human needs theory, in particular psychological needs, to address family financial matters. In their study on perceived saving motives and hierarchical financial needs, five assumptions are proposed. Firstly, financial needs are defined as motivations for current and future consumption. Secondly, financial needs are considered as human needs. Thirdly, financial needs for current consumption are considered as lower-level needs while needs for future consumption are considered as higher-level needs. Furthermore, these financial needs are hierarchical following Maslow’s theory. Additionally, the major motivator for higher levels of needs is the status of ‘richness’ which is often captured through income and wealth variables. The authors found that there are potential associations between hierarchical financial needs, such as between consumers’ motives for saving for retirement, children, and wealth growth. Furthermore, families are likely to move onto more and higher-level needs when their financial resources (e.g. income, assets, and net worth) increase. These results are in line with Maslow's (1954) theory. Xiao and Noring (1994) suggest that financial needs may be diverse and have numerous scenarios depending on different life cycle stages or family compositions. Financial needs are multiple, diverse, and hierarchical in accordance with the increase of family financial resources. Xiao and Noring (1994) conclude that families have multiple financial needs that are diverse due to differences in their characteristics. Therefore, setting priorities amongst these needs is necessary.

Later, Xiao and Anderson (1997) developed a framework based on Maslow’s (1943) hierarchy of needs and other theories to explore the relationship between family financial needs and household financial asset shares. The authors found varying types and differing levels of assets are held by households to meet their financial needs. When household resources increased, families tend to have a higher level of financial needs and different motives for saving. Xiao and Anderson (1997) considered this finding as a reflection of hierarchical household financial needs based on Maslow’s (1954) theory. The authors suggest three hierarchical family financial needs: survival, security, and growth (Xiao and Anderson, 1997).

Recently, Kiymaz and Öztürkkal (2019, p.191) share a similar concept of financial needs with Xiao and Anderson (1997) and Xiao and Noring (1994) which is based on Maslow’s (1943) hierarchy of needs. Kiymaz and Öztürkkal (2019) describe
financial needs as "consumer perceived ability to meet current living expenses in the short-term as well as their assessment for the retirement security in the long-term". In their study, Kiymaz and Öztürkkal (2019) examined the relationship between perceived financial needs and subjective financial well-being. The authors found that households’ assessments of their subjective financial well-being were in line with Maslow’s hierarchical theory of human needs. For instance, households are concerned by a lack of ability to meet short-term expenses such as healthcare, living expenses (food and utilities) on daily basis. Not being able to maintain the existing living standard is a highly significant factor that explains their subjective financial well-being. Likewise, in the longer term, having enough income during retirement is positively related to their subjective financial well-being. In relation to Maslow’s hierarchical theory of human needs, Kiymaz and Öztürkkal (2019) suggest lower-level needs are households’ daily concerns (i.e. the ability to pay for current living expenses) and the next level is desired savings and wealth. Having wealth to be able to satisfy safety needs for security and can cover future expenses (i.e. retirement). The desire for financial stability such as having money to save, can be a possible reflection of safety needs (Kiymaz and Öztürkkal (2019). Maslow’s (1943) hierarchy of needs explains consumer motivations for savings to both short- and long-term needs (Netemeyer et. al., 2018).

Following previous studies (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994), this study adapts Maslow's human needs theory to explore one type of human needs, financial needs and its satisfaction. Understanding human motivation and how it links to an individual's wellbeing is important (Clarke et al., 2006; Hagerty, 1999; Sirgy, 1986). Since Maslow’s theory of human needs and motivation provides an explanation about what is required to improve life outcomes (Clarke et al., 2006), it is suited to measure FWB through financial needs satisfaction. Therefore, this study examines the model of FWB in consideration of individual financial needs satisfaction. This study does not look at the conceptualisation of FWB as a whole but an element of it, financial needs satisfaction by drawing from Maslow's framework to measure or assess financial needs. Financial needs satisfaction is considered as an alternative measure of subjective FWB. The application of Maslow’s theory of human needs into personal finance is discussed in-depth in section 3.2 below.
2.2.5 Justification of the Selected Approach to Investigate Financial Wellbeing

Having reviewed the definitions and measures of FWB, Brüggen et al.’s FWB framework (2017) has been chosen as it is the most relevant approach given the context of this study. This framework comprehensively covers all aspects of FWB: personal factors (categories 1 and 2), personal perceptions of current and future financial situations with elements relating to living standards, enjoyment of life and financial freedom (categories 3 and 4). These are also endorsed by various authors (i.e. Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014) as explored in Section 2.2.1. In their FWB framework, Brüggen et al. (2017) also include FWB interventions such as financial education. Having financial education as an element in the framework makes it relevant to the context of this study, online financial education. The aim of this study is to also inform FWB interventions. Hence, Brüggen et al., (2017) provide an underpinning conceptual framework for this research.

After choosing a FWB framework (Brüggen et al., 2017) as seen in Figure II-2, this research reviews the approach to identify concepts of FWB. Note that this framework has not previously been tested empirically. Brüggen et al. (2017) does not clarify how to measure the elements of desired living standards and financial freedom in their concept. Reviewing the literature suggests that a subjective measure of FWB appears to be the most appropriate approach.

This study selects the subjective approach because it involves personal perceptions of individual financial conditions (Tenney and Kalenkoski, 2019; Gerrans et al., 2014). This approach is more comprehensive in defining and measuring complex and personal phenomenon such as FWB (Brüggen et al., 2017). The subjective approach can also capture non-financial issues that an objective approach does not identify (Brüggen et al., 2017). Objective measures of income do not reflect an individual’s perception of the adequacy of their income to meet their needs (Mirowsky and Ross, 1999; Hazelrigg and Hardy, 1997). Previous studies found that income did not explain any variance in positive and negative feelings in relation to an individual’s financial position, but relates more to the fulfilment of social, respect,
and autonomy needs (Tay and Diener, 2011). Being financially satisfied regardless of financial resources (e.g. wealth and debt) is the ultimate outcome of desirable financial wellbeing (Ali et al., 2015; Xiao et al., 2013; Yin-Fah et al., 2010; Joo and Grable, 2004).

Following Brüggen et al's concept (2017), the examination of perceived financial satisfaction, a fulfilment of enjoyment in life and financial freedom, are expected to shape individual subjective FWB. However, the challenge is that the existing subjective approach of FWB in the literature does not offer a foundation to identify these elements. Therefore, this study takes a further step to examine different perspectives of SFWB.

There is a research gap in relation to the concept of satisfaction of needs as part of FWB. Campbell et al. (1976), cited in Blishen (1977), provide a concept but clarification on how to measure the elements of that concept is not offered. Recently, Brüggen et al. (2017) and CFPB (2015a) shared a similar concept of FWB that stressed the ability to satisfy the highest level of needs, such as desired living standards and financial freedom, but the authors did not explain how to measure the individual satisfaction of needs. Furthermore, it should be noted that these needs are important (e.g. desired living standards and financial freedom) in order for individuals to understand how they can alter their perceptions of FWB.

This gap in knowledge drives the motivation for this study to adapt the human needs theory of Maslow (1943) to assess the concept of the satisfaction of financial needs. The concept of subjective financial wellbeing or perceived FWB has been discussed widely while the concept of financial needs satisfaction is still emerging. There is a lack of studies that adapt Maslow’s hierarchy of human needs (1954) in order to examine financial needs satisfaction as an actor of financial satisfaction and wellbeing. Financial needs satisfaction may also be a good indicator to represent desired living standards and financial freedom in more recent concepts of FWB (Brüggen et al., 2017; CFPB, 2015a).

2.2.6 Conclusion on the Financial Wellbeing Frameworks
In summary, the research in this thesis reviews two components of FWB – Perceived FWB with existing measures and new measures of financial needs satisfaction – to assess the participants’ FWB. A combination of different research-based concepts of Perceived FWB with emotions driven and financial needs satisfaction are expected to contribute to the measurements of perceptions of FWB since these are not as clearly defined in the literature (Tenney and Kalenkoski, 2019). This subjective approach acknowledges individual characteristics, financial needs, obligations, behaviours, and the ability to fulfil needs and wants (CFPB, 2015; Ng and Diener 2014; Vlaev and Elliott, 2014).

Based on the literature review, individual perceptions towards personal financial situations, such as financial satisfaction, being in control, or confidence and not having negative feelings (e.g. anxiety, financial strain) drive the measures of Perceived FWB in this study. Finally, this section has reviewed and justified the choice of a FWB framework (Brüggen et al., 2017) and a subjective approach for further investigative research.

The following sections explore the determinants of FWB found in previous studies. This section also examines the relationships between the determinants of FWB and the two subjective components of FWB explored above. This will also help inform the intervention programmes required to identify the key determinants for improving individual FWB.

2.3 The Key Determinants of Financial Wellbeing

This section examines the determinants of FWB in the literature before focusing on the relationship between FWB and financial capability. This process explains why financial capability and its components are considered as determinants of FWB. There are various concepts of financial capability, but this study conceptualises it by using four components: financial capacity, financial behaviour, financial literacy, and financial attitude.

In addition, this section explores the relationships of the four variables with FWB and with each other. This is vital to justify how the four components of financial
capability determine FWB. As previous studies have focused on financial behaviour as the key determinant of FWB, this study explores which variables are the key determinants of the selected FWB model. It is also useful to re-evaluate whether financial behaviour change should remain as the key focus of financial capability interventions in relation to FWB. The findings in this study can inform FWB intervention programmes.

2.3.1 An Overview of the Determinants of FWB

Having reviewed FWB with different labels and multiple dimensions in Section 2.2.1, it is expected that there are various factors that influence FWB. These factors include individual and environmental or contextual aspects. In Brüggen et al.’s (2017, p. 231) FWB framework, the authors describe five groups of elements that influence or are influenced by FWB: (1) contextual factors (i.e. economic, legal, political, social-cultural, technological and market factors); (2) interventions (i.e. financial education and financial counselling); (3) financial behaviour; (4) personal factors (i.e. sociodemographics, skills, values, attitudes and motivations); and (5) consequences of FWB (i.e. quality of life and happiness, general well-being, mental health and interpersonal relationship quality).

At an individual level, financial capability is considered as an important component and influencer of FWB (Salignac et al., 2019). In addition, Ponchio et al. (2019) highlighted multiple personal factors that have been identified as antecedents of FWB, with an emphasis on financial knowledge (Norvilitis and MacLean, 2010; Fernandes et al., 2014), materialism (Dittmar et al., 2014), time perspective and self-control (Lynch et al., 2010; Drever et al., 2015). The authors (Ponchio et al., 2019) used Netemeyer et al.’s (2018) perceived FWB concept and Brüggen et al.’s (2017) FWB framework to examine the antecedents of perceived FWB. The results endorsed that financial behaviours and personal characteristics affect FWB (Ponchio et al., 2019). However, financial knowledge has a weak role in predicting FWB in the presence of psychological variables (Ponchio et al., 2019). Self-control is another factor that has been found to influence financial and economic behaviour and financial well-being in various studies (Bialowolski et al., 2021; Ponchio et al., 2019; Strömbäck et al., 2017; Lunt and Livingstone, 1991). Similarly, Shahnaz
Mahdzan et al. (2019) found financial behaviour, locus of control, financial knowledge and financial stress are determinants of SFWB. Financial behaviour and locus of control have been found to have a significant positive relationship with SFWB, while a significant negative relationship has been found between SFWB and financial stress as well as financial knowledge (Shahnaz Mahdzan et al., 2019).

From an environmental or contextual perspective, FWB develops in interaction with social and institutional structures (e.g. family, peers, communities, institutions and society) (Salignac et al., 2019; Bronfenbrenner, 1977, 1994). These contextual factors decide personal resources. Furthermore, contextual factors such as childhood and family have been found to influence individual financial literacy and behaviours which affect their FWB (Salignac et al., 2019; Shim et al., 2009).

The determinants of FWB can be summarised in Table II-2. As described in this table, there are some common factors found to have an impact on FWB from different studies such as financial capability, financial behaviour, financial attitude, financial knowledge, financial education, financial resources (e.g. income, materialism) etc. These factors are related to the concept of financial capability in the literature where some authors include certain elements of financial behaviour, financial attitude, financial knowledge/literacy, income/financial resources as parts of financial capability (Xiao and O’Neill, 2016; Taylor, 2010).

<table>
<thead>
<tr>
<th>Determinants/Influential Factors of FWB</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 • Perceived control is a significant predictor of financial behavioral intentions which predicts FWB • Financial capability, personal traits, employment, health and wellbeing, gender and education and skills are strong influencers of FWB</td>
<td>Salignac et al., 2019; Shim et al., 2009</td>
</tr>
<tr>
<td>2 • Perceived control over an individual’s financial situation, income, debt-to-income ratio, attitudes towards finances and external pressures that affect borrowing are predictors of FWB • Having a positive financial attitude is an important factor contributing to FWB</td>
<td>Vlaev and Elliott, 2014</td>
</tr>
<tr>
<td>3 • Positive financial behaviours, willingness to take investment risks and plan for money long-term, materialism, late/minimum payments and lack of self-control influence FWB</td>
<td>Netemeyer et. Al. (2018)</td>
</tr>
<tr>
<td>4 • Self-control influences financial behaviour and financial well-being</td>
<td>Bialowolski et al., 2021; Strömbäck et al. 2017; Lunt and Livingstone, 1991</td>
</tr>
</tbody>
</table>
To select the factors to examine their relationships with FWB in this study, some aspects are considered by the researcher. Firstly, the selected factors need to be well recognised as the determinants of FWB in the literature review. Secondly, these factors fit in the concept of financial capability that is used in this study. Lastly, the researcher needs to consider the length of the questionnaires. As a result, the current study focuses on four factors: financial behaviour, financial attitude, financial knowledge/literacy, financial capacity (income/financial resources). The following sections review the relationship between financial capability and FWB. It also explains further the conceptualisation of financial capability in the current study.

### 2.3.2 The Relationship Between Financial Capability and Financial Wellbeing

A social movement is emerging to enhance individual financial satisfaction through promoting financial capability (Xiao et al., 2014). The movement started in developed countries and then expanded to developing countries. Reviewing data from 11 emerging and developed economies to provide a systematic analysis of predictors of consumer financial wellbeing, Fu (2019) found that demographic, socioeconomic, and financial capability indicators explain roughly one-third of the variation of FWB.

FWB is often considered as a financial capability outcome in both theoretical and practical frameworks (Brüggen et al., 2017; CFPB, 2017; Bagwell et al., 2014). Salignac et al. (2019) describe financial capability as an important component and influencer of FWB. In other words, financial capability determines FWB.

The link between financial capability and FWB can also be seen in its relation to financial satisfaction. Financial capability is a mediator of financial satisfaction which
is closely related to subjective wellbeing (Vera-Toscano et al., 2006). Other authors also found perceived financial capability to be positively associated with financial satisfaction (Xiao et al., 2014b).

The association between financial capability and FWB is also reflected in the concept of financial self-efficacy, a term often used to described perceived financial capability (Xiao and O’Neill, 2016). It was found that financial self-efficacy enhances FWB (Xiao et al., 2016; Lown, 2011). Similarly, Jian et al. (2014) used the data from the 2009 US State-by-State Survey of Financial Capability to explore the potential effects of consumer financial capability on financial satisfaction. A positive association between perceived financial capability or financial self-efficacy and financial satisfaction was found (Xiao et al., 2014). Other authors also found a strong positive relationship between FWB and satisfaction with remuneration as well as personal financial efficacy (Vosloo et al., 2014).

The above studies have endorsed a direct relationship between financial capability and wellbeing in which financial capability determines FWB. It is important to point out that the relationship between financial capability and FWB could be seen through different concepts of FWB (e.g. financial satisfaction) and financial capability (e.g. perceived financial capacity or financial self-efficacy).

Hence, it is very important to clarify the terms and concepts of financial capability and FWB that are used in different studies in order to able to cross-examine and compare the results. The following section reviews the definitions of financial capability and how it is measured in previous studies. In this process, the four components of financial capability come to light.

### 2.3.3 Definitions of Financial Capability

The term ‘financial capability’ was first introduced in a 2006 national survey in the United Kingdom (Atkinson et al., 2006). Prior to this financial capability survey conducted by the Financial Services Authority (FSA), many countries, including the United Kingdom, used the term ‘financial literacy’ in national surveys (Xiao and
O’Neill, 2016). More definitions of financial capability have subsequently been developed.

Financial capability is seen as an ability to manage money well through the practice of desirable behaviours (Taylor, 2011; Atkinson et al., 2006). Atkinson et al. (2007) describe four domains of financial capability: (1) Managing money, (2) planning ahead, (3) choosing products and (4) staying informed (Atkinson et al., 2007). In their study Atkinson et al. (2010) found that when thinking about financial capability, participants linked it to ‘behaviour’ because some people possess the financial knowledge and/or skills needed to manage their money effectively but do not actually put them into practice (Atkinson et al., 2007).

While Taylor (2010) describes financial capability as a variety of skills, knowledge, and behaviour relating to a person’s ability to manage their income. Financial capability is also related to the ability to manage and take control of personal finances (Taylor, 2010), to apply appropriate financial knowledge, and to perform desirable behaviour to achieve FWB (Xiao and Porto, 2017; Xiao and Neill, 2016; Xiao et al., 2014; Taylor, 2011; Atkinson et al., 2006). Similarly, Xiao and O’Neill (2016) suggest that having a certain level of financial knowledge and performing desirable behaviour result in the achievement of FWB.

In addition, financial capability is described as having the appropriate financial decision-making skills to manage credit and debt, and to be able to identify suitable financial products and services (Mason and Wilson, 2000; Noctor et al., 1992). Kempson et al. (2005) propose three components of financial capability that influence financial behaviour: (a) knowledge and understanding, (b) skills, and (c) confidence and attitudes.

On the other hand, due to the difficulty in measuring tangible financial capabilities directly, financial self-efficacy becomes a good proxy to measure this variable according to some authors. The concept of financial self-efficacy, which is based on the psychological concept of self-efficacy, can be used to measure financial capability (Xiao et al., 2016; Lown, 2011). These authors consider perceived financial capability as financial self-efficacy (Xiao and O’Neill, 2016). Accordingly,
the terms financial self-efficacy and perceived financial capability have been used interchangeably (Jian et al., 2014).

There are different definitions of financial self-efficacy, but their interpretations are mainly rooted from the same concept of perceived self-efficacy which was introduced by Bandura (1982). Bandura states: “Perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations” (Xiao et al., 2014, p.418; Bandura, 1982). In the domain of personal finance, financial self-efficacy helps individuals to manage their finances effectively (Xiao et al., 2014). Financial self-efficacy helps people manage their money to achieve FWB (Lown, 2011).

Fox and Bartholomae (2008) argue that financial self-efficacy is defined as knowledge and ability to influence and control personal financial matters. Other authors describe financial self-efficacy as one’s perceived capability to control their personal finances (Vosloo et al., 2014; Postmus, 2011; Lapp, 2010). Vosloo, et al. (2014) argue that financial self-efficacy is also interpreted as a person’s satisfaction with, or confidence in their level of financial knowledge and their ability to meet financial objectives by.

Overall, reviewing the definitions of financial capability, it could be said that there are different approaches to conceptualise financial capability. Atkinson et al.’s concept (2006) focuses on the practice, such as managing, planning, and decision-making. While other authors (Xiao and O’Neill, 2016; Taylor, 2010; Kempson et al., 2005) focus on the input elements of financial capacity, such as knowledge and behaviour which corresponds with the practical outcome referred to in Atkinson et al.’s concept (2006). By contrast, the concept of perceived financial capability focuses on psychological factors in the form of financial self-efficacy. The interchangeable use of terms such as financial self-efficacy and perceived financial capability makes the concept of financial capability even more confusing.

In order to inform intervention programmes, it is important to focus on the concept of financial capability and its measures (Xiao and O’Neill, 2016; Taylor, 2010) as it helps to understand what interventions need to occur to produce desirable practical
outcomes (Atkinson et al., 2006). Therefore, this study adopts this approach as it helps to understand which underlying variables need to be targeted in intervention programmes. To understand what components of financial capability are, the next section is going to review the measures of financial capability.

### 2.3.4 Measures of Financial Capability

Due to the different interpretations of the concept of financial capability, there are different approaches to measuring this variable. Atkinson et al. (2006) focuses on several desirable behaviours while Taylor (2011) uses an index that combines both behaviour and outcome. Taylor (2011) concentrates on making ends meet and money management – these being two key contributory factors in financial capability. A range of the indicators of an individual’s current financial situation are also reviewed by Taylor (2011). Xiao et al. (2014b) categorise and measure financial capability as a sum of desirable and undesirable behaviours, objective and subjective financial literacy and perceived financial capability variables. In a later study, Xiao et al. (2015) use an index that combines both objective and subjective measures of financial literacy and financial behaviour to measure financial capability.

Xiao and O’Neill (2016) calculate the financial capability index by summing total scores of perceived financial capability, desirable financial behaviour, objective financial literacy, and subjective financial literacy. Most of the above interpretations of financial capability do not consider the outcomes of knowledge and behaviour, except for Taylor (2010), who takes into account the outcome of knowledge and behaviour while measuring financial capability. This study endorses Taylor's approach (2010), as it is important to include financial outcomes as an element of financial capability, since it demonstrates the ability to apply financial knowledge, skills, and behaviour effectively. Therefore, the components of financial capability should include a financial outcome element. The financial outcomes can be seen, for example, through levels of savings or debts.

Jian et al. (2014) measure financial self-efficacy as a proxy for perceived financial capability. It is measured by whether a person is “good at dealing with day-to-day
financial matters, such as checking accounts, credit and debit cards, and tracking expenses” (Xiao et al., 2014, p. 421). An omission of this study is that the authors did not measure the ability of a person to plan ahead with their finances – something that is clearly important. The authors acknowledge that three variables – financial literacy, financial behaviour, and perceived financial capability, might not fully represent a complete financial capability. They were unsure how much of perceived financial capability implied actual financial capability. Finding a method to measure financial capability directly is still needed. While a universal agreement on how to measure financial capability has not been reached, measuring the key components that shape financial capability seems to be an acceptable method. Therefore, the following section conceptualises the components of financial capability.

2.3.5 Conceptualising The Components of Financial Capability

Having reviewed the definitions and measures of financial capability, some components of financial capability can be identified, such as financial literacy, financial behaviour, and financial self-efficacy (Xiao et al., 2016; Shim et al., 2013; Taylor, 2011). In addition, Kempson et al. (2005) identify three components of financial capability that influence behaviour: (a) knowledge and understanding, (b) skills, and (c) confidence and attitudes (Xiao et al., 2014). Similarly, Xiao and O’Neill (2016) describe financial capability components as perceived financial capability, desirable financial behaviour, objective financial literacy, and subjective financial literacy.

However, there are no existing concepts of financial capability that refer to the financial ability to promote financial needs satisfaction in order to achieve (subjective) FWB. This thesis proposes that if people have the ability to manage and take control of their finances (Taylor 2011) they would be able to satisfy their financial needs as well. Therefore, it is suggested that financial capacity to fulfil economic needs or individual lifestyles (Rickel et al., 1984) should be included as a component of financial capability. Accordingly, in the context of this study, a new concept of financial capability is offered to demonstrate its important role in the achievement of financial needs satisfaction as a part of a selected FWB model (see section 2.2.4). This study proposes that financial capability is the individual's ability to take control of their finances and satisfy their financial needs.
Following the FWB models proposed by Brüggen et al. (2017), CFPB (2015), and Vlaev and Elliott (2014) (see Figure II-2), this study selects four components of financial capability to examine: financial literacy, behaviours, attitudes, and capacity. These are examined in the context of the FWB model (see Figure II-5). The concept of financial capability in Figure II-5 can be defined as the ability to transform financial literacy to desirable financial behaviours and attitudes and produce the financial capacity to satisfy financial needs and perceived positive subjective wellbeing. This study assumes that the four components are related and the performance of one or more components are likely to influence the others. This assumption is based on the literature review which will be discussed further in section 2.3.7.2. These components shape individual financial capability and determine FWB.

![Figure II-5: Four components of financial capability or determinants of FWB](image)

Reviewing financial capability and its components helps to partly explain why financial capability interventions are often used to enhance individual FWB through advancing the ability to manage personal finances (see section 0). A direct relationship between financial capability and FWB also rationalises why financial capability components can be considered to be determinants of FWB.

The next section reviews four selected components of financial capability in depth in order to understand what it is and how to measure it. The relationships within the four components themselves are reviewed, and an exploration of how each component influences FWB.
2.3.6 Four Components of Financial Capability

2.3.6.1. Financial Capacity

2.3.6.1.1 Definitions of Financial Capacity

Financial capacity is one of the important components of financial capability. There are different approaches to define this term which depend on the context and focus of individual studies. Financial capacity is described in various terms, such as financial resources, assets, means, and economic capital. This section reviews these concepts and the research context to explain how these terminologies emerged. This process will justify the choice in this thesis to endorse a broad concept of financial capacity that covers the above terms.

In FWB intervention, financial capacity is described as the financial means to achieve FWB. In the Money Advice Service’s financial capability outcome framework, the concept of financial means is described as “the financial resources that an individual (or household) has at their disposal and which they use to cover their everyday financial costs as well as cope with unexpected or expected larger expenses” (Bagwell et al., 2014, p.12). Lusardi et al. (2011) share a similar idea to Bagwell et al. (2014) which suggest the ability to make ends meet, the funds to deal with financial shock or abilities to access emergency funds from any source can enhance households’ overall well-being (Lusardi et al., 2011). The sources can be from savings, friends and family funds, credit. Non-financial assets or liquid wealth that may be sold (car(s), furniture, jewelry etc.) are included (Lusardi et al., 2011). Lusardi et al. (2011) use some terms that are relevant to the concept of financial capacity in this study such as “capacity to cope” and “come up with the needed funds”.

Furthermore, in another FWB framework (Zemtsov and Osipova, 2015), financial capacity is described as an objective feature of FWB with a set of financial assets (Zemtsov and Osipova, 2015). This concept of financial capacity or personal economic capital is derived from human capital theory (Zemtsov and Osipova, 2015). In Zemtsov and Osipova’s model of FWB (2015), financial behaviour and basic assets (i.e. physical health capital, human capital, and social capital) create financial capital and define FWB. The concept of financial capital in this study adopts
the term of financial capital in Zemtsov and Osipova’s study (2015, p. 388) which means “a set of financial assets”.

In addition, when examining one of two dimensions of perceived FWB, ‘current money management stress’, Netemeyer et al. (2018) referred materialism (i.e. excessive credit card debt, over-borrowing, and impulsive/compulsive spending) as one of its antecedents. Whilst the other dimension is ‘expected future financial security’. Netemeyer et al. (2018, p.71) explain the second dimension reflects ‘the perceptions of having a financially secure future and meeting future financial goals’. Following these concepts, an individual’s financial capacity should include the ability to meet an individual’s consumption and expected future financial security.

Both FWB frameworks (Zemtsov and Osipova, 2015; Bagwell et al., 2014) endorse that financial capacity interacts with financial behaviour to define FWB. These frameworks suggest that an intervention towards an individual’s financial behaviour requires them to have an adequate financial capacity to generate positive FWB. It means a financial capability framework should include financial capacity together with financial behaviour. The link between financial capacity and financial behaviour is discussed further in section 2.3.7.2.

In financial practice, such as debt management, financial capacity is the ability to borrow and repay debt obligations based on cash flow and assets (Kavussanos and Visvikis, 2016). It can be seen that these concepts of financial capacity (Kavussanos and Visvikis, 2016; Bagwell et al., 2014) focus on financial obligations (costs, expenses) and commitments (debts) rather than other aspects of financial needs; for example, living standards, lifestyle, savings, and pensions.

The missing aspects of financial needs above can be covered in the concept of financial capacity that links financial needs and human needs. Accordingly, financial capacity is interpreted as the total financial resources a person has to enable them to achieve their financial goals and meet their needs. Financial resources relates to income to meet economic needs and support an individual’s lifestyle (Rickel et al., 1984). This concept of economic needs and individual lifestyle is close to the term of financial needs used in this research. This research defines financial needs as
money needs for current and future consumption (adapted from Xiao and Noring, 1994, p. 29).

After reviewing the concepts of financial capacity above (Kavussanos and Visvikis, 2016; Zemtsov and Osipova, 2015; Bagwell et al., 2014; Xiao and Noring, 1994), this study uses the term ‘financial capacity’ to describe the financial resources that an individual (or household) has at their disposal to meet the money needs for current and future consumption and financial protection. By contrast, there are other definitions of financial capacity, which are not relevant to this thesis. For example, in the disciplines of psychology and health, financial capacity is described as “a medical-legal construct that represents the ability independently to manage one’s own financial affairs in a manner consistent with personal self-interest and values” (Marson et al., 2016, p. 362). The reason for not applying this approach is that it focusses on medical and health issues that are outside the scope of this thesis.

In addition, this study does not share the same approach as the Financial Capacity Instrument (FCI) designed by Marson et al. (2000) to assess everyday financial activities and abilities. The FCI includes six domains of financial activity: basic monetary skills, financial conceptual knowledge, cash transactions, cheque book management, bank statement management, and financial judgment (Marson, Kerr and McLaren, 2016, p. 362). The reason for not incorporating this concept in this study is that this concept of financial capacity is quite similar to financial capability. This concept suggests the terms of financial capability and financial capacity address the same thing and considers financial management behaviour and financial knowledge are parts of financial capacity (Marson et al., 2000). This is a matter of using different terminologies to describe common financial activities and abilities. However, this study endorses a different perception of financial capacity that relates to the financial resources or means that a person owns (Kavussanos and Visvikis, 2016; Zemtsov and Osipova, 2015; Bagwell et al., 2014; Xiao and Noring, 1994). This is to distinguish financial capability from financial capacity.

2.3.6.1.2 Measures of Financial Capacity

Acknowledging the above definitions of financial capacity, there are different indicators that can be used to measure this variable. The first indicator is a common
approach to assessing how much money a person has. This includes income, savings, other assets, and affordable credit products (Bagwell et al., 2014).

The second indicator is Perceived Attributes of the Financial Domain Attribute (PAFDA) which is introduced by Porter and Garman (1993, p.145). “Perceived adequacy of family income” and “perceived net worth” are two components of PAFDA. “Perceived adequacy of family income” focuses on individual economic needs or lifestyle, and also emphasises the relationship between human needs and income, and the capacity to meet those needs. By contrast, “Perceived net worth” focusses on a person’s financial balance sheet and on the excess left after meeting their immediate spending needs. Another indicator to measure financial capacity is the duration or the length or strength of an individual’s financial capacity in the long-term. For instance, assessing the length of time an individual could make ends meet if faced with an unexpected drop in income without borrowing (Atkinson et al., 2006).

Overall, it is useful to combine these indicators to have an overview of an individual’s financial capacity. Knowing how much money a person has does not provide information about how long it lasts for individuals without borrowing. In addition, people have different levels of needs, wants, expenditures, and other financial commitments (e.g. liabilities to pay off). Consequently, different people with the same amount of money could have distinctly different perceptions of their financial capacity. Additionally, where there is limited data on income, it is useful to be able to draw on other indicators of financial capacity.

### 2.3.6.2 Financial Behaviour

Financial behaviour is considered to be an element of financial capability (Taylor, 2011; Atkinson et al., 2006). Interventions to change unhealthy financial behaviour to healthy financial behaviour can improve financial capability. This section is going to identify what is financial behaviour and how, according to the literature, it may be measured.

#### 2.3.6.2.1 Definitions of Financial Behaviour
There are different definitions of financial behaviour, but most focuses on key aspects, such as decision-making, financial resources management, financial management practice (e.g. planning, spending, borrowing, and saving). This section reviews some definitions that are relevant to the context of this study.

In order to harmonise individual motives and enterprise goals, Weston and Brigham (1981) describe financial management behaviour as financial decision-making. Horne and Wachowicz (2002), however, define financial management behaviour as a combination of determination, acquisition, allocation, and utilisation of financial resources to meet a financial goal. Deacon and Firebaugh (1988) explain personal financial management as a set of behaviours, which include planning, implementing and evaluating financial resources, such as cash, credit, insurance, investments, retirement, and estate. Xiao and Dew (2011) describe personal financial management as cash flow, credit, investing and savings management. The most common financial behaviours are related to spending, borrowing, and saving (Xiao et al., 2014).

A national study of consumers revealed a hierarchical pattern of financial management behaviours (Dew and Xiao, 2011; Hilgert et al., 2003). Hilgert et al. (2003), cited in Dew and Xiao (2011), suggest that cash management behaviour developed first, then credit, savings, and finally investment management. From the response rate received, a proportion of 66% of the participants practiced cash flow management, 45% managed credit, 33% used savings management, and only 19% of the participants invested. This behavioural hierarchy may arise because of the differences in financial resources. For example, people may not have the capacity to save if families’ incomes are insufficient to meet their financial obligations (Garasky et al., 2008). In addition, certain financial management behaviours, such as paying off consumer credit, may be prioritised over other behaviours such as contributing to a retirement fund (Dew and Xiao, 2011; Bernstein, 2004).

This study describes the term financial management behaviour as a set of behaviours in managing financial resources. This set of behaviours includes a cycle of actions including planning, implementing, tracking, and evaluating financial
resources and outcomes. This concept is adapted from various authors (Dew and Xiao, 2011, p. 58; Dowling et al., 2008: Xiao, 2008a).

Finally, while discussing financial behaviour, the concepts of ‘good’, ‘healthy’ or ‘positive’ behaviours are used as shorthand expressions for the desired behaviours that an intervention aims at generating. By contrast, the terms ‘bad’, ‘unhealthy’ or ‘negative’ are used to describe the harmful behaviours that an intervention aims to prevent or control (Glanz et al., 2002; Caldini, 2001; Tversky and Kahneman, 1974).

2.3.6.2.2 Measures of Financial Behaviour

This section reviews the measures of financial behaviour and justifies the choice of measures used in this thesis. The measures of financial behaviour are developed from definitions of financial behaviour that also focus on some similar key aspects, such as decision-making, actions in financial management practice (e.g. planning, spending, borrowing, and saving), financial resources management (e.g. reducing living expenses). The main difference between the previous studies lies in the design of the measures of financial behaviour: the choice of financial behaviours, the description of these financial behaviours, and the examination of their scale and development.

Dowling et al. (2008) and Joo and Grable (2004) use a modified version of a ten-item financial behaviour measure in their studies. The measures comprise seven questions to evaluate the use of money management practices, such as cash management, credit management, budgeting, financial planning, and general money management (Dowling et al., 2008). By contrast, Dew and Xiao (2011, p. 58) use a set of twelve behaviours containing a cycle of actions: planning, implementing, tracking and evaluating financial resources, and outcomes. These financial resources are convertible into money in different forms such as cash, credit, fund, assets, and investments. Other studies focus on specific financial behaviours. For example, in the context of credit counselling, Xiao et al. (2006, p.115) use nine self-reported positive financial behaviours that relate to credit or debt management, such
as “reduced some of my personal debts”, “cut down on living expenses” and “followed a budget or spending plan”.

In summary, the choices of measures of financial behaviour depend on the context of the research and the focus of the study. A study may focus on specific behaviours (e.g. borrowing or saving only) or cover all financial behaviours. Accordingly, this research focuses on some specific behaviours that are relevant to the focus of the interventional programme of the MMM course. As a result, the financial management behaviour scale developed by Dew and Xiao (2011) is the most relevant to the MMM course in terms of the measures of financial behaviour.

2.3.6.3 Financial Literacy

Individual FWB is proposed as the ultimate measure of success for financial literacy efforts (CFPB, 2015a). This section reviews the definitions and measures of financial literacy to inform the approach to design of the measures of this variable in this thesis.

2.3.6.3.1 Definitions of Financial Literacy

There are disagreements in the use of financial literacy terms. Some authors argue that financial literacy, financial knowledge, and financial education can be used interchangeably (e.g. Yoong et al., 2012; Howlett et al., 2008). Furthermore, financial literacy and financial capability are also used interchangeably. Both of these terms are described as the ability to apply certain levels of financial knowledge and to perform desirable financial behaviours in order to achieve FWB (Xiao and Porto, 2017; Xiao et al., 2014; Atkinson et al., 2006).

Huston (2010) argues that financial knowledge and financial education are two dimensions of financial literacy. Using human capital theory, Huston (2010) describes financial literacy and financial knowledge as two constructs of human capital while financial education is seen as a tool to influence human capital in order to enhance FWB. Financial knowledge is not seen to be equivalent to financial literacy but an integral dimension instead (Huston, 2010).
The difference between financial literacy and financial knowledge is that financial literacy has an additional application dimension that financial knowledge does not have (Huston, 2010). This application dimension refers to the individuals’ ability and confidence to use their financial knowledge or human capital to make rational financial decisions in personal finance (Huston, 2010). By contrast, financial knowledge is often described as a proxy of financial literacy. Financial knowledge is an individual’s ability to understand financial concepts (Huang et al., 2013). Reviewing 71 studies with 52 different datasets, the definition of financial knowledge is categorised in four groups by Huston (2010): (1) basic money concepts, (2) borrowing, (3) saving or investment and (4) protection concepts (Huang, Nam and Sherraden, 2013, p.4). Multiple items, a grading system or a threshold value are commonly used to explain levels of financial knowledge in these studies, but they sometimes do not include an application ability element (Huston, 2010). Therefore, the author suggests that when developing an instrument to measure financial literacy, it is important to assess both financial knowledge and the ability to apply the knowledge in practice appropriately (Huston, 2010).

Even though there are differences in defining financial literacy terms, the general approach can be seen the elements of skills, attitudes, knowledge, behaviours and their outcomes as FWB. Financial literacy is not simply a basic understanding of financial terms and definitions, but also the capability to transfer financial knowledge into financial decision-making and behaviour. The consequences of financial decisions and behaviours accumulate over the course of life.

A standard definition of financial literacy does not exist in the research literature (Allgood and Walstad, 2016; Lusardi and Mitchell, 2014; Huston, 2010; Remund, 2010; Hung et al., 2009). Different definitions of financial literacy are summarised in Table II-3.

<table>
<thead>
<tr>
<th>Definition/Concept</th>
<th>References</th>
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<tbody>
<tr>
<td>1 Financial literacy is a set of knowledge, skills, values, and attitudes of citizens that are required in order to financially secure themselves and their families</td>
<td>(Balaban et al. (2011), cited in Belás et al. (2016))</td>
</tr>
</tbody>
</table>
2. Measuring how well an individual can understand and use personal finance-related information (Huston 2010; Ali et al., 2015)

3. A combination of awareness, knowledge, skills, attitude, and behaviours necessary to make sound financial decisions and ultimately achieve individual FWB (Atkinson and Messy (2011); cited in Ali et al. (2015))

4. The ability to use knowledge and skills to manage financial resources effectively for a lifetime of FWB (The President’s Advisory Council on Financial Literacy, 2008, cited in Collins and Holden (2014))

5. The ability to make informed judgments and to take effective actions regarding the current and future use and management of money ((The U.S. Financial Literacy and Education Commission, cited in Miley (2008))

6. The level of financial knowledge and the ability to apply the knowledge to improve financial status (Xiao and Porto, 2017; Huhmann, 2014; Lusardi and Mitchell, 2014)

7. The capability of an individual to use his/her knowledge and skills to take appropriate financial decisions for effective management of financial resources (Rai et al., 2019; Sanderson, 2015)

8. A blend of skill, behaviour, awareness, attitude, and knowledge of the individual that is required to make sound financial decisions leading towards the achievement of FWB (Rai et al., 2019; OECD, 2013)

Table II-3: Definitions of financial literacy

Sebstad et al. (2006, p. 6) describe financial literacy as “knowledge of basic financial concepts and the skills and attitudes to translate this knowledge into behaviours that improve financial outcomes”. Financial literacy is “a set of knowledge, skills and values and attitudes of citizens that are required to financially secure themselves and their families” (Belás et al., 2016; p. 194; Balaban et al., 2011). Anthes (2004), cited in Rai et al. (2019, p. 52), proposes an elaborative definition of personal financial literacy: “the ability to know, analyse, manage and inform about the financial conditions that affect material wellbeing of an individual”.

One of the most widely used definitions is proposed by the OECD, which defines financial literacy as “a combination of awareness, knowledge, skill, attitude, and behaviour required to take financial decisions and ultimately achieve individual FWB” (OECD, 2013, p. 135).
To some extent, the later definitions of financial literacy are based on the OECD (2013) definition. For example, Potrich et al. (2016, p.356) define financial literacy as ‘the mastery of a set of knowledge, attitudes and behaviours that has a fundamental role in allowing and enabling people to make responsible decisions to attain FWB. Furthermore, Rai et al. (2019, p. 51) describe financial literacy as ‘an ability of an individual to take considerable decisions in respect of the effective and efficient utilisation of money’. The authors accord with previous studies (e.g. OECD, 2013) that financial knowledge, financial behaviour, and financial attitude are three important determinants of financial literacy.

In summary, there is no universally accepted meaning of financial literacy (Huston, 2010). Researchers must justify their choice of a definition of financial literacy in order to explain their research model, the conceptualisation of terms also influences how financial literacy is measured. The following section is going to review the measures of financial literacy.

2.3.6.3.2 Measures of Financial Literacy

Determining how best to measure financial literacy is a challenge when conducting research on financial literacy. Measuring how well an individual can understand and apply personal finance-related information is not an easy task (Huston, 2010). There are some major obstacles to establishing a standard financial literacy measure, such as a lack of conceptualisation and definition of financial literacy, its measuring instrument and interpretation of the instrument (Huston, 2010). For example, when the terms ‘financial literacy’ and ‘financial knowledge’ are used interchangeably, it is necessary to ask whether a measure of financial knowledge is representative of financial literacy? This is an ongoing debate that limits the ability to assess individual financial literacy and its impact on FWB (Huston, 2010).

In literature, there are two major approaches to measuring financial literacy: objective and subjective viewpoints. These cognitive dimensions are constructed to measure what people know or understand about financial concepts. Economists and researchers (Allgood and Walstad, 2016; Lusardi and Mitchell, 2014; Hastings et al., 2013) often use a set of multiple-choice or true–false test questions to
measure financial literacy. Measuring financial literacy subjectively, for example, by a self-assessment of financial literacy or knowledge, provides an alternative method (Allgood and Walstad, 2016). By contrast, numeracy, personal finance, economics, or a mixture of these objective measures are used in some studies. Allgood and Walstad (2016) called such objective measures ‘actual’ financial literacy (Lusardi and Mitchell, 2014; Hung et al., 2009).

Kim (2000), cited in Kim (2007, p. 2), measures financial knowledge with a self-assessment question – “how would you rate your financial knowledge?” – using a 7-point scale response (from beginner = 1 to expert = 7). Similarly, Hasler and Lusardi (2017) use the basic knowledge of four fundamental concepts in financial decision making to measure financial literacy: inflation, numeracy (interest), compound interest, and risk diversification. A person is considered as financially literate when they correctly understand at least three out of the above four financial concepts.

Reviewing the literature reveals that there are different ways to design the measures of financial literacy. A universal standard for measuring financial literacy does not exist. Hence, the choice of measures of financial literacy relies on the purposes and context of the research. A researcher can choose either existing measures from previous studies or develop new measures that are related to their study. For instance, to evaluate the impact of a financial education programme, it might be more useful to assess the financial literacy of the participants in respect of the specific contents that are being taught rather than generic questions. Accordingly, it is more accurate to assess the role of that programme in enhancing the financial literacy of participants if they are assessed pre- and post-training. Therefore, this is the approach that this study chooses in designing the measures of financial literacy.

2.3.6.4 Financial Attitude

Financial attitude is a form of human psychology that is not easy to conceptualise. In personal finance, desirable financial attitudes support financial capability. There are better chances of a person reaching their financial goals if they understand their financial attitudes and values (Pankow, 2012). This section reviews the definitions and measures of financial attitude to inform the design of measures of this variable.
2.3.6.4.1 Definitions of Financial Attitude

Eagle and Chaiken (1993), cited in Rajna et al. (2011, p.106), describe attitude as a “psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour”. Attitudes reflect an individual’s state of mind, opinions, and judgments about the world (Pankow, 2012) or feelings and approaches towards a person or object (Von Stumm et al., 2013; Funder, 2001). Attitude is believed to be less stable than personality traits (Armstrong et al., 2011) as they are often influenced by situational and circumstantial factors (Von Stumm et al., 2013).

In the context of education, financial attitudes are defined “as a combination of concepts, information and emotions about learning, which results in a readiness to react favourably” (Potrich et al., 2016, p. 359; Shockey, 2002). In financial practice, Rajna et al. (2011, p. 106) define financial attitudes as “the application of financial principles to create and maintain value through decision making and proper resource management”. Financial attitude demonstrates a psychological tendency such as agreement or disagreement towards recommended financial management practices (Rai et al., 2019; Jodi and Phyllis, 1998).

2.3.6.4.2 Measures of Financial Attitude

In order to explore financial attitude, it is important to construct its measures. Previous studies demonstrate different measures relating to financial attitudes. However, there are some common aspects that can be seen, such as (a) the affective aspects of money (e.g. distrust, anxiety, power, prestige, esteem or achievement), and (b) economic aspects (e.g. budgeting, planning, spending retention, or debts) (Gasiorowska, 2014).

Fürfgeld and Wang (2009) use five components of financial attitudes and behaviour: anxiety, interests in financial issues, decision styles, precautionary savings need, and spending tendency. By contrast, in a Money Attitudes Questionnaire (MAQ), Gasiorowska (2014) uses two dimensions of money attitudes: money anxiety and financial control. The MAQ is a short version of MAQ-
25 which consists of 25 items categories in six different dimensions of attitudes toward money: (1) financial control, (2) power, (3) money anxiety, (4) debt aversion, (5) occasion-seeking, and (6) root of evil (Gasiorowska, 2014; Gasiorowska, 2013a, 2013b; Zaleskiewicz et al., 2013; Gasiorowska and Helka, 2012).

Another approach to measuring financial attitude is linked to financial behaviour. For instance, Wiener et al. (2005) measure attitudes through unneeded spending on goods that are not affordable, which is based on Ajzen’s theory of planned behaviour (Ajzen, 1988). Similarly, Shim et al. (2009, p.713) assess financial attitudes by asking respondents to indicate how desirable they would rate three financial behaviours (e.g. spending within the budget, maintaining sufficient balances in a bank account, and paying bills on time each month). In a study that defines the components of FWB, Vlaev and Elliott (2014) identify four factors of financial attitude: (1) being in control (overall finances), (2) comfort with being in debt, (3) external pressures affecting borrowing and (4) ability to influence the situation.

In summary, there are different definitions and measures of financial attitude in the literature. Researchers tend to choose the measures of financial attitude based on their research context. This study chooses the measures of financial attitude introduced by Vlaev and Elliott (2014) as it is relevant to the focus of the interventional programme of the MMM course.

### 2.3.7 The Roles that Four Components of Financial Capability Play as Determinants of FWB

Research inquiry to understand the relationship between financial capability and other financial constructs such as financial literacy and FWB is emerging (The Economic Society of Australia, 2019). This section reviews the associations between FWB and financial capacity, financial knowledge, financial behaviour, and financial attitude. This helps to explain why in this thesis the four components of financial capability are considered as determinants of FWB.
2.3.7.1 The Relationships between Four Components of Financial Capability and Financial Wellbeing

a. Financial Capacity in Relation to Financial Wellbeing

Financial capacity has a large influence on FWB (Bagwell et al., 2014). Previous studies found that a temporary or long-term lack of financial capacity or unexpected financial pressures are a key reason for poor FWB (Bagwell et al., 2014). Having the financial capacity to withstand a financial shock is one of the four elements of FWB introduced by the CFPB (2015). People may know saving money is important and they should save monthly, but in order to do that they need to earn a certain amount to pay for their living expenses with some left over before they can make monthly savings.

Income, one dimension of financial capacity, has an expected positive relationship with financial satisfaction (Plagnol, 2011). Having financial capacity to meet expenses (including to pay off debts) and having some money left over to afford choices are important dimensions of FWB (Salignac et al., 2019). Plagnol (2011) also points out that the increase in financial satisfaction in older age may be partly explained by a decrease in liabilities, a reduction in dependency burden, and an increase in financial assets. It could also be that the need to have financial resources to support their family might no longer be a priority in old age. As a result, their financial needs satisfaction might be enhanced.

Finally, the relationship between individual financial capacity and FWB might change depending on the stage of life that a person is at (Salignac et al., 2019). This proposition suggests that FWB is not temporally situated (Salignac et al., 2019). Therefore, studies on FWB should take into account a person’s stage of life.

b. Financial Behaviour in Relation to Financial Wellbeing

Financial behaviour has been identified as one of most important determinants that inform financial capability and wellbeing (CFPB, 2015; Zemtsov and Osipova, 2015). Some authors even stress that behaviour demonstrates consumer financial capability (Xiao et al., 2014). Positive financial behaviours are associated with
financial satisfaction (Shim et al., 2009; Xiao et al., 2006; Godwin, 1994). An intention to engage in a positive financial behaviour might be related to a person’s individual satisfaction with their financial status, or them having less debt (Shim et al., 2009).

Desirable or positive behaviour should be associated with higher financial capability and FWB. Financial behaviours that trigger negative consequences and damage FWB are undesirable or negative behaviours (Xiao et al., 2014). In previous studies (Dew and Xiao 2011; Xiao et al., 2009), financial behaviour is associated with financial outcomes.

Ortiz (2018) uses data from the CFPB 2016 National Financial Wellbeing Survey, a national survey of adults to examine the association between FWB and financial knowledge, financial skills, financial behaviour, and objective financial situation. After controlling for personal characteristics, strong associations were found between older adults’ financial behaviour and their objective financial situation, as well as their perceived FWB (Ortiz, 2018). In research on credit counselling clients, the authors found positive financial behaviours tend to reduce financial stress and increase financial satisfaction (Lyons et al., 2008; Xiao et al., 2006).

c. Financial Literacy in Relation to Financial Wellbeing

It has been recognised that financial literacy training enhances FWB (Zhan et al., 2006; Osteen et al., 2007). Gaining financial knowledge is at the core of positive FWB (Collins and Holden, 2014). Low financial knowledge has substantial financial consequences, as it is linked to poor financial decisions (Hasler and Lusardi, 2017). People tend to pay attention to fees, borrow at low cost, invest in the stock market to accumulate retirement wealth, and diversify risk if they are more financially literate (Lusardi and Tufano, 2015; Lusardi and Mitchell, 2014; Lusardi and de Bassa Scheresberg, 2013; van Rooij et al., 2011; Lusardi and Mitchell, 2008).

According to Xiao et al. (2014) financial literacy is an important component of financial capability. Financial literacy was found to be an important determinant of financial satisfaction and, together with attitudes towards money, are significant antecedent variables of financial planning (Ali et al., 2015). Financial literacy was
found to be positively associated with financial capability which results in financial satisfaction (Xiao et al., 2014). An increase in financial literacy has been found to decrease financial stress (Vosloo et al., 2014; Steen and MacKenzie, 2013; Calamato, 2010) and increase FWB (Kumaran, 2013; Holland et al., 2008; Garman et al., 1999). As a result, gaining financial knowledge is at the core of positive FWB (Bucks and Pence, 2008; Campbell, 2006; Mandell, 2004).

d. Financial Attitude in Relation to Financial Wellbeing

Attitudes are a crucial factor influencing financial behaviour and FWB. Previous studies have emphasised the importance of personal characteristics (Joo and Grable, 2004) and financial behavioural factors (Shim et al., 2009) while assessing individual FWB (Brüggen et al., 2017). Their concept of FWB covers many of the dimensions that have an impact on how an individual might perceive their FWB.

Hayes (2006) argues that the impact of financial education to enhance FWB may be limited if a person has a lack of self-responsibility. Unless individuals feel that they are in control of their own destiny, they may not extract the full benefit of their knowledge or financial resources (Perry and Morris, 2005). This point is in line with the findings from Vlaev and Elliott's research (2014) that suggests the 'being in control' factor is the key attitude-based driver of FWB. Salignac et al. (2019) also argue that being in control of one's financial situation in the present and future should be at the centre of the conceptualisation of FWB.

Reviewing the relationships between FWB and the four components of financial capability in the literature, one could argue that financial behaviour, financial attitude, financial literacy, and financial capacity influence FWB. This means that these variables could be considered to be determinants of FWB. However, it is unclear which variable is more significant in driving individual FWB. Is financial behaviour at the centre of financial capability interventions that enhance FWB, or is it one of the other three variables? This questioned is investigated below (section 2.3.7.2)
The following section reviews the relationships between financial capacity, financial knowledge, financial behaviour, and financial attitude. Knowing the associations between these variables could offer explanations for the variances in FWB.

### 2.3.7.2 The Relationships between the Four Determinants in Relation to Financial Capability and FWB

Financial behaviour, financial attitude, financial literacy, and financial capacity have things in common, since they are components of financial capability and determinants of FWB. This is at the root of the multi-dimensional relationships between four determinants of FWB. For example, Sabri and Zakaria (2015) found associations between (1) moderate levels of financial literacy, financial capability and FWB, (2) highly desirable money attitudes and (3) a low level of financial strain. Furthermore, previous studies only examine some of these variables, which makes it difficult to see the whole picture of the relationships between them. However, it does not clarify what are the key determinants of financial wellbeing.

Zemtsov and Osipova (2015) describe financial behaviour as an outcome of financial literacy, knowledge, attitudes, and management. Following this approach, individual economic capital or financial resources have a relationship with financial behaviour that influences FWB (Zemtsov and Osipova, 2015). On the other hand, other authors suggest financial attitude is an outcome of a certain behaviour that can be established through a decision maker's economic and non-economic beliefs (Rai et al., 2019; Ajzen, 1991). This suggests a direct relationship between financial behaviour, literacy, knowledge, and attitude.

It has been hypothesised that if we can change people’s minds – such as their beliefs, attitudes, and goals – then we can change their behaviours (Dolan et al., 2012). There are various studies on financial attitudes and how these influence financial behaviours, such as savings, borrowings or debts, and investments. In England, those who have more tolerant attitudes toward credit use, tend to be in debt (Norvilitis and MacLean, 2010; Livingstone and Lunt, 1992).

Similarly, studies in the United States show that people have high levels of self-control, tend to save more and spend less (Baumeister, 2002; Romal and Kaplan,
1995) as well as tending not to engage in impulsive spending (Strayhorn, 2002). A correlation between debt behaviour and debt attitudes has also been found (Lea et al., 1995; Lea et al., 1993; Livingstone and Lunt, 1992a;). Studies on attitudes towards savings and retirement planning, show that those who have more positive attitudes towards retirement are better prepared for their retirement (Kim et al., 2005) and are more likely to have retirement savings in place (Joo and Grable, 2005).

By contrast, other studies found an insignificant direct relationship between attitudes and behaviour (Füngfeld and Wang, 2009; Wärneryd, 1999). In two studies of young Australian workers, no positive association was found between displayed positive attitudes and positive financial management practices (Dowling et al., 2008). Those who displayed positive attitudes still experienced financial problems and dissatisfaction (Dowling et al., 2008). Unfortunately, these positive financial management attitudes did not seem to translate into positive financial management practices.

The extent to which attitudes are predictive of behaviour has long been a controversial issue, as research has often found the relationship to be weak or dependent upon the presence of certain conditions (e.g. McBroom and Reed, 1992). Further research is required to address the potentially complex relationship between financial attitudes and behaviour. It is needed to identify the obstructions that prevent positive financial management attitudes from transforming into good financial practice.

The relationships between financial behaviour and financial literacy are also varied. Financial behaviours appear to mediate the indirect relationship between financial skills and FWB (Ortiz, 2018). However, Ortiz (2018) found limited associations between factual financial knowledge, financial behaviour, and FWB. In a study of the emerging Asian middles class, Grohmann (2018) argues that higher financial literacy leads to improved financial decision making. The evidence of effectiveness of an educational programme can be assessed through positive changes in the determinants of FWB, such as financial knowledge, attitudes toward irresponsible spending, and financial behaviour (Wiener et al., 2005).
Previous studies have found a link between financial attitudes and financial literacy among the youth (Kasman et al., 2018; Grable and Lytton, 1998). Positive attitudes towards finance and money can influence students’ behaviour to enhance financial knowledge and achieve financial literacy (Rai et al., 2019). By contrast, negative attitudes can weaken their financial decision-making ability (Sohn et al., 2012; Shim et al., 2009). In addition, Potrich et al. (2016) found that good financial attitudes and financial knowledge have positive impacts on financial behaviour.

Finally, individual financial behaviour is affected by a person’s financial capacity – how much money they have (Bagwell et al., 2014). On the other hand, financial behaviours can also, in turn, increase or decrease this financial capacity (Bagwell et al., 2014). In addition, financial attitude influence how people perceive their financial capacity. For example, Gasiorowska (2014) found that perceived financial control affects the subjective perception of objective wealth. This includes the assessment of one’s financial situation and perceived adequacy of income to fulfil needs, wants, and the ability to make ends meet (Gasiorowska, 2014).

In summary, reviewing the literature, this study has found four components of financial capability that are associated with, and which determine, FWB. Despite mixed views on the relationships between financial capacity, attitude, knowledge, literacy, and behaviour, it helps to explain why there are educational programmes to enhance FWB that are influenced by these variables.

This suggests that interventions to enhance FWB need to take into account all of these variables. For example, financial knowledge alone is not adequate to manage finances effectively, as financial attitudes are mediating the influence of financial knowledge on behaviour (Potrich et al., 2016; Xiao et al., 2011; Norvilitis and Maclean, 2010).

However, when limited resources are invested in the interventions, they need to prioritise which variables should be focused on. For instance, as found in the literature, financial attitude and financial behaviour can have an impact on FWB (Rai et al., 2019). However, it is unclear whether these two variables play an equally
significant role as key determinants of FWB, or if one is more important than the other? This understanding can help one decide which variable(s) should be focused on in the intervention process in order to gain more significant outcomes for an individual's FWB.

This gap in current knowledge has been the motivation for this study to investigate the key determinants of FWB. This is expected to inform the FWB interventions required to focus on the key determinants – especially when limited resources need to be justified. It is also helpful to see if the findings in the literature match those found in this research in the context of online financial education and the use of a new conceptual model of FWB with two subjective components.

2.3.8 Financial Capability Intervention in The Context of Financial Education

The previous section has explored the direct relationship between financial capability and FWB. This section reviews how this relationship has been utilised in the development of interventions to enhance FWB. The section explains the use of financial capability interventions to enhance FWB. Some types of financial capability interventions are explored, including financial education. Financial education is one of the most popular financial capability interventions (Fu, 2019) and online delivery of financial education is potentially useful for adult audiences (Haynes et al., 2011). This section helps to understand the context of this study and explain why this study is investigating the FWB of participants in online financial education context. In addition, this section also reviews financial education interventions in previous studies. However, it is worth to note that this study does not assess the effectiveness of financial education due to data limitation. The main purpose of the section is to understand the benefits that financial education might be able to offer, in relation to FWB interventions, whilst also acknowledging the limitations of what can be achieved by financial education. This leads to suggestions about how to make use of online financial education in combination with other interventions to enhance an individual's financial literacy to promote FWB.
2.3.8.1 Financial Capability Interventions

Financial capability interventions have been developed to enhance individual FWB. FWB has been set as a core goal of financial empowerment, capability, and educational efforts (CFPB, 2015a). There are different interventional strategies based on the understanding of the relationships between financial capability and its components, and FWB.

In the UK, four out of ten people do not have the ability to manage their money. In 2018, 16 million working age people had less than £300 in savings and eight million people were overly indebted (The Money Advice Service, 2018). Total personal debt in September 2018 was £1.605 trillion; the average total debt per UK household, including a mortgage, was £59,008; and the total credit card debt was £72.4 billion or £2,663 per household (The Money Charity, 2018). Low financial literacy levels, manifested in the inability to use knowledge and skills to manage financial resources effectively are commonly considered as the cause of low personal savings rates, high levels of consumer debt, and increases in personal bankruptcy filings (Collins and Holden, 2014; Lusardi, 2010; Lyons et al., 2006; Bell and Lerman, 2005; National Endowment for Financial Education, 2004).

Increasing levels of financial capability in the UK population has become a priority in the work of The Money Advice Service (MAS), set up by the UK government (Bagwell et al., 2014). The MAS has developed the Financial Capability Strategy for the UK. In their financial capability outcome framework, FWB is the ultimate outcome of their financial capability interventions (see Figure II-6). Furthermore, similar to the FWB concept proposed by Brüggen et al. (2017), financial behaviour is at the centre of the MAS’s financial capability outcome framework. However, financial behaviour is not a component of financial capability but an outcome of financial capability instead.

In Bagwell et al.’s financial framework (2014, p. 9), financial capability reflects “people’s ability to manage their money effectively and make good financial decisions given their particular circumstances”. The financial capability outcome framework of financial capability decides the focus of the interventions. Their framework (Bagwell et al., 2014) targets both internal financial capability (ability and
mindset) and external financial capability (social connection, and positive and negative social influences). For example, external financial capability focuses on the external resources that are available to an individual in society. It can be the opportunity to access financial products, services and information that help people when they are in need. Those who have low income might need access to low-interest loans, or over-indebted people might need advice on how to pay off their debts. To provide these opportunities for people in need, it requires the involvement of the financial institutions and financial service providers in the intervention programmes.

The outcomes of the MAS’s financial capability interventions are to improve financial behaviour and wellbeing (Bagwell et al., 2014). Therefore, the main types of financial interventions are related to the enhancement of financial behaviour which include (Bagwell et al., 2014):

- financial education programmes for children and young people
- family focused programmes (e.g. that work with parents, carers, and children to help with money management and communication about money at home)
- debt advice
- financial and money advice
- intermediary focused programmes (e.g. teaching teachers, volunteers, and youth workers, how to deliver financial capability programmes)
- edutainment (e.g. using entertainment, such as video games or television programmes to deliver educational messages)
- social marketing.

The ideas of these intervention programmes are based on behavioural insights research; for example, the MINDSPACE model developed by the Cabinet Office and the Institute for Government. This model has nine elements: messenger behaviour, incentives, norms, defaults, salience, priming, affect, commitments, and ego. The MINDSPACE model focuses on behavioural outcomes with guidance on how it can be used by charities, banks, and policy makers, to help improve financial capability and financial behaviour (Bagwell et al., 2014).
In addition to the interventions introduced above, financial inclusion, which involves collaborative resources, have become an important agenda of governments, not-for-profits organisations, and corporations around the world to increase people’s overall FWB (Salignac et al., 2019; Kempson and Poppe, 2018). This interventional approach stresses that people need both the “ability to act” (e.g. knowledge, skills, confidence, and motivation) and the “opportunity to act” (e.g. access to both beneficial financial products and institutions) (Fu, 2019, p. 3; Sherraden and Ansong, 2016; Nussbaum, 2011; Sen and Muellbauer, 1988).

As a result, there are programmes offering a package of financial education with formal financial products to enhance practical skills and access financial services (Fu, 2019; Loke et al., 2015; Huang et al., 2013). Similarly, some workplace FWB programmes also offer a wide range of services and types of support together with financial education and guidance (FinCAP, 2020). People are offered tools and resources to increase knowledge and change their behaviour desirably (Consumer Financial Protection Bureau, 2018; Von Stumm et al., 2013). Financial counselling provides specialist support services to individual needs in managing personal
finances (Prawitz et al. 2006). Another type of intervention is lobbying policymakers to establish regulations to protect consumers of financial services (Salignac et al., 2019; Gibbons et al., 2016) that take into account consumer behaviour patterns. Regulation is needed, as consumer education is too long term to be the only response to issues relating to financial capability (Atkinson et al., 2007).

Finally, Lusardi (2012) stresses the role of financial institutions and the state in enhancing individual financial ability, behaviour, and financial knowledge (see Beláš et al., 2016). To enhance financial literacy, Lusardi (2012) proposes the combination of three main pillars: 1) financial ability and behaviour, 2) financial knowledge and 3) state support. The level and the quality of the first two pillars are enhanced by the third pillar of state support, which requires support from financial institutions. With the appropriate approach, the impact of financial education could be expanded.

Overall, what these programmes have in common is that they use financial literacy or inclusion interventions to shape FWB (Fu, 2019). After reviewing the financial capability interventions, it can be seen that financial education is one of the major tools of financial behaviour change, aimed at enhancing FWB. The next section reviews the actual use of financial education and considers the debate about its impact on financial capability and wellbeing.

2.3.8.2 Financial Education in Financial Capability Interventions

Financial education might improve individual financial literacy (knowledge, skills) and encourage a positive change in financial behaviour (Cole et al., 2012; Willis, 2011, 2009; Lyons et al., 2006) to achieve a better financial capacity that results in improving FWB (Shim et al., 2009; Xiao et al. 2009; Xiao et al. 2006). As a result, financial education has been used as a tool in social marketing to design the programmes that support people in making a change in their financial behaviour, which enhances their FWB (Darnton, 2008). Understanding the effectiveness of financial education can inform programme development and improvement to meet community needs in respect of family financial management (Hilgert et al., 2003). Therefore, this section reviews the use of financial education and its impact. This section also helps to understand why this study chooses online financial education as a research context.
Financial education is:

The process by which people improve their understanding of financial products, services, and concepts, so they are empowered to make informed choices, avoid pitfalls, know where to go for help and take other actions to improve their present and long-term FWB (President’s Advisory Council on Financial Literacy, 2009, p. 4).

The goal of financial education is to help improve FWB (CFPB, 2015). The improvements in FWB have been used as an important indicator to assess the effectiveness of the financial education and capability programmes to promote behaviour change (CFPB, 2015). It is widely believed that financial education improves financial literacy and financial security for families (Osteen et al., 2007; Garman, 1999) which helps them to avoid financial difficulties or to solve the pitfalls of extreme debt, such as bankruptcy. Financial education is needed to build financial knowledge in the population at large and in particular amongst women (Hasler and Lusardi, 2017).

Financial education should lead to an improvement in financial capability, knowledge, and outcomes (Reifner and Schelhowe, 2010). However, there are different views on the effectiveness of using financial education to enhance FWB, due to the inconsistent outcomes reported in the research literature. Endorsers of financial education suggest that it enhances consumer financial capability and welfare through improving the level of financial literacy and promoting desirable financial behaviours (Mouna and Jarboui, 2015; Huhmann and McQuitty, 2009; Atkinson et al., 2006). Previous studies also found a positive association between perceived financial capability and financial education (Xiao et al., 2016). Financial education can be used to advance individual financial literacy, motivate desirable financial behaviours, and enrich FWB (Lusardi and Mitchell, 2014). Kaiser and Menkoff (2016) found that financial education has a significant positive impact on financial literacy and financial behaviour. Xiao and Porto (2017) suggest that financial education may affect financial satisfaction, through financial literacy, financial behaviour, and financial capability variables. Financial education helps enhance financial self-efficacy which results in an improvement in FWB (Xiao and
Porto, 2017). Among low income populations, some early evaluations of financial education programmes showed an improvement in financial knowledge and behaviours of their participants (Zhan et al., 2006; Hirad and Zorn, 2001; Hogarth and Swanson, 1995; Shelton and Hill, 1995).

By contrast, there are some doubts about the impact of financial education on FWB. It is argued that educational interventions do not always result in a positive change in people’s level of financial capability and FWB. Furthermore, financial behaviour change does not always have a direct impact on financial capability and FWB (Bagwell et al., 2014).

The are some identifiable reasons for the disagreements in relation to the impact of financial education. Firstly, it is due to a lack of evidence to show a positive link between financial education and an increase in financial capability and financial outcomes (Collins and Holden, 2014). Causal relationships between financial education and financial literacy, financial behaviour, and financial outcomes, have not been demonstrated objectively (Willis, 2011; Gale and Levine, 2010; Willis, 2009; Hathaway and Khatiwada, 2008). No significant relationship between taking a high school course and investment knowledge has been found (Peng et al., 2007). Investment knowledge and savings amounts relate instead to experience with traded financial assets (Peng et al., 2007). Financial education has been found to have weak effects on behavioural changes and consumer welfare outcomes among lower-income populations (Fu, 2019; Kaiser and Menkhoff, 2017). Secondly, the complexity of outcomes can be problematic. For instance, Miller et al. (2014) suggests that financial education might have a positive impact on some aspects of financial management, such as increasing savings, but not on others, such as reducing loan defaults. The authors reviewed the literature on financial education interventions in a comprehensive meta-analysis (Miller et al., 2014). The study (Miller et al., 2014) reviews 188 papers and articles, focusing on financial education studies that aim to strengthen the financial knowledge and behaviours of consumers. Most studies focused on one or more elements of financial capability such as behaviour, literacy, and attitude. Out of 188 studies, there were less than 10 studies that explored FWB. 30 studies were delivered online in the US. The financial education programmes in these studies were considered as financial
capability interventions by the authors (Miller et al., 2014). These studies examined the impact results of interventions, such as increasing consumers’ financial knowledge (financial literacy) or skills, attitudes, and behaviours (financial capability). Miller et al.’s meta-analysis (2014) indicated that financial literacy and capability interventions can have a positive impact in increasing savings but not in reducing loan defaults.

On the other hand, Fernandes et al. (2014) carried out a meta-analysis of 168 papers with 201 studies conducted to examine the relationship of financial literacy and financial education in relation to financial behaviours. They found limited evidence of the impact of financial literacy interventions on financial behaviours (e.g. financial literacy explains only 0.1% of the variance of financial behaviour). The effects were even weaker in low-income samples. The authors suggested a ‘just in time’ financial education interventions that targeted the specific behaviours might have a better impact (Fernandes et al., 2014). In the US, Allgood and Walstad (2016) have examined the impact of financial literacy towards financial behaviours in a large national survey of adults and households (n = 28,146). The study explored five topics of financial literacy: credit cards, investments, loans, insurance, and financial advice. The study did not identify a causal relationship between overall financial literacy and behaviour. However, their probit analysis shows that both perceived and actual financial literacy do influence financial behaviour (Allgood and Walstad, 2016).

Thirdly, in relation to the reasons for the different views on the impact of financial education, it could be that personal factors inhibit interventions of financial education. In theory, people who are fully informed should be able to make rational decisions about their personal finances. Nevertheless, empirical studies show that there are people who have access to information, but despite this they are not always fully informed and cannot make rational choices (Xiao et al., 2014; Campbell et al., 2011; De Meza et al., 2008). Furthermore, there are other influential factors such as cognitive biases and self-control problems, and influences relating to family, peer groups, financial resources, community, and institutions that might constrain the outcome of financial education intervention (Huston, 2010). Lastly, despite decades of growth in financial education attracting the interest of policymakers and
industry, there are few financial education programmes that have strong evaluations. There are different reasons for this situation, such as the lack of clearly defined mechanisms, frameworks, or theories to guide interventions, along with unclear outcomes and measures (Collins and Holden, 2014). There is also a lack of unbiased comparison groups for a randomised control evaluation and data collection problems. Another problem is the different results between the treatment and comparison groups.

Collins and Holden (2014) argue that the design and evaluations of many financial education programs do not have any underpinning theory to frame how the delivery of the programme might result in behaviour change. In the public health literature on health behaviour change, there are a number of theories: Fishbein and Ajzen's (1975) theory of reasoned action, Ajzen's (1991) theory of planned behaviour, and Prochaska et. al (1992) five-stage transtheoretical model. These theories indicate that behaviour change results from a combination of factors beyond education, such as attitudes, social norms, and intentions. These theories are more useful in predicting decision behaviour but less beneficial in providing an explanation about why individuals may take longer or may never reach various decision-making stages. These theories may offer the information of who and how individuals make financial decisions but lack the ability to confidently predict about how to change the decision-making process.

In order to mitigate the gap in relation to the lack of underpinning theory when evaluating the impact of financial education, Stuart (2012) introduces the financial education theory of change. A traditional financial education programme is designed to change the knowledge, skills, and attitudes (KSAs) of participants, which is meant to motivate a change of behaviour, which, in turn, results in a change in economic wellbeing (Stuart, 2012). Stuart (2012) described in the financial education model of change that as a result of gaining financial knowledge and skills, participants were expected to develop positive changes in financial attitudes and behaviour after the intervention. The basis for participant assessments of their satisfaction with their money management skills changed over the course of the study (Stuart, 2012). In both treatment and comparison groups, participants placed less emphasis on income or earnings in assessing satisfaction with money management, and more
emphasis on being able to meet one’s needs, plan, budget, save, or invest. This suggests a potential link to financial satisfaction and financial needs satisfaction in this study. Stuart (2012) suggests that policy makers, financial service providers, and educators need to keep in mind that changes in knowledge, attitudes, and skills do not always translate directly into behaviour change, at least not within a short time frame.

Despite the arguments on the impact of a financial education intervention on FWB, its environment offers great opportunities for researchers to investigate the participants’ FWB. This is the reason why the current research chooses financial education as a context to study about FWB of those who seek help to enhance their financial capability.

Looking at financial education as a research context, there are two major categories of financial education interventions that have formal and informal settings to target different group populations. The first category is formal education to advance financial capability among the young by making personal finance a required course at schools, colleges, and universities. It helps equip the young with the necessary skills and knowledge to manage their finances wisely (Hasler and Lusardi, 2017). For example, in 2014, statutory financial education was introduced in English secondary schools (Foster, 2016). By 2016, nine out of ten schools were offering some form of financial education (Foster, 2016). Positive effects on financial knowledge and behaviours of the youth have been found in school-based financial education (Zhan et al., 2006; Barrese et al., 1998; Boyce et al., 1998). For example, Bernheim et al. (2001) found a positive association between having financial education during high school and savings rates in adulthood.

The second category is informal education, which includes financial education at work, consumer financial education, and financial training delivered by social workers. Financial education at work is provided by employers (Hasler and Lusardi, 2017). These programmes have positively impacted on the personal financial practices of employees (Zhan et al., 2006; Garman et al., 1999; Clark and Schreiber, 1998). Such programmes have proved an important source of financial education in relation to retirement savings for many American adults (Zhan et al., 2006).
Employers also offer financial education with additional support, such as regulated advice, financial products, and services (FinCap, 2020).

Consumer financial education has caught the attention of researchers, practitioners, and consumer financial policy makers (Xiao and Porto, 2017; CFPB, 2015). There is growing concern about the over-indebtedness of households. Moreover, many consumers cannot make informed choices of financial products that meet their needs, due to a lack of financial skill (Atkinson et al., 2007). Consequently, consumer education has become an important aspect of corporate social responsibility principles outlined by the OECD (Reifner and Schelhowe, 2010). Corporate social responsibility requires financial institutions such as banks to invest in financial education to enhance public finances. Financial education can become a part of consumer protection from the risk of financial traps such as poorly functioning markets, misleading product information, and taking advantages of illiterate consumers (Reifner and Schelhowe, 2010). Financial education also addresses the practical needs of consumers to use financial services in a way that suits their needs, and they can make the most of the opportunities that the financial markets offer them, such as loans, savings and investment products (Reifner and Schelhowe, 2010). Financial education also enables households to manage their income more productively.

Lastly, financial education is delivered by social workers to low-income people through the development and provision of financially related materials (Zhan, Anderson and Scott, 2006). Social workers can assist families with credit information and advocate at the micro and macro level to give them access to credit (Birkenmaier and Curley, 2009). This will support families who are struggling for financial stability. Social workers understand the financial situations of their clients better than financial educators; thus, they can also introduce suitable community financial education programs to their clients. Social workers can play a significant role in increasing the financial awareness of low-income consumers (Zhan et al., 2006).

In comparing formal and informal financial education, it is argued that early interventions, such as providing financial education in schools, could be more
effective in establishing the foundations of financial literacy (Zhan et al., 2006). Early interventions/financial education in schools can also help break the cycle of generational financial illiteracy and gain access to different demographic groups, in particular vulnerable groups such as low income and/or migrant families. The involvement of different parties such as schools, teachers and parents, encourage desirable financial habits and behaviours in the wider community (Zhan et al., 2006). The learning and teaching environment in schools can be an active and efficient environment to develop financial skills. A lack of early exposure to financial education might have a negative impact on the effectiveness of financial training in the workplace or other settings in adulthood (Zhan et al., 2006).

On the other hand, informal settings of education are also needed in adulthood to keep up with changes in financial regulations, financial products, services and markets (Zhan et al., 2006). Furthermore, becoming an adult means a person has access to certain financial resources, financial products, services for 18 years old and above. Hence, the school-leavers would need to be equipped with practical financial management skills. This is to help them make use of the financial resources wisely, build up credit scores and to prevent them from struggling with debts because of financial illiteracy.

In summary, it could be seen that financial education has been used separately or in combination with other interventions to influence individual financial capability and wellbeing. Previous studies also show that consumers have a need of financial education to help them manage their finances effectively. Furthermore, the attention of financial education intervention focuses on behaviour change to create a direct outcome of FWB. It is clear, though, that there are mixed views about the efficacy of financial education in achieving financial behaviour change. Moreover, it is important to have realistic expectations of what financial education can achieve when there are many other factors that can influence the learners’ progression.

The findings from the literature suggest that it is advisable to take a step back to question whether financial behaviour should always be the key indicator to measure the impact of financial education/other interventions in order to promote FWB. Therefore, this study examines the key determinants of FWB with two selected
components (Perceived FWB and financial needs satisfaction) and financial capability, and its four components (financial capacity, behaviour, literacy, and attitude).

Reviewing the two categories of financial education intervention, it can be seen that both early intervention and education in adulthood are important in their own right. Each serves different needs for certain stages in life. Since financial education intervention has become important amongst financial consumers who are mostly working, it requires a convenient format and appropriate timescale for the delivery of the training. This is where online financial education is most useful: people can learn anywhere, in their own time and at their own pace. However, there are currently limited studies on those who take part in online financial education in relation to financial capability and wellbeing. Consequently, this study investigates participants’ financial capability and wellbeing in the context of online financial education. The following section reviews online financial education to understand the context of this study.

2.3.8.3 Online Financial Education Intervention as A Research Context in The Current Research

Online financial education is a potential tool to promote FWB through changing financial behaviour change (Miller et al., 2014). Adult learners need to learn how to deal with the changes in financial marketplace. This is why educational programs for large communities are needed (Collins and Holden, 2014). Financial education for adults can be delivered through various methods, such as in a classroom, online, or through home study. It is often assumed that face-to-face mode is more effective than other methods of delivery (Collins and Holden, 2014). However, Clancy and Carroll (2007) suggest that multiple modes of delivery may be more effective.

Online financial education has rapidly become a popular method of delivery thanks to the fast growth of internet technology. It offers open and easy access to resources that enhance individual financial literacy. For example, the Federal Deposit Insurance Corporation (2007) developed Money Smart to enhance financial knowledge and positive relationships with financial institutions for adults outside the
financial mainstream. The easy-to-use tools for learning basic personal financial management were delivered through the Money Smart Computer-Based Instruction (CBI). The users completed assignments at their own pace. Many months after completing the training, this program positively affected consumer behaviour. For example, participants tended to open deposit accounts, save money in a mainstream deposit product, and reviewed their budget or had begun the process. Confidence in their own financial abilities also increased in the six to twelve months after completing the Money Smart programme (Federal Deposit Insurance Corporation, 2007).

In addition, an online financial education intervention targeted chronically ill rural women. The program used a net worth statement to track FWB (Haynes et al., 2011). The underlying assumption of this program was that overall wellbeing can be improved through increasing financial knowledge. The finding from this intervention endorsed the effectiveness of online personal and family financial education programmes in improving FWB (Haynes et al., 2011).

Furthermore, online financial education programmes that offer free access to the public can benefit the larger low-income population better than other forms of delivery, including workplace training. For example, low-income youth have fewer chances to access school-based education programs, as they are more likely to drop out of high school (Zhan et al., 2006). Low-income adults have less chance to benefit from the programmes developed for the general population. They are also less likely to work for employers who offer retirement benefits or provide workplace financial education (Zhan et al., 2006). Online financial education could be an ideal solution to target low-income adults outside of employment and school settings.

One of the important functions of online financial education is the online discussion platform. These platforms create social networks for learners with the support from their mentors. Other learners can also share their experience in managing their finances. Previous studies found that the use of social support groups is important as it enhances the quality of life and improved decision-making (White and Dorman, 2001; Cline, 1999; Spiegel, 1994; Spiegel et al., 1989). A sense of empowerment can be created through a social support group with a holistic and cooperative approach to meeting cultural and social needs (Braithwaite et al., 1999).
Online support groups are likely to expand when computer-mediated communication technology has been well developed. There are many benefits of online communications in educational intervention compared with face-to-face training (White and Dorman, 2001). For instance, online support groups are ideal for reaching population groups who prefer to keep their anonymity when discussing personal matters. Online communications are also a cost-effective means of providing support, encouragement, and information to a large number of people (Galinsky et al., 1997). Online communications also empower learners by sharing and obtaining information between online groups (Burrows et al., 2000). Online group is a beneficial environment for communicating educational messages, and those with positive behaviours can become good influencers within the online community.

However, it is important to stress the negative side of online communities whose members can sometimes promote inaccurate or inappropriate information. While online education and communication is highly accessible to people anywhere in the world, it also requires technology-related skills from both educators and learners. This might be a constraint for some people who have limited skills and resources (e.g. computer, internet) to participate in the community.

Further research is required to examine the role of online support groups in relation to increasing learners’ satisfaction with the achievement of desired outcomes (White and Dorman, 2001). It is not clear that any one mode of educational delivery is superior (Collins and Holden, 2014). Regardless of methods of delivery, educational programs face the same challenges to demonstrate their ability to change knowledge and behaviour. Finally, reviewing the literature, this study found that there is currently no study that investigates financial needs satisfaction and subjective wellbeing in relation to financial literacy, behaviour, attitude, capacity, and perceived financial capability in the context of online financial education. This absence has brought about the motivation to examine this topic in this thesis.

2.4 Conclusions

In summary, this chapter has explored FWB, its components and determinants. The links between perceived financial capability, financial attitudes, financial capacity,
financial behaviours, subjective financial literacy, financial needs satisfaction, and Perceived FWB, have been endorsed within different disciplines, such as human needs and personal finance. The links explain why understanding Perceived FWB and its determinants within the online financial education context are at the centre of this thesis.

Moreover, there are gaps in the existing literature that prompt the need for further investigation. For example, a research gap was found when defining the approach to measure the satisfaction of needs to capture the concept of FWB in relation to the key elements of desired living standards and financial freedom. Some authors propose a concept without clarifying how to measure these elements within their research (Brüggen et al., 2017; CFPB, 2015a; Blishen, 1977; Campbell et al., 1976). Responding to this gap, this study adopts the human needs theory of Maslow (1943) to measure the concept of the satisfaction of financial needs.

In order to inform FWB intervention programmes, the relationship between FWB and financial capability has been examined to define the determinants of FWB. Accordingly, the determinants of FWB are defined as financial capability and its four components: financial capacity, financial behaviour, financial literacy and financial attitude. The relationships between these four components and FWB are also reviewed. These relationships are integrated into a research model and tested in this research.

Note that due to limited post-data after the intervention (i.e. post and follow-up surveys and interviews), this study could not provide evidence to support the impact of online education. This study has therefore focused on understanding the unique characteristics of people who need online educational support and their perceived needs to achieve better financial outcomes. The research then further explores the financial needs satisfaction, financial capability and Perceived FWB amongst online learners. It is hoped that understanding these matters might inform interested parties about how an improvement in financial capability and its components can potentially enhance financial needs satisfaction and wellbeing.
Based on the literature review, the next chapter is going to outline two research models for this study. These models use a financial needs hierarchy and a FWB framework. The research questions and hypotheses to test FWB framework are also set out.
III. RESEARCH FRAMEWORKS CHAPTER

3.1 Introduction

This thesis proposes two research frameworks: a FWB conceptual framework and a theoretical framework of a financial needs hierarchy. These are original frameworks that have been developed from extending the frameworks and concepts used in the various related bodies of literature reviewed above, which form the basis for the empirical research conducted in this study. The FWB conceptual framework is the key research focus of this research as this framework examines the key determinants of FWB. This conceptual framework includes two components – Perceived FWB and financial needs satisfaction – and the links to their determinants, such as perceived financial capability, capacity, behaviour, literacy, and attitude. The second framework, a financial needs hierarchy, is developed based on Maslow’s hierarchy of human needs (1954).

These two frameworks are the main contributions to knowledge for this study. This chapter explains the two research frameworks. After reviewing the FWB conceptual framework, the hypotheses are proposed in accordance with the key research questions.

3.2 Conceptual Framework of Financial Wellbeing

This section recaps the literature review to establish the theoretical insights for the FWB framework to be tested in this study. The theoretical insights section provides a side-by-side framework to explain how this study adopts human wellbeing theory to the FWB framework. Then, the derivation of hypotheses section focuses on the framework that will be tested in this study.

3.2.1 Theoretical Insights for Financial Wellbeing Framework

The literature review highlights a gap in knowledge with regard to the nature of personal financial wellbeing (FWB) and its determinants (Brüggen et al., 2017). This thesis seeks to extend existing theories of human wellbeing to understand FWB. The literature lacks a unified theory that can explain cross-sectional and inter-
temporal variations in the construct of FWB. A more creative approach is needed for the study of FWB intervention, one that incorporates a combination of different disciplines to cover multidimensions of FWB (Brüggen et al., 2017). This thesis proposes such a framework and then uses it to derive hypotheses to explain FWB.

Subjective or personal wellbeing consists of physical, psychological (including emotional and mental), social and FWB (Zemtsov and Osipova, 2015). The concept of FWB in the current study with two components, perceived FWB and financial needs satisfaction, is rooted in two major philosophies in personal wellbeing, hedonism and eudaimonism (Nanda and Banerjee, 2021; Diener et al., 2009; Ryan and Deci, 2000). There are two blocks A and B in Figure III-1 that describe the theoretical framework of the current study, along with building blocks derived from the earlier literature.

In block A of Figure III-1, the two traditions, hedonism and eudaimonium, reflects two distinct views of human nature and of what constitutes a good society (Ryan and Deci, 2000). These two views are drawn from the positive psychology literature (Nanda and Banerjee, 2021). In empirical studies, well-being is considered as a multidimensional phenomenon that includes aspects of both the Hedonic and Eudaimonic conceptions of wellbeing (Ryan and Deci, 2000). The origin of the hedonic view of wellbeing is in a larger construct of subjective wellbeing (SWB) which contains life satisfaction and happiness. Diener et al. (2009, p.187), cited in

Figure III-1: Theoretical Framework of FWB
Nanda and Banerjee, 2021, defined SWB as an evaluation of a person’s life as a whole (see more in Section 2.2.4). By contrast, the eudaimonic viewpoint focuses on psychological wellbeing (Ryan and Deci, 2000). The eudaimonic view of wellbeing encapsulates the importance of having a sense of purpose and direction, achieving satisfying relationships with others, and gaining a sense of self-realisation (Nanda and Banerjee, 2021; Ryff, 1989). The eudaimonic viewpoint focuses on the fully functioning person with different elements of wellness variables (Ryan and Deci, 2000) or happiness plus meaningfulness (Ryan and Deci, 2000; McGregor and Little; 1998), or a set of six dimensions (Ryan and Deci, 2000; Ryff, 1989a).

These two approaches have generated distinct, but also overlapping (Ryan and Deci, 2000). There have been debates between hedonic and eudaimonic theorists both ancient and contemporary (Ryan and Deci, 2000). The definition of well-being is controversial and unresolved (Ryan and Deci, 2000). However, this study does not intend to resolve it but has adapted these two traditions to construct two components of FWB to investigate their determinants. This study attempts to respond to the research inquiry on the knowledge of the factors that promote individual wellbeing, particularly FWB (Ryan and Deci, 2000). The findings hope to point the way toward means through which individuals can seek hedonic or eudaimonic outcomes to attain fully functioning and life satisfaction (Ryan and Deci, 2000). Nanda and Banerjee (2021) suggested that understanding the hedonic and eudaimonic views of wellbeing provides a theoretical background for researchers to explore further this area.

This study applies the two philosophies of wellbeing in research on FWB. In previous studies, FWB construct was measured objectively or and subjectively (see more in Section 2.2.3). This study focuses on assessing the subjective aspects of FWB. This study selects the subjective approach because it involves personal perceptions of individual financial conditions (Tenney and Kalenkoski, 2019; Gerrans et al., 2014). This approach is more comprehensive in defining and measuring complex and personal phenomena such as FWB (Brüggen et al., 2017). An objective approach does not capture non-financial issues that the subjective approach can identify (Brüggen et al., 2017) (see more in Section 2.2.5).
The first part of block B of Figure III-1 shows how this study follows the two viewpoints of wellbeing with two components of FWB. The first component, Subjective or Perceived FWB adopts Diener’s hedonic view of SWB (Nanda and Banerjee, 2021) which evaluate a person’s feelings about their overall financial circumstances. Perceived FWB focus on a person’s self-assessment of his/her disposition, attitude, belief, and behaviours related to money management (Nanda and Banerjee, 2021, p.1; Netemeyer et al., 2018; Brüggen et al., 2017). Perceived FWB in this study consists of (1) having positive feelings and (2) not having negative feelings with overall financial circumstances (Strumpel, 1976; Porter and Garman, 1993; Shim et al., 2009; Vlaev and Elliott, 2014).

By contrast, the second component, financial needs satisfaction, uses the eudaimonic view. Following the eudaimonic view, the concepts of financial capability and emerging definitions of FWB include other elements such as living standards or financial freedom (Nanda and Banerjee, 2021). Accordingly, this study adopts Brüggen et al.’s definition of FWB (2017) and Maslow’s human needs theory (1943) to construct the second component of FWB. Brüggen et al.’s definition of FWB (2017) is positioned under the eudemonic view of wellbeing because it emphasises the potential of an individual by achieving an aspirational living standard and freedom (Nanda and Banerjee, 2021). Brüggen et al. (2017) defined FWB as “the perception of being able to sustain current and anticipated desired living standard and financial freedom” (p.2). Some recent studies (Nanda and Banerjee, 2021; Chatterjee et al., 2019; Hampson et al., 2018; Losada- Otalora et al., 2018; Hampson and McGoldrick, 2017;) have used this definition to explore FWB. On the other hand, this study adapts Maslow’s human needs theory (1943) to construct the concept of anticipated desired living standard and financial freedom in Brüggen et al.’s FWB definition (2017). Previous studies used Maslow’s theory to develop the financial needs construct (e.g. Xiao and Anderson, 1997; Xiao and Noring, 1994), as well as explore the relationship between financial needs and FWB (e.g. Kiymaz and Öztürkkal, 2019) (see more in Section 2.2.4.2). This study does not test Maslow’s theory but follow previous studies (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994) to adapt Maslow’s human needs theory to develop the constructs of financial needs and financial needs satisfaction. Accordingly, the theoretical insights of the concept of financial needs and financial
needs satisfaction in this study are based on eudaimonic view in human wellbeing theory, Brüggen et al.’s definition of FWB (2017) and Maslow’s human needs theory (1943). By using two views of wellbeing to capture the concept of FWB, this study hopes to understand the nature of FWB from different perspectives.

The second part of block B of Figure III-1, financial capability with four components, financial literacy, behaviours, attitudes, and capacity, is theorised as determinants of FWB in this study (Xiao et al., 2016; Xiao and O’Neill, 2016; Shim et al., 2013; Taylor, 2011). There are various internal and external factors that influence an individual FWB (see Section 2.3.1). However, this study focuses on financial capability and conceptualises it with four components (see Sections 2.3.5 and 2.3.6).

In this study, the concept of financial capability is constructed based on both theoretical and empirical insights (see more Section 2.3.3). The theoretical insights come from personal wellbeing theory that describes a person capability can influence their wellbeing. From a personal wellbeing perspective, when assessing human well-being and development, there are certain elements are considered such as utility (i.e. happiness, desire-fulfilment or choice), resources (i.e. income, commodity command or entitlements) and capability to achieve valuable function(ing)s (Clark, 2007). A person’s functionings are described as the collection of ‘beings’ and ‘doings’ that a person actually achieves. Whilst a person’s capabilities focus on their real opportunities or positive freedom of choice between possible lifestyles (Clark, 2007; Sen, 1985; 1992; 1999). Applying this approach to this study, financial capability is the ability to meet financial needs satisfaction with financial freedom is the ultimate outcome. There are no existing concepts of financial capability that refer to the financial ability to promote financial needs satisfaction in order to achieve (subjective) FWB. Therefore, a new concept of financial capability is offered to demonstrate its important role in the achievement of financial needs satisfaction as a part of a selected FWB model (see Section 2.2.4). This study proposes that financial capability is the individual’s ability to take control of their finances and satisfy their financial needs of having financial freedom.
The empirical insights to construct financial capability and four components are based on the results of empirical studies in the personal finance area. In personal finance, there are various approaches to defining financial capability (see Section 2.3.3). Financial capability is also related to the ability to manage and take control of personal finances (Taylor, 2010), to apply appropriate financial knowledge, and to perform desirable behaviour to achieve FWB (Xiao and Porto, 2017; Xiao and Neill, 2016; Xiao et al., 2014; Taylor, 2011; Atkinson et al., 2006). There are some common factors found to have an impact on FWB from different studies such as financial capability, financial behaviour, financial attitude, financial knowledge, financial education, financial resources (e.g. income, materialism) etc. These factors are related to the concept of financial capability in the literature where some authors include certain elements of financial behaviour, financial attitude, financial knowledge/literacy, income/financial resources as parts of financial capability (Xiao and O’Neill, 2016; Taylor, 2010).

To select the factors to examine their relationships with FWB in this study, some aspects are considered by the researcher. Firstly, the selected factors need to be well recognised as the determinants of FWB in the literature review. Secondly, these factors fit in the concept of financial capability that is used in this study. Lastly, the researcher needs to consider the length of the questionnaires. As a result, the current study focuses on four factors: financial behaviour, financial attitude, financial knowledge/literacy, financial capacity (income/financial resources).

In summary, the theoretical framework in this study illustrates that the focus of this study is on FWB. The theoretical framework is established based on human wellbeing theory as well as personal finance theory and practice. By exploring the determinants of two components of FWB, this study hopes to inform FWB intervention programmes. Understanding the differences between hedonic or eudaimonic outcomes and their determinants is an essential step to help a person attain fully functioning and life satisfaction for themselves (Ryan and Deci, 2000). The next session is focusing on the conceptual framework to be tested in the study. This testing conceptual framework is a shortcut of the theoretical framework in Figure III-1.
3.2.2 Theoretical Framework of Financial Needs Hierarchy

This section reviews some key findings from the literature and proposes a hierarchy of financial needs to be examined in this research. The previous chapter (2.2.4.2), discussed the concept of financial needs satisfaction, as derived from Maslow’s hierarchy of human needs (1954). Tay and Diener (2011) have expanded on Maslow’s five hierarchical model with the six hierarchical needs (i.e. ‘basic’, ‘safety’, ‘social’, ‘respect’, ‘mastery’ and ‘autonomy’) in relation to three types of SWB: life evaluations, positive feelings, and negative feelings. For instance, basic needs for food and shelter were satisfied when in the past 12 months a respondent (a) had enough money for food, (b) had enough money for shelter, and (c) did not go hungry (Tay and Diener, 2011, p. 356).

In order to assess the hierarchy of needs, various authors have used different approaches to test the theory. For example, Taormina and Gao (2013) adapt Maslow’s (1943) assumption that it is necessary for lower-level needs to be mostly satisfied before the higher-level needs can be met. Taormina and Gao (2013) found that the satisfaction of higher level of needs are positively and significantly correlated with the immediate lower-level needs in the hierarchy. The finding endorses Maslow’s theory of hierarchy of needs. By contrast, the physiological needs are at the lowest level. Therefore, it is not necessary to run a test, but it can be used as a potential predictor of the higher levels (Taormina and Gao, 2013).

By contrast, Tay and Diener (2011) categorise individual need variables using a stepwise approach for the hierarchical order, such as basic, safety, social, respect, mastery, and autonomy, which partly follows Maslow’s hierarchy. This approach attempts to shed light on the general effects of psychosocial needs beyond physiological needs. Using this stepwise procedure, they found that individual-level basic needs are important to life evaluations (25% of variance) and negative feelings (6% of variance). Similarly, social (7% of variance) and respect needs (9% of variance) are important for positive emotions, beyond basic needs. Respect also accounted for an additional 3% of the variance for negative emotions, beyond basic needs.
In addition to the method of testing hierarchical needs in relation to human wellbeing or self-actualisation, Clarke et al. (2006) use weighted procedures. The weights are based on a value judgment that the appropriate weights should reflect a hierarchical and simple linear progression (Clarke et al., 2006). Greater weight is given to the higher needs. Wellbeing or self-actualisation is achieved through the fulfilment of the hierarchical categories. Therefore, the importance of the different categories in relation to their impact on wellbeing is the rationale for the authors to assign a weight to a different level of needs. Accordingly, basic needs are weighted least (×1); safety needs are weighted as twice as important (×2); belong needs are three times as important (×3), and self-esteem needs, four times as important (×4) (Clarke et al., 2006, p. 939). They claim that their approach is in line with normative social choice theory in which the analyst is given the freedom to interpret society’s preferences and value judgments (Bonner, 1986). The limitation of this approach is that they only focus on four levels of hierarchical needs, which excludes the top-level autonomy or self-actualisation (Bordages, 1989). Furthermore, Clarke et al. (2006) focus on the strength of the hierarchical approach but they do not take into account that the individual has different priorities, which depend on their values and circumstances. The importance of hierarchical needs is not likely to be equal between individuals. A certain financial need is important to one person but not important to others. Hence, a fixed number to calculate the weights of the importance of each level of needs as proposed by Clarke et al. (2006) is debatable. The weight should consider the level of the importance of each financial need for an individual, rather than calculate a fixed number for all financial needs within one level of the hierarchy.

In a study at national level across the world, Ng and Diener (2014) used the data from the Gallup World Poll. The authors found an association between financial satisfaction and SWB. Furthermore, the postmaterialist needs and SWB were stronger in richer nations compared with poor ones. As a result, developed countries should focus on both material and psychological needs as well as economic gains, as both measures are essential to wellbeing. Satisfaction with the material aspects of life is essential for wellbeing, and contrary to popular belief, it has a stronger impact on SWB in wealthier countries than in the poor ones (Ng and Diener, 2014). It is suggested that in societies that are economically developed and stable, like the
UK, economic growth and self-expression values should be taken into account to enhance individual FWB.

In the context of this study, most participants who took part in the online MMM are from the UK, and Continental Europe. There were smaller numbers of participants from other continents. It was useful to test the concept of financial needs hierarchy in contribution to individual FWB amongst a mixture of populations from both developing and developed countries.

Finally, Howell et al. (2013) found evidence that money can buy satisfaction by increasing individual financial security and psychological need satisfaction. The authors suggest that future research should explore the mediator role of psychological need satisfaction in relation to an individual’s financial capability and wellbeing (Howell et al., 2013).

Having examined the above approaches, this study recognises that none of these studies have looked at financial needs satisfaction based on the needs of having money or financial resources to satisfy human needs to achieve FWB; for example, financial needs to afford lifestyle, aspirations and disposable household income for non-essentials (Vlaev and Elliott, 2014).

Furthermore, there is a lack of study into behaviour that links financial needs and financial behaviour in order to explain why people behave in certain ways with their money. For example, why do people save money and put money in pension funds? This links to the need to be financially secure in accordance with Maslow’s theory. The above rational considerations have prompted this study to explore hierarchical financial needs with a consideration of the importance of each need to the individual. People might have different levels of human needs that are required to be fulfilled, but this fulfilment is not always possible if their resources are limited. Hence, they often have to set different financial priorities based on their needs, such as deciding which ones they ‘must have’. Understanding the importance of certain financial needs in relation to individuals is essential to shed light on their current financial priorities and their financial needs satisfaction. Finally, based on the literature and the proposed theoretical framework, this study defines financial needs satisfaction
as the perception of being able to fulfill financial needs to sustain a current and anticipated living standard and financial freedom.

In summary, this study proposes a theoretical financial needs hierarchy adapted from both Maslow’s theory of human needs and more recent studies that have made use of Maslow’s theory in relation to personal finance (Ng and Diener, 2014; Howell et al., 2013; Xiao and Noring, 1994; Maslow, 1943). The financial needs model is based on the assumptions of financial behaviours and the link between financial needs and behaviours. In this model (see Figure III-2), there are five levels of financial needs: (1) finance for existence, (2) financial security, (3) financial maintenance, (4) financial confidence and (5) financial freedom.

![Figure III-2: The conceptualised hierarchy of financial needs is based on Maslow’s human needs theory](image)

**Finance for Existence**

Finance for existence is the lowest level of financial needs, which refers to the need for financial resources to fulfil basic physiological needs such as food, water, shelter, clothing, and transport. The achievement of basic needs occurs at a low level of income. Therefore, the satisfaction of basic needs is an absolute outcome as it is not dependent on an increase in income (Clarke et al., 2006).
Financial Security

Financial security is a part of human safety and security needs which is influenced by an individual's financial position (Howell et al., 2013). Financial security is an important outcome of socio-economic status, such as income, wealth, savings, and lack of debt. Financial security is the second lowest level of financial needs that relates to the need for safety and security needs. The financial security term refers to the financial capability that can provide individuals with the feelings of safety and assurance. This financial security can relate to the possession of valuable assets such as home ownership, rather than having a basic shelter or rented housing. Financial security covers the financial needs that are relevant to different financial behaviours. For instance, being able to save for rainy days or unexpected major expenses or retirement, is a form of financial security. Saving to purchase products or services for financial protection (e.g. private pension, income protection insurance) is potentially a type of financial security (Xiao and Noring, 1994). Financial security can also relate to such things as being able to pay for health care and insurance, or being able to afford higher education.

Previous studies suggest that the subjective evaluation of financial security has an impact on individual wellbeing (Howell et al., 2013). Perception of financial security may be influenced by changes in financial status over time, which is likely to be a significant determinant of wellbeing (Moghaddam, 2008). Howell et al. (2013) propose that financial security influences SWB, particularly amongst people who have basic needs met. Therefore, should financial circumstances change in the future, such as losing a job or a decrease of income, people would still be able to meet both basic needs and to afford desired purchases. In a study by Howell et al. (2013), financial security was found to be the strongest mediator in the relationship between wealth and subjective wellbeing.

In addition, financial security can be a predictor of life satisfaction for certain groups such as students (Howell et al., 2013; Zumbo and Michalos, 2000). In a study carried out by Michalos et al. (2005) (see Howell et al., 2013), financial security is also an important determinant of health and life satisfaction. Financial security contributes to the variance that explains happiness and life satisfaction (Michalos et al., 2005; Michalos et al., 2000). The present study is investigating financial security as a part
of financial needs satisfaction in relation to Perceived FWB from a human needs perspective.

Financial Maintenance

Financial maintenance is the third level of financial need. It refers to the need to have enough money to satisfy love and belonging needs and maintain social inclusion (Howell et al., 2013). It does not only relate to being able to look after oneself but also to care and support for others, such as family, friends, or society (i.e. charity). Financial maintenance can also relate to having the capacity to pay for social activities to maintain social networks for belonging and social inclusion needs. Oleson (2004) pointed that there is a psychological component beyond the physiological component of money to pay for basic needs. This component reflects an individual’s financial attitude and how money is associated with their wellbeing. Financial maintenance is one part of that psychological component. Some authors (Biswas-Diener and Diener, 2001) suggest there might be a positive correlation between higher income and social support.

Financial Confidence

Financial confidence relates to financial esteem needs where a person is confident with their financial circumstance, such as being able to feel proud or respected for their wealth. Needs relating to self-esteem and esteem from other people (Taormina and Gao, 2013; Maslow, 1943) are embedded within this category. Self-esteem includes the mastery of skills or getting social attention and recognition (Clarke et al., 2006). Satisfaction of financial esteem is also expected to bring about confidence and empowerment to individuals, as they can make financial decisions without having tight financial constraints.

Financial Freedom

The top level of financial needs is financial freedom, which represents self-actualisation in financial needs. Self-actualisation relates to the desire to become the most that one can be. This study uses financial freedom as the highest level of financial needs, based on the concept of FWB. Financial freedom is the ability to sustain a desired lifestyle and financial freedom of choice (Brüggen et al., 2017); for example, having the capacity to be a wealthy philanthropist who promotes the
welfare of others through making donations to good causes. At this level of needs, people are actively seeking (financial) knowledge or educational inspiration and are inspired to reach their potential. In a previous study, Clarke et al. (2006) define wellbeing as the fulfilment of the top level of human needs – self-actualisation. The fulfilment of hierarchical self-actualisation is the sum of all four lower levels, such as basic needs, safety needs, belonging needs and self-esteem needs (Clarke et al., 2006). The authors identify wellbeing as a fulfilment of human needs. Accordingly, in the context of this study, FWB is described as fulfilment or satisfaction of financial needs.

3.3 Derivation of Hypotheses

Informed by the literature review and supported by theoretical insights, this study proposes an empirical framework of FWB to be tested in this study (see block B in Figure III-1). Set out below is a summary of the literature review that supports the above framework with Perceive FWB and financial needs satisfaction are two components of FWB:

**Perceive FWB**

People perceive FWB when they have a sense of material security, such as feeling satisfied with their income and savings (Strumpel, 1976). Perceived FWB is a component of FWB (Shim et al., 2009; Porter and Garman, 1992). Perceived FWB is measured by perceptions and evaluations of financial status (Xiao, 2015; see Xiao and Porto, 2017). Brüggen et al. (2017) suggest that a subjective approach is more comprehensive than an objective approach to define and measure FWB, a complex and personal phenomenon. The reason is that it can identify non-financial issues such as an individual's perception and emotions towards their financial circumstances. One of the definitions of Perceived FWB is linked to financial needs satisfaction: “The individual’s self-rating of their income adequacy to meet their general needs” (Arber et al., 2014, p.12).

**Financial needs satisfaction**

Satisfaction with consumption, family financial management, and household situations is used to measure individual perceptions of FWB (Porter and Garman, 1993; Wilhelm et al., 1987; Hira, 1986; Jeries and Allen, 1986; Godwin and Carroll,
1985; Hafstrom and Dunsing, 1973). Satisfaction with resources and living standards are important predictors of perceived economic wellbeing (Walson and Fitzsimmons, 1993). In a study across 149 nations, Ng and Diener (2014) found that people who had higher financial satisfaction and fulfilment of materialist or financial needs are associated with having positive SWB (e.g. higher life evaluation, more positive feelings, and less negative feelings). Similarly, other authors accord that the satisfaction of basic physiological, psychological, and motivational needs, positively influence individual wellbeing (Taormina and Gao, 2013; Deci and Ryan, 2009; Ryan and Deci, 2000).

**Determinants of Perceived Financial Wellbeing**

An overview of literature review is set out below that shapes the links between FWB and perceived financial capability, financial attitudes, financial capacity, financial behaviours and subjective financial literacy as follows:

*Perceived financial capability*

Perceived financial capability is associated positively with financial satisfaction (Jian et al., 2014). Perceived financial capability is described as a mediator of financial satisfaction that is closely related to subjective wellbeing (Vera-Toscano et al., 2006). Financial satisfaction plays an important mediating factor between income and subjective wellbeing (Diener and Biswas-Diener, 2002). Other authors have observed a positive association between perceived financial capability and financial satisfaction (Xiao et al., 2014b) and found that financial self-efficacy is associated with FWB (Xiao et al., 2016; Lown, 2011). Based on the literature, this study posits that:

*H1:* Perceived financial capability has a significant and positive relationship with Perceived FWB among online learners.

*Financial attitude*

In Vlaev and Elliott's research (2014), the ‘being in control’ factor was found as the key attitude-based driver of FWB. Sabri and Zakaria (2015) found that those who had moderate levels of financial literacy, financial capability, and FWB, tended to have more positive money attitudes and less financial strain. Gasiorowska (2014) found that two dimensions of money attitudes – perceived financial control and
money anxiety – affect the subjective perception of the objective wealth of FWB. Thus, based on the previous studies, researchers have formulated and tested following hypothesis:

**H2: Financial attitude has a significant and positive relationship with Perceived FWB among online learners.**

**Financial capacity**

Financial capital is considered to be an objective feature of FWB (Zemtsov and Osipova, 2015). Financial capacity is also considered an element in perceiving FWB (CFPB, 2015) and the outcome of financial capability should be FWB (Xiao and O’Neill, 2016). Having financial capacity to absorb a financial shock is one of four elements of the FWB concept introduced by CFPB (2015). Based on the above discussion, this study postulates that:

**H3: Financial capacity has a significant and positive relationship with Perceived FWB among online learners.**

**Financial behaviour**

It has been argued that financial behaviour is one of the most important elements that form financial capability and wellbeing (CFPB, 2015; Zemtsov and Osipova, 2015). Positive financial behaviours tend to reduce financial stress and increase financial satisfaction (Lyons et al., 2008; Xiao et al., 2006). Hence, based on these arguments, this study posits that:

**H4: Financial behaviour has a significant and positive relationship with Perceived FWB among online learners.**

**Subjective financial literacy**

Subjective financial literacy was found to be a positive contributing factor to financial satisfaction (Xiao et al., 2014). Xiao and Porto (2017) suggest that financial education may affect financial satisfaction through different factors, including financial literacy. Financial education is expected to enhance consumer financial capability, as well as welfare, by improving the level of financial literacy and promoting desirable financial behaviours (Mouna and Jarboui, 2015; Huhmann and McQuitty, 2009; Atkinson et al., 2006). Stuart (2012) proposes a model for ‘financial education theory of change’ where financial literacy is seen to motivate a change of
behaviour, which, in turn, results in a change in economic wellbeing. Online financial education has been used to influence financial behaviour change in order to promote FWB (Miller et al., 2014). Since people with high financial literacy tend to perceive higher level of FWB, the following hypothesis is tested:

\[ H5: \text{Subjective financial literacy has a significant and positive relationship with Perceived FWB among online learners.} \]

**The Determinants of Financial Needs Satisfaction**

The financial needs model in this study informs the design of measures of financial needs satisfaction. The aim is to understand how financial needs satisfaction accounts for individual FWB. It is worth noting that since Maslow’s theory is a psychological theory, there are problems of invalid constructs, measurement, and controversial assumptions, when applying it to the context of family finance (Xiao and Noring, 1994). Therefore, this study takes an exploratory approach to assessing the relationship between financial needs satisfaction and the determinants of FWB. The question is, what is required so that people can satisfy their needs and achieve Perceived FWB? Or can people still satisfy their financial needs without it?

This study suggests that financial capability is one of the conditions that link financial needs satisfaction and (subjective) FWB. To satisfy human needs, their financial obligations, an individual needs to have the financial capability to fulfil their needs (e.g. finances for existence and enjoyment). People have different needs and their financial needs are motivated by their wealth status and financial resources (Xiao and Noring, 1994). Based on Maslow’s theory of needs (1943), financial needs are likely to be hierarchical. People who have limited financial resources tend to have lower-levels of needs, such as survival and security needs. Their financial needs are likely to expand when their financial resources increase, and lower level financial needs are already met. Xiao and Noring (1994) suggest that these financial needs are hierarchical in accordance with the increase of family financial resources. In addition, financial needs are diverse because people have different characteristics. For example, some people do not have the need to arrange financial protection for their future, as they tend to live for today. By contrast, others feel worried or stressed...
if they do not have long-term financial needs satisfied, such as income protection and retirement funds.

Therefore, from the above discussion, the researcher formulates the following hypotheses to test the associations between components of financial capability and financial needs satisfaction.

H6: Perceived financial capability has a significant and positive relationship with financial needs satisfaction among online learners.
H7: Financial attitude has a significant and positive relationship with financial needs satisfaction among online learners.
H8: Financial capacity has a significant and positive relationship with financial needs satisfaction among online learners.
H9: Financial behaviour has a significant and positive relationship with financial needs satisfaction among online learners.
H10: Subjective financial literacy has significant and a positive relationship with financial needs satisfaction among online learners.

Furthermore, this study also explores the conceptualisation of FWB with financial needs satisfaction being one of its components. To address the research question “what is the nature of financial needs satisfaction, as a component of FWB?”, this thesis attempts to understand how people satisfy their financial needs and whether there is a hierarchy. This is based on the theoretical hierarchy of financial needs adapted from Maslow’s human needs theory. To explore the chosen concept of FWB where financial freedom is at its heart (Salignac et al., 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014), this study examines whether financial freedom is categorised within the same category with other higher-level financial needs and at the top of the hierarchy. The empirical data in this study will supply the evidence to resolve the research question, as well as support the theoretical framework for the hierarchy of financial needs as seen in Figure III-2.
3.4 Conclusions

This chapter has explored two research frameworks, which are tested in this thesis – a theoretical framework of financial needs hierarchy and a FWB framework. These two research frameworks are the key contribution to knowledge in this research. This chapter has also proposed two main hypotheses to be tested and the research questions to be answered. In order to answer the key research questions, this study examines the participants who took part in the MMM course. The next chapter discusses the methodology used to answer the research questions and to test the research frameworks.
IV. METHODOLOGY CHAPTER

4.1 Introduction

The research methodology relates to the research strategy that includes a plan of action, a research process or design for the use of specific methods to achieve the expected outcomes (Crotty, 1998). This chapter discusses the methodology adopted in this study, which includes the research philosophy, research design, data collection, and data management strategies.

4.2 Research Approach

This study adopts a pragmatic approach. The rationale of choice is based on certain aspects, such as the research ontology, epistemology, research field, purposes, questions. These aspects are explained in this section.

Pragmatism emerges at the beginning of the twentieth century when three American philosophers attempt to resolve the problems of American society at the time (Gray, 2014). Charles Pierce (1839–1914) was the first spokesman for pragmatism, William James (1842–1910) translates it to a wider audience and John Dewey (1859–1952) its most renowned advocate (Gray, 2014). Pragmatists emphasise that a proposition can either fit a particular ontology or purpose with an ability to create an action (Rorty, 1998). Since the 1970s, pragmatism has reclaimed its popularity thanks to its potential in providing an epistemological justification for mixing approaches and methods (Onwuegbuzie et al., 2009).

Pragmatic paradigms can remain separate or be mixed or combined into another research design. A pragmatic model allows for a combination of quantitative and qualitative methods in a single study (Gray, 2014). According to Frels and Onwuegbuzie (2013) pragmatism becomes one of the contemporary research paradigms as seen in Table IV-1.
Pragmatism has been widely used to justify the employment of mixed methods research in order to employ the best paradigm for the purpose (Rallis and Rossman, 2003; Tashakkori and Teddlie, 1998, 2003). Pragmatism provides a philosophical foundation and a framework for designing and conducting mixed methods research (Burke Johnson, 2004). Mixed methods research is often used as expedient means of meeting the needs of empirically-based research (Truscott et al., 2010).

There are some scholarly objections to the pragmatic and mixed methods approach. The criticisms of the mixed method approach come from its philosophical foothold, pragmatism. It is deemed not to be able to provide the philosophical foundation for mixed methods research (Cameron, 2011a). In addition, both quantitative and qualitative purists think their paradigms as the ideal for research. Therefore, they supported the in-compatibility thesis (Howe, 1988), which suggests that qualitative and quantitative research paradigms and associated methods should not be mixed.
(Burke Johnson, 2004). Acknowledging objections to the pragmatic and mixed methods approach Cameron (2011a) suggested that mixed methods researchers need to acknowledge the criticism of pragmatism as being eclectic and rigorously and defend their pragmatic approaches and choices in their research.

Other researchers who support the pragmatic approach and mixed methods argue that these can be better suited to answer certain questions such as about the philosophical implications and justifications of their designs (Biesta, 2010; Cameron, 2010; Truscott et al., 2010; Niglas, 2004; Teddlie and Tashakkori, 2003). Having the ability to simultaneously answer the confirmatory and exploratory questions is one of the major advantages of mixed methods. Mixed methods enable the researcher to verify and generate theory in the same study (Teddlie and Tashakkori, 2003). Furthermore, it is suggested that the field should move beyond the quantitative versus qualitative debate because mixed method research has recognised the importance and usefulness of both quantitative and qualitative research (Truscott et al., 2010; Teddlie and Tashakkori, 2003). Mixed methods research is not aiming at replacing quantitative and qualitative research. Mixed methods research enhances the strengths and minimising the weakness of both quantitative and qualitative approaches in a single study as well as across studies instead (Truscott et al., 2010; Johnson and Onwuegubuzie, 2004; Twinn, 2003).

This study adopts the pragmatic paradigm because the study of human needs, capability and Perceived FWB, can be efficiently evaluated through the pragmatic approach. This research paradigm can embrace the complexity of the topic and also offer new insights on participants’ financial needs, capability and wellbeing. The choice of a pragmatic paradigm has been influenced by research topics, since this study investigates complex research topics, such as the theories of human behaviour, education, finance, and social marketing areas. Pragmatism is suitable for these topics because it focuses on what works best to achieve the desired result. Using a pragmatic approach, researchers determine the model of inquiry and best-suited methods based on research questions (Morgan, 2007). The pragmatic approach offers transferability of research results. For example, qualitative approach focuses on research context, whilst quantitative approach concentrates on generality (Morgan, 2007).
Furthermore, mixed methods research has become important in some scientific areas. Mixed methods have been extensively discussed by multiple disciplines in educational journals between 1999 and 2008, of which 33% are mixed method studies (Lopez-Fernandez and Molina-Azorin, 2011). Certain research questions are best addressed using different types of research methods. The underpinning pragmatic philosophy in this study allows a flexible systematic application of qualitative and quantitative methods to address each research question. This study adopts a quantitative dominant crossover mixed analysis, as it seeks to answer research questions through a postpositivist (quantitative) perspective. It is also thought that qualitative data and analysis help address the research questions(s) to a greater extent (Frels and Onwuegbuzie, 2013). For instance, in this study, the research question “what appear to be the determinants of FWB?” is best addressed using quantitative analysis, whilst the qualitative findings can supply in-depth information for the sub-question (i.e. how significant are each of these determinants?). Using mixed methods to analyse data can enhance the interpretation of significant findings in both quantitative- and qualitative-based evaluation research (Onwuegbuzie and Leech, 2004).

Moreover, this research also pursues the identification of the fundamental factors that explain the relationship between FWB and its determinants. A scientific process of hypothesising is therefore required to test the relationships between variables using a deductive approach. The hypothesis is either accepted or rejected on the basis of the evidence from research findings (Gray, 2014). These relationships then need to be illustrated in a theoretical framework that is applicable and robust in different contexts and populations (Easterby-Smith et. al, 2008). Thanks to an objective approach that observes and measures the reality quantitatively, a deductive approach is employed predominantly in financial research such as personal finance.

Research questions inform to the choice of research methodology. This study seeks to find out the laws in the relationships between various subjects or variables, including FWB, financial needs, financial capacity, behaviour, attitude, and capability. A mixed methods approach is required to answer the following research questions:
What is the nature of financial needs satisfaction, as a component of FWB?
How do the elements of financial capability relate to the two components of FWB in the context of online financial education?

In order to answer these questions, a combination of quantitative and qualitative methods is more useful than a single method approach. Moreover, Atkinson (2008) suggests that it is impossible to generalise the pattern of the laws in the relationship between and within variables by using a single qualitative approach, due to the scale of population in qualitative research often being too small and inadequate to validate the conclusion whilst assessing the outcomes of an educational intervention. In-depth qualitative studies are normally conducted on a smaller scale that have insufficient participants to identify patterns in the responses (Atkinson, 2008). Therefore, a quantitative dominant crossover mixed analysis with some elements of a qualitative approach is more suitable.

For the above reasons, this study adopts pragmatism and mixed methods research in examining the relationships between FWB, human needs, financial capacity, behaviour, attitude, and capability. The hypotheses of these relationships, which are based on the existing theories about personal finance, FWB and human needs, will be tested to find the evidence. The mixed method approach is adopted to observe and capture the existence of evidence that may prove or reject the relevant theories. The findings from qualitative data offer some insights about participants that can support the quantitative findings. The following section further discusses the research methods of this study.

### 4.3 Mixed Methods Research

This section explores and justifies the use of mixed methods research (MMR) in this study. The fundamental aspects discussed in this part relate to mixed methods in testing and explaining the relevant theories of FWB and financial education context.

#### 4.3.1 Concepts of Mixed Methods

In an effort to move beyond the quantitative versus qualitative debate, there has been a rapid rise in the popularity of MMR as a third methodological movement in
education and social sciences (Guetterman et al., 2019; Cameron, 2011a; Truscott et al., 2010; Teddlie and Tashakkori, 2003). MMR is a new concept but increasingly recognised as a robust method. Its goal is not to replace the quantitative or qualitative approach but to draw from their strengths, minimise their limitations (Cameron, 2011b; Creswell and Plano Clark, 2007; Twinn, 2003), and foster fresh ideas about them (Lopez-Fernandez and Molina-Azorin, 2011).

Using MMR for a study that examines different disciplines (e.g. sociology, economics, and psychology) provides supplementary perspectives and a more comprehensive understanding of the research problem or phenomenon than a single approach (Tenuche, 2018; Creswell, 2013; Cameron, 2011a, b). MMR also encourages collaborative and transdisciplinary research. For example, where an opportunity for conducting experimentation in a study is limited; the researcher might need to rely on multiple data sources with mixed (quantitative and qualitative) data to understand complex phenomena (Cameron, 2011 a, b; Bazeley, 2008). Therefore, multiple perspectives and interpretations have to be taken into consideration when researching in education where the use of various research techniques is crucial.

The characteristics of MMR are influenced by a growing body of transdisciplinary literature, prominent research methodologists or authorities, the emergence of mixed-method specific journals, research texts and courses, and a growth in popularity amongst research funding bodies (Cameron, 2011b, p. 245). A major advantage of MMR is that it provides more insight and a deeper understanding of the studied phenomenon than a single monomethod (Cameron, 2011b).

MMR can address combined sets of quantitative and qualitative questions within a single research study, which neither quantitative nor qualitative research can do (Frels and Onwuegbuzie, 2013). For instance, quantitative research is useful to provide the answer for certain questions, such as “who, where, how many, how much, and what is the relationship between specific variables” (Adler, 1996, p. 5). Quantitative research is not optimal for answering ‘why’ and ‘how’ questions, but qualitative research does (Frels and Onwuegbuzie, 2013). MMR also gives answers
to questions that are difficult for a single method to answer (Tashakkori and Teddlie, 2010; Greene et al., 1989).

MMR is defined as a process in which a researcher collects and analyses data, integrates the findings, and draws implications using both qualitative and quantitative methods in a single study or a program of inquiry (Tashakkori and Creswell, 2007; Creswell and Plano Clark, 2011; Guetterman et al., 2019). This process may include philosophical assumptions and theoretical frameworks (Tenuche, 2018). A key concept in MMR definition relates to the desire for the integration of results (Tashakkori and Creswell, 2007). MMR can be a collection and analysis of two types of data (qualitative and quantitative), two types of data collection procedures (e.g. focus groups and surveys), two types of research questions (with qualitative and quantitative approaches) or two types of data analysis (statistical and thematic) (Tashakkori and Creswell, 2007).

There are different definitions of MMR, but they all share similar in relation to data collection and analysis (Johnson et al., 2007). A comprehensive definition of mixed methods research has been proposed in a previous study:

Mixed methods is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth, depth of understanding and corroboration (Rinne and Fairweather, 2012, p.167; Johnson et al., 2007).

Collins et al. (2006), cited in Lopez-Fernandez (2011, p. 272), list four main reasons or purposes for conducting mixed methods research: (a) participant enrichment, b) instrument fidelity, (c) treatment integrity, and (d) significance enhancement . By contrast, Bryman and Bell (2007), cited in Lopez-Fernandez and Molina-Azorin (2011, p. 272), suggest various purposes for mixed methods research: (a) triangulation, (b) qualitative research facilitates quantitative research, (c) quantitative research facilitates qualitative research, (d) allows for analysis of static and processual features, (f) qualitative research facilitates the interpretation of the
relationship among the variables, and (g) enables the analysis of different aspects of a phenomenon.

In mixed methods studies, the combination can be useful at several stages of the study. In this study, the researcher aims to understand the frameworks of financial needs hierarchy, FWB, and its determinants constructed from the literature. Qualitative data can play a significant role by giving meaning to or clarifying and validating quantitative results. Figures or visual models can be used to present the results (Ivankova et al., 2006).

In the behavioural sciences, using mixed methods research may help to explore existing studies in a new perspective or a setting (Lopez-Fernandez and Molina-Azorin, 2011). The mixed methods approach is suitable for this study, as the development of information communication technologies can enhance the ability to collect and analyse mixed data (Cameron, 2011a,b). Furthermore, there is an increase in the use of diverse forms of interdisciplinary research which opens a new era for mixed methods in relation to research skill sets and mindsets (Cameron, 2011b). However, it is worth noting that mixed methods are still developing, thus the researchers may have to develop a new design, because the best approach for their project may not exist in some cases (Tashakkori and Creswell, 2007). In addition, using a mixed method design enables research expansion, such as seeking to analyse and explore diverse aspects, or enable a richer and more detailed understanding of a phenomenon in personal finances (Lopez-Fernandez and Molina-Azorin, 2011). Accordingly, this study uses a mixed-method approach mainly for participant enrichment, to identify participants' characteristics to inform intervention providers and to improve the interpretation of the results and enhance significant findings (Lopez-Fernandez and Molina-Azorin, 2011).

4.3.2 Key Features of Mixed Methods

There are some key features of the mixed-method approach (Franzosi, 2012). In a research programme, mixed methods may be applied within one study or across several studies. It is required to clarify and justify the strategy for mixing methods in terms of the prioritising of the methods (equal, or several methods prioritised), the sequence of methods (qualitative first, or quantitative first, or simultaneous), and the
nature and timing of integration (during data collection, analysis, or interpretation, full or partial) (Franzosi, 2012). Parallel mixed methods analysis is used in quantitative studies that combine the qualitative and quantitative data at the interpretation stage of the research process (Onwuegbuzie and Leech, 2004). In the case of this study, the quantitative component of the study is given the most weight and the qualitative data is combined with quantitative data at the interpretation of research findings.

There are nine options of crossover mixed analyses: reduce, display, transform, correlate, consolidate, compare, integrate, assert, and import data (Frels and Onwuegbuzie, 2013, p.187; Onwuegbuzie and Teddlie, 2003). These options are:

- **Compare**: qualitative and quantitative data/findings are examined side-by-side (Onwuegbuzie and Teddlie, 2003)
- **Integrate**: qualitative and quantitative data/findings are either incorporated into a coherent whole or two separate sets (i.e. quantitative and qualitative) of coherent wholes (Onwuegbuzie and Teddlie, 2003)
- **Import data**: follow-up findings from the qualitative analysis are used to inform the quantitative analysis, such as qualitative follow-up interaction analysis, and qualitative internal replication analysis (Onwuegbuzie and Teddlie, 2003)
- **Consolidate**: multiple data sets are merged to create new or consolidated codes, data sets or variables (Onwuegbuzie and Teddlie, 2003).

In the context of this study, there is no integration of quantitative and qualitative data analysis but at interpretation stage of research findings instead (Cameron, 2011a, b; Tashakkori and Creswell, 2007). The collection, analysis, and interpretation of qualitative data aid the interpretation of statistically and practically significant findings from quantitative analysis (Onwuegbuzie and Leech, 2004). The approach of presenting the findings in this study is based on previous studies that use crossover mixed data analyses and findings (Onwuegbuzie and Teddlie, 2003; see Frels and Onwuegbuzie, 2013) such as:

- **Compare qualitative and quantitative data or findings side-by-side to explore in-depth the determinants of Perceived FWB and the hierarchy of financial needs satisfaction;**
• Integrate qualitative and quantitative data/findings into two separate sets of coherent whole findings in relation to Perceived FWB, financial needs satisfaction and its influential factors;

• Import data of follow-up findings from qualitative analysis to inform the quantitative findings, including qualitative follow-up interaction analysis to help understand the hierarchy of financial needs satisfaction, FWB and its determinants in the context of an online educational intervention.

It is important to justify the dominant choice of data. Two main factors can determine the mixed methods design (Lopez-Fernandez and Molina-Azorin, 2011; Onwuegbuzie et al., 2009; Creswell, 2003; Tashakkori and Teddlie, 1998):

• Priority: (1) equal weight designs means the quantitative and qualitative aspects can be given the same priority, weight, or status; (2) different weight designs can give greater weight to one of them.

• Implementation of data collection refers to the order of collecting quantitative and qualitative data, which determines the resulting design. There are two options: collect both types of data at the same time (concurrent, simultaneous, or parallel designs) or at different periods (sequential or two-stage designs).

Morse (1991) introduced a useful and easy system to indicate the different possible designs of mixed methods (Lopez-Fernandez and Molina-Azorin, 2011). Morse’s system (1991) uses the abbreviations Quan and Qual to characterise the quantitative and qualitative elements accordingly. The form of abbreviations is changed into capitals letters (i.e. QUAN, QUAL) when one method has greater weight than the other, whereas when the method has a lower weight, it remains in lower case (i.e., quan, qual). Furthermore, a simultaneous design uses the symbol +, whereas a sequential design uses the arrow → symbol (Lopez-Fernandez and Molina-Azorin, 2011, p. 3). This system is summarised in Figure IV-1. The four blocks in Figure IV-1 describe the various combinations of data collection strategy and priority, which develop nine mixed method designs (Lopez-Fernandez and Molina-Azorin, 2011, p. 4; Johnson and Onwuegbuzie, 2004):

(a) Equal weight, simultaneous: (1) QUAL + QUAN.
(b) Equal weight, sequential: (2) QUAL→QUAN; (3) QUAN→QUAL.
(c) Different weight, simultaneous: (4) QUAL + quan; (5) QUAN + qual.
Adapting the system above, the design of this study is sequential = QUANT → qual (Cameron, 2011b) with the two stages of data collection (i.e. pre-survey for quantitative data and follow-up interviews for qualitative data) (Lopez-Fernandez and Molina-Azorin, 2011). This research uses QUAN→qual design in which the qualitative data is used to support the findings from the main quantitative data (Lopez-Fernandez and Molina-Azorin, 2011). Greene et al. (1989) suggest that the complementary data, such as the qualitative findings in this research, seek to clarify or to illustrate the results obtained in the quantitative findings. In this case, the sequential designs are usually used (Johnson and Onwuegbuzie, 2004) when one of the methods has the least weight, which helps to enhance the main or dominant method in some way (Lopez-Fernandez and Molina-Azorin, 2011). This study uses a sequential mixed design as it allows the researcher to address some issues already discussed in the literature in one phase of the study, and to explore the knowledge in another phase of the research (Tashakkori and Creswell, 2007). For example, the findings from pre-survey can be similar to the results of the follow-up interviews. Similar findings from the interviews can also check the credibility of the quantitative findings.
4.3.3 Data Collection Methods

A range of data collection methods using computer technology and the internet has become popular due to its accessibility and reliability (Reardon and Grogan, 2011; Dillman et al., 2009). These methods have provided ease of access to larger populations nationally and globally. The internet has also improved the response rates for survey-based studies. Open-ended questions are more frequently used in online questionnaires or other internet-based means (i.e. email interviews) (Pearce et al., 2014; James, 2007; Meho, 2006; Murray, 2005; Murray and Sixsmith, 2002). Due to the participants of this study being online learners from all over the UK and around the world, online surveys and interviews have been selected as the most suitable choice to collect data.

4.3.3.1 Online Survey Method

This study views the knowledge of individual financial behaviour, financial needs, financial capability and FWB exists externally to the researcher. According to Aiken (1956), cited in Easterby-Smith et al. (2002), an objective approach is the best way to investigate human and social behaviour. Exploring the objective and common rules of financial behaviour in a large scale of the population, can provide more adequate and accurate information for actions of intervention. For instance, policymakers in the field of personal finance need to know the common laws in its citizens’ financial behaviour and the influential factors that can drive desirable financial behaviour change. This knowledge can help them develop the policies or interventions that are applicable to large populations but can also help them to identify differences in some segments. In the context of this study, the hypothesis of the laws or principles in the relationships between FWB and its determinants, are proposed to test objectively. Through objective observation, this process collects evidence to support or reject knowledge of the relationships between these variables.

Moreover, this study examines FWB of participants in online financial education which is relevant to educational theory. Educational theory is described as factual of scientific knowledge (OPEN, 2016). Scientific methodology is usually applied to
investigate the social and psychological phenomena associated with human behaviour (Easterby-Smith et al., 2008). Cross-sectional analysis has been applied where variations across samples are compared in order to identify the common regularities in the relationship between human behaviour and an educational intervention (Easterby-Smith et al., 2008). Accordingly, this study explores the relationship between FWB components and its determinants through empirical methods (Crotty, 1998) that measure these variables in a value-free and objective way (Easterby-Smith et al., 2008).

The survey is a popular method used to collect specific evidence. A survey involves systematic observations or interviewing to test the knowledge claims of a population (Sapsford, 2007). Hence, this study adopts the survey method to collect evidence of the laws or principles of the relationships between FWB and its determinants.

The survey and experiment are two major methodologies of a deductive approach (Gray, 2014). Both methodologies use highly structured methods with the control of variables and the generalisability of results (Gray, 2014). However, in practice, there are some key differences that make the experiment methodology more difficult to conduct. The experiment is randomly assigned to either an experimental or control group (Gray, 2014). The experimental group does receive the intervention or treatment whereas the control group does not. Then these two groups are compared to produce the outcome of the intervention. Hence, the research result is generalised from samples to similar populations. Nevertheless, in reality, conducting truly experimental research is often impossible, due to the difficulty of finding a sample for two groups that have similar demographic characteristics, such as age, gender, and the socioeconomic context (Gray, 2014).

By contrast, a survey is more manageable than an experiment with fewer stresses on the selection of samples (Gray, 2014). A survey tends to carefully choose random sampling, and thus the results can be generalised to a large population that has different situations or contexts. As this study aims to be able to generalisable the results to a large population, this is one of the key reasons why this study adopts a survey methodology for collecting data. However, a survey has limitations in relation to assessing the impact of a treatment. A survey tends to be less accurate in the
measurement of outcomes of the treatment than an experiment, as there is a possibility that the participants are biased in their self-reporting of the outcomes of the treatment. Moreover, the ability of participants to provide instructive information is limited in the survey. The researcher takes these limitations into account in order to find solutions to mitigate them whilst conducting the research.

The survey questionnaire is one of the most popular research methods. Surveys comprise a systematic observation by using standardised questions to collect data from participants through structured answers or open-ended responses. A questionnaire that consists of designed questions is recognised as a reliable method to collect structured data (Marsh et al., 2013). The data can be easily coded and analysed. A standardised questionnaire is considered as a measuring instrument (Sapsford, 2007). To measure multifaceted aspects of the variable in a reliable, valid and efficient way, the questionnaire outlines a multiple choice of constructed answers (Marsh et al., 2007). In practice, the questionnaire is used to assess the pre- and post-educational contexts (Considine et al., 2005).

Questionnaires include open-ended questions or answers that offer the participants an opportunity to share their views or experience with the subject rather than the limited choice with constructed items are designed by the researcher (Allen and Potkay, 1983; Salancik, 1979). An individual’s thoughts and perspectives can be collected as new knowledge and used to develop theoretical models in a scientific inquiry (Gray, 2014), or can be used to modify the measurement instruments in future research.

A questionnaire design covers many aspects, such as research objectives, questions, and the kind of data the researcher needs to collect; from which measurement instruments are created. Moreover, a questionnaire needs to take into account the particular contexts of the participants, such as language, literacy difficulties, age of respondents, and time constraints (Atkinson, 2008). A failure in the design of a questionnaire may pose a threat to the success of the evaluation, as well as a waste of valuable resources.
Surveys can be conducted in different ways: postal questionnaires, structured interviews, and telephone interviews. This study uses a web-based survey to send out questionnaires to collect data. This is because the MMM course, is an online education programme. Hence, the connections between educators and learners in this programme are established and maintained through an online platform. Furthermore, a web-based survey is more cost-effective and manageable than other choices. Online surveys have been used to collect data in studies on personal finance (Despard and Chowa, 2013), FWB (Shim et al., 2009), and social marketing (Rundle-Thiele et al., 2015). As a result, an online survey is considered as the best choice to approach online learners and collect the data for this research project.

4.3.3.2 Interview Method

The interview is one of the most popular methods for collecting qualitative data, due to its ability to collect rich and meaningful data (Frels and Onwuegbuzie, 2013; Roulston, 2010). The interview is a natural mode inquiry that can be enriched when collected alongside quantitative data (Frels and Onwuegbuzie, 2013).

Teddle and Tashakkori (2009) view the interview as a strategy of mixed methods data collection. Frels and Onwuegbuzie (2013) call it a mixed methods interview. This method contains both open-ended and closed-ended items (Brannen, 2005). This method also combines qualitative open-ended interview questions with items within standardised quantitative instruments, such as Likert-format scales or rating scales. The quantitative instruments that have adequate score reliability and validity, allow the researcher to further contextualise the response from the qualitative interview.

An online interview has been selected for this study because the internet provides a feasible means for overcoming issues around access and distance (Evans et al., 2008). The online interview also encourages a more equal relationship between the researcher and the participants, by offering them some degree of control over the research process (Hanna, 2012; Rappaport and Stewart, 1997). This study has offered the choice of Skype or other platforms for online interviews, or meeting in person at The Open University for those participants who live in Milton Keynes and
surrounding areas. Five of the six participants chose Skype interviews, while one participant preferred to answer the interview questions through an online platform (i.e. Qualtrics). This participant was not comfortable with a verbal interview. Telephone interviews were not chosen for this study, as they are rarely seen as a practical alternative to face-to-face interviews (Sturges and Hanrahan, 2004). This decision took into account the quality of sound, costs, and possible disruptions.

Using Skype allows the researcher to take advantage of both the traditional face-to-face interview and the telephone interview (Hanna, 2012; Holt, 2010). Skype has an instant messaging (IM) service that has been recommended as an online interviewing tool. Skype offers a synchronous method of exchange of content between the interviewer and the participant (Pearce et al., 2014; Kazmer and Xie, 2008; Opdenakker, 2006). Skype creates the most viable alternative to face-to-face interviews (Hanna, 2012). Furthermore, the researcher can easily record the interview with some benefits, such as low cost and ease of access (Hanna, 2012). In addition, Skype is a ‘safe location’ for a meeting for both the researcher and the participants in respect of personal space (Hanna, 2012).

The following section explains the measurement instruments and the stages of data collection of the research design. This will provide a guideline to create research questionnaires for a later longitudinal study.

4.4 Research Design: Variables, Data, and Sample Selection

The main purpose of this study is to explore individual FWB and its determinants in the context of online educational interventions. This section will justify the methods used to measure individual FWB and its determinants. While reviewing the design of this study, it is important to reiterate that this study also intended to investigate the impact of the online educational interventions in relation to FWB and its determinants, such as financial behaviour. Due to low response rates, this intention was not achieved. However, this original intention did influence the plan for research design, data collection, and questionnaires.
4.4.1 Data Collection Plan

This study adopts a model of three stages of measurements – before, after, and follow-up – which is an effective method in educational evaluation (Atkinson, 2008; Vitt et al., 2000). Atkinson (2008) stresses that measuring outcomes in a post measurement study will not provide enough information to evaluate a programme effectively. Hence, a follow-up stage is needed.

It is useful to employ different stages of measurement while investigating the conceptual model of FWB, its components and determinants. Having different datasets is important for the exploration and confirmation of the conceptual model in relation to the same population in a different period. Furthermore, different stages of data collection also provide data in relation to whether there is an improvement or change after treatment when examining levels of FWB and its determinants, such as behaviour, financial attitude or knowledge. The before and after measurements can help identify improvements or changes. Moreover, the transitions between before and after data also need to be taken into account, as a person’s actions today are likely to be associated with their previous actions (Atkinson, 2008). For instance, a person might shift from being a non-saver to a saver, or to being unbanked to banked. Furthermore, the timeframe of observation outcomes should be taken into account, due to the prospect that some outcomes might be immediately observable in the short-term, such as an increase in knowledge. However, knowledge retention and behavioural change may need a longer period to become visible. Failure to consider the likely period needed for change could result in false conclusions of the evaluation. Hence, the follow-up measurement for a longer period after the delivery of the programme is needed.

Atkinson (2008) suggests the evaluation of an educational programme should have clear objectives in order to assess the achievements and outcomes. There are two typical overlapping groups of evaluation: process and outcome evaluations (Atkinson, 2008). While process evaluations tend to identify the challenges and successes of organisational and procedural operation, outcome evaluations focus on measuring or describing the results of the process. The outcomes identified are often typically related to knowledge, behaviour or attitudes.
Vitt et al. (2000), cited in Atkinson (2008) suggest seven aspects that make effective evaluations:

1. Baseline measurements are needed which are usually referred to as the ‘before’ and ‘after’ measurements.
2. Appropriate measurement objectives.
3. Research and education principles are combined.
4. A follow-up survey is conducted within six months of programme completion.
5. Contact database of participants are well-maintained.
7. Communications is important for improvement (getting feedback) or promotion (the value of the programme) or competition (for resources).

The measurement of outcomes requires an objective method. However, in certain cases, the self-reported measures of participants are necessary and acceptable. For instance, self-reports on attitudes or on the amount of savings and wealth accumulation (Atkinson, 2008). Nevertheless, Atkinson (2008) strongly recommends that knowledge should be tested directly and objectively rather than asking people to rate their own levels of knowledge. Asking people to communicate their experiences depends heavily on their general levels of self-confidence and the awareness of participants, which may not provide useful evidence for evaluation.

Therefore, this study has designed data collection in three stages: before, after, and follow-up (Atkinson, 2008; Vitt et al, 2000) (see Figure IV-2). The benchmark measurements of research variables are designed appropriately to the target group. The before measurements that set the starting point while after measurements recognise the immediate change after completing the programme, and follow-up measurements identify the sustained change within six months of the programme completion. Moreover, for each stage of data collection, two phases have been undertaken: a pilot study and a main survey. The pilot study will be used to modify and refine the measurements. The main survey has been used to test the measurement and structural models.
The design of the measurements of concepts are based on previous studies. The measurements of the variables are repeated in three stages of data collection to assure the measurement instruments are consistent. It needs to make clear that the before measurement collects the pre-intervention score of all variables, which are to be repeated in the two other stages. However, the after and follow-up measurement will also add the new instruments to measure the impact of the intervention, such as the completed steps or specific behaviour change.

### 4.4.2 Sampling

A study often has to identify its representative research sample. This sample contains the key characteristics of the entire population (Sapsford, 2007). It is not only the instruments used to collect data that need to be well designed, the management of the participants’ data/information need to be well maintained throughout all stages of data collection. For instance, coding the participants’ identity and good administrative records of contact details and their responses. It is also important to obtain the consent of the participants which allows the researcher to contact them for all three stages of data collection. It is also necessary to understand the sensitive nature of the topic (e.g. personal matters) and the need for confidentiality (Atkinson, 2008).

The size of a sample is important in quantitative research, which requires a large enough sample in order to recognise even small changes in outcomes through significant statistics (Atkinson, 2008). Furthermore, to measure the changes, data
needs to be collected in different stages from the same participants. Therefore, this study has three steps procedure to select the participants. In step one, all learners were invited to take part in the Pre-Survey. In step 2, only those who took part in the Pre-Survey were invited to take part in Post and Follow-up Surveys. Finally, in step 3, only those who agreed to be contacted in the follow-up survey form were invited to take part in the follow-up interview. The samples in the current study are non-probability samples or convenience samples (Fricker, 2008). It is left up to the participants to decide whether they want to participate in the survey.

In this study, 3,918 people joined the course but only 1,569 of them were active learners (see Figure IV-3). Only 6.44% of active learners completed 90% steps or over. During the course, only approximately 5% of learners (N=316) engaged with the mentors and other learners through the online discussion platform in the course contents.

<table>
<thead>
<tr>
<th>Learners that took part and engaged during the MMM course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joiners</td>
</tr>
<tr>
<td>Leavers</td>
</tr>
<tr>
<td>Learners</td>
</tr>
<tr>
<td>Active Learners</td>
</tr>
<tr>
<td>Social Learners</td>
</tr>
<tr>
<td>Learners with ≥50% step completion</td>
</tr>
<tr>
<td>Learners with ≥90% step completion</td>
</tr>
</tbody>
</table>

*Figure IV-3: Learners enrolment and engagement statistics*

A summary of the demographic characteristics of participants in the pre-survey are presented in the appendix and Table A.1-1. Due to the limited data that PUFin was able to collect from the participants, this study does not have sufficient data on participant demographics relating to gender, age, and level of education.
**Age and Gender**

In order to mitigate the issue of a lack data relating to gender, the NVivo coding was used to track the gender of participants through their online conversation/text based on some key words, such as ‘my husband’, ‘my wife’, ‘my boyfriend’, ‘my girlfriend’. This method took into account same sex relationships; hence, the full length of text was screened to assure that the gender was accurately detected. The data was then merged with the survey data using learner’s identity numbers. Using this method, four participants were identified as male and 19 participants as female. As result, there were 73 females and 22 males who took part in this study. By contrast, the gender of 304 participants who took part in the three surveys of this study are unknown.

<table>
<thead>
<tr>
<th>AGE</th>
<th>&lt;18</th>
<th>&gt;65</th>
<th>18-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
<th>56-65</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>2</td>
<td>9</td>
<td>4</td>
<td>16</td>
<td>11</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>13</td>
<td>5</td>
<td>19</td>
<td>13</td>
<td>16</td>
<td>12</td>
<td>319</td>
</tr>
</tbody>
</table>

*Table IV-2: Gender and age cross tabulation*

(Source: a combination of data from survey, online discussion, and Future Learn statistics)

**Level of Education**

The limited data relating to the level of education in the pre-survey showed that there are different levels of education among participants. Out of 82 responses, 67% of them had a high level of education, a degree or higher.

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCSE/Vocational/ O level</td>
<td>16</td>
</tr>
<tr>
<td>A level or equivalent</td>
<td>11</td>
</tr>
<tr>
<td>Degree or higher</td>
<td>55</td>
</tr>
<tr>
<td>Unknown</td>
<td>316</td>
</tr>
</tbody>
</table>

*Table IV-3: Level of education (source: pre-survey)*
Economic Status

Regarding the participants’ accommodation status, most of the respondents (N=289) own their accommodation with a mortgage (N=84) or rent privately (N=70) (see Table A.2-1). Some 47 participants owned their property outright, while a similar number lived with their parents (N=43). By contrast, 29 participants rented from a housing association or another type of social landlord.

The main sources of income were from salaries (N=211) or self-employment (N=40). Other sources of income came from things such as pension, family aid, property investment and benefits (N= 20-29 participants, see Table A.1-1). The level of personal annual income of respondents (N=219) was quite low. The highest number of learners with over 30% (N=67), earned between £0-£11,499. This was followed by 50 participants who earned between £11,500-£19,999. Just over 10% of participants earned over £50,000. By contrast, the level of their household annual income (N=184) was higher due to the contributions of partners or family members. The highest number of participants had a household annual income of over £50,000 (N=61) which was followed by the category of £30,000-£50,000 with 40 respondents. Furthermore, 29 households earned between £0-£11,499.

When assessing the income levels of the participants of this study, it should be noted that they were from different world regions. Out of 398 participants, 230 were from the UK (see Figure IV-4), while over 42% (N=168) were from other countries. Therefore, their earnings and living standards are different from the UK.
Interview Demographics

Six participants took part in the follow-up interviews. Demographics of the participants were mixed. It reflected the fact that the MMM course attracted the participants worldwide. Four participants were from the UK while the other two participants lived in Australia and St. Lucia (see Table A.2-1). The levels of their personal and household incomes were wide-ranging from £0-£11,499 to £150,000. Four participants were at working age while the other two were pensioners. One of participants was unemployed and living with their parents. The group was made up of four females, and two males. Four participants had partners with children while two participants were single with no children. Five participants had a high level of education, such as a degree or higher. One participant had O levels, but their household income was the highest among all participants (around £150,000).

Overall, there were a mixture of demographic characteristics among participants in this study. Most of the respondents had a high level of education and/or a low level of personal income. There were more female than male participants. Finally, the multi-national participants that took part in this study, can offer interesting insights into the FWB model that could be applicable to the international context.
4.4.3 Research Questionnaires, Quizzes, and Interview Questions

This study carried out two surveys which including a pilot survey with one questionnaire and the main survey with three questionnaires for three stages of data collection. The pilot survey combined all questions in the main survey to test the instruments used in the main survey, while the data from the main survey provided the central source for data analysis in this study. Most of the questions were repeated in all three questionnaires, except for the instruments to measure the impact of the intervention, such as completion rate of the course, course evaluation or specific changes in FWB, its components and determinants. A follow-up interview questionnaire was used to collect in-depth data regarding participants' FWB, its components and determinants after the intervention.

Using quizzes and self-assessment questions, this study made use of both objective and subjective measures to assess the financial literacy of participants. This is an unbiased approach to assess the financial literacy. However, due to a low response rate on the quiz, the objective literacy was not included in the data analysis. Therefore, the subjective measure was mainly used and named as subjective financial literacy. The designs of the survey questionnaires in three stages, and the interview questions are presented in this section.

The measures of FWB, its components and determinants were repeated throughout three stages of data collection with an exception to the instruments related to educational intervention. These instruments are used to assess the impact of the MMM course on the changes in the research variables. Measures to assess the educational intervention started at the second and third stages, when people had already taken part in the MMM course. Questions were arranged logically in which some questions were hidden when learners selected a specific answer in the previous question. This helped to minimize the amount of questions that were not relevant to individuals.

All the questions in the questionnaire of stage 1 were repeated in Questionnaire 2. The post-questionnaire added some questions to assess the role of the MMM
course and its involvement in any change of measures of other variables (if any), and whether the course met the expectations of participants. Some indicators were measured, such as the course steps that participants completed, identifying if any changes in FWB, its components and determinants as a result of the MMM course. In these two questionnaires, the demographic data of participants was not collected. This is because Future Learn assured that participants provided the demographic information when they signed up, such as age, gender, and education level.

Due to the low response rate in the post-survey, all questions in the questionnaires of stage 1 and stage 2 are repeated in questionnaire 3. In addition, it was found that many learners did not share their demographic data when registering on the course as Future Learn expected. Therefore, the follow-up survey included demographic questions. However, the low response rate in this survey was not helpful to mitigate the issue of a lack of demographic data.

Some reasons may cause a low response rate in the post and follow-up surveys. It could be that the length of the questionnaires might have put participants off from taking part in the surveys. For example, the pre-and post-questionnaires were quite long with 34 questions. The questionnaires were long due to the current study had to combine with the questions from the questionnaires of the course organiser. By default, each course on Future Learn has a pre- and post-course survey. It would therefore not be reasonable to send two questionnaires separately to participants before and at the end of the course. Therefore, a combination of two questionnaires in one was the only choice for this study. Furthermore, the questions of the course organiser were prioritised on the first pages of the questionnaires, which resulted in an undesirable effect on the completion of the questions in this study. A sample of the pre-survey questionnaire and interview questions can be seen in the appendix A.

4.4.4 Key Variables and their Measures in this Study
This section describes the seven key variables that are examined in this study. It also clarifies how these are measured based on the literature review.
a. Perceived Financial Wellbeing

The subjective or perceived FWB measures have been constructed based on the subjective FWB definitions in literature review, which consist of (1) having positive feelings and (2) not having negative feelings with overall financial circumstances (Vlaev and Elliott, 2014; Guo et al., 2013; Shim et al., 2009; Porter and Garman, 1993; Strumpel, 1976). Tay and Diener (2011) assess subjective wellbeing by examining positive and negative feelings. Vlaev and Elliott (2014) measure satisfaction with overall financial circumstances as part of instruments of financial wellbeing. Accordingly, being 'satisfied' with overall financial circumstances is used as one of the measures of individual positive feelings in this study.

In this study, Perceived FWB is measured by three desirable feelings and nine undesirable feelings in relation to overall financial circumstances. The three desirable feelings are: 'happy', 'confident', and 'satisfied'. The scales were from 1 to 5 (not at all - 1 and very much - 5). The coding of the Perceived FWB variable is summarised in Table IV-4.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived FWB</td>
<td>Thinking about your personal finance, how do you feel about your overall financial circumstances? Please choose the adjective and its scale that best describes the intensity of your feelings</td>
<td>Happy</td>
<td>PFWB.HAP</td>
<td>Self-constructed measures based on different sources such as Strumpel (1976), Tay and Diener (2011), Vlaev and Elliott (2014)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Satisfied</td>
<td>PFWB.SAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confident</td>
<td>PFWB.CON</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nervous</td>
<td>PFWB.NER*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worried</td>
<td>PFWB.WOR*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anxious</td>
<td>PFWB.ANX*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Angry</td>
<td>PFWB.ANG*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frustrated</td>
<td>PFWB.FRU*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hopeless</td>
<td>PFWB.HOP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lonely</td>
<td>PFWB.LON*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depressed</td>
<td>PFWB.DEP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tense</td>
<td>PFWB.TEN*</td>
<td></td>
</tr>
</tbody>
</table>

*Table IV-4: Coding of the Perceived FWB variable*
b. Financial Needs Satisfaction

Twenty-one items were self-constructed under five levels of financial needs based on Maslow’s hierarchy of needs (1943, 1954) that related to individual financial behaviours (Dew and Xiao, 2011). This is to assess the importance of financial needs and its satisfaction to Perceived FWB (Vlaev and Elliott 2014; Howell, Kurai and Tam, 2013). Twenty-one items were categorised in five levels of human needs: (1) finance for existence, (2) financial security, (3) financial maintenance, (4) financial confidence, and (5) financial freedom (see Figure III-2). Twenty-one items were used in both questions to assess the importance of each financial need and its satisfaction. The scale used to measure the importance of financial needs ranges from 1 (not at all important) to 5 (extremely important). Whilst the scale to measure the satisfaction of financial needs ranges from 1 (dissatisfied) to 5 (extremely satisfied). The coding of financial needs satisfaction and the importance of variables is summarised in Table IV-5.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial needs importance and satisfaction</td>
<td>Thinking of the importance and satisfaction of your current financial needs, please choose the following that best applies to you</td>
<td>Money for my basic needs</td>
<td>FN.I.BN (Importance)/FN.S.BN (Satisfaction)</td>
<td>Self-constructed based on different sources such as Maslow (1943, 1954), Dew and Xiao (2011), Howell, Kurai and Tam (2013), Vlaev and Elliott (2014)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Money for my education</td>
<td>FN.I.ED (Importance)/FN.S.ED (Satisfaction)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Money for my health care</td>
<td>FN.I.HC (Importance)/FN.S.HC (Satisfaction)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Money for a house (mortgage and bills)</td>
<td>FN.I.BH (Importance)/FN.S.BH (Satisfaction)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Money for insurances (e.g. house, car, motorbike)</td>
<td>FN.I.IN (Importance)/FN.S.IN (Satisfaction)</td>
<td></td>
</tr>
<tr>
<td>Money</td>
<td>FN.I</td>
<td>FN.S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money for special occasions (wedding, birthday, Christmas)</td>
<td>SO</td>
<td>SO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to save for rainy days</td>
<td>RD</td>
<td>RD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to save for unexpected major expenses</td>
<td>UME</td>
<td>UME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money for my pension fund or/and investment for wealth</td>
<td>PIN</td>
<td>PIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money for my lifestyle (e.g. eating out, luxury goods, hobbies, holidays etc.)</td>
<td>LS</td>
<td>LS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to buy things I don't really need but I want to have</td>
<td>BTIW</td>
<td>BTIW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to pay for social activities and maintain my social connections</td>
<td>SC</td>
<td>SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial support from social networks</td>
<td>CFS</td>
<td>CFS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Need</td>
<td>Importance</td>
<td>Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to support social networks</td>
<td>FN.I.TSO</td>
<td>FN.S.TSO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money to donate for charity</td>
<td>FN.I.DON</td>
<td>FN.S.DON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money for my educational inspirations</td>
<td>FN.I.EIN</td>
<td>FN.S.EIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master my knowledge in managing my finance</td>
<td>FN.I.MKN</td>
<td>FN.S.MKN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respected by others thanks to my wealth</td>
<td>FN.I.RW</td>
<td>FN.S.RW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proud of my wealth</td>
<td>FN.I.POW</td>
<td>FN.S.POW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having the wealth for philanthropic actions</td>
<td>FN.I.HNP</td>
<td>FN.S.HNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having financial freedom</td>
<td>FN.I.FD</td>
<td>FN.S.FD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table IV-5: Coding of financial needs satisfaction and importance variables

c. Perceived Financial Capability

The perceived financial capability is based on two facets: to manage finances and financial outcomes as a result of having that ability. The concept is constructed using the measures from Xiao and O’Neill (2016) and Taylor (2010). Xiao and O’Neill
describe perceived financial capability as an individual’s self-assessment of their financial behaviour and their ability to manage money on a day-to-day basis. In addition, to assess the ability of the participant to manage their money in the long-term, this study adds another element to perceived financial capability: the ability to plan ahead. Financial ability in this study indicates the ability to manage personal finances day-to-day and to plan for the future.

By contrast, Taylor (2010) views perceived financial capability in terms of living standards or individual financial circumstances. To measure perceived financial capability Taylor (2010, p. 300) used a question: “How well would you say you yourself are managing financially these days?”. This study adopts the question from Taylor (2010) to measure perceived financial capability with as a small change – “How well would you say you have managed financially over the past six months?” – as a measure of the outcomes of financial ability and financial behaviours. The coding of perceived financial capability variable is summarised in Table IV-6.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Financial Capability</td>
<td>In general, please indicate the extent to which you agree or disagree with the following statements about your ability to manage your finance?</td>
<td>I’m good at managing my money day-to-day</td>
<td>FA. Managing money day-to-day</td>
<td>Xiao and O’Neill (2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I’m good at planning ahead for future</td>
<td>FA. Planning ahead</td>
<td>Self-constructed measure</td>
</tr>
<tr>
<td></td>
<td>How well would you say you have managed financially</td>
<td>Living comfortably</td>
<td>FCAP. Perceived financial capability</td>
<td>Taylor (2010)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Doing alright</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Just about getting by</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Finding it quite difficult</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Finding it very difficult</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
over the past six months? Would you say you are

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Capacity</td>
<td>How long could you keep up with the following</td>
<td>Length of time I could make ends meet if faced with an unexpected drop in income without borrowing is…</td>
<td>FCAPA.LME. DI</td>
<td>(Atkinson et al., 2006)</td>
</tr>
</tbody>
</table>

Table IV-6: Coding of perceived financial capability variable

d. Financial Capacity

This study examines three dimensions of financial capacity. The study covers the assessment of income adequacy and keeping up with financial commitments. The first two dimensions adopt the measures of Perceived Attributes of the Financial Domain Attribute (PAFDA) from Porter and Garman (1993, p. 145). PAFDA has two components: “perceived adequacy of family income” and “perceived net worth”. The first dimension stresses the relationship between human needs and income, and how income meets needs or wants. The “perceived adequacy of family income” focuses on individual economic needs or lifestyle. By contrast, the second dimension, “perceived net worth” emphasises the balance sheet or ‘making ends meet’ after need and wants spending has taken place. The third dimension explores the “duration of financial capacity”. The duration relates to the length or strength of their financial capacity in the long-term; for example, assessing the length of time an individual could make ends meet if faced with an unexpected drop in income without borrowing (Atkinson et al., 2006). These three dimensions explore individual financial capacity in-depth. Atkinson et al. (2006) use factor and score in their analysis. However, the new scales are combined from two sources of Porter and Garman (1993) and Atkinson et al. (2006), thus new factor analysis is required in this study. The coding of the financial capacity variable is summarised in Table IV-7.
How would you rate your current income?

- Not at all adequate
- Can meet necessities only
- Can afford some of the things I want
- Can afford just about everything I want
- Can afford everything I want and still save

How would you describe your financial situation over the last 6 months?

- Have something left over
- Break even
- Be in debt
- I don’t know

Table IV-7: Coding of financial capacity variable

**e. Financial Behaviour**

This study is interested in some target behaviours that relate to the modules taught in the MMM course. These target behaviours include: (1) setting goals, (2) budgeting and keep tracking, making ends meet, (3) borrowing and managing debts (credit cards, loans), (4) savings, (5) pensions, and (6) shopping for financial products. The measure used Likert-scale with $1 = \text{never}$ to $5 = \text{always}$. The scores of undesirable behaviours are marked with asterisks (*) and have been reversed.

This study focuses on some target behaviours that relate to the modules taught in the case study MMM course. These target behaviours include: (1) setting goals, (2) budgeting and keep tracking, making ends meet, (3) borrowing and managing debts (credit cards, loans), (4) savings, (5) pensions, and (6) shopping for financial products. Therefore, this study adopts the financial management behaviour scale.
from Dew and Xiao (2011, p. 58) with 12 behaviours: ten desirable financial behaviours and two reversed-undesirable financial behaviours. This study examines how the participants who took part in the MMM course practise these behaviours and how it associates with their financial capability, financial needs satisfaction, and subjective wellbeing. The coding of financial behaviour variable is summarised in Table IV-8.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Behaviour</td>
<td>Please indicate how often you have engaged in the following activities in the past six months?</td>
<td>Comparison shopped when purchasing a product or service</td>
<td>FB.COS</td>
<td>Dew and Xiao (2011, p. 58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paid all your bills on time</td>
<td>FB.POT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kept a written or electronic record of your monthly expenses</td>
<td>FB.KRE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stayed within your budget or spending plan</td>
<td>FB.SBUD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paid off credit card balance in full each month</td>
<td>FB.POC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘Maxed out’ the limit on one or more credit cards*</td>
<td>FB.MOC*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Made only minimum payments on a loan*</td>
<td>FB.MINP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Began or maintained an emergency savings fund</td>
<td>FB.EMERS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saved money from every pay check</td>
<td>FB.RESAV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saved for a long-term goal such as a car, education, home, etc.</td>
<td>FB.SAVLT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contributed money to a retirement account</td>
<td>FB.CRET</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bought bonds, shares or put money in investment funds</td>
<td>FB.INVEST</td>
<td></td>
</tr>
</tbody>
</table>

Table IV-8: Coding of financial behaviour variable
f. Financial Attitudes

With the intention of understanding the roles of individual attitudes towards financial capability, financial needs satisfaction, and FWB, this study forms the measures of financial attitudes from two sources: Vlaev and Elliott's (2014) - eleven items, and Atkinson et al. (2006, p. 71) - single item (“I tend to live for today and let tomorrow take care of itself”). Vlaev and Elliott (2014, p. 1109) define four factors of financial attitude: (1) being in control (overall finances), (2) comfort with being in debt, (3) external pressures affecting borrowing, and (4) ability to influence situation.

Vlaev and Elliott (2014, p. 1109) carried out an exploratory factor analysis on these items. However, as this study adds a new item from Atkinson et al. (2006) so that a factor analysis is required for this study. The scores of negative financial attitudes were reversed. The coding of financial attitude variable is summarised in Table IV-9.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>Please indicate the extent to which you agree or disagree with the following statements</td>
<td>I feel I am on top of my monthly outgoings</td>
<td>FA.FOT</td>
<td>Vlaev and Elliott (2014, p. 1109)</td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
<td>I know the detail of my financial situation at all times of the month</td>
<td>FA.KDET</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I feel comfortable dealing with financial matters</td>
<td>FA.FCOMF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I only spend within my means</td>
<td>FA.SMEANS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Borrowing makes me feel uncomfortable*</td>
<td>FA.BUCOMF*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am comfortable with borrowing for something that I consider to be essential*</td>
<td>FA.COMB*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I find it difficult to resist pressure to “keep up with the Joneses”*</td>
<td>FA.DTR*</td>
<td></td>
</tr>
</tbody>
</table>
In order to keep in touch with friends, I spend money that I would rather not spend on going out*  

I always use credit for non-essential items*  

I think it is easy to get into debt because banks and shops make it too easy to get credit*  

I adjust the amount of money I spend on non-essentials when my life changes  

I tend to live for today and let tomorrow take care of itself*  

| In order to keep in touch with friends, I spend money that I would rather not spend on going out* | FA.SRNOT* |
| I always use credit for non-essential items* | FA.CNESS |
| I think it is easy to get into debt because banks and shops make it too easy to get credit* | FA.EIND* |
| I adjust the amount of money I spend on non-essentials when my life changes | FA.DNESS |
| I tend to live for today and let tomorrow take care of itself* | FA.LFTODAY |

Atkinson et al. (2006)

Table IV-9: Coding of financial attitude variable

g. Subjective Financial Literacy

The measures of subjective literacy relate to the single question “how would you assess your financial knowledge and skills?” with a ten-point scale (1=very low and 10=very high). The items of financial knowledge and skills are related to eight key financial areas which are included in the course contents: (1) financial planning for the future, (2) household budgeting, (3) consumer credit and borrowing, (4) mortgages/home loans, (5) debt management, (6) savings, (7) pensions, and (8) Insurance. The question was adapted from previous studies. For instance, Kim (2000), cited in (Kim, 2007, p. 2), evaluates financial knowledge using the self-assessment “how would you rate your financial knowledge?” with a seven-point scale. In addition, Xiao and Neill (2016) also assess subjective financial literacy by using a self-assessment of financial knowledge with a seven-point scale, while objective financial literacy is measured using a financial quiz with five multiple choice questions. The coding of financial literacy variable is summarised in Table IV-10.
### Table IV-10: Coding of subjective financial literacy variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question(s)</th>
<th>Items</th>
<th>Name Code</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Financial Literacy</td>
<td>How would you assess your financial knowledge and skills in the following areas? (1=very low and 10=very high)</td>
<td>Financial planning for the future</td>
<td>FKN.PL</td>
<td>Kim (2000), (Kim, 2007)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Household budgeting</td>
<td>FKN.BU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consumer credit and borrowing</td>
<td>FKN.CB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mortgages/home loans</td>
<td>FKN.MO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Debt management</td>
<td>FKN.DM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Savings</td>
<td>FKN.SAV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pensions</td>
<td>FKN.PEN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insurance</td>
<td>FKN.INS</td>
<td></td>
</tr>
</tbody>
</table>

### 4.4.5 Response Rates in Surveys, the Interview and Quizzes

Assessing the impacts of financial education, for example, on financial behaviour change has been a challenge due to low response rates. A high drop-out rate during educational programmes and low survey response rates can cause problems (Lyons et al., 2006; Anderson et al., 2004). This study, unfortunately, faced the problem of low response rates, in particular, in relation to the post and follow-up surveys.

One week before the MMM course started, the first survey was sent out to all participants who signed up for the course. However, there only 398 participants took part in the pre-course survey. In order to measure the impact of the intervention, the pre- and post-data from the same group of participants were needed. Accordingly, the post-course and follow-up surveys were sent out to those who completed the pre-course survey only. However, there were errors with the emailing system. As a result, five out of fourteen participants who took part in the post-survey did not take part in the pre- or follow-up surveys, while one participant took part in the follow-up survey but did not take part in both the pre- and post-surveys.

The response rates of post and follow-up surveys were significantly lower than what this study aimed for with 14 and 26 participants respectively. There are possible reasons for the causes of the significant decrease in response rates in the post- and follow-up surveys. The emails that included the links to the post and follow-up...
surveys were sent out at the end of the course. Hence, those who had completed the course in the previous weeks may not have been interested in checking emails or responding to the emails from FutureLearn. By contrast, the pre-survey was embedded in the course contents at the beginning of the course. The pre-survey link was also sent out to learners via email one week before the course, as well as at the beginning of week one of the course. The learners might have thought that the pre-survey was a part of the course activities. This could be another reason why the response rates of the pre-survey were very much higher than the post- and follow-up surveys with 398 Participants. In addition, Future Learn often send out marketing emails to participants for different courses, so it could also be that learners did not check their emails.

Another aspect that might have caused the low response rates was that some learners did not actively engage in the course. While incentives such as Amazon vouchers were offered, it was not sufficient to engage those learners who lacked interest in the course. The course completion statistics showed that only 194 learners out of 1,569 active learners completed 50% or over of the course contents.

Access to learners proved to be a limitation in conducting this research. This might have caused the low response rates of the post- and follow-up surveys. The researcher did not have access to learners' email addresses. Hence, all survey emails were sent out by Future Learn. Moreover, the data protection and privacy rules were set by Future Learn that did not allow the researcher to send more than one reminder email to the learners. Long questionnaires might have also put learners off. This is a dilemma in research – when the research topics are multifaceted it requires many questions to be asked, since it is necessary to collect adequate data for the in-depth exploration of topics. Furthermore, the research questions in this study were an addition to Future Learn’s questionnaires, which are used to collect learner feedback on the course for commercial purposes. This meant that the questionnaires in the pre- and post-surveys were quite lengthy.

Finally, a previous study suggests that a low response rate can be expected in surveys that ask for financial information, since the targeted population tend to dismiss these as junk e-mail (Peng et al., 2007). On the other hand, FWB
components and determinants of these non-respondents may be different from the respondents. This could bias research results in favour of those who responded.

When inviting participants to take part in the follow-up interview, they were asked to leave their emails in an external link. This was required by the gatekeepers as they did not want to share learners’ email addresses. Only six participants took part. The response statistics can be seen in Table IV-11.

<table>
<thead>
<tr>
<th>Numbers of Participants Took Part in the Surveys</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Participated in pre-survey</td>
<td>398</td>
</tr>
<tr>
<td>Participated in post-survey</td>
<td>14</td>
</tr>
<tr>
<td>Participated in follow-up survey</td>
<td>26</td>
</tr>
<tr>
<td>Participated in both pre- and post-surveys</td>
<td>9</td>
</tr>
<tr>
<td>Participated in both post and follow-up surveys</td>
<td>3</td>
</tr>
<tr>
<td>Participated in all three surveys</td>
<td>3</td>
</tr>
<tr>
<td>Participated in post-survey but not in pre- or follow-up surveys</td>
<td>5</td>
</tr>
<tr>
<td>Participated in follow-survey but not in post or follow-up surveys</td>
<td>1</td>
</tr>
<tr>
<td>Numbers of participants who took part in the follow-up interview</td>
<td>6</td>
</tr>
</tbody>
</table>

Table IV-11: Response rates to three surveys and follow-up interview

In summary, the response rates of the pre- and post-surveys were very low and did not provide adequate data to measure the impact of the intervention in a large-scale population. Some potential causes of this limitation were proposed, such as low engagement with the course or no access to learner's contact to send out the questionnaires. This was a challenge for the researcher who had to change the focus of the research based on the availability of the data. As a result, only pre-survey and follow-up interview data were used in this thesis.

4.4.6 Data Collection

4.4.6.1 Gaining Access

Gaining access to an organisation to collect data is important successful research. This study is sponsored by PUFIn who organises the MMM course; hence, gaining access to the sample is an advantage to the implementation of the study. However, there were limitations in identifying participants across the surveys and post-interviews. Due to data protection and privacy policies of the gatekeeper, it was not
permitted to identify participants across the three sources of data collection. Having limited access to the participants presented a challenge for this study.

4.4.6.2 Pilot Survey

On the 15th of December 2017, this study carried out a pilot survey for the learners who took part in the MMM in the previous year. It was not an ideal period for conducting a survey as it was so close to Christmas and New Year. People may have been on holiday and not checking their emails or may not have been in the mood to spend time on a survey.

For the pilot study, the researcher created the questionnaire on Qualtrics and shared the link to Future Learn to send to the learners. There was an interesting observation regarding the setting up of force response. At the beginning, the researcher set force-response to all questions. However, after observing 12 pending responses at various percentages under 15-65% in relation to completion, the researcher removed the force response setting. This resulted in the completion of the pending responses. It seemed that the force response setting might have put people off from completing the questionnaire. Overall, there were only 49 responses with missing data. Due to the small sample size, the data from the pilot study was not used in this thesis.

4.4.6.3 Ethical Considerations

This study understands the sensitive nature of the topic and the need for confidentiality (Atkinson, 2008). The major ethical considerations relate to the participants, which include informed consent, confidentiality of personal information, providing incentives, and seeking sensitive information. After collecting data, the researcher has an ethical responsibility when using it. Good ethical practice includes anonymity, the confidentiality, and privacy where requested in order to retain the trust between the researcher and the subject (Novak, 2014). The researcher has ethical responsibilities such as using an inappropriate research methodology and correct reporting.
In this study, ethical considerations are an on-going process in relation to privacy policy and the terms and conditions of the gatekeeper in collected, stored, used, and shared data. Formal consent procedures have been attached with the questionnaires and given to the participants who agree to take part in the course surveys when they register. Data confidentiality statements are provided to participants. Initial formal ethics approval, reference HREC/2592/Nguyen, has been obtained following the code of ethics developed by the Human Research Ethics Committee at The Open University (see appendix C).

4.4.6.4 Data Handling and Preparation for Analysis

The information provided by participants will become the raw data for the variable measures which has been coded. The data in this study is stored and handled securely following the appropriate data protection regulations and guidelines. This is to ensure that the contact details collected during the surveys will be used only for the purpose of validating the survey responses. Moreover, as this research is a longitudinal study, the researcher has maintained contact with the gatekeepers during three stages of data collection. Furthermore, the raw data has been cleaned or coded consistently to prepare for analysis, which enables high quality data.

4.5 Data Analysis

The data in this study has been analysed in a number of ways to test the relationships between the variables. Factor analysis has been used to verify and validate the data in order to consider how the survey questions translate into key concepts, and to analyse the nature and categories of financial needs satisfaction. Various forms of linear regression were then employed to build on the factor analysis of financial needs satisfaction and to consider the existence and order of a hierarchy, answering research question one, and to also analyse the relationships between the potential determinants of FWB and the two primary measures of FWB, answering research question two. This analysis has been conducted using SPSS.

The qualitative data from the interviews has been analysed using NVivo to extract the main themes and provide insight into the mechanisms, thought processes, and
actions of the participants that may explain the quantitative findings. This section expands on the methods used and how they are combined to generate findings, as well as some of the issues encountered and how they are dealt with.

4.5.1 Factor Analysis

This study uses factor analysis to test and refine the scales to measure the concepts of financial capacity, financial behaviour, financial attitude, financial capability, FWB, and financial needs satisfaction. Various measures have been proposed or used to measure these concepts in previous studies. Performing factor analysis on these variables enables this study to propose, refine, or validate the scales of each variable, or a combination of measures for a specific concept. This study uses these scales to analyse the relationships between concepts in order to help identify what combination of factors are driving different aspects of FWB.

Factor analysis (FA) is a set of statistical methods used to identify the underlying relationships between observed variables (Norris and Lecavalier, 2010). FA is beneficial for conceptualising theories, categorising a set of variables into meaningful subgroups. FA is also useful for developing and refining instruments (Norris and Lecavalier, 2010). Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are two types of factor analysis. There is ongoing debate over the use of EFA and CFA (Hurley et al., 1997). CFA is often used to test specific hypotheses whilst EFA is exploratory in nature and works best for scale development (Costello and Osborne, 2005; Fabrigar et al., 1999; Hurley et al., 1997). This debate has not been resolved; however, there is an acceptance among the authors that both types of FA have their own place and uses, depending on the context of the study.

This study uses EFA for specific reasons. Firstly, because this study is testing the new concept of financial needs satisfaction and four components of financial capability in relation to FWB. Since these concepts are in the early stages of scale development, EFA is more suitable than CFA (Hurley et al., 1997). EFA is useful for identifying the common factors and the patterns of factor loading. In addition, it is beneficial when there is little supporting evidence for the factor structure of a
variable or a concept. By contrast, CFA is used when the goal is to validate previous models or when empirical evidence has already identifies certain variables should load onto common factors (Norris and Lecavalier, 2010; Floyd and Widaman, 1995). Moreover, CFA does not show how well the items load on the non-hypothesised factors (Hurley et al., 1997; Kelloway, 1995). CFA works better with measurement models which have a well-developed underlying theory for hypothesised patterns of loading (Hurley et al., 1997). The concept of financial needs satisfaction that defines Perceived FWB has not been well-developed in the literature. Hence, EFA is thought to be the most appropriate method for the initial testing of this model.

Secondly, even though this study adapts the scales of some variables from previous studies, it does not focus on confirming the factors of those variables. The main purpose of this study is to clarify the concept that financial needs satisfaction is a component of FWB. Furthermore, this study explores the variables that are determinants of FWB.

In addition, this study has contemplated the possibility of using both methods on the same data set (Hurley et al., 1997). This study has examined recent studies which use both analyses on the same data set by Maliňáková et al. (2019) and Moyo et al. (2018). However, it has been a challenge to replicate the same approach as previous studies due to the limited sample size of this study. In previous studies, the total sample sizes are over 700 participants. The analytic sample randomly divides the population in half. For instance, Maliňáková et al. (2019) divide their sample into two groups in which one group (N=551) is used for EFA and the second (N=550) for CFA. Similarly, Moyo et al. (2018) separate the whole population respectively to 367 for EFA and 366 for CFA. Costello and Osborne (2005, p. 5) stress that CFA is a “large-sample” procedure. Accordingly, generalisable or replicable results are unlikely if the sample of the study is to small to be divided in half in order to carry out a CFA (N=398/2=199) (Costello and Osborne, 2005). Sample sizes of at least 300 are generally sufficient in most cases for FA (Worthington and Whittaker, 2006). In comparison to the sample size of previous studies, the sample size of this study is not large enough (N=398) to be able to offer statistically significant analysis and meaningful findings.
For the above reasons, only EFA is used in this study. For future research, CFA is required for a larger population. This study can be seen as the start of a journey into a better understanding of how financial capability determines financial needs satisfaction and Perceived FWB. This study also raises additional questions best addressed by further research. Longitudinal studies that measure individual financial capability, financial needs satisfaction and Perceived FWB are required to test the concept of these variables further. Observation of these variables in different settings and populations can also provide useful data for analysis in the future.

4.5.2 Factor Analysis Steps

According to Norris and Lecavalier (2010) EFA is widely used but its statistical procedure is poorly understood. Therefore, this study has taken the necessary steps to meet a good standard of EFA. There are some key indicators that need to take into account when running EFA, including factor loadings, rotation methods, and retaining factors (Carpenter, 2018).

(1) Verifying the Factorability of the Data

Some key steps were taken in this study to validate the scales as follows:

a. Kaiser-Meyer-Olkin (KMO) test of Sampling Adequacy and Bartlett’s Test of Sphericity

In order to test the reliability and construct the validity of the questionnaire, two tests are used: the KMO test of sampling adequacy (KMO) and Bartlett’s test of sphericity (Zabihi and Pordel, 2011). The KMO test and Bartlett’s test are useful to assess sampling adequacy and factorability (Worthington and Whittaker, 2006). The KMO test accounts for the relationship of partial correlations to the sum of squared correlations (Worthington and Whittaker, 2006), and also helps to determine the sampling adequacy of data that is used for factor analysis. Tabachnick and Fidell (2001), cited in Worthington and Whittaker (2006), suggest that good factor analysis requires to have KMO test values of .60 and higher. By contrast, Bartlett’s test of sphericity is used to verify the factorability of data. The factorability of data is
significant when the participants to items ratio is between 3:1 and 5:1 (Worthington and Whittaker, 2006).

b. Cronbach’s Alpha for Testing Questionnaire Reliability

The internal consistency of a set of items of the questionnaire is measured by Cronbach’s alpha to test the scale reliability. It is recommended that the minimum cut-off for a reliable measure of Cronbach’s alpha is 0.7 (Boateng et al., 2018). The method of pairwise deletion is used to handle missing data while conducting the correlational analysis to compute Cronbach’s alpha (Chen, 2015).

(2) Select Factor Extraction Method

The extraction method obtains latent variables from the manifest variables by assessing the correlation/covariation across all of the scale items (Osborne, 2014). EFA is often used to identify latent constructs. However, a common mistake made by researchers is that they use of principal components analysis (PCA) instead of EFA (Carpenter, 2018; Goldberg and Velicer, 2006; Reise et al., 2000). PCA is the default extraction method in statistical software such as SPSS, which might be the potential cause of that mistake. PCA is distinct from exploratory factor analysis in respect of both concept and mathematics. EFA focuses on the sources of common variation while PCA includes error variance, which retains too many components (Costello and Osborne, 2005; Goldberg and Velicer, 2006; Preacher and MacCallum, 2003; see Carpenter, 2018). Therefore, it is recommended to use EFA rather than PCA (Carpenter, 2018).

There are different extraction methods used under EFA, such as maximum likelihood, principal axis factoring, and alpha factoring (Osborne, 2014; see Carpenter, 2018). However, little information is provided on the drawbacks and advantages of these extraction methods. Principal axis factoring (PAF) or maximum likelihood (ML) are the most popular methods based on observations and research (Carpenter, 2018). Both of these methods try to reproduce the correlation matrix. The results of these methods are considered more generalisable when submitting hypothesised models to a confirmatory factor analysis in the future (Carpenter,
PAF and ML are both considered acceptable extraction methods.

PAF is recommended as the most robust method to use when sample sizes are small, and normality is violated. By contrast, ML is endorsed when data is normally distributed (Costello and Osborne, 2005; Fabrigar et al., 1999; Nunnally and Bernstein, 1994). ML assumes the sample is random and the normality of variables are multivariate. The distribution of items included in the EFA are recommended to be tested for normality (Norris and Lecavalier, 2010). A normality check examines univariate skewness values and univariate kurtosis values to decide the suitability of the empirical data for the predetermined statistical analysis procedures (Lu et al., 2013). However, some authors argue that the majority of data collected in behavioural research does not follow either univariate normal distribution or a multivariate normal distribution (Curran et al., 1996; Micceri, 1989). For this reason, this study runs a normality check to test the assumption of non-normality of the data in behavioural research.

(3) Determine the Number of Factors

There are various approaches used to determine the number of factors, such as eigenvalue and scree test (Carpenter, 2018). Eigenvalue greater than one is the most popular indicator used (Morrison, 2009; Henson and Roberts, 2006; Russell, 2002). Some methodologists have recently questioned the use of a cut-off of one eigenvalue to determine the number of factors. The reason is that the total number of variables included in a model is likely related to the number of factors above one. This leads to too many or too few factors being extracted (Carpenter, 2018; Kline, 2013; Goldberg and Velicer, 2006; Worthington and Whittaker, 2006). Although it is widely used, it is not generally recommended (Norris and Lecavalier, 2010).

The scree test is a visual plot of eigenvalues derived from the factors that informs researchers of the number of factors that can be retained (Carpenter, 2018). The cut-off line for a number of factors is determined when the last sharp drop in values (the ‘elbow’), which identifies the number of factors that should be retained (Norris and Lecavalier, 2010; Catell, 1966). The scree test is considered more accurate...
than the eigenvalue rule (Carpenter, 2018; Pett et al., 2003; Preacher and MacCallum, 2003).

In addition to the two popular approaches above, parallel analysis, and minimum average partial (Carpenter, 2018) or the root mean square error of approximation (RMSEA) (Norris and Lecavalier, 2010) can be used to determine the appropriate number of factors to be retained in a hypothetical model (Carpenter, 2018; DeVellis, 2012; Conway and Huffcutt, 2003). This study determines the number of factors based on the theory and use multiple tools when necessary (Carpenter, 2018).

(4) Rotate Factors

Rotation aims to obtain a simple structure of factors in order to improve its interpretability (Norris and Lecavalier, 2010). A simple structure is accomplished when items have high loadings on a small number of factors and low loadings on other factors (Norris and Lecavalier, 2010; Browne, 2001). In general, there are two basic categories of rotation: orthogonal and oblique. Orthogonal rotations (e.g. varimax) are used when the extracted factors are assumed or known to be uncorrelated (Norris and Lecavalier, 2010; Worthington and Whittaker, 2006). In fact, this is not usually the case in social, behavioural, and psychological research (Norris and Lecavalier, 2010). Also, in the social sciences, it is common for factors to correlate with one another (Carpenter, 2018; DeVellis, 2012; McCrosky and Young, 1979). Therefore, methodologists often recommend using oblique rotations within the field of this study instead. Oblique rotations (e.g. direct oblimin, direct quartimin, promax) accept that extracted factors are correlated. This approach often reflects reality more accurately than orthogonal rotations. It also offers more useful results in empirical studies. When case factors are unrelated, both oblique rotations and orthogonal rotations produce identical results which making orthogonal rotation needless (Norris and Lecavalier, 2010). Another advantage of oblique rotation is its production of estimates of correlations among the factors, which can be beneficial in the interpretation of the results. Despite these benefits, oblique rotations are only used by 30% of studies (Norris and Lecavalier, 2010). Following the authors’ suggestion (Norris and Lecavalier, 2010; Worthington and Whittaker, 2006), this study uses oblique rotations, such as direct oblimin for the factor analysis, as the
research subject fits in the relevant field (e.g. behavioural, and psychological research).

(5) Retain and Delete Items based on A Priori Criteria

According to Carpenter (2018) variables or questions can be indicated as items. To ensure participant motivation, it is important to optimise scale length. There are different aspects to be considered to remove or retain an item by assessing the statistical significance of a factor loading. Carpenter (2018) suggests that a reduction of items should be based on a multiple criteria; for example, theory, item loadings, no significant cross-loadings, communalities, and factor reliability levels (Carpenter, 2018). It is extremely important for the interpretation of the results to present a factor loading matrix with the pattern of loadings; for example, where clusters of high and low loadings are in the matrix (Norris and Lecavalier, 2010).

Furthermore, sample size decides the significance of a factor loading. In the case of a very large sample size, it is possible to reduce the item number and maintain a strong factor. For a sample size of 300, it should be greater than 0.298 (Field, 2000). Applying those rules to this study, which has a sample size over 300, all the factor loadings with a value less than 0.3 to be suppressed for interpretation purposes. Researchers often take an absolute value of more than 0.3 to be statistically important. According to Tabachnick and Fidell (2001) a factor loading of 0.32 is a good principle for the minimum loading of an item. This figure is approximately 10% of overlapping variance with the other items in that factor (Costello and Osborne, 2005; Tabachnick and Fidell, 2001). Similarly, Boateng et al. (2018) agree that items that have factor loadings or slope coefficients less than 0.30 are insufficient. This is because these items contribute less than 10% variation of the latent construct measured. Accordingly, the authors recommend the items that have factor loadings of 0.40 and above should be retained (Boateng et al., 2018).

In addition, a ‘cross loading’ item is when it loads at 0.32 or higher on two or more factors (Costello and Osborne, 2005; Tabachnick and Fidell, 2001). To some extent, when the item has a loading factor of 0.4 or above on multiple factors, it is assigned to the factor where it has the highest loading (Moyo et al., 2018). Otherwise, cross-
loading is allowed when the loadings are comparable in magnitude (Moyo et al., 2018). If the items have several cross loaders, it may be due to them being poorly written or that the a priori factor structure is likely imperfect (Costello and Osborne, 2005; Tabachnick and Fidell, 2001). Therefore, the researcher needs to make a decision on keeping or removing the cross-loading items. It may be a reasonable decision if a factor already has several adequate to strong loaders (0.50 or higher) (Costello and Osborne, 2005; Tabachnick and Fidell, 2001). A factor that has five or more strongly loading items (0.50 or higher) is desirable, as it indicates a solid factor. By contrast, a factor that has fewer than three loading items is normally viewed as weak and unstable (Costello and Osborne, 2005). It is recommended to remove the items that have factor loadings less than 0.32 or cross-loadings less than 0.15 difference from the item that has the highest factor loading (Worthington and Whittaker, 2006).

4.5.3 Multiple Regression

Multiple regression (MR), sometimes referred to as multivariable analysis, is a statistical tool to decide the linear relationship between the variables (Pal and Bhattacharya, 2013, p.48). MR examines the relationship between independent variables as a set of predictors and dependent variables as a criterion (Plonsky and Ghanbar, 2018; Jeon, 2015; Tabachnick and Fidell, 2013; Hair et al., 2010). MR estimates the effect of specific independent variables on the dependent variable in various research contexts and data structures (Plonsky and Ghanbar, 2018). This estimate of the variance in the dependent variable (DP) is explained by a set of independent variables (IVs).

MR is an extension of simple linear regression (Sedgwick, 2013). Simple linear regression examines the relationship between a dependent variable and one independent variable. By contrast, MR explores two or more independent variables simultaneously to explain a dependent variable. Furthermore, in simple linear regression, the association between them is considered to be linear and both the dependent and independent variables are continuous. Nevertheless, in MR, the independent variables can be either continuous or categorical variables (Plonsky and Ghanbar, 2018; Sedgwick, 2013). The variables have a p value less than 0.05
and a $t$ value more than ±2 are retained in the model or otherwise excluded (Pal and Bhattacharya, 2013). According to Fritz and Berger (2015), a variable is entered into the equation if a $t$-test shows that it is significant. Otherwise, the variable does not enter the equation.

According to Plonsky and Ghanbar (2018), certain important processes and statistics need to be considered and understood at a conceptual and statistical levels. Firstly, the equation underlying MR can be shown as follows:

$$Y_i = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_nX_n + e_i$$

where $Y$ refers to the predicted value of the DV, $B_0$ (an intercept or constant value in the output of different statistical packages) is the value of $Y$ when all the $B$ values are zero, $X$s are different IVs, and $n$ is the number of IVs (Plonsky and Ghanbar, 2018, p. 715). Applying the equation to this study, there are two regression models to be tested as below:

**Perceived FWB** = $B_0 + B_1$ * financial behaviour + $B_2$ * financial attitude + $B_3$ * financial capacity + $B_4$ * subjective financial literacy + $B_5$ * perceived financial capability + $e_{PFWB}$

**Financial needs satisfaction** = $B_0 + B_1$ * financial behaviour + $B_2$ * financial attitude + $B_3$ * financial capacity + $B_4$ * subjective financial literacy + $B_5$ * perceived financial capability + $e_{FNSI}$

Producing regression coefficients with different estimated values of Bs (unstandardized B) is the ultimate purpose of MR analysis. These regression coefficients reflect the residuals or the minimised differences between obtained and predicted values of the DV (Plonsky and Ghanbar, 2018). $B$ and $\beta$ are two types of regression coefficients. Specifically, unstandardized regression coefficient ($B$) is an estimate of change in a DV as a result of one-unit change in an IV. The error term ($e_i$) is the sum of all the errors of the prediction in the regression equation. Due to each predictor is being used to predict the DV, the error term is the value of variance in the DV which is not accounted for by all the PVs simultaneously.
R² (R squared) is considered as the most important statistic in the output of MR (Plonsky and Ghanbar, 2018). R² is described as the percent of variance in a DV predicted or explained by all the IVs. Closely related to R² is adjusted R², which attempts to illustrate an alternative version of this statistic for what might be expected in the population which contrasts with the selected sample in a given study (Hair et al., 2010). Both R² and adjusted R² are fundamental measures of any regression model to assess its predictive accuracy. Adjusted R² takes into account both the sample size and model parsimony. Adjusted R² is fine-tuned to protect the model against the overparameterisation with a minimum number of great explanatory predictors. However, the multiple-correlation coefficient (R) is another important element in the output of MR. It is recommended to interpret R² and adjusted R² in the results of MR (Plonsky and Ghanbar, 2018).

There are different types of MR, such as (a) standard multiple regression, (b) stepwise multiple regression, and (c) sequential multiple regression. Standard multiple regression only focuses on a specific number of IVs in the regression model in order to test the hypotheses (Plonsky and Ghanbar, 2018). Standard multiple regression is useful for explanatory purposes such as estimating the relative effect of different IVs on a DV. In addition, it can also be utilised when the research purpose is to determine the unique effect of each IV on a DV. A risk of entering inappropriate IVs and/or ignoring other potentially relevant variables is a drawback of this method (Plonsky and Ghanbar, 2018). It is advised that robust theoretical grounds should be provided by researchers for each independent variable included in a standard MR (Plonsky and Ghanbar, 2018).

By contrast, stepwise multiple regression focuses on identifying the relative contribution of each of the IVs to the overall regression model. Three different techniques in stepwise regression are (a) forward selection, (b) backward deletion, and (c) stepwise procedure (Plonsky and Ghanbar, 2018). Contrary to standard and sequential MR, this analysis mainly is used for prediction, not explanation (Plonsky and Ghanbar, 2018; Keith, 2015). In stepwise MR, the software package determines that the IVs are assigned to the model one by one in order of their significance based on statistical criteria rather than by the researcher. After adding the DV in every step, the contributions of IVs in the model are reexamined. The IVs that do not make
a statistically significant contribution to the model are removed. As a result, it is useful to employ stepwise procedures for discovering the best set of predictors of an IV.

According to Fritz and Berger (2015) the stepwise process has a built-in process that will delete any variable that does not retain its significance. A variable can be significant as it enters the equation, but it can lose its significance when other variables enter the equation. It happens because each new variable that enters the equation is required to add unique information, and if the new variable duplicates the information, this makes the current variable no longer significant. Consequently, the stepwise process removes that variable. The stepwise regression process guarantees that the results with all variables in the equation will be significant and there are no other variables that could be significant if they entered the equation (Fritz and Berger, 2015).

In previous studies, multiple linear regression analyses with a stepwise method have been praised for their ability to identify the best predictors in foreign language achievement in relation to cultural capital scores (Zabihi and Pordel, 2011) and in research determining financial literacy (Mandell and Klein, 2007). In Mandell and Klein’s study (2007), three motivational variables were entered to the regression model. During the data mining procedures, each was added one stage at a time to see the independent effects, and eliminated if the effect was insignificant (Mandell and Klein, 2007). In another study, Shockey and Seiling (2004) used stepwise regression in research on behaviour change in relation to financial education. Whilst DeVaney et al. (1996) used stepwise regression to analyse the effect of the independent variables on financial practices such as cash flow and credit use. Since this study explores the factors that make a statistically significant contribution to Perceived FWB and financial needs satisfaction models, stepwise multiple regression appears to be the reasonable choice for the analysis.

Having highlighted the advantages of the stepwise process, it should be noted that its efficacy has been challenged on two key issues. The first is that the $R^2$ value may be inflated due to chance, which brings about the second issue, since there is a possibility of getting variables in the equation that do not belong there (Fritz and
Berger, 2015). However, a good sample size would minimise the chance of a misleading result. In spite of the possible inflation aspect of performing a stepwise regression, it is still thought to be the best available method to use in a multiple-regression-analysis situation when confronted with several variables which have a chance of high correlation among independent variables (Fritz and Berger, 2015).

There are four statistical assumptions of MR (Plonsky and Ghanbar, 2018). The first assumption relates to multicollinearity which arises when the IVs in a regression model are highly correlated (0.90 or higher) with each other. Singularity is a specific type of multicollinearity which occurs when an IV is completely correlated with other IVs. Based on this assumption, IVs in a regression model should not have multicollinearity due to the risk of severely reducing the predictive power of IVs.

Normality, linearity, and homoscedasticity are the other three assumptions of MR (Plonsky and Ghanbar, 2018). In the assumption of normality, all residuals are expected to scatter normally around the predicted values of a DV. The assumption of linearity refers to a linear relationship between the predicted values of a DV and the errors of prediction (Plonsky and Ghanbar, 2018). Homoscedasticity or the assumption of constant variance is met when the variance of residuals of all the predicted values of a DV are the same. The absence of correlated residuals or the independence of error terms is the last assumption. This assumption suggests that the error of each predicted value and the errors of other predicted values should not correlate. Finally, the scatterplots of residuals that are provided in the output of different regression software can be used to evaluate all four assumptions: normality, linearity, homoscedasticity, and independence of error terms. It is important to understand these limitations of the method when interpreting the results of this study.

Cross-sectional multiple regression on concurrently-measured variables cannot definitively show causality. It can, however, provide some insight into the possible relationships between variables and provide evidence that, while far from conclusive, is suggestive of or consistent with (or the opposite) potential causal relationships. As such, this study aims to provide insight into the potential determinants of FWB by examining their correlational relationships with the two
proposed components of FWB, in conjunction with previous results and theories documented in the literature. Moreover, by using structural equation modelling alongside more simple regression methods, it is possible to compare the strength of evidence for different forms of relationship between the variables. It remains important to acknowledge the significant limitations of multiple regression when interpreting results and drawing conclusions, in particular the inability to demonstrate causality, and this study attempts to do this.

4.5.4 Multicollinearity in Regression and Factor Analysis

Multicollinearity can present a problem because when independent variables are strongly correlated with each other, it can generate large errors in the coefficients (Shockey and Seiling, 2004; Goldberger, 1964). Accordingly, the coefficients may be insignificant and have erroneous signs (Jensen, 2003). The moderate correlation of 0.60 is used as the cut-off point by the researcher to assess whether there is concern.

Field (2005) points out that for factor analysis, mild multicollinearity is not a problem. However, the author emphasises the importance of avoiding extreme multicollinearity in the regression model (i.e. very highly correlated IVs) and singularity (perfectly correlated IVs) (Field, 2005). In factor analysis, singularity causes problems due to it being impossible to determine the unique contribution of IVs that are highly correlated to a factor (Field, 2005). It is also the case for multiple regression. Therefore, an elimination is needed at the early stage for any variables that either correlate very highly with other variables (R <.9) or that do not correlate with other variables (Field, 2005).

The determinant of the R-matrix can detect multicollinearity (Field, 2005). The determinant of the R-matrix should be greater than 0.00001; otherwise, examining the correlation matrix for very highly correlated variables with R > 0.8. Depending on the extent of the problem, one or more of the variables should be considered for elimination before proceeding. Making a decision on which of the variables to eliminate is arbitrary (Field, 2005). In addition, finding multicollinearity also raises
concerns about the choice of items within a questionnaire. The determinant can be seen at the bottom of the correlation matrix (Field, 2005).

However, it is worth noting that multicollinearity is not always a problem. Shockey and Seiling (2004) found that in their stepwise regression procedure, independent variables were highly significant, and were positively related to the dependent variables. However, it appears that the results in their study were not compromised by multicollinearity.

4.5.5 Handling Missing Data in Factor Analysis and Multiple Regression

Missing data is considered as a practical problem of research. There are growing indications that missing data may cause serious distortion in statistical analysis (Mackelprang, 1970) but it depends on how the missing data are handled, in order for it to cause errors in measurement or sampling. The problem of missing data is much the same in multiple regression as in factor analysis (Mackelprang, 1970). This section explores different approaches in dealing with missing data.

Relatively high levels of missing data can be tolerated without excessive distortion when the level of intercorrelation among the variables is moderate or low, and when pairwise procedures are used (Mackelprang, 1970). The efficiency of pairwise procedures is quite high under such conditions. However, the effectiveness of pairwise correlation procedures in highly correlated samples is marginal, and the use of such procedures may, in fact, magnify the distortion. Among the conditions shown to be important in determining the magnitude of the distortion produced by missing data are: the level of correlation (in multiple regression only), the level of missing data, and the size of the sample (Mackelprang, 1970). The method of handling missing data is of prime importance in determining the effects of missing data in the factor analysis and multiple regression (Mackelprang, 1970).

There are different techniques to deal with missing data such as technique-pairwise correlation (Miller et al., 2002; Mackelprang, 1970) or cases can be excluded that have missing values (Xiao and Wu, 2008). If the researcher wants to minimise the
deletions of too many cases, the pairwise deletion method is preferable. When one or the other variable in each individual correlation is missing, the statistical software, such as SPSS, only uses the correlations in the matrix with excluded cases after calculating the correlations (Miller et al., 2002). In factor analysis, when conducting the correlational analysis to compute the Cronbach alpha (to test the scale reliability), the method of pairwise deletion is used for subjects with missing data (Chen, 2015). On the whole, pairwise correlation appears to be generally effective in reducing the distortion caused by missing data (Mackelprang, 1970). For data sets with an N of less than 100 cases, however, distortion is likely to be substantial regardless of whether pairwise procedures are used.

In addition, listwise deletion is another option. Listwise deletion is used when a case has a missing value in at least one of the specified variables and is dropped from the analysis. Only cases which have a complete set of data are analysed. This process is different to pairwise deletion which uses cases that contain some missing data in the statistical procedure. A particular variable that has a missing value cannot be included in the pairwise procedure, but it can still be used when other variables with non-missing values are analysed. Accordingly, pairwise deletion makes use of the available data more than listwise deletion. The missing values analysis option in SPSS statistics offers multiple imputation methods to handle missing data (IBM, 2018).

When missing data-handling techniques cannot be used for the items that have large numbers of missing cases, some researchers delete these items (Boateng et al., 2018). In the context of survey research, there are two options for using multiple imputation to recover missing data. The first option relates to individual items that can be imputed individually prior to computing the scale scores. The second option imputes the scale scores from other scale scores. Item-level imputation is recognised to produce more efficient estimates over scale-level imputation. Therefore, for missing cases, imputing individual items before scale development is preferred to imputing newly developed scales (Boateng et al., 2018).
4.5.6 Scale Scores or Index Scores in Multiple Regression

After factor analysis and the tests of dimensionality, scale scores can be created using finalised items for substantive analysis, such as reliability and validity tests. There are two procedures used to calculate scale scores: unweighted or weighted techniques. Scale scores using an unweighted approach are calculated by a sum of raw item scores or standardised item scores. This can also be done by computing the mean of raw item scores (Boateng et al., 2018). In the weighted approach, the calculation of scale scores can be handled using statistical software programs such as SPSS. Generally, the performance of the scale of unweighted items (e.g., mean or sum scores) and weighted items (e.g., factor scores) is not much different (Boateng et al., 2018).

For instance, Xiao et al. (2015) used an unweighted approach which sums up scores of items to create a variable, such as financial behaviour, literacy and perceived financial capability in regression analysis. The authors then created a financial capability index by calculating the sum of Z scores of objective financial literacy, subjective financial literacy, desirable financial behaviour, and perceived financial capability. By contrast, Porter and Garman (1993, p. 153) utilised weighted items to calculate the "Index of Wellbeing" which introduced by Campbell et al. (1976). This index produced a single measure of the perception of general wellbeing and life satisfaction amongst the participants. The computation of the index included the respondents (N = 483) with complete responses for the life satisfaction item and eight semantic-differential items on the survey instrument. The sum of the eight semantic-differential items was divided by eight to calculate the average score. To assess life satisfaction, Porter and Garman (1993, p. 153) used a single item asking, "How satisfied are you with your life as a whole these days?" The sum of this item was multiplied by 1.1 (in accordance with the weighting used by Campbell et al. (1976)). This result was then combined with the average of the semantic differential items to create the index of wellbeing for each participant.

On the other hand, in a study where a regression carries out after a factor analysis of variables, there are two ways to calculate the scores. It is either calculated by the total scores of a group of items under each factor, or the total score of all items under the variables. Both factor score and total score of all items can be used in
regressions. For instance, Dew and Xiao (2011) used factor analysis to develop the financial management behavior scale (FMBS), which extracted four factors or subscales. The authors then used both four subscales and the index of FMBS in regressions.

This study combines the methods of Xiao et al (2015) and Dew and Xiao (2011) who calculate the total score of all items under each variable, as well as the total scores of a group of items under each factor. This study uses both of these ways of calculating the scale score for multiple regression including unweighted items and weighted items. For example, to create the financial needs satisfaction index, this study used weighted items of importance of financial needs and multiplied it with the score of satisfaction of financial needs. In addition, both individual factor components (items scores), as well as total scores of the variables as a whole, were computed to run a multiple regression in an effort to make a robust testing.

4.5.7 Common Method Variance

This section addresses the possibility of common method variance (CMV) when using cross-sectional data in the current study. Cross-sectional studies are at risk of having the inflation of correlations by CMV (Lindell and Whitney, 2001). Data from cross-sectional studies are collected at the same time from individuals' reports of related constructs/variables at the present and in the past (Lindell and Whitney, 2001). CMV is a concern when data from a self-reported single source are used (Cui et al., 2021; Meade et al., 2007). The consequence of measuring different constructs with the same method is the possibility that CMV can inflate the observed correlations between dependent and independent variables artifically. CMV can result in research conclusions being incorrect (Cui et al., 2021; Podsakoff et al., 2003).

This study collects the data from two methods (i.e. survey and interview) and the research design was longitudinal with three stages of data collection. However, due to the limitations in data collection, the survey is the main source to collect data for the variables of interest with supporting data from a small number of interviews. There are two potential effects of CMV that the current study might face. Firstly,
method factors can bias estimates of construct reliability and validity (Podsakoff et al., 2012; Williams et al., 2010; Bagozzi 1984). Secondly, it can bias parameter estimates of the relationship between two different constructs (Podsakoff et al., 2012). Previous studies found that method bias can inflate, deflate, or have no effect on estimates of the relationship between two constructs. Hence, it is important that both forms of bias are controlled whenever possible (Podsakoff et al., 2012).

To mitigate the problem of method bias, this study applied some procedural remedies following Podsakoff et al.’s recommendations (2012). The questionnaires were designed in a simple way so that the participants were more likely to respond accurately. Developing a good cover story and clear instructions in the email sent out to the participants was another suggestion that the current study adopted (Podsakoff et al., 2012; Aronson et al. 1998). To motivate the respondents to provide accurate answers, this study also explained how the information will be used or how it will benefit them (Podsakoff et al., 2012). The current study encouraged the desire for self-expression or emotional catharsis by explaining in the instructions of the questionnaires that we value the learners’ opinion to improve their online learning experience (Podsakoff et al., 2012). Furthermore, Harman’s single factor test is often used to diminish the threat of CMV (Cui et al., 2021; Craighead et al., 2011). This study conducted this test to detect the CMV issue.

A potential issue of CMV in this study is that, while conceptually the elements of financial capability and financial wellbeing are distinct, there are necessary similarities in how participants may interpret some of the questions used to measure different elements. In particular, questions linked to whether participants had the financial resources/money to meet their needs form part of measures of financial capacity and financial needs satisfaction. To help mitigate any bias this might cause, this study models financial needs satisfaction in two ways – one including financial capacity as a possible factor and one excluding it – to see what difference it makes when examining the determinants of financial needs satisfaction. As financial capacity appears to be the most important factor in both measures of FWB, excluding it could introduce a substantial omitted variable bias. This study uses structural equation modelling to consider potential interpretations that might explain the results with and without financial capacity. As neither CMV nor omitted
variable bias can be excluded or entirely mitigated, most importantly this study interprets research findings with an understanding of their possibility.

### 4.5.8 Endogeneity Bias

When interpreting the results of the current study, it is important to take into account the possibility of having endogeneity bias. Endogeneity bias is described as a critical issue while analysing cause and effect relationships between variables in research (Zaefarian et al., 2017). Endogeneity can increase the likeliness of making flawed causal interpretations that based on biased and inconsistent results (Zaefarian et al., 2017; Semadeni et al., 2014). Three primary sources that cause endogeneity are (1) omission of variables, (2) errors-in-variables, and (3) simultaneous causality (Zaefarian et al., 2017; Bascle, 2008; Wooldridge, 2002). This section addresses some sources that may cause endogeneity bias in the current study.

Omission of variables could be a potential issue in the current study. The omission of variables in a model occurs when data is unavailable. The omitted variable can be associated with both the dependent variable and any of the independent variables (Zaefarian et al., 2017; Kennedy, 2008; Wooldridge, 2002). The current study examines the relationships between four components of financial capability and FWB. Other variables of the components of financial capability such as an individual's confidence and motivation to manage their finances that may also affect FWB. However, these variables are not investigated in this study and therefore, omitted from the model and thus not considered in the analysis of determinants of FWB. The variations caused by these variables will be captured by the error term in the model, thus producing endogeneity problems (Zaefarian et al., 2017).

The errors of variables measurement arise when using inadequate measurement instruments to capture concepts of interest, or incomprehensive data collection method (Kennedy, 2008). The choices of scales to measure a variable affect the results. This study adopted some measurements constructed from previous studies such as financial behaviour (Dew and Xiao, 2011) and financial attitude (Vlaev and Elliott, 2014). However, this does not guarantee that these measurements capture all aspects of financial behaviour and financial attitude concepts. Especially, the
literature review shows there are different measurements of these two concepts. On the other hand, some variables may have overlapping concept such as financial capacity and financial needs satisfaction in the current study. Likewise, missing data in this study is also described as a form of measurement error (Kennedy, 2008).

As this study uses regression of concurrently-measured variables, simultaneous causality might be a concern (Zaefarian et al., 2017; Wooldridge, 2002). If assuming that an individual’s financial behaviour causes their FWB, one can argue that FWB can motivate financial management behaviour as well. For example, a person feels worried about his/her finances that trigger them to manage their finance more carefully whilst managing their finance wisely can result in a positive perception of FWB. The causal relationships between financial literacy and retirement planning may go both ways in the case of those “who plan may also become more financially literate and develop the ability to do retirement calculations” (Lusardi et al., 2011, p.25). Likewise, financial capacity affects an individual’s ability to act such as saving money. In the meantime, if a person does not manage their finances effectively they may not have the desirable financial capacity (i.e. saving amounts or investment returns etc.). Simultaneous causality also may happen amongst the determinants of FWB. For instance, financial attitude can affect financial behaviour and vice versa. It is not possible to determine the direction of relationships using multiple regression, so this is primarily mitigated by considering results in the context of theory and the existing literature. To aid in considering different sets of possible relationships that might explain the correlations found, this study uses structural equation modelling to analyse these correlations in combination.

Apart from three main sources of endogeneity above, there are other causes. For instance, the participants can understand and interpret the questions differently which can result in unreliable findings. Participants in this study were from different countries. They may have different ideas on the same questions such as health care, social care. Limited responses and selective participants can also be sources of endogeneity.

In addition, this study seeks to understand the financial wellbeing and determining factors of this for those who take financial education. This is one of the first steps towards considering how financial education might be improved to enhance the
participants’ FWB. Effectively, the population of interest is people who take financial education. Hence, while there may be some self-selection bias in terms of who is selected and responded to this research, the sample invited would appear to match well to the population of interest. Nevertheless, the endogeneity bias will be addressed in-depth when the causal relationships between FWB and its determinants are at the centre of future research.

4.5.9 Structural Equation Modelling (SEM)

An econometric model includes a set of dependent variables and one or more dependent variable (Aaker and Bagozzi, 1979). The relationships between these variables are often defined by an equation for each dependent variable. The relationships can be empirical associations or causal links. According to Dion (2008, p.365) “the overall objective of structural equation modelling is to establish that a model derived from theory has a close fit to the sample data in terms of the difference between the sample and model-predicted covariance matrices”. A conceptual difference between SEM and regression is that in SEM the interactions amongst these variables are modelled whilst in a regression model each explanatory variable is assumed to be independent and exogenous (Dion, 2008). This influences the size of the coefficients found in regression analysis (Dion, 2008).

There are some reasons why this study uses SEM for the final step of hypothesis testing. Firstly, SEM is stated as a hypothetico-deductive strategy focused on the predictive testing of statistical models and theory construction methodology (Borsboom et al., 2021). It is a useful tool for this study to test the theory of financial wellbeing. Secondly, SEM is a useful data analytical tool for testing complex relationships between many variables (Peugh and Feldon, 2020). SEM can be used to test multiple mediating and moderating relationships, estimate latent variables based on related measures. The key variables such as Perceived FWB and financial needs satisfaction in this study are unobservable variables or theoretical constructs. Therefore, it is useful to take one of the advantages of SEM in its ability to analyse unobservable constructs for parameter estimation and hypothesis testing in causal models (Aaker and Bagozzi, 1979). Another important strength of SEM is that it can combine and exploit the best features of both psychometric and econometric analyses. In disciplines such as marketing, it is often unavoidable for theoretical
constructs to have challenges in terms of a single measure and measurement error (Aaker and Bagozzi, 1979). SEM is an ideal method to examine the relationships among unobservable variables in various disciplines such as marketing, sociology, statistics, econometrics, and psychometrics (Aaker and Bagozzi, 1979).

In this study, carrying out the SEM is also useful to validate the results and mitigate the limitations of the stepwise regression method in examining the relationships between the key variables. In addition, SEM has been used in studies on personal finance. For example, SEM was used to develop and validate an instrument measuring subjective financial wellbeing (Sorgente and Lanz, 2019), to examine the relationship between financial wellbeing and personal financial wellness (Gerrans et al., 2014), financial knowledge and financial behaviour (Arifin, 2017).

The “fit” between the models and the sample’s data is assessed to examine whether a hypothesised model provides an appropriate characterisation of the collective relationships between its variables (Peugh and Feldon, 2020). The absolute fit indices are often used to test the convergent validity of the measurement modeling validity (Sorgente and Lanz, 2019; Potrich et.al., 2016). There are some common indexes such as χ2 value, Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI) (Sorgente and Lanz, 2019; Potrich et.al., 2016), normed fit index (NFI), Tucker-Lewis index (TLI) (Potrich et.al., 2016). There is no universal agreement regarding acceptable values for these indices (Potrich et.al., 2016). The interpretation guidelines related to goodness-of-fit indexes are not treated as “golden rules” but only as rough guidelines for such as descriptive model evaluation and theoretical adequacy (Sorgente and Lanz, 2019; Fan and Sivo, 2007).

For example, the χ2 value is a measure of poor fit. If the χ2 values are large and significant, the model fits the data poorly. By contrast, the model is consistent with the data of χ2 values are non-significant (Sorgente and Lanz, 2019). Recommendations for the χ2 and degrees of freedom vary from less than five to less than two (Potrich et.al, 2016; Hooper et al., 2008). However, a limitation of this index is that the χ2 is strongly influenced by the sample size (Sorgente and Lanz,
2019; Cheung and Rensvold, 2002). The $\chi^2$ becomes unreliable when the sample size is high (Sorgente and Lanz, 2019).

RMSEA is a measure of poor fit. According to Sorgente and Lanz (2019) RMSEA values close to zero indicate better fit (i.e., values below .05 indicate good fit whilst values less than .10 indicate reasonable fit (Sorgente and Lanz, 2019). CFI is an indicator of goodness of fit, with values close to 1 indicating a good model (Sorgente and Lanz, 2019). Whilst CFI values less than .90 indicate that the model does not fit the data well (Sorgente and Lanz, 2019; Marsh et al., 2004). However, in Potrich et.al's paper (2016), they referred to the ideal benchmark for CFI, GFI, NFI and TLI is less than 0.95 and for RMSR and RMSA is less than 0.05 and 0.08 accordingly (Hooper et al., 2008).

4.5.10 NVivo Coding for Qualitative Data

This study uses thematic analysis to transcribe, analyse and interpret the qualitative data from the follow-up interview (Lynass et al., 2012; Braun and Clarke, 2006; Boyatzis, 1998). According to Braun and Clarke (2006, p. 79), thematic analysis is “a method for identifying, analysing and reporting patterns (themes) within data”. Similarly, Hartman and Conklin (2012, p. 828) describe thematic analysis as “a process of encoding qualitative information and requires the coder to create and use an explicit code to create a list of themes present in the data”. Thematic analysis provides a researcher with a useful way of analysing and making sense of qualitative information (Hartman and Conklin, 2012). Thematic analysis is useful to expand the perspective of a study as it provides the researcher with more diverse phenomenological information than a typical quantitative study (Hartman and Conklin, 2012).

This study codes the themes to identify two key themes – the hierarchy of financial needs and the determinants of FWB – in the interview data in relation to the research questions. These themes represent certain levels of patterned response or meaning within the data set (Braun and Clarke, 2006). The flexibility of thematic analysis allows a researcher to determine themes in various ways. According to Braun and Clarke (2006) there are primarily two ways in thematic analysis to identify themes or patterns: an inductive or ‘bottom up’ approach for qualitative data (Frith and
Gleeson, 2004), or a ‘top down’ approach for a theoretical or deductive study (Boyatzis, 1998; Hayes, 1997). The themes identified in an inductive approach are strongly linked to the data themselves without trying to fit their into a pre-existing coding frame, or the researcher’s analytic preconceptions (Braun and Clarke, 2006; Patton, 1990). By contrast, a deductive approach or ‘theoretical’ thematic approach is more explicitly analyst-driven. Therefore, this approach is inclined to be driven by the researcher’s theoretical framework or analytic interest (Braun and Clarke, 2006). ‘Theoretical’ thematic analysis has a tendency to provide a more detailed analysis of the selective aspects of the data but provides a less rich description in general.

This study uses a deductive or ‘theoretical’ thematic analysis to support the results of testing two theoretical frameworks from the quantitative data analysis. Since the thematic approach is analyst-driven, in order to support the quantitative findings, the results of the analysis are not presented in the data analysis chapter but the findings chapters only. This study used NVivo software to code the themes in the follow-up interviews. During the deductive thematic analysis, this study utilises the six phases of thematic analysis set out by Braun and Clarke (2006, p. 87) (see Table IV-12).

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description of the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarizing yourself with your data:</td>
<td>Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.</td>
</tr>
<tr>
<td>2. Generating initial codes:</td>
<td>Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.</td>
</tr>
<tr>
<td>3. Searching for themes:</td>
<td>Collating codes into potential themes, gathering all data relevant to each potential theme.</td>
</tr>
<tr>
<td>4. Reviewing themes:</td>
<td>Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis.</td>
</tr>
<tr>
<td>5. Defining and naming themes:</td>
<td>Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.</td>
</tr>
<tr>
<td>6. Producing the report:</td>
<td>The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.</td>
</tr>
</tbody>
</table>

Table IV-12: Six phases of thematic analysis (Braun and Clarke, 2006, p. 87)

An example of the six phases can be summarised below:

- Step 1: This study transcribed data using an online app (ie.temi.com) and imported the transcripts of individual participants into Nvivo for coding. Initial ideas were noted following the key findings from the quantitative data such as key factors that influenced participants’ perception of financial wellbeing.

- Step 2: There are various codes were generated with a focus on three areas such as (a) hierarchy of financial needs or financial behaviours, (b) financial
needs satisfaction (i.e. priority, fulfilment and perceived feelings) and (c) key factors influenced how participants perceived their financial wellbeing. The transcribed data were collated under each code.

- **Step 3:** The patterns (themes) within data that related to the overall research question and key findings from quantitative findings, were identified. For example, one of the themes found among the majority of the participants was that financial capacity was mentioned as the key factor that influenced participants’ financial behaviours and how they prioritised and satisfied their financial needs and perceived their financial wellbeing.

- **Step 4:** Reviewing themes and thematic ‘maps’ or ‘word trees’ was created under each potential theme.

- **Step 5:** Each theme was given a name that captured the storyline of the data. For instance, financial capacity is a key influential factor of FWB with low financial capacity results in low perceived FWB.

- **Step 6:** A report of the analysis, the themes and extracted direct quotes were presented in the results chapter to support the findings from quantitative findings to answer the research questions and link it to the literature.

In addition, due to a lack of data on gender, the NVivo coding was used to track the gender of participants through their online conversation/texts based on some key words, such as “my husband’, ‘my wife’, ‘my boyfriend’, and ‘my girlfriend’. The data was then merged to the surveys’ data.

### 4.6 Conclusion

This chapter describes the methodology of this study which follows a pragmatic approach with mixed methods. Survey and interviews were used as methods to collect data. Three questionnaires were designed to collect data in three stages of collection but only dataset from the pre-survey was used in the thesis. In addition, a follow-up interview provided additional data to support the findings from the pre-survey. The chapter also discusses the different methods of data analysis to explore the links between FWB, its components and determinants such as factor analysis and multiple regression. The research limitations were also discussed.
V. DATA ANALYSIS CHAPTER

5.1 Introduction

This chapter presents the quantitative data analysis to provide an answer to the research questions “What is the nature of financial needs satisfaction, as a component of FWB? And “How do the elements of financial capability relate to the two components of FWB in the context of online financial education?” To provide the answers for these research questions, this study tests 10 hypotheses and the conceptualisation of financial needs satisfaction as seen in Table V-1. The analysis mainly uses the data from the pre-survey with 398 responses.

<table>
<thead>
<tr>
<th>Determinants of</th>
<th>How do the elements of financial capability relate to Perceived FWB, a component of FWB in the context of online financial education?</th>
</tr>
</thead>
</table>
| Perceived FWB   | • What appear to be the determinants of FWB?  
|                 | • How significant are each of these determinants?  |

H1: Perceived financial capability has a significant and positive relationship with Perceived FWB among online learners.

H2: Financial attitude has a significant and positive relationship with Perceived FWB among online learners.

H3: Financial capacity has a significant and positive relationship with Perceived FWB among online learners.

H4: Financial behaviour has a significant and positive relationship with Perceived FWB among online learners.

H5: Subjective financial literacy has a significant and positive relationship with Perceived FWB among online learners.

<table>
<thead>
<tr>
<th>Determinants of financial needs satisfaction</th>
<th>How do the elements of financial capability relate to financial needs satisfaction, a component of FWB in the context of online financial education?</th>
</tr>
</thead>
</table>
The first group of research questions focuses on the determinants of FWB. It is essential to understand the components and determining factors of Perceived FWB in order to inform interventional ideas for promoting individual FWB. By testing hypotheses one to five (H1-H5), this study examines the associations between Perceived FWB and perceived financial capability, and four components of financial capability. Whilst the second group of research questions and hypotheses six to ten (H6-H10) focus on the determining factors of financial needs satisfaction. In the context of how online financial education may be able to improve FWB, these questions enable a consideration of the nature of FWB and how potential determinants affect different aspects of it. In empirical studies, it is more difficult to establish a causal relationship between variables than to predict the relationship between them. This issue is due to a lack of information about unobservable variables and their contributions to the outcome variable. This study acknowledges this challenge in Section 4.5.8 which discusses endogeneity bias.

Missing demographic data is a common challenge in research and this research is no exception. Demographic variables tend to be controlled in regression equations. Unfortunately, for the current research, the key demographic data such as gender,
age, level of education variables had around a 20%-25% response rate which is very low to offer meaningful results. As a result, these variables were not included in the regression equations.

This chapter proceeds as follows: 5.2 identifies and validates key variables; 5.3 examines the determinants of FWB (hypotheses 1-10); 5.4 robust testing the results from Section 5.3; and 5.4 explains the conclusions of the chapter.

5.2 Identifying and Validating Key Variables

5.2.1 Normality Test

This study uses SPSS 24.0 for statistical analysis. There are two fundamental tests are used to examine the normality of data before running the factor analysis and multiple regression. The two tests include the Kolmogorov-Smirnov test and the Shapiro-Wilk test. These tests compare the set of scores in the sample to a normally distributed set of scores with the same mean and standard deviation (Field, 2000). The distribution of the sample is not significantly different from a normal or non-normal distribution if p>0.05 and vice versa (Field, 2000). Previous studies have use the Kolmogorov-Smirnov test to examine the normality of data distribution (Rajna et al., 2011; Schug and Hagedorn, 2004).

This study tested the normality of variables in relation to Perceived FWB, financial needs importance and satisfaction, perceived financial capability, and financial capability components (i.e. behaviour, attitudes, and literacy). The Kolmogorov-Smirnov test and the Shapiro-Wilk test revealed that the data of all variables were non-normally distributed (p<0.05). The findings provided evidence for the argument that the majority of data collected in behavioural research does not follow either a univariate normal distribution or a multivariate normal distribution (Curran et al., 1996; Micceri, 1989). The results of the normality test also informed the choices of methods in carrying out a factor analysis and multiple regression.

Having examined the data with a non-normal distribution for the factor analysis of all variables, an extraction method of principal-axis factoring and direct oblimin – a method of oblique rotation method – was selected (Carpenter, 2018; Worthington
and Whittaker, 2006). Pairwise deletion was selected to deal with missing data (Miller et al., 2002).

## 5.2.2 Perceived Financial Wellbeing: Factor Analysis

The two tests – Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett’s test of sphericity – illustrate the reliability and the construct validity of the questionnaire in this study (Zabihi and Pordel, 2011; Worthington and Whittaker, 2006). The results showed a KMO value of 0.924 (see Table V-2) which indicates that a reasonable level of intercorrelation between the items, and that the sampling was adequate, making them appropriate for factor analysis (Carpenter, 2018). Bartlett’s chi-square was highly significant (p<0.001) suggesting that the factor model is appropriate for factor analysis and did not need to be reviewed (Kramer et al., 2006). Moreover, a Cronbach’s alpha of 0.934 (see Table V-3) was much higher than the minimum cut-off for a reliable measure, which also confirms the reliability of the questionnaire (Boateng et al., 2018). In addition, Cronbach’s alpha reliability of factor 1 (.938) was higher than the overall result (see Table V-3) and factor 2 (.839).

Both the scree test and eigenvalues (>1) showed a two-factor solution of Perceived FWB. The pattern matrix was used to assess salience and simple structure of the factor model (Carpenter, 2018). Factor one included all items under the category “not having negative feelings”, and factor two covered all items under the category “having positive feelings” with factor loadings greater than 0.5. The factor matrix (see Table V-4) was in accordance with the structure of testing theory in this study. This study used one index as a sum of two categories – ‘not having negative feelings’ and ‘having positive feelings’ – to measure Perceived FWB. The use of one index is to cover both aspects of Perceived FWB. It is important that those who perceive desirable Perceived FWB should not only have positive feelings but also should not have negative feelings with their financial circumstances.

<table>
<thead>
<tr>
<th>KMO and Bartlett’s Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin measure of sampling adequacy.</td>
<td>0.924</td>
</tr>
</tbody>
</table>
Table V-2: KMO and Bartlett's test on Perceived FWB

<table>
<thead>
<tr>
<th>Bartlett's test of sphericity</th>
<th>approx. chi-square</th>
<th>2845.426</th>
</tr>
</thead>
<tbody>
<tr>
<td>df</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table V-3: Cronbach's Alpha of Perceived FWB variable

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>N of Items</td>
<td></td>
</tr>
<tr>
<td>0.934</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table V-4: Pattern matrix of Perceived FWB factor analysis

<table>
<thead>
<tr>
<th>Pattern Matrixa</th>
<th>Factor</th>
<th>Negative feelings</th>
<th>Positive feelings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFWB.HAP</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.SAT</td>
<td>0.901</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.CON</td>
<td>0.753</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.NER*</td>
<td>0.685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.WOR*</td>
<td>0.761</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.ANX*</td>
<td>0.782</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.ANG*</td>
<td>0.782</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.FRU*</td>
<td>0.786</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.HOP*</td>
<td>0.846</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.LON*</td>
<td>0.754</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.DEP*</td>
<td>0.799</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFWB.TEN*</td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extraction method: principal axis factoring.
Rotation method: oblimin with Kaiser normalization.
A rotation converged in four iterations.

*The asterisks indicate significant loadings.
5.2.3 Financial Needs Satisfaction and Financial Needs Importance: Factor Analysis

This section shows the results of the factor analysis of two variables, financial needs satisfaction and financial needs importance. These results are used to partially inform the hierarchy of financial needs satisfaction and calculate the index scores for regression analysis at a later stage. The factor analysis of financial needs satisfaction is the primary source to determine the hierarchy of financial needs satisfaction. By contrast, running factor analysis on financial needs importance helps to define whether the result supports the same broad conclusions as found in financial needs satisfaction.

5.2.3.1 Factor Analysis on The Measures of Financial Needs Satisfaction

The factor analysis of financial needs satisfaction (FNS) had a Cronbach’s alpha of 0.943 as seen in Table V-5. This result indicates the reliability of the questionnaire (Boateng et al., 2018). Whilst Cronbach’s alpha (α) reliability of all four factors were adequate but lower than the overall result (0.934) (see Table V-5) with α of factor 1 is 0.889, factor 2 is 0.862, factor 3 is 0.880 and factor 4 is 0.867. Testing the factorability, as seen in Table V-6, KMO of 0.907 and Bartlett’s chi-square was highly significant (p<0.001). The results suggest that the questionnaire was appropriate and the sampling was adequate for factor analysis (Carpenter, 2018; Kramer et al., 2006).

The factor analysis for financial needs satisfaction extracted four factors that potentially suggested four levels of financial needs satisfaction. This result indicates that financial needs satisfaction does not have five hierarchical levels. The basic needs together with a higher level of financial needs correlated with factor four as seen in Table V-7.
### Reliability Statistics

<table>
<thead>
<tr>
<th></th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.943</td>
<td>21</td>
</tr>
</tbody>
</table>

*Table V-5: Cronbach’s alpha of SFN variable*

### KMO and Bartlett's Test

<table>
<thead>
<tr>
<th></th>
<th>Kaiser-Meyer-Olkin measure of sampling adequacy</th>
<th>0.907</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's test of sphericity</td>
<td>approx. chi-square</td>
<td>3749.721</td>
</tr>
<tr>
<td></td>
<td>df</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Table V-6: KMO and Bartlett’s test on SFN variable*

### Pattern Matrix

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance for Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.BN - Money for my basic needs</td>
<td>0.597</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.ED - Money for my education</td>
<td>0.605</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.HC - Money for my health care</td>
<td>0.786</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.BH - Money for a house (mortgage and bills)</td>
<td>0.641</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.IN - Money for insurances (e.g. house, car, motorbike)</td>
<td>0.873</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.SO - Money for special occasions (wedding, birthday, Christmas etc.)</td>
<td></td>
<td>-0.483</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.RD - Money to save for rainy days</td>
<td>0.771</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.UME - Money to save for unexpected major expenses</td>
<td>0.833</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.PIN - Money for my pension fund or/and invest for wealth</td>
<td>0.504</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN.S.LS - Money for my lifestyle (e.g. eat out, luxury goods, hobbies, holidays)</td>
<td></td>
<td></td>
<td>-0.753</td>
<td></td>
</tr>
</tbody>
</table>
Factor one of financial needs satisfaction is comprised of a mix of elements of ‘financial security’, ‘financial confidence’, and ‘financial freedom’. The items included money ‘for rainy days’, ‘for unexpected major expenses’, ‘for my pension fund or/and invest for wealth’, ‘to donate for charity’, ‘for my educational inspirations’, ‘master my knowledge in managing my finance’, ‘having the wealth for philanthropic acts’ and ‘having financial freedom’. ‘Having financial freedom’ was hypothesised as the highest level of financial needs satisfaction in the theoretical framework of financial needs. However, the result somehow indicated that participants in this study aligned the satisfaction of ‘financial freedom’ needs to the satisfaction of ‘financial security’. It seems that their perception of ‘financial freedom’ was related to short- and long-

Table V-7: Pattern matrix of SFN factor analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Rotation converged in eight iterations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN.S.BTIW</td>
<td>Money to buy things I don’t really need but I want to have</td>
<td>-0.812</td>
</tr>
<tr>
<td>FN.S.SC</td>
<td>Money to pay for social activities and maintain my social connections</td>
<td>-0.791</td>
</tr>
<tr>
<td>FN.S.CFS</td>
<td>Financial support from social networks</td>
<td>0.531</td>
</tr>
<tr>
<td>FN.S.TSO</td>
<td>Money to support social networks</td>
<td>0.359 0.376</td>
</tr>
<tr>
<td>FN.S.DON</td>
<td>Money to donate for charity</td>
<td>0.376</td>
</tr>
<tr>
<td>FN.S.EIN</td>
<td>Money for my educational inspirations</td>
<td>0.407</td>
</tr>
<tr>
<td>FN.S.MKN</td>
<td>Master my knowledge in managing my finance</td>
<td>0.445</td>
</tr>
<tr>
<td>FN.S.RW</td>
<td>Respected by others thanks to my wealth</td>
<td>0.777</td>
</tr>
<tr>
<td>FN.S.POW</td>
<td>Proud of my wealth</td>
<td>0.673</td>
</tr>
<tr>
<td>FN.S.HNP</td>
<td>Having the wealth for philanthropic acts</td>
<td>0.357 0.603</td>
</tr>
<tr>
<td>FN.S.FD</td>
<td>Having financial freedom</td>
<td>0.612</td>
</tr>
</tbody>
</table>

Extraction method: principal axis factoring.
Rotation method: oblimin with Kaiser normalization.
term financial security, as well as the extra money to give away to good causes. Due to the items of financial security being dominant within this factor, it has been labelled as a factor.

The factor two of financial needs satisfaction contained six items. One of the items was giving the financial support the social networks and society (e.g. ‘having wealth for philanthropic acts’). Another item was perceiving self-esteem thanks to the wealth and receiving social esteem from other people as a result (i.e. ‘respected by others thanks to my wealth’). Considering that factor two included the elements of financial esteem and educational inspiration, this could potentially be the higher hierarchical order of financial needs satisfaction than factor 1. This factor has the characteristics of self-actualisation.

By contrast, factor three of financial needs satisfaction had five items. These items can be described as life enjoyment, such as having money ‘for special occasions (wedding, birthday, Christmas etc.)’, ‘for my lifestyle (e.g. eat out, luxury goods, hobbies, holidays)’, ‘to buy things I don’t really need but I want to have’, and ‘to pay for social activities and maintain my social connections’.

Finally, factor four of financial needs satisfaction included five items: ‘basic needs’, ‘my education’, ‘my health care’, ‘a house (mortgage and bills)’, and ‘insurances’ (e.g. house, car, motorbike)”. This factor covered the elements of finances for existence as well as some elements of financial security, such as insurances. Participants in the study related education and health care to “basic needs”. The participants, to some extent, grouped being able to buy a house with a mortgage and pay bills together within the basic needs category.

It is worth mentioning that all variables had negative factor loadings on factor three – “finance for enjoyment”. The result indicated that the importance of factor three was going in a different direction to factor one: “finance for security”, factor two: “finance for self-actualisation” and factor four: “finance for existence”. Furthermore, all items had factor loadings above a cut-off point of 0.32 (Tabachnick and Fidell, 2001; Field, 2000). Therefore, all items are retained. However, there are two items
(FN.S.TSO and FN.S.HNP) that had cross-loadings. Both these items are assigned to factor 2 where it has the highest loading. Overall, based on the features of the items that were loaded on four factors, this study named the factors as follows:

- Factor one: finance for security with elements of financial freedom, advance financial security (emergencies and long-term security- retirement, social esteem, self-esteem- being respected)
- Factor two: finance for self-actualisation with elements of giving and receiving social support, and self-esteem and social esteem
- Factor three: finance for enjoyment with elements of lifestyle, socialising, and special occasions
- Factor four: finance for existence with elements of immediate financial security such as basic needs, housing, insurance, plus basic education and healthcare.

The results from the factor analysis of financial needs satisfaction did not support the conception which proposed that ‘there are five distinct categories of financial needs satisfaction’. The results initially suggest that the participants in this study classified the satisfaction of their financial needs in four categories.

### 5.2.3.2 Factor Analysis on the Measures of Financial Needs Importance

The factor analysis of financial needs importance (FNI) had a Cronbach’s alpha of 0.846 (see Table V-8). This result was sufficiently robust to confirm the reliability of the questionnaire (Boateng et al., 2018). Furthermore, Cronbach’s alpha (α) reliability of all five factors were sufficient but lower than the overall result (0.872) (see Table V-8) with α of factor 1 is 0.770, factor 2 is 0.799, factor 3 is 0.801 and factor 4 is .771 and factor 5 is 0.683. Factor 5 had lowest α value.

Testing the factorability of the measures of the importance of financial needs, KMO of 0.872 and Bartlett’s chi-square was highly significant (p<0.001) (see Table V-9). The results suggested that the sampling was adequate, and the questionnaire was appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006). Both the scree
test and eigenvalues (>1) showed a five-factor solution to the importance of financial needs. The pattern matrix was used to assess salience and simple structure of the factor model (Carpenter, 2018).

The factor matrix extracted five factors as seen in Table V-10. These factors are labelled as follows:

- Factor one: finance or existence and security (existence and security)
- Factor two: finance for enjoyment (financial freedom, lifestyle)
- Factor three: finance for self-esteem (self-esteem: respect / pride)
- Factor four: finance for education and health care (social fundamentals: health, education, and support)
- Factor five: finance for social-esteem (support others, social esteem)

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
</tr>
<tr>
<td>0.872</td>
</tr>
</tbody>
</table>

*Table V-8: Cronbach's Alpha of IFN variable*

<table>
<thead>
<tr>
<th>KMO and Bartlett's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bartlett's test of sphericity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Table V-9: KMO and Bartlett's test on IFN variable*

<table>
<thead>
<tr>
<th>Pattern Matrix$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
</tr>
<tr>
<td>Factor 1</td>
</tr>
<tr>
<td>FN.I.BN - Money for my basic needs</td>
</tr>
<tr>
<td>Code</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>FN.I.ED</td>
</tr>
<tr>
<td>FN.I.HC</td>
</tr>
<tr>
<td>FN.I.BH</td>
</tr>
<tr>
<td>FN.I.IN</td>
</tr>
<tr>
<td>FN.I.SO</td>
</tr>
<tr>
<td>FN.I.RD</td>
</tr>
<tr>
<td>FN.I.UME</td>
</tr>
<tr>
<td>FN.I.PIN</td>
</tr>
<tr>
<td>FN.I.LS</td>
</tr>
<tr>
<td>FN.I.BTIW</td>
</tr>
<tr>
<td>FN.I.SC</td>
</tr>
<tr>
<td>FN.I.CFS - Financial support from social networks</td>
</tr>
<tr>
<td>FN.I.TSO - Money to support social networks</td>
</tr>
<tr>
<td>FN.I.DON - Money to donate for charity</td>
</tr>
<tr>
<td>FN.I.EIN - Money for my educational inspirations</td>
</tr>
<tr>
<td>FN.I.MKN - Master my knowledge in managing my finance</td>
</tr>
<tr>
<td>FN.I.RW - Respected by others thanks to my wealth</td>
</tr>
<tr>
<td>FN.I.POW - Proud of my wealth</td>
</tr>
<tr>
<td>FN.I.HNP - Having the wealth for philanthropic acts</td>
</tr>
<tr>
<td>FN.I.FD - Having financial freedom</td>
</tr>
</tbody>
</table>

**Extraction method:** principal axis factoring.

**Rotation method:** oblimin with Kaiser normalization.

*a Rotation converged in ten10 iterations.*

**Table V-10: Pattern matrix of FNI factor analysis**

Although the results from the pattern matrix (see Table V-10) showed financial needs importance had one more factor than financial needs satisfaction, it appeared to support the finding of the factor analysis in relation to financial needs satisfaction in a broad view. Five factors in financial needs importance can be fitted appropriately into the four factors found in financial needs satisfaction: ‘finance for existence’, ‘finance for security’, ‘finance for enjoyment’, and ‘finance for self-actualisation’.
It is important to highlight some differences between the results of the factor analysis of financial needs importance and financial needs satisfaction. The items of financial needs importance correlated significantly on different factors in comparison to the results of the factor analysis of financial needs satisfaction. However, the differences between the two results did not broadly affect the consistency of the results. This is because the distinction between the two results was mainly that two categories of the broad factors in financial needs satisfaction were combined into one factor, or some items in one factor were separated to create a new factor of financial needs importance.

The first difference was that the factor analysis of the financial needs importance divided ‘education’ and ‘healthcare’ out of the ‘financial for existence’ factor to be an independent factor (‘finance for education and health care’) whereas financial needs satisfaction combined them within one factor (‘finance for existence’). Accordingly, most of the items within factor four of financial needs importance (‘finance for education and health care’), was a part of factor four (‘finance for existence’) of financial needs satisfaction.

The second difference between the two results was that two factors in financial needs importance analysis, factor three (‘self-esteem’) and factor five (‘social esteem’), were a part of factor 2 (‘finance for self-actualisation’) in financial needs satisfaction analysis. Similarly, two factors, factor one (‘finance for security’) and factor four (‘finance for existence’), of financial needs satisfaction were combined into factor (‘finance for existence and security’) of financial needs importance.

Lastly, it also became known that the ‘financial freedom’ item loaded weakly in factor two (‘finance for enjoyment’) of financial needs importance whilst being a part of factor one (‘finance for security’) of financial needs satisfaction. This result suggests that participants viewed financial freedom as having the money to buy and do the things they want for enjoyment and socialising, rather than being a higher order of financial needs, to be free in general.
A slight distinction between the two results of the factor analyses indicates that the participants weighted the importance of certain financial needs differently within a broad category. However, the characteristic of the factors between the two factor analyses (financial needs importance and satisfaction) were not significantly different. It is rather a fluid preference of an individual on the importance of certain financial needs and how the groups of specific financial needs were correlated and satisfied.

In relation to the methodology, the negative factor loadings of some factors reflect the different directions between these factors. A factor loading reflects the slope of increase (or decrease if the loading is negative) in units of a measured variable for each unit of increase in the common factor (Leandre and Duane, 2012). However, previous studies do not relate the meanings of negative factor loadings to the findings but, rather, focus on the result (Stenling et al., 2018; Erdle and Rushton, 2010). One of the reasons for this is that a negative factor loading does not indicate any meaning in relation to the strength of the variable to the factor but shows it is related in the opposite direction from the factor (Asnawi et al., 2012). It can be seen that factors one and two had the same positive direction with the positive factor loadings, whilst factor three, four, and five went in the opposite direction. All variables had negative factor loadings on factor three, four, and five (see Table V-10). Applied to this study, factor one and four represent two aspects of financial security needs: finances for existence and security, and social fundamentals, covering elements of health, education, and social care. The results indicate that the importance of factors three, four, and five are going in a different direction to factor one and factor two.

In addition, two items had factor loadings less than a cut-off point of 0.3, which included: FN.I.FD – ‘having financial freedom’ (0.255) and FN.I.CFS- ‘financial support from social networks’ (cross loadings on two factors four and five of -0.233, -0.229 accordingly). It was suggested that these items should be removed from the measures. However, the factor analysis on the measures of financial needs satisfaction indicated that it should remain. Therefore, these items remained as a part of financial needs importance in order to later calculate the financial needs satisfaction index.
Finally, based on the results of the two-factor analysis and a consideration of the theory, this study kept all 21 items to account for the measures of financial needs satisfaction. A weighted procedure was also employed to calculate the index score of financial needs satisfaction:

\[
FNSI = (IFN_1 \times SFN_1) + (IFN_2 \times SFN_2) + \ldots (IFN_n \times SFN_n)
\]

Where \( FNSI \) = financial needs satisfaction index, \( IFN= \) importance of each financial needs, \( SFN = \) importance of each financial needs and \( n \): the number of needs.

This procedure gave the individual an opportunity to outline their own hierarchy of financial needs, which has an impact on their Perceived FWB. This procedure is contrary to some previous studies that enforced a fix weighted number (e.g. Clarke et al., 2006).

### 5.2.3.3 Index Scores of Financial Needs Satisfaction

This section presents how the score of financial needs satisfaction index is calculated. The calculation is mainly based on the result of the factor analysis of financial needs satisfaction and takes into account of the weight of importance of individual financial needs. The results of Cronbach’s alpha confirm the reliability of the measures of FNS and FNI and their factors. The calculation is summarised in Table V-11. This index score is later used in the regressions.

<table>
<thead>
<tr>
<th>Variable label</th>
<th>Attribute</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Satisfaction Index (FNSI)</td>
<td>Multiple score of importance x score of satisfaction on 21 financial needs (five-point scales)</td>
<td>All 21 items remained</td>
</tr>
</tbody>
</table>

*Table V-11: Attributes of financial needs satisfaction variable and its index score*
5.2.4 The Determinants of Financial Wellbeing: Factor Analysis

5.2.4.1 Perceived Financial Capability

To measure perceived financial capability, this study combines the measures from Xiao and O'Neill (2016) and Taylor (2010). A Cronbach’s alpha of 0.779 (see Table V-12) confirmed the reliability of the questionnaire (Boateng et al., 2018). The validity of the measures was confirmed by the KMO and Bartlett's test, which showed that the sample size was acceptable to run the analysis with R= 0.671 (see Table V-13). Bartlett’s chi-square was highly significant (p<0.001). The results suggest that the sampling was adequate, and the questionnaire was appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006).

Both the scree test and eigenvalues (>1) showed a one-factor solution. The factor analysis with the pattern matrix showed that there was one pattern in perceived financial capability of participants (see Table V-14). The single component which explained 52.229 % of variance with five items, had loadings of 0.589 and above. This result suggests that a combination of measures from two sources of measures and those self-constructed by the author could be used to define individual perceived financial capability. This study could not compare the results between this study and Taylor's study (2010) as the author referred to (exploratory) factor analysis in their paper but did not show the details of the result.

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>N of Items</td>
</tr>
<tr>
<td>0.779</td>
<td>3</td>
</tr>
</tbody>
</table>

*Table V-12: Cronbach's Alpha of PFC variable*
### KMO and Bartlett’s Test

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin, measure of sampling adequacy</td>
<td>0.671</td>
</tr>
<tr>
<td>Bartlett's test of sphericity</td>
<td>approx. chi-square 325.883</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Table V-13: KMO and Bartlett's test on PFC variable*

#### Factor Matrix

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA. Managing money day-to-day</td>
<td>0.849</td>
</tr>
<tr>
<td>FA. Planning ahead</td>
<td>0.793</td>
</tr>
<tr>
<td>FCAP. Perceived financial capability</td>
<td>0.589</td>
</tr>
<tr>
<td>Extraction method: principal axis factoring.</td>
<td></td>
</tr>
</tbody>
</table>

*a 1 factors extracted. 12 iterations required.*

*Table V-14: Pattern matrix of PFC factor analysis*

### 5.2.4.2 Financial Behaviour

This study adopts the financial management behaviour scale from Dew and Xiao (2011, p. 58) with 12 behaviours. The authors conducted exploratory factor analysis on these variables (Dew and Xiao, 2011, p. 58). However, this study carried out the factor analysis to test its reliability for the specific investigated population.

A Cronbach’s alpha of 0.825 (see Table V-15) confirmed the reliability of the questionnaire (Boateng et al., 2018). Cronbach’s alpha results of each factor were not as strong as the overall result but moderate. Cronbach’s alpha of factor 1 was .741 or slightly improved when removed FB.COS item (.761). Whilst Cronbach’s alphas of factors 2 and 3 were lower with .666 and .713 accordingly.

The validity of the measures was confirmed by the KMO with R= 0.829 and Bartlett’s chi-square (see Table V-16), which was highly significant (p<0.001). The results
suggest that the sampling was adequate, and the questionnaire was appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006).

Both the scree test and eigenvalues (>1) showed a three-factor solution of financial behaviour. In Table V-17, the pattern matrix showed that there were three factors as found in Dew and Xiao (2011): factor one (‘savings and investment behaviours’), factor two (‘cash management’), and factor three (‘credit management’). Most of the items correlated on each factor were in line with the findings from Dew and Xiao (2011) with an exception of a single item FB.COS – ‘comparison shopped when purchasing a product or service’. This item had low loadings on all factors with the highest number less than 0.18. Due to this reason, this study removed this item from the measures when calculating the scores of financial behaviour variable to later run the regression. The removal of this item did not have any negative effect on the reliability and factorability of the questionnaire (Cronbach’s alpha of 0.83, KMO of 0.832, and Bartlett’s chi-square was highly significant (p<0.001)).

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>0.825</td>
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</tbody>
</table>

*Table V-15: Cronbach's alpha of FB variable*

<table>
<thead>
<tr>
<th>KMO and Bartlett’s Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin measure of sampling adequacy.</td>
</tr>
<tr>
<td>Bartlett's test of sphericity</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

*Table V-16: KMO and Bartlett's test on FB variable*
<table>
<thead>
<tr>
<th></th>
<th>Savings and Investment Behaviours</th>
<th>Cash Management</th>
<th>Credit Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB.COS</td>
<td>0.159</td>
<td>0.173</td>
<td>-0.029</td>
</tr>
<tr>
<td>FB.POT</td>
<td>0.313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FB.KRE</td>
<td>0.796</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FB.SBUD</td>
<td>0.625</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FB.POC</td>
<td></td>
<td>0.672</td>
<td></td>
</tr>
<tr>
<td>FB.MOC*</td>
<td></td>
<td>0.492</td>
<td></td>
</tr>
<tr>
<td>FB.MINP*</td>
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<td>0.787</td>
<td></td>
</tr>
<tr>
<td>FB.EMERS</td>
<td>0.512</td>
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<td></td>
</tr>
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<td>FB.SAVLT</td>
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<td></td>
</tr>
<tr>
<td>FB.CRET</td>
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<td></td>
</tr>
<tr>
<td>FB.INVEST</td>
<td>0.455</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extraction method: principal axis factoring.
Rotation method: oblimin with Kaiser normalization.
A rotation converged in 12 iterations.

Table V-17: Pattern matrix of FB factor analysis

### 5.2.4.3 Financial Capacity

A factor analysis was carried out to examine how the three dimensions of financial capacity represent an individual's perceived financial capacity (see 2.3.6.1.2 for the measures of financial capacity). The factor analysis assesses the correlations between complex variables to measure individual financial capacity. A Cronbach's alpha of 0.830 (see Table V-18) confirmed the reliability of the questionnaire (Boateng et al., 2018). The KMO with R= 0.786 and Bartlett's chi-square was highly significant (p<0.001), endorsing the validity of the scales (seen Table V-19). The results suggest that the sampling was adequate and the questionnaire appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006).
Both the scree test and eigenvalues (>1) showed a one-factor solution of financial capacity. The pattern matrix also exhibited one factor account for financial capacity (see Table V-20). The single component which explained 52.229 % of variance with five items had the loadings of 0.418 and above. This result suggests that a combination of measures from two sources of Porter and Garman (1993) and Atkinson et al. (2006) was appropriate to define individual financial capacity.

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's alpha</td>
</tr>
<tr>
<td>N of Items</td>
</tr>
</tbody>
</table>

Table V-18: Cronbach's alpha of FC variable

<table>
<thead>
<tr>
<th>KMO and Bartlett's test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin measure of sampling adequacy.</td>
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<tr>
<td>Bartlett's test of sphericity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Table V-19: KMO and Bartlett's test on FC variable

<table>
<thead>
<tr>
<th>Factor Matrixa</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCAPA.INC</td>
</tr>
<tr>
<td>FCAPA.6MS</td>
</tr>
<tr>
<td>FCAPA.LME.DI</td>
</tr>
<tr>
<td>FCAPA.LME.ME</td>
</tr>
<tr>
<td>FCAPA.LME.KC</td>
</tr>
</tbody>
</table>

Extraction method: principal axis factoring.

A one factor extracted. Five iterations required.

Table V-20: Pattern matrix of FC factor analysis
5.2.4.4 Financial Attitude

The measures of financial attitudes variable combined 11 items from Vlaev and Elliott (2014), and one item from FSA (2006) (see 2.3.6.4). A Cronbach’s alpha of 0.635 (see Table V-21) was acceptable to verify the reliability of the questionnaire (Boateng et al., 2018). Cronbach’s alpha of factor 1 was much higher than the overall result (0.811). Whilst factor 2 was lower but also reasonable for a reliability test (0.619).

The validity of the measures was confirmed by the KMO with $R = 0.757$, and Bartlett’s chi-square was highly significant ($p<0.001$) (see Table V-22). The results suggest that the sampling was adequate and the questionnaire appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006).

Both the scree test and eigenvalues (>1) showed a four-factor solution of financial attitudes. The factor analysis with the pattern matrix (see Table V-23) showed that there were four factors as found in Dew and Xiao (2011, p. 48): factor one ('being in control' of overall finances), factor two ('external pressures affecting borrowing'), factor three ('comfort with being in debt'), and factor four ('ability to influence situation'). The additional item FA.LFTODAY ('I tend to live for today and let tomorrow take care of itself') had a high loading on factor two ('external pressures affecting borrowing').

The addition of the item FA.LFTODAY, which was taken from Atkinson et al. (2006), did not have a negative impact on the reliability of the scales. The Cronbach’s alpha decreased to 0.588 when that item was removed from the scales. On the other hand, the single item, FA.EIND* ('I think it is easy to get into debt because banks and shops make it too easy to get credit') had low loading scores with (0.233), or without (0.211) the additional item FA.LFTODAY. This study removed the FA.EIND* item, which did not have a negative impact on the results. The factor loadings changed slightly but did not change the results as a whole. Consequently, only 11 items were included in the later calculation of the financial attitude variable in the multiple regression.
### Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's alpha</th>
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<tr>
<td>0.635</td>
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*Table V-21: Cronbach's alpha of FA variable*

### KMO and Bartlett's Test

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<th>Kaiser-Meyer-Olkin measure of sampling adequacy.</th>
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<tr>
<td>Bartlett's test of sphericity</td>
<td>approx. chi-square</td>
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<tr>
<td>df</td>
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<tr>
<td>Sig.</td>
<td>0.000</td>
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</table>

*Table V-22: KMO and Bartlett's test on FA variable*

### Pattern Matrix

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<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being in control (overall finances)</td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External pressures affecting borrowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfort with being in debt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to influence situation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA.FOT</td>
<td></td>
<td></td>
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<tr>
<td>FA.KDET</td>
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<td>FA.FCOMF</td>
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<tr>
<td>FA.SMEANS</td>
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<tr>
<td>FA.BUCOMF*</td>
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<tr>
<td>FA.COMB*</td>
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<tr>
<td>FA.DTR*</td>
<td>0.897</td>
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<tr>
<td>FA.SRNOT*</td>
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<tr>
<td>FA.CNESS</td>
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<tr>
<td>FA.EIND*</td>
<td></td>
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<td></td>
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<tr>
<td>FA.DNESS</td>
<td></td>
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<td></td>
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<tr>
<td>FA.LFTODAY</td>
<td>0.41</td>
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5.2.4.5 Subjective Financial Literacy

The single question – “how would you assess your financial knowledge and skills?” – was used to measure subjective literacy. The question was based on a ten-point scale (1=very low and 10=very high). A Cronbach’s alpha of 0.922 confirmed the reliability of the questionnaire (see Table V-24) (Boateng et al., 2018). The validity of the scales was satisfied with the KMO of R= 0.898 and Bartlett’s chi-square was highly significant (p<0.001) (see Table V-25). The results indicate that the sampling was adequate, and the questionnaire was appropriate for factor analysis (Carpenter, 2018; Kramer et al., 2006). Both the scree test and eigenvalues (>1) showed a one-factor solution for subjective financial literacy. The pattern matrix also displayed one factor account for subjective financial literacy (see Table V-26). The single component which explains 59.634 % of variance with eight items had the loadings of 0.712 and above.

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</tbody>
</table>

*Table V-24: Cronbach’s alpha of SFL variable*

<table>
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<th>KMO and Bartlett’s Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin measure of sampling adequacy</td>
</tr>
<tr>
<td>Bartlett’s test of sphericity</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

*Table V-25: KMO and Bartlett's test on SFL variable*
Finally, after having the factor analysis carried out on individual variables, this study ran the factor analysis for the variables of all 95 items. The purpose was to test whether these variables measured the same or different concepts and whether FB, FC, FA, PFC, SFL can be treated as independent variables of FWB. The factor analysis extracted 23 factors. This result suggests that these items measured part of different concepts of Perceived FWB, FB, FC, FA, PFC, SFL, FNS and FNI. Accordingly, FB, FC, FA, PFC, SFL variables are fundamentally different concepts. Therefore, these variables can be treated as independent variables of PFWB – perceived financial wellbeing and FNSI - financial needs satisfaction index.

### 5.2.4.6 Index Scores of the Key Variables

This section summarises the attributes of SFWB and how other independent variables act as determinants of FWB. The section also explains how the index scores of these variables are calculated. The results of Cronbach’s alpha confirm the reliability of the measures of all variables and their factors. The calculations are based on the results of the factor analysis of these variables. For most variables, factor analysis shows why combining all items in one index is valid. Whilst for FNS
and FNI, the factor analysis is also attempting to identify and group the different factors for theory testing of its hierarchical nature.

It is worth highlighting that there are five variables that have more than one factor within the same construct: Perceived FWB, financial needs satisfaction, financial needs importance, financial behaviour, and financial attitude. However, this study uses the index scores of these variables instead of using the scores of each factor. This is because this study primarily aims to explore relationships between these concepts as a whole and the two components of FWB, rather than relationships between individual factors of each concept. This study also examines the relationships using individual factors of two independent variables which have more than one factor, financial attitudes and financial behaviour, both to test for robustness and as understanding what the independent variables consist of and how these might link to components of FWB sheds light on the nature of the potential determinants of financial wellbeing.

The descriptions are summarised in Table V-27. These index scores are used in the regressions.

<table>
<thead>
<tr>
<th>Variable label</th>
<th>Attribute</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Financial Wellbeing (PFWB)</td>
<td>Sum of three perceived positive feelings and nine not perceived negative feelings (how do you feel about your overall financial circumstances?) 1=Not at all, 5= Very much</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Financial Capability (PFC)</td>
<td>Sum of ability to manage your finances (good at managing my money day-to-day and good at planning ahead for the future) and outcome of financial ability (living comfortably, doing alright, just about getting by, finding it quite difficult, finding it very difficult)</td>
<td></td>
</tr>
</tbody>
</table>
Subjective Financial Literacy (SFL) | Subjective financial literacy. How would you assess your financial knowledge and skills? 1=very low, 10=very high
---|---
Financial Behaviour (FB) | The sum of nine desirable financial behaviours and two reversed-undesirable financial behaviours 1=Never, 5=Always
---|---
Financial Capacity (FC) | Sum of personal income + income adequacy + net worth + length of time can meet financial commitments without borrowing
---|---
Financial Attitudes (FA) | Sum of 11 financial attitudes 1=Disagree strongly, 7=Agree strongly
---|---
Financial Capability Index (FCI) | Sum of Z scores of subjective financial literacy, desirable financial behaviour, financial capacity, financial attitudes and perceived financial capability

Removed one item FB.COS from the original scales
Removed one item FA.EIND from the original scales

Table V-27: Attributes of Two Components of FWB, independent variables and its index score

### 5.2.5 Descriptive Analysis of All Key Variables

This section presents the descriptive analysis of seven variables (see the

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>PFWB</th>
<th>FNSI</th>
<th>PFC</th>
<th>SFL</th>
<th>FB</th>
<th>FC</th>
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</thead>
<tbody>
<tr>
<td>PFWB</td>
<td>344</td>
<td>56</td>
<td>1</td>
<td>57</td>
<td>37.43</td>
<td>13.44</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FNSI</td>
<td>284</td>
<td>411</td>
<td>9</td>
<td>420</td>
<td>171.5</td>
<td>73.54</td>
<td>.379**</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PFC</td>
<td>356</td>
<td>16</td>
<td>3</td>
<td>19</td>
<td>11.4</td>
<td>3.94</td>
<td>.467**</td>
<td>.276**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFL</td>
<td>356</td>
<td>75</td>
<td>5</td>
<td>80</td>
<td>32.19</td>
<td>16.88</td>
<td>.299**</td>
<td>.339**</td>
<td>.524**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

221
Table V-28 below). All variables were significantly and positively correlated with p<0.001. This multicollinearity presents the primary difficulty of working out which variables are actually responsible for driving FWB and which are merely related. Hence, it is important to use multiple regression or other methods that can help to define FWB determinants.

The statistics in

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>PFWB</th>
<th>FNSI</th>
<th>PFC</th>
<th>SFL</th>
<th>FB</th>
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<tbody>
<tr>
<td>PFWB</td>
<td>344</td>
<td>56</td>
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<td>FNSI</td>
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<td>PFC</td>
<td>356</td>
<td>16</td>
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<td>19</td>
<td>11.4</td>
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<td>.467**</td>
<td>.276**</td>
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<tr>
<td>SFL</td>
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<td>75</td>
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<td>.339**</td>
<td>.524**</td>
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<td>.350**</td>
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<td>.474**</td>
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<td>.497**</td>
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<tr>
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<td>71</td>
<td>46.35</td>
<td>9.8</td>
<td>.457**</td>
<td>.237**</td>
<td>.587**</td>
<td>.477**</td>
<td>.502**</td>
<td>.485**</td>
</tr>
</tbody>
</table>

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

Table V-28 suggest the scores of FWB and other variables were not high among participants when they started taking part in the MMM course. The mean score of Perceived FWB was the highest with 37.43 out of 57 (65.67%) which was followed closely by FA with a mean score of 46.35 out of 71 (65.28%). By contrast, the mean score of FNSI was the lowest with 171.50 out of 420 (40%), followed by SFL with 32.19 out of 80 (40.23%). The mean scores of PFC, FB, and FC were in the middle...
of the range. Even though the mean score of Perceived FWB was the highest among all the variables, it was only a scale of 65.67% out of 100%.

The standard deviation (SD) results suggest that the financial needs satisfaction index (FNSI) is highly volatile compared to the other six variables. The FNSI scores fluctuated ranging from the lowest point of 9 to the highest point of 420. The ranges within other variables are also relatively high. The results reflect the issue of missing data when some participants did not complete all the questions which affected the scores of FNSI and other variables. In general, the SD data of the key variables are relatively high. Perceived financial capability and financial capacity have lowest SD values. It means the data of these two variables are relatively more consistent. Whilst the data of subjective financial literacy, Perceived FWB, financial behaviour, financial attitudes have more variable and less consistent. This study aims to explain this variation in the outcome variables (dependent variables): Perceived FWB and financial needs satisfaction.
<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
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<th>FNSI</th>
<th>PFC</th>
<th>SFL</th>
<th>FB</th>
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<td>73.54</td>
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<td>0.379**</td>
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</tbody>
</table>

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

Table V-28: Correlations between key variables
Following the review of the methods of multiple regression in section 4.5.3, stepwise multiple regression was selected to run the analysis. To test the hypotheses, stepwise regression was used to identify which variables are the best to add into the equation to define individual Perceived FWB.

### 5.2.6 Multicollinearity Check

Multicollinearity can produce large errors in the coefficients, as the coefficients may be insignificant and have erroneous signs (Jensen, 2003). Multicollinearity occurs where two or more predictor variables in a multiple regression model are highly correlated (Um et al., 2011). A multicollinearity problem arises when a tolerance of less than 0.20–0.10 or the Variance Inflation Factor (VIF) of a variable exceeds ten (Sidhu, 2016; Um et al., 2011; Lin, 2008; Gujarati, 2003) or $R^2$ exceeds 0.90 (Sidhu, 2016; Gujarati, 2003).

This study carried out collinearity statistics to check the multicollinearity of all six independent variables of FWB. Multicollinearity was not a serious problem for any of the regression models in this study, as the coefficients of independent variables were less than 0.90 and the VIF less than 10 (see Table V-29). There was no high correlation among the independent variables. Therefore, multicollinearity is unlikely to threaten the reliability of the findings.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA</td>
<td>0.497</td>
<td>2.013</td>
</tr>
<tr>
<td>FB</td>
<td>0.506</td>
<td>1.975</td>
</tr>
<tr>
<td>SFL</td>
<td>0.579</td>
<td>1.728</td>
</tr>
<tr>
<td>PFC</td>
<td>0.462</td>
<td>2.162</td>
</tr>
<tr>
<td>FC</td>
<td>0.555</td>
<td>1.801</td>
</tr>
</tbody>
</table>

*a Dependent variable: PF WB* 

*Table V-29: Collinearity statistics*
5.2.7 Measurements Validation

This study carried out some tests to validate the measurements. The results of reliability and validity tests are summarised in Table V-30 and Table V-31. Firstly, to test the potential issue of common method variance (CMV), Harman’s single factor test was carried out. The result showed that a single factor accounts for 21.71% of the variance between the variables, which lies below the 50% threshold for CMV concerns. This result provides some evidence that CMV is a potential but not a major issue in this study (Cui et al., 2021).

Secondly, Cronbach’s Alpha and composite reliability (CR) are used as the parameter for the reliability test (Cui et al., 2021). In previous sections, Chronbach’s alpha of all variables were found adequate in factor analysis (see Table V-5, Table V-8, Table V-3, Table V-12, Table V-15, Table V-18, Table V-21, Table V-24). Construct reliability (CR) is computed from the squared sum of factor loadings ($L_i$) for each construct and the sum of the error variance terms for a construct ($e_i$) (Hair et al., 2018, p.619):

$$
CR = \frac{\left(\sum_{i=1}^{n} L_i\right)^2}{\left(\sum_{i=1}^{n} L_i\right)^2 + \left(\sum_{i=1}^{n} e_i\right)^2}
$$

The rule of thumb for good reliability is .7 or higher (Hair et al., 2018). Reliability between .6 and .7 may be acceptable if other indicators of a model’s construct validity are good (Hair et al., 2018). High construct reliability reflects the internal consistency of the measures. In this study, CR of all variables are presented in Table V-30. The results confirmed the construct reliability of measurement items in this study. Most constructs had CR higher than the recommended cut-off value of 0.60 (Cui et al., 2021; Bagozzi and Yi, 1988; Fornell and Larcker, 1981) except “ability to influence situation” factor within the financial attitude construct (CR=0.44).
Lastly, average variance extracted (AVE), convergent validity and discriminant validity are examined for validity test (Cui et. al., 2021; Hair et. al., 2018; Fornell and Larcker, 1981). The average variance extracted (AVE) is calculated as the mean variance extracted for the items loading on a construct and is a summary indicator of convergence (Hair et. al., 2018, p.619). This value can be calculated using standardized loadings (Hair et. al., 2018, p.619):

$$\text{AVE} = \frac{\sum_{i=1}^{n} L_i^2}{n}$$

The Li represents the standardized factor loading, and i is the number of items. For n items, AVE is computed as the sum of all squared standardized factor loadings (squared multiple correlations) divided by the number of items (Hair et. al., 2018, p.619). An AVE of .5 or higher is a good rule of thumb suggesting adequate convergence. By contrast, an AVE of less than .5 shows that more error remains in the items on average than variance explained by the latent (Hair et. al., 2018). The results of AVE calculations are present in Table V-30. There were 13 out of 21 constructs had AVE of less than .5. However, Fornell and Larcker (1981) pointed that if AVE is less than 0.5, but CR is higher than 0.6, the convergent validity of the construct is still acceptable. Following this criteria, 11 constructs had AVE less than 0.5 and CR is higher than 0.6. Whilst 2 out of 13 items did not meet both the AVE and CR benchmarks including “comfort with being in debt” and “ability to influence situation”. The results indicated that most of constructs in this study showed evidence of convergent validity (Cui et. al., 2021; Hair et. al., 2018; Fornell and Larcker, 1981). Whilst two factors within the financial attitude construct showed weaker evidence. The results were unexpected as this study used the measurements of the financial attitude construct from Vlaev and Elliott’s study (2014). It is impossible to cross-check the results as Vlaev and Elliott (2014) did not carry out the validity tests using AVE and CR indicators. Future research should consider alternative measurements of financial attitude that satisfied convergent validity tests.
<table>
<thead>
<tr>
<th></th>
<th>Items</th>
<th>AVE</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceive Financial Wellbeing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Positive Feelings</td>
<td>3</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>Negative Feelings</td>
<td>9</td>
<td>0.61</td>
</tr>
<tr>
<td>2</td>
<td>Financial Needs Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finance For Security</td>
<td>6</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>Finance For Self-Actualisation</td>
<td>6</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Finance For Enjoyment</td>
<td>4</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>Finance For Existence</td>
<td>5</td>
<td>0.50</td>
</tr>
<tr>
<td>3</td>
<td>Financial Needs Importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finance For Existence and Security</td>
<td>7</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>Finance For Enjoyment</td>
<td>5</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Finance For Self-Esteem</td>
<td>2</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>Finance For Education And Health Care</td>
<td>4</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Finance For Social-Esteem</td>
<td>3</td>
<td>0.35</td>
</tr>
<tr>
<td>4</td>
<td>Financial Behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Savings and Investment Behaviours</td>
<td>5</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>Cash Management</td>
<td>4</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Credit Management</td>
<td>3</td>
<td>0.26</td>
</tr>
<tr>
<td>5</td>
<td>Financial Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Being In Control Overall Finances</td>
<td>4</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>External Pressures Affecting Borrowing</td>
<td>4</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Comfort With Being In Debt</td>
<td>2</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>Ability To Influence Situation</td>
<td>1</td>
<td>0.44</td>
</tr>
<tr>
<td>6</td>
<td>Financial Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>0.52</td>
</tr>
<tr>
<td>7</td>
<td>Perceived Financial Capability</td>
<td>3</td>
<td>0.57</td>
</tr>
<tr>
<td>8</td>
<td>Subjective Financial Literacy</td>
<td>8</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Table V-30: Results of validity and reliability tests

To test discriminant validity, this study used Fronell-Larcker criterion to examine the correlation between each pair of constructs. Discriminant validity is met if the correlation was lower than the square root of the AVE for each associated construct (Cui et. al., 2021; Fornell and Larcker, 1981). The results are presented in Table V-31. Most of the correlations between each pair of constructs was lower than the square root of the AVE with some exceptions. Examples for the exceptions are the correlations between the “finance for security” factor and “finance for self-actualisation”, “finance for enjoyment” and “finance for existence” factors were lower than the square root of its AVE (0.560). Similarly, the correlations between “finance
for self-actualisation” factor and “finance for enjoyment” and “finance for existence” were also lower than the square root of its AVE (0.579). The results indicated that “finance for security” and “finance for self-actualisation” latent constructs explained less of the variance in its item measures that they shared with other constructs (Hair et. al., 2018). The results reflected the fact that the categories of financial needs satisfaction were not totally distinctive. People do not always satisfy their financial needs in a well-defined order. Hence, labelling the latent constructs for a mixed of items from different categories can be a challenge.

Some other constructs also did not meet Fronell-Larcker criterion such as “cash management” in relation to “being in control overall finances”; “credit management” in relation to “financial capacity” and “perceived financial capability”; and “being in control overall finances” and “perceived financial capability”. The issue is an example of potential endogeneity bias in this study. However, this issue is expected in behavioural research where the constructs are highly correlated. For instance, both “being in control overall finances” and “perceived financial capability” are outcomes of financial behaviours, financial capacity so it is understandable that these two constructs have shared variance.
**Table V-31: Discriminant validity test uses Fronell-Larcker criterion**

**Note**

<table>
<thead>
<tr>
<th>PF</th>
<th>NF</th>
<th>FFS</th>
<th>FFS-A</th>
<th>FFE</th>
<th>FFE</th>
<th>FFES</th>
<th>FFE</th>
<th>FFE</th>
<th>FFES</th>
<th>FFE</th>
<th>FFE</th>
<th>FFE</th>
<th>FFE</th>
<th>FFE</th>
<th>FFE</th>
<th>SIB</th>
<th>CM</th>
<th>CRM</th>
<th>BICOF</th>
<th>EPAB</th>
<th>CBID</th>
<th>ATIS</th>
<th>FCA</th>
<th>PFC</th>
<th>SFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Feelings</td>
<td>Negative Feelings</td>
<td>Finance For Security</td>
<td>Finance For Self-Actualisation</td>
<td>Finance For Enjoyment</td>
<td>Finance For Existence</td>
<td>Finance For Existence And Security</td>
<td>Finance For Education And Health Care</td>
<td>Finance For Self-Esteem</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td>FFEHC</td>
<td>FFSE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PF</strong></td>
<td>0.754</td>
<td><strong>NF</strong></td>
<td>0.560</td>
<td><strong>FFS</strong></td>
<td>0.579</td>
<td><strong>FFS-A</strong></td>
<td>0.722</td>
<td><strong>FFE</strong></td>
<td>0.709</td>
<td><strong>FFES</strong></td>
<td>0.539</td>
<td><strong>FFE</strong></td>
<td>0.637</td>
<td><strong>FFE</strong></td>
<td>0.588</td>
<td><strong>SIB</strong></td>
<td>0.566</td>
<td><strong>CM</strong></td>
<td>0.474</td>
<td><strong>CRM</strong></td>
<td>0.512</td>
<td><strong>BICOF</strong></td>
<td>0.695</td>
<td><strong>EPAB</strong></td>
<td>0.592</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive Feelings</th>
<th>Negative Feelings</th>
<th>Finance For Security</th>
<th>Finance For Self-Actualisation</th>
<th>Finance For Enjoyment</th>
<th>Finance For Existence</th>
<th>Finance For Existence And Security</th>
<th>Finance For Education And Health Care</th>
<th>Finance For Self-Esteem</th>
<th><strong>SIB</strong></th>
<th><strong>CM</strong></th>
<th><strong>CRM</strong></th>
<th><strong>BICOF</strong></th>
<th><strong>EPAB</strong></th>
<th><strong>CBID</strong></th>
<th><strong>ATIS</strong></th>
<th><strong>FCA</strong></th>
<th><strong>PFC</strong></th>
<th><strong>SFL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings And Investment Behaviours</td>
<td>Cash Management</td>
<td>Credit Management</td>
<td>Being In Control Of Overall Finances</td>
<td>External Pressures Affecting Borrowing</td>
<td>Comfort With Being In Debt</td>
<td>Ability To Influence Situation</td>
<td>Financial Capacity</td>
<td>Perceived Financial Capability</td>
<td>Subjective Financial Literacy</td>
<td><strong>PF</strong></td>
<td><strong>NF</strong></td>
<td><strong>FFS</strong></td>
<td><strong>FFS-A</strong></td>
<td><strong>FFE</strong></td>
<td><strong>FFES</strong></td>
<td><strong>FFE</strong></td>
<td><strong>FFE</strong></td>
<td><strong>FFE</strong></td>
</tr>
</tbody>
</table>

- **PF**: Positive Feelings
- **NF**: Negative Feelings
- **FFS**: Finance For Security
- **FFS-A**: Finance For Self-Actualisation
- **FFE**: Finance For Enjoyment
- **FFES**: Finance For Existence
- **FEEHC**: Finance For Education And Health Care
- **FFSE**: Finance For Self-Esteem
- **SIB**: Subjective Information Bias
- **CM**: Cash Management
- **CRM**: Credit Management
- **BICOF**: Being In Control Of Overall Finances
- **EPAB**: External Pressures Affecting Borrowing
- **CBID**: Comfort With Being In Debt
- **ATIS**: Ability To Influence Situation
- **FCA**: Financial Capacity
- **PFC**: Perceived Financial Capability
- **SFL**: Subjective Financial Literacy
5.3 Examining the Determinants of Financial Wellbeing

This section tests the hypotheses one to ten to provide the answers for the research questions: what are the determinants of FWB? How important are each of these determinants? These hypotheses suggest that perceived financial capability, financial capacity, financial behaviour, financial attitude, and subjective financial literacy, are all determinants of Perceived FWB and financial needs satisfaction, with financial behaviour being the most important.

Stepwise multiple regression is used to identify the determinants of FWB and the importance of each determinant. Additional analyses are carried out on two variables, financial attitudes and financial behaviours, which had more than one factor (see Table V-17 and Table V-23). The aim is to identify which factors within these two variables play the more important roles in determining the two aspects of FWB, Perceived FWB, and financial needs satisfaction, and to ensure results are robust to evaluate how these variables are specified.

5.3.1 Testing Hypotheses 1-5: Significant Determinants of Perceived Financial Wellbeing

This section presents the result of testing hypotheses one to five which propose that perceived financial capability, financial capacity, financial behaviour, financial attitudes, and subjective financial literacy are significant determinants of Perceived FWB. Stepwise multiple regression was carried out to test the hypothesis with Perceived FWB being the dependent variable.

After three steps, the stepwise process produced one model (seen Table V-32). The model has a $R^2$ value of 0.316 which meant the three variables of FC, FA, and PFC explained 31.6% of the Perceived FWB variable. The order of importance of variables accounts for Perceived FWB is FC - financial capacity, FA - financial attitudes and PFC - perceived financial capability. This order is based on the magnitude of the ‘beta coefficients’ in Table V-33 which roughly reflects the relative importance of the variables (Fritz and Berger, 2015). Accordingly, financial capacity (FC) was the most important variable in all three models, followed by
financial attitudes (FA), whilst perceived financial capability was the least important variable. Based on the coefficients in Table V-33, the equation of model three is as follows:

\[ Y = 6.266 + 0.71 \times FC + 0.286 \times FA + 0.698 \times PFC \]

By contrast, two variables, financial behaviour and subjective financial literacy, were removed from all four models. This result indicates that these two variables did not add enough unique information to justify their inclusion in the model. It means that the result of stepwise multiple regression did not support hypothesis four and five. Only three out of five hypothesised variables were significant determinants of Perceived FWB.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Squar e</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.474a</td>
<td>0.225</td>
<td>0.222</td>
<td>11.85918</td>
<td>R Square Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>df1</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>df2</td>
</tr>
<tr>
<td>2</td>
<td>.540b</td>
<td>0.292</td>
<td>0.287</td>
<td>11.35146</td>
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</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>29.809</td>
</tr>
<tr>
<td>3</td>
<td>.562c</td>
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<td>0.309</td>
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<td>0.024</td>
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<td></td>
<td></td>
<td></td>
<td>1.313</td>
</tr>
</tbody>
</table>

Table V-32: Model summary of stepwise multiple regression for dependent variable PFWB

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>19.55</td>
<td>1.988</td>
<td>9.834</td>
</tr>
<tr>
<td></td>
<td>FC</td>
<td>1.274</td>
<td>0.133</td>
<td>0.474</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>6.133</td>
<td>3.108</td>
<td>1.973</td>
</tr>
</tbody>
</table>
**5.3.2 Testing Hypotheses 6-10: Significant Determinants of Financial Needs Satisfaction**

This section presents the results of testing hypotheses six to ten which suggest that perceived financial capability, financial capacity, financial behaviour, financial attitudes, and subjective financial literacy are significant determinants of financial needs satisfaction. This group of hypotheses was propositioned with two models: model one includes financial capacity, whilst model two excludes it. Although Harman’s single factor test provides some evidence that CMV is not a major problem in the current study, the second model was added for robust testing. This approach addresses the possibility of common method variance (CMV) in the design of the measures of financial capacity and financial needs satisfaction. This is because financial capacity may overlap with financial needs satisfaction as both have components that relate to having finance to satisfy needs. As such, it might bias the coefficients of other explanatory variables in the regression. The second model examines how other variables relate to financial needs satisfaction with the potentially biasing effect of financial capacity removed.

### 5.3.2.1 Model One: with Financial Capacity in the Equation

Following similar steps to the previous section, stepwise multiple regression has been used with financial needs satisfaction (FNSI) as the dependent variable, and financial capacity (FC), financial behaviour (FB), financial attitudes (FA), perceived financial capability (PFC), and subjective financial literacy (SFL) as potential explanatory variables, to test hypotheses six to ten. The results are shown in Table V-33:

<table>
<thead>
<tr>
<th></th>
<th>FC</th>
<th>FA</th>
<th>PFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
<td>0.888</td>
<td>0.407</td>
<td>0.698</td>
</tr>
<tr>
<td></td>
<td>0.146</td>
<td>0.074</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>0.33</td>
<td>0.297</td>
<td>0.205</td>
</tr>
<tr>
<td></td>
<td>6.077</td>
<td>5.46</td>
<td>3.325</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table V-33: Coefficients in stepwise multiple regression for dependent variable PFWB

**Dependent variable:** PFWB
V-34 and Table V-35. Only two variables, FC and SFL, were found to offer enough unique information to justify being included in the final model, and together explain 22.77% of the variation in financial needs satisfaction. The equation of model two is as follows:

$$Y = 69.06 + 5.39*FC + 0.83*SFL$$

By contrast, three variables – financial behaviour, attitudes, and perceived financial capability – were rejected by the stepwise process. This result indicates that these three variables did not add unique information to justify inclusion.

<table>
<thead>
<tr>
<th>Model Summarya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

a Predictors: (constant), FC  
b Predictors: (constant), FC, SFL  
c Dependent variable: FNSI

Table V-34: Model summary of stepwise multiple regression for dependent variable FNSI

<table>
<thead>
<tr>
<th>Coefficientsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>FC</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>FC</td>
</tr>
<tr>
<td>SFL</td>
</tr>
</tbody>
</table>

a Dependent variable: FNSI

Table V-35: Coefficients in stepwise multiple regression for dependent variable FNSI
5.3.2.2 Model Two: Without Financial Capacity in the Equation

As discussed above, for robust testing the possibility of CMV, model two removes the potentially biasing effect of financial capacity to analyse how other variables might be interacting with financial needs satisfaction. Following identical steps, a stepwise multiple regression with financial needs satisfaction index (FNSI) as the dependent variable, and financial behaviour (FB), financial attitudes (FA), perceived financial capability (PFC), and subjective financial literacy (SFL) as potential explanatory variables, yields the following model:

\[ Y = 95.342 + 1.614 \times FB + 0.905 \times SFL \]

The results are shown in Table V-36 and Table V-37. Two variables, FB and SFL, explain 15.2% of the variation in financial needs satisfaction. Financial attitudes and perceived financial capability were rejected by the stepwise process as they did not add enough unique information to justify their inclusion in the model.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R Square Change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F Change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>df 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>df2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sig. F Change</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.350a</td>
<td>0.123</td>
<td>0.119</td>
<td>69.01534</td>
<td>0.123</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.390b</td>
<td>0.152</td>
<td>0.146</td>
<td>67.97026</td>
<td>0.029</td>
<td></td>
</tr>
</tbody>
</table>

Table V-36: Model summary of stepwise multiple regression for dependent variable FNSI

\[ a \ Predictors: \ (constant), FB \\
\[ b \ Predictors: \ (constant), FB, SFL \\
\[ c \ Dependent variable: FNSI \]
### Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(constant)</td>
<td>100.798</td>
<td>12.03</td>
<td>8.379</td>
</tr>
<tr>
<td></td>
<td>FB</td>
<td>2.426</td>
<td>0.388</td>
<td>0.35</td>
</tr>
<tr>
<td>2</td>
<td>(constant)</td>
<td>95.342</td>
<td>11.977</td>
<td>7.96</td>
</tr>
<tr>
<td></td>
<td>FB</td>
<td>1.614</td>
<td>0.463</td>
<td>0.233</td>
</tr>
<tr>
<td></td>
<td>SFL</td>
<td>0.905</td>
<td>0.291</td>
<td>0.208</td>
</tr>
</tbody>
</table>

*a Dependent variable: FNSI*

Table V-37: Coefficients in stepwise multiple regression for dependent variable FNSI

### 5.3.3 Factors of Financial Attitudes and Financial Behaviours that Correlate with Financial Wellbeing

#### 5.3.3.1 Factors of Financial Attitudes that Correlate with Perceived Financial Wellbeing

This section presents the findings on the relationship between FWB and the factors of financial attitudes, which replicates Vlaev and Elliott's study (2014). In Vlaev and Elliott's study (2014) on FWB components in relation to financial attitudes, they found that ‘being in control’ and the single item ‘I adjust the amount of money I spend on non-essentials when my life changes’ is associated positively and negatively with financial satisfaction respectively. This study used multiple regression analysis on the three factors, and one item was extracted from the factor analysis (see section 5.2.4.4) in relation to Perceived FWB. The result suggested that only one factor, ‘being in control’, was positively associated with Perceived FWB (seen in Table V-38). The result in this study is in line with Vlaev and Elliott's study (2014).

On the other hand, a similar test was run on financial needs satisfaction. However, none of the factors of the financial attitudes had a significant association with financial needs satisfaction. This result is in line with the results when testing hypothesis 7 on both model one and two which found that financial attitudes do not contribute significantly to financial needs satisfaction.
### Table V-38: Coefficients in standard multiple regression for dependent variable PFWB

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(constant)</td>
<td>8.943</td>
<td>33.131</td>
<td>0.27</td>
<td>0.791</td>
</tr>
<tr>
<td>Being in control</td>
<td>1.978</td>
<td>0.74</td>
<td>0.708</td>
<td>2.673</td>
</tr>
<tr>
<td>External pressures affecting borrowing</td>
<td>-0.444</td>
<td>1.202</td>
<td>-0.089</td>
<td>-0.369</td>
</tr>
<tr>
<td>Comfort with being in debt</td>
<td>0.479</td>
<td>1.89</td>
<td>0.057</td>
<td>0.254</td>
</tr>
<tr>
<td>1</td>
<td>I adjust the amount of money I spend on non-essentials when my life changes</td>
<td>0.702</td>
<td>3.793</td>
<td>0.048</td>
</tr>
</tbody>
</table>

*a Dependent variable: PFWB*

#### 5.3.3.2 Factors of Financial Behaviours that Correlate with Financial Needs Satisfaction

This study replicated the standard multiple regression between the factors of financial behaviours and Perceived FWB as carried out with financial attitudes in the previous section. The analysis indicates that only factor one, ‘savings and investment behaviours’ is associated significantly and positively with financial needs satisfaction with p<0.05 (see Table V-39). This finding supports the result of testing hypothesis 9, model two, which showed that financial behaviours became a significant determinant of financial needs satisfaction in the absence of other variables, such as financial capacity. It is worth noting that whilst ‘savings and investment behaviours’ appears to be the most important behaviour; it does not show as having a significant effect on financial needs satisfaction when other variables are included in a stepwise process.
### Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>122.709</td>
<td>23.56</td>
<td>5.208</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 1 - Savings and investment behaviours</td>
<td>3.86</td>
<td>1.27</td>
<td>0.289</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 2 - Cash management</td>
<td>-1.564</td>
<td>2.396</td>
<td>-0.059</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 3 - Credit management</td>
<td>2.11</td>
<td>1.753</td>
<td>0.108</td>
</tr>
</tbody>
</table>

*Dependent variable: FNSI

Table V-39: Coefficients in standard multiple regression for dependent variable FNSI

On the other hand, the same test was repeated on Perceived FWB. The result in Table V-40 reveals that two factors, ‘savings and investment behaviours’ and ‘credit management’ are significantly associated with Perceived FWB. It means that two factors of financial behaviours have a significant effect on Perceived FWB in the absence of other variables, such as financial capacity. In addition, ‘savings and investment behaviours’ is the only factor that is significantly associated with both financial needs satisfaction and Perceived FWB.

### Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>14.536</td>
<td>3.542</td>
<td>4.103</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 1 - Savings and investment behaviours</td>
<td>0.613</td>
<td>0.196</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 2 - Cash management</td>
<td>0.399</td>
<td>0.34</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td>FB.Factor 3 - Credit management</td>
<td>1.026</td>
<td>0.28</td>
<td>0.272</td>
</tr>
</tbody>
</table>

*Dependent variable: PFWB

238
Table V-40: Coefficients in standard multiple regression for dependent variable SFWB

In conclusion, the results from the standard multiple regressions show that one factor, ‘being in control’, of financial attitudes is positively associated with Perceived FWB. This result endorses a similar finding in Vlaev and Elliott's study (2014). By contrast, none of the financial attitudes had a significant association with financial needs satisfaction. This result supports the result of testing hypothesis 7 which implies that financial attitudes are not a significant determinant of financial needs satisfaction.

Similarly, only one out of three factors of financial behaviours, ‘savings and investment behaviours’ were significantly associated with financial needs satisfaction. Whilst two factors, ‘savings and investment behaviours’ and ‘credit management’ were significantly associated with Perceived FWB. These results occurred in the absence of other variables such as financial capacity. Hence, this result does not conflict with the result of testing hypotheses four and nine, which found that financial behaviours were not a significant determinant of Perceived FWB in the presence of other variables such as financial capacity.

5.3.3.3 The Correlations between Factors of Financial Behaviours and Financial Needs Satisfaction

This study examines the correlations between different factors of financial behaviours and financial needs satisfaction. This may explain why people behave in certain ways with their money. It also helps to understand whether any links exist between different categories of financial behaviours and financial needs satisfaction. The result indicated that all three factors of financial behaviours correlated with four factors of financial needs satisfaction as seen in Table V-41.
### Correlations

<table>
<thead>
<tr>
<th>Factor</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB.Factor 1 - Savings and investment behaviours</td>
<td>.411**</td>
<td>0.000</td>
<td>202</td>
</tr>
<tr>
<td>FB.Factor 2 - Cash management</td>
<td>.136*</td>
<td>0.041</td>
<td>225</td>
</tr>
<tr>
<td>FB.Factor 3 - Credit management</td>
<td>.287**</td>
<td>0.000</td>
<td>174</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

**Table V-41: The correlations between factors of financial behaviour and financial needs satisfaction**

### 5.4 Theoretical Model Testing

To test the robustness of the results from the stepwise regressions and to provide evidence to support the theoretical framework of FWB as described in Figure III-1, this study carried out structural equation modelling (SEM). After testing ten hypotheses, two different sets of independent variables were correlated positively with Perceived FWB and financial needs satisfaction. This research used AMOS 26 software to test six models that reflected and adjusted the results from testing hypotheses 1-10. To examine the determinants of Perceived FWB and financial needs satisfaction, six models are estimated in Figure V-1 and their fit indices are summarised in Table V-42. A description of these models is below:

Model 1 included all ten hypotheses where all five variables are hypothesised as a significant determinant of Perceived FWB and financial needs satisfaction. The results from their fit indices (see Table V-42) showed that this model fits the data poorly with RMSEA > 0.05.
Model 2 displayed the indirect relationship between financial behaviour and financial needs satisfaction through financial capacity as found in the result of testing hypotheses 6-10 (see Section 5.3.2.2). This model fits the data poorly with RMSEA > 0.05.

Model 3 is an adjusted model from model 2. The improvement of this model was guided by the modification indices from model 2. In this model, financial behaviour together with other variables have an indirect relationship with financial needs satisfaction through financial capacity. This model fits the data with RMSEA < 0.05.

Model 4 is capturing the hypotheses 6-10 model two (see Section 5.3.2.2) where financial capacity was excluded from the equation. This model fits the data poorly with RMSEA > 0.05. This result suggests that financial capacity is fundamental determinant of FWB.

Model 5 also reviews the hypotheses 6-10 model two (see Section 5.3.2.2) where financial behaviour was excluded from the equation. The model fits the data with RMSEA < 0.05.

Model 6 is an adjustment from model 1 based on its modification indices. The model fits the data with RMSEA < 0.05. This model is presented at the end of this list because it is different from the above models. The model shows financial behaviour together with financial capacity was one of the determinants of both Perceived FWB and financial needs satisfaction. This model coincidentally reflected the results should standard multiple regression had been selected on the equations when testing ten hypotheses instead of stepwise regression.
Table V-42: Fit indices of six models

<table>
<thead>
<tr>
<th>Fit indices</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square (value)</td>
<td>3.306</td>
<td>77.366</td>
<td>10.24</td>
<td>41.862</td>
<td>4.051</td>
<td>5.261</td>
</tr>
<tr>
<td>Chi-square (probability)</td>
<td>0.069</td>
<td>0.000</td>
<td>0.115</td>
<td>0.000</td>
<td>0.399</td>
<td>0.262</td>
</tr>
<tr>
<td>Freedom degree</td>
<td>1</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>GFI</td>
<td>0.998</td>
<td>0.950</td>
<td>0.993</td>
<td>0.969</td>
<td>0.997</td>
<td>0.996</td>
</tr>
<tr>
<td>CFI</td>
<td>0.998</td>
<td>0.938</td>
<td>0.996</td>
<td>0.955</td>
<td>1</td>
<td>0.999</td>
</tr>
<tr>
<td>NFI</td>
<td>0.997</td>
<td>0.932</td>
<td>0.991</td>
<td>0.95</td>
<td>0.995</td>
<td>0.995</td>
</tr>
<tr>
<td>TLI</td>
<td>0.956</td>
<td>0.856</td>
<td>0.987</td>
<td>0.866</td>
<td>1</td>
<td>0.994</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.076</td>
<td>0.138</td>
<td>0.042</td>
<td>0.136</td>
<td>0.006</td>
<td>0.028</td>
</tr>
<tr>
<td>AIC</td>
<td>57.306</td>
<td>115.366</td>
<td>54.24</td>
<td>73.862</td>
<td>38.051</td>
<td>53.261</td>
</tr>
<tr>
<td>BIC</td>
<td>164.94</td>
<td>191.109</td>
<td>141.942</td>
<td>137.645</td>
<td>105.82</td>
<td>148.936</td>
</tr>
<tr>
<td>ECVI</td>
<td>0.144</td>
<td>0.291</td>
<td>0.137</td>
<td>0.186</td>
<td>0.096</td>
<td>0.134</td>
</tr>
</tbody>
</table>
5.5 Conclusions

In this chapter, the quantitative data has been analysed to provide the answers to the research questions and ten hypotheses. In order to assure the validity and robustness of the results, some key quantitative analyses were carried out, such as a normality test, factor analysis, multicollinearity check, measurements validation, multiple regression and structural equation modelling. Using stepwise process, multiple linear regressions, and structural equation modelling, the results of testing ten hypotheses shed light on the determinants of FWB and the nature of financial needs satisfaction. The following chapter explores and interprets the key findings from these results.
VI. FINDINGS CHAPTER

6.1 Introduction

This chapter combines the quantitative and qualitative findings of this study. Following the QUAN→qual design, the presentation of qualitative findings are used mainly to support the findings from the quantitative data (Lopez-Fernandez and Molina-Azorin, 2011). This study carried out follow-up interviews that explored how financial capacity, attitudes, perceived financial capability, behaviour, and subjective financial literacy could have an impact on an individual’s FWB. Due to the small sample size (N=6), the findings from the interviews can only be used to support the findings in the quantitative data to answer the research questions. These findings do, however, offer some insights that might be useful to explore in future research.

The first section of this chapter focuses on the determinants of perceived financial wellbeing and financial needs satisfaction. The second part emphasizes the nature of how people satisfy their financial needs. The findings from quantitative and qualitative findings have further strengthened the conclusion that financial capacity appears to be the most significant determinant of FWB. Other factors have much smaller and less robust direct correlations with FWB, such as financial attitudes, perceived financial capability, subjective financial literacy, and financial behaviour. This finding does not support the literature that endorses financial behaviour as the key determinant of FWB. Both the quantitative and qualitative findings consistently endorse the existence of different categories of financial needs satisfaction, which is consistent with the theory of a hierarchy of financial needs, although the results suggest a slightly different form than the proposed framework.

6.2 The Determinants of Financial Wellbeing

When attempting to discover which variable is the strongest influential factor or the most significant predictor, the standardized regression coefficients (b) are used (Cui et al., 2021). The higher the coefficient, the stronger the variable correlates to the dependent variable (Vlaev and Elliott, 2014). Following this approach, this study
uses the standardized regression coefficients from the regressions and structural equation models to suggest the most or least significant determinant of FWB.

This study highlights the key determinants of two components of FWB: Perceived FWB and financial needs satisfaction. The data analysis suggests financial capacity is the key determinant of both Perceived FWB and financial needs satisfaction and that having more money or resources is what matters most for our FWB. The strength of this relationship runs somewhat counter to previous literature on wealth and happiness. For example, according to Easterlin’s paradox (1974), cited in Aronczyk (2013, p. 248), “despite the correlation at a given point in time between happiness and income, there exists no correlation over time between national economic growth and its citizens’ wellbeing”. By contrast, financial attitudes, perceived financial capability have smaller and less robust direct effects on FWB. Financial attitudes and perceived financial capability appear as significant determinants of Perceived FWB only.

The role of financial behaviour is less significant in both methods of running data analysis. The result from the stepwise regression suggested an insignificant influence of financial behaviour in determining FWB. Whilst the structural equation modelling indicated including financial behaviour appears to make any model fit the data worse. Financial behaviour does have a significant coefficient with respect to financial needs satisfaction when financial capacity is excluded from the model, which could imply it has some role that is crowded out when capacity is included, however the structural equation models do not support financial behaviour having an indirect effect in this way. While this is not sufficient to demonstrate that financial behaviour is has no significant impact on financial wellbeing, providing no evidence for any impact is a notable divergence from the literature.

Subjective financial literacy only appears as a significant factor in FWB through its relationship to financial needs satisfaction, and even where statistically significant appears to be the least important factor. Breaking down financial behaviour and attitudes into specific factors, it appears that the financial attitudes relating to ‘being in control’ and the behaviours around ‘saving and investment’ are the determinants of any significant attitudinal or behavioural effects.
Accordingly, the determinants of FWB can be categorised into three distinct levels of importance: (1) material wealth/income - financial capacity, (2) action-based financial capability factors - financial attitudes, perceived financial capability and financial behaviour, and (3) knowledge-based financial capability factors - subjective financial literacy. The key findings of this study are summarised in Figure VI-1.

When interpreting the findings in this study, it is worth acknowledging one of the limitations of multiple regression is that the unique contribution of each variable in the regression applies to a specific set of independent variables or predictors. In the context of a different set of independent variables, the unique contribution of these variables is likely to change. This limitation also relates to potential endogeneity bias such as when the omission of variables and simultaneous causality occurs. Multiple regression of concurrently measured variables/factors does not show causality. However, it can provide evidence of possible relationships between variables. Furthermore, by using structural equation modelling in addition to stepwise multiple regression, this study can consider relationships between the variables holistically. Where both methods yield the same findings this give greater confidence in their robustness to model specification, though as both are correlational methods that share some of the same core limitations this this does not overcome those, so care must be taken when considering the strength and limits of the evidence. If new potential determining factors are added to the equation, the weight or significance of the factors towards Perceived FWB and financial needs satisfaction would change. In addition, the potential for the reverse relationships between the dependent variable and independent variables in multiple regression mean that Perceived FWB and financial needs satisfaction may determine these factors also.

The results from the stepwise multiple regressions and structural equation modelling indicate that financial capacity is the key determinant of both Perceived FWB and financial needs satisfaction (see Table V-32, Table V-33, Table V-34, Table V-35, Figure V-1). Three SEM models showed the evidence of its significant contribution with the highest standardized regression coefficients. For example, in models 3 and 5, these figures are 0.50 and 0.27 while in model 6, these are 0.49 and 0.23 (see Figure V-1).

Material wealth/income is found to be more important than psychological or subjective factors, such as attitudes and perceived financial capability, in driving individual Perceived FWB. The role of financial capacity in driving FWB is so strong it almost excludes other factors such as financial behaviour from the equation of financial needs satisfaction in the stepwise regression. This result implies that money or financial resources influence an individual’s FWB.

The findings from qualitative data also endorse the significant role of financial capacity in relation to FWB. The participants in this study shed some light on how financial capacity can influence their FWB. Some key points are summarised below:
Financial Capacity Influences Individual Financial Wellbeing through Financial Needs Satisfaction and Subjective Financial Wellbeing

The findings from the qualitative data support the literature review that suggests individuals have different needs or financial priorities depending on their financial circumstances and life cycles. Income adequacy is the means to satisfy their financial needs. For those who have low income or are unemployed, it is more difficult to pay household expenses. They may not be able to contribute anything or increase their contribution to savings or a pension plan.

These examples also illustrate the role of financial capacity in defining individual financial needs and satisfaction. A pensioner, MR, who is single with no financial responsibility is spending money that she has saved for her retirement. Her financial goal is to maximise her monthly income from pensions and rent to be able to travel overseas. She claims she has “enough to do what I want” but describes her FWB as only “okay” (MR) as she wants more. She did not achieve ‘the top level of satisfaction’ which is a sense of financial freedom.

The Effect of Financial Capacity on Financial Wellbeing Might Be Different Due To Some Factors, Such As Age, Level Of Financial Capacity.

The qualitative findings indicate that requirements for financial capacity and financial needs are different depending on the participants’ age. For instance, while the pensioner (MR) has focused on her lifestyle of travelling overseas, the younger participant (OLF) is trying to find a job to pay for household expenses. She also wants to save more for financial security needs and retirement. OLF is in her mid-30s and unemployed. She has moved in with her parents and is living on her savings:

I’d like to increase my income. I mean ideally to save a bit but also to be able to contribute more to household expenses. It would be nice to be able to put more into a pension. I would feel a lot happier if I had more income (OLF).
The above example illustrates that an increase in financial capacity also enhances positive financial behaviours, such as saving and putting money into a pension. This evidence endorses the relationship between financial capacity and behaviour as discussed in the quantitative findings.

For those who have less financial capacity, their financial satisfaction is simply being able to pay for basic short-term needs:

- I feel better if I knew I have the finances to meet (my needs) but now I'm satisfied because I am able to pay my bills. All on my own and as much as I have a feeling for a plan with my retirement, … I may not have all that I wish I would have, I am satisfied (MAF).

This example supports the important role of financial capacity in determining financial needs satisfaction as found in the quantitative findings; in particular the lower levels of financial needs, such as ‘finance for existence’ and ‘finance for security’.

**c. Financial Capacity Influences Perception of Being in Control of Finances**

In the quantitative findings, ‘being in control’ of finances was found to be the key attitude-based driver of FWB that relates to one’s financial capacity. Similar findings can be seen in the qualitative findings. Participants admit that income decides their perception of financial self-control. Furthermore, learners with stronger financial capacity perceive higher self-control of their financial circumstances and vice versa:

- “If I have more money, I feel more in control. I'm in control provided nothing really untoward happens. If you’ve got a lot of unexpected expenses, suddenly you’re out of control” (MR).

The qualitative data provides the evidence to support the quantitative findings that suggest financial capacity is a key driver of FWB, which is achieved by showing how financial capacity influences individual financial needs satisfaction and the participants’ perception of being in control of their finances.
In summary, the interview data offers some evidence to support the findings from the quantitative data. Providing a partial answer for research question two, the qualitative findings also indicate how financial capacity affects FWB. Financial capacity influences individual FWB through financial needs satisfaction and Perceived FWB. In addition, financial capacity influences the perception of being in control of finances, a key driver of financial attitudes and Perceived FWB. Some factors, such as age, might control the effect of financial capacity on FWB. For those participants who have higher financial capacity, their financial satisfaction and wellbeing is the result of being able to control their finances (Strömbäck et al., 2017). In the first research area which focuses on the nature of financial needs satisfaction, the qualitative findings do not suggest a clear hierarchy of financial needs. However, they do stress that people have different financial needs and expectations. For some people, a small change in their financial capacity will not change their perceived wellbeing, but those who have very basic financial needs are satisfied by just being able to fulfil them. This study supports the importance of using financial needs satisfaction to assess individual FWB (Howell et al., 2013).

6.2.2 Financial Attitude: A Secondary Driver of Subjective Financial Wellbeing

This study found financial attitudes are a secondary driver of Perceived FWB. This finding is supported by the results from testing hypothesis two. The model summary has shown the order of the variables that contribute to Perceived FWB significantly (see in Table V-32, Figure V-1). The order of the contribution is financial capacity, followed by financial attitude and perceived financial capability. Hence, being a secondary driver of Perceived FWB, financial attitude is one of the important factors that FWB interventions might target.

To some extent, financial attitudes offer a more significant and unique contribution to Perceived FWB than subjective financial literacy and financial behaviour. This is shown by subjective financial literacy and financial behaviour being rejected by the stepwise process in the Perceived FWB model. This point is supported by Fritz and Berger (2015) who suggests that the stepwise regression process keeps all significant and unique variables in the equation. Although financial attitudes were
rejected by the stepwise process in the model of financial needs satisfaction, it still has a significant contribution to FWB as a whole. This is because the Perceived FWB variable in this study covers wide-ranging perceptions or feelings in relation to overall financial circumstances (e.g. nine emotions). Financial satisfaction or financial needs satisfaction is just one part of the overall perception of FWB. Therefore, it is more important to note that financial attitudes determine the overall perception of FWB rather than being a significant driver for just one part of FWB, financial needs satisfaction. Accordingly, financial attitudes’ insignificant role in driving financial needs satisfaction should not undervalue financial attitudes in determining FWB in general.

Furthermore, this study found that the ‘being in control’ factor is the key driver of financial attitudes that determine Perceived FWB, with all other attitudes having no significant additional effect (see Table V-38). This finding is in line with a previous study on financial attitudes conducted by Vlaev and Elliott (2014), which found that the ‘being in control’ factor was the most important determinant of financial satisfaction.

### 6.2.3 Perceived Financial Capability: Another Secondary Factor of Subjective Financial Wellbeing

Similar to financial attitudes, perceived financial capability plays an important role in determining Perceived FWB. The regression model summary shows that perceived financial capability is close to financial attitude in its significant contribution to Perceived FWB (Table V-32 and Figure V-1). In addition, the standardized regression coefficients (b) of perceived financial capability and financial attitude are so close in SEM models. In models 3 and 5, the standardized regression coefficient (b) of perceived financial capability was lower than financial attitude. Whilst in model 6, they have the same standardized regression coefficients of 0.18. This result suggests that perceived financial capability is one of the significant determinants of Perceived FWB. The result also indicates that the ability to manage money on a day-to-day basis, plan ahead, and financial outcomes, are factors that can make a significant contribution to FWB (Fritz and Berger, 2015).
Nevertheless, perceived financial capability was not found to be a key determinant of financial needs satisfaction. Despite observing a positive correlation between the two variables (see Table V-28) other variables appear to play a more significant role in determining financial needs satisfaction than perceived financial capability. For this reason, perceived financial capability was excluded from the regression model of financial needs satisfaction (Fritz and Berger, 2015).

### 6.2.4 Financial Behaviour: A Less Significant Determinant of Financial Wellbeing

Financial behaviour has been endorsed as the most important determinant of both Perceived FWB and financial needs satisfaction in the literature. However, in this study, financial behaviour was found to be a less significant contributor of Perceived FWB in comparison to financial capacity, financial attitude, and perceived financial capability.
There are two pictures in the contribution of financial behaviour to FWB. The result from stepwise regression, in the presence of financial capacity, financial behaviour was not one of the significant determinants of both Perceived FWB and financial needs satisfaction. Model 5 from structural equation modelling supported this result. This model without financial behaviour fits the data better than model 3 which included financial behaviour through an indirect relationship with financial needs satisfaction. Model 5 also fits the data better than model 6 which modelled financial behaviour as having a direct relationship with both Perceived FWB and financial needs satisfaction. Following these results, financial behaviour appears to play a less significant role in determining FWB than other variables.

Diving into the relationship between financial behaviour and FWB, the result from the quantitative data (see Table V-41) suggested a link between four categories of financial needs satisfaction and three groups of financial behaviours. This finding indicated that either people manage their finances in a way to satisfy their financial needs or it could be that their financial needs lead their way of managing their finances. This suggests that elements of financial behaviour might be linked to elements of FWB, even though the results do not show a robust correlation between the indices of financial behaviour and financial needs satisfaction as a whole.

In addition, based on the results of the stepwise regression, financial behaviour may be a hidden driver of financial needs satisfaction, as financial behaviour appears as a significant determinant of financial needs satisfaction when excluding financial capacity from the equation (sees Table V-36, Table V-37). Whilst financial capacity appears to be the primary driver of financial needs satisfaction, care must be taken in assigning weight to a regression that excludes it, as the two variables share some similar information in relation to how they are derived. As such, including financial capacity in a regression on financial needs satisfaction could bias the other variables and crowd out any effects they may have, which means it is worth considering the regression both with and without financial capacity.

Since financial behaviour appears as the primary driver of financial needs satisfaction when financial capacity is excluded, yet insignificant when it is included, this might suggest that the measures of financial behaviour and capacity share part
of the same concept. It could be that financial behaviour and capacity share overlapped information. Stepwise regression only keeps one of these overlapped variables, whichever one is slightly more predictive than the other (Fritz and Berger, 2015). The one of the two overlapped variables that stays in the equation is significant, both statistically and intuitively (Fritz and Berger, 2015). Following the procedures for stepwise regression, there are two possible reasons why financial behaviour has been excluded. The first reason might be that financial behaviour is a non-significant variable and does not provide unique information in comparison to financial capacity. Otherwise, it could be that the overlapped information between financial behaviour and financial capacity was the reason why financial behaviour was no longer seen to be significant in the equation with the presence of financial capacity.

One possible theory that may explain these results is that financial behaviour could be a driver of financial capacity, such as behaviour to save or otherwise act in ways that increase wealth or resilience to shocks. If so, this could imply financial behaviour is an important driver in financial needs satisfaction, acting through financial capacity. Another possible explanation could be that financial behaviour and financial capacity are not directly related but correlated due to their links to other variables (e.g. education level, employment, family background, or many other possible factors). This explanation would imply that financial behaviour is not an important factor of financial needs satisfaction, with its correlation being caused by links to these hidden variables.

The results from the SEM analysis provide some evidence that financial behaviour is not acting through financial capacity. While it does not explicitly reject all the models that include financial behaviour, the addition of financial behaviour appears to make any model fit the data worse. This is not to conclusively say that financial behaviour does not have an impact on some measure of FWB. However, it further adds to the argument that the results do not find any evidence that it does have an impact, and suggests the most likely models of both elements of FWB do not include financial behaviour. Moreover, including financial capacity as an intermediate variable appears to make the model fit the data worse than including it as a primary variable, for example comparing models 2 and 3 to 5 and 6 respectively, which
include the same variables but change the position of financial capacity. Putting these together suggests a result in contrast to much of the literature: that financial behaviour does not appear to be a major important a determinant of FWB. While this does not reject all arguments for the importance of financial behaviour within the theory, it suggests this is an area that warrants further research.

To what extent that financial behaviour may have an effect on financial needs satisfaction, the ‘saving and investment behaviours’ factor appears to be the key driver of this issue (see Table V-39). This might shed some light on the relationship between financial behaviour and capacity discussed above, as saving and investment behaviours directly affect the financial capacity of people: any increase in savings and investment would be expected to increase financial capacity over time, as higher savings imply greater wealth and capacity to meet financial needs.

To some extent that savings and investment behaviours lead to increased financial capacity, the results strongly suggest that it is the result of saving that has the dominant effect on financial needs satisfaction, rather than the act of saving itself. In other words, whilst saving and investing may increase someone’s capacity and hence their ability to satisfy their needs, it is that increased capacity that this study indicates as the dominant cause of financial needs satisfaction.

Furthermore, it is understandable that financial behaviour could play an important role in determining financial needs satisfaction in the absence of financial capacity, as certain financial needs require actions (i.e. behaviour) to achieve the satisfaction, such as having enough money to save or put aside for rainy days or emergencies. In general, the results imply that an intervention towards financial behaviour might have an impact on financial capacity, which results in an improvement in financial needs satisfaction, particularly if focused on savings and investment behaviours; however, the evidence is not enough to conclusively state this. This is potentially a fruitful topic for further research.
6.2.5 Subjective Financial Literacy: A Contributing Factor of Financial Needs Satisfaction

It was unexpected to find that subjective financial literacy is not shown to be a driver of perceived FWB but a contributing factor of financial needs satisfaction. Subjective financial literacy consistently appears as one of the drivers of financial needs satisfaction, but the less important one, whether financial capacity is included in the model or not (see Table V-34, Table V-35, Table V-36, Table V-37). The results from the stepwise regression suggest subjective financial literacy can be viewed as a contributing, and consistent, but less important determinant of FWB than other significant factors. SEM models seem to show subjective financial literacy having the next biggest impact after financial capacity, though with the exception of financial capacity all the significant factors appear to have a similar size of impact. Moreover, whilst the stepwise regression has it as a secondary factor in both models of financial needs satisfaction, it is the only variable to show up in both models and the SEM analyses in relation to FNS. This suggests subjective financial literacy is a consistent factor, less important than financial capacity but on a similar level to the other significant determinants.

The finding may reflect the fact that one of the measures of financial needs satisfaction includes the desire of mastery of knowledge in managing finances. Hence, when an individual has a need for having advanced financial knowledge, it is understandable that a satisfaction of this need relates to how they perceive their financial literacy. Another possible explanation is that greater financial literacy, or at least believing we have greater financial literacy, could make us feel more satisfied and confident about our financial needs, either directly or by enabling us to make better financial decisions, without making us feel a sense of greater wellbeing about our finances in general. For example, by knowing more about finance a person can satisfy more needs but are also more aware of money worries or potential future problems. A final possible theory is that subjective financial literacy is acting as a proxy for other variables, such as education or employment, which correlate with it and could have some role in helping satisfy financial needs. All three of these possible theories could explain how subjective financial literacy is associated
significantly and positively with financial needs satisfaction but not Perceived FWB. The evidence does not make it possible to conclusively determine which is correct, though it is important to note that the impact of subjective financial literacy appears consistently small, so regardless of the mechanism it appears unlikely that targeting improvements in subjective financial literacy is the most effective way for interventions to increase FWB.

6.3 The Nature of Financial Needs

This section focuses on the second research area that attends the research question “what is the nature of financial needs satisfaction, as a component of FWB?” by exploring how people satisfy their financial needs. Accordingly, the evidence from four categories of a hierarchy of financial needs satisfaction are reviewed: ‘finance for existence’, ‘finance for security’, ‘finance for enjoyment’, and ‘finance for self-actualisation’. This study considers the items within each category and cross-examines them to see how they fit together, and how well these items and categories match the proposed hierarchy of financial needs developed from the literature review and presented in 3.2.2. The results are consistent with the theory that financial needs satisfaction is hierarchical, but more evidence is needed to definitively confirm this. Whether or not the categories are hierarchical, it is still useful to categorise the needs and put them into "pots" in accordance with individual's personal financial practice.

6.3.1 Hierarchy of Financial Needs Satisfaction

6.3.1.1 Quantitative Findings

One of the most striking results to emerge from the quantitative data relates to the hierarchy of financial needs satisfaction. The hierarchy of financial needs satisfaction is drawn out from the findings in two factor analyses on the measures of the importance of financial needs (see Table V-10) and the satisfaction of financial needs (see Table V-7). This study uses factor analysis to examine what groups these factors fit in. Then, it compares these groups to the proposed hierarchy developed from the literature (Salignac et al., 2019; Kiymaz and Öztürkkal, 2019; Brüggen et al., 2017; CFPB, 2015a; Vlaev and Elliott, 2014; Ng and Diener, 2014; Howell et al., 2013; Taormina and Gao, 2013; Tay and Diener, 2011; Xiao and
Anderson, 1997; Xiao and Noring, 1994), and more broadly to Maslow's hierarchy of needs (Maslow, 1943), to explore how these needs might fit together. The factor analysis indicates there are four groups, supporting an adapted version of the five-level proposed hierarchy, summarised in Figure VI-2. This hierarchy provides the answer to the research question “what is the nature of financial needs satisfaction, as a component of FWB?” by identifying how the participants satisfied their financial needs.

![Figure VI-2: Research findings on hierarchy of financial needs](image)

The hierarchy of financial needs satisfaction includes four categories: finance for existence, finance for security, finance for enjoyment, and finance for self-actualisation. The details of each category can be described as follows:

(1) **Finance for existence**: Having money to pay for immediate things a person needs to survive in a society. This category includes factor four of financial needs satisfaction and half of factor one of financial needs importance with the key

![Diagram showing the hierarchy of financial needs]

*Finance for Self-Actualisation*
- FNS2 & FNI3+5
  - supporting social networks and charity, respect and pride from wealth, educational aspirations

*Finance for Enjoyment*
- FNS3 & FNI2
  - money for lifestyle, socialising, special occasions

*Finance for Security*
- FNS1 & other half of FNI1
  - savings, pensions, resilience to unexpected expenses, financial knowledge and financial freedom.

*Finance for Existence*
- FNS4 & half of FNI1
  - basic needs, housing, insurance, basic education and healthcare
items of basic needs, including education and health care. It also contains some elements of immediate financial needs such as sufficient finance for housing (i.e. mortgage and bills) and insurances (e.g. house, car).

(2) **Finance for security:** Having money to achieve financial security and assurance. This is similar to having ‘finance for existence’ but here, as the needs are not immediate, there is less priority. This category includes factor one in financial needs satisfaction and the other half of factor one of financial needs importance with the key items of future security, including savings, provisions for pensions, and resilience to unexpected expenses. This sense of financial security includes the ability to master financial knowledge, support social networks, and donate to charity. This category principally contains financial freedom. It is worth noting that financial freedom is theorised as the highest level of financial needs satisfaction in this research (see Figure III-2).

(3) **Finance for enjoyment:** Having money to fund lifestyles that people want rather than need. This category includes factor three in financial needs satisfaction and factor two of financial needs importance. The items relating to ‘lifestyle’ spending, include eating out, the purchase of luxury goods, hobbies, holidays, socialising, expenditure on special occasions, and generally, buying things that are wanted rather than needed.

(4) **Finance for self-actualisation:** Having money to satisfy self and social esteem. This includes self-esteem and esteem from other people (Taormina and Gao, 2013; Maslow, 1943). This also includes the things people aspire to do with their money and the respect they gain from doing so. In this research, this category is a combination of aspirations, personal pride, and provision of support for society; for example, supporting social networks and charity, gaining respect and pride from the use of one’s wealth, and educational achievements. In exploring the aspects of esteem, Taormina and Gao (2013) use 15 items that are categorised into two parts. The two parts are combined into a single measure to explore esteem needs satisfaction. The first part focuses on satisfaction with individual feelings of self-esteem, self-worth, self-respect, and positive self-regard, whilst the second part examines satisfaction with esteem from others,
such as prestige, respect, esteem, recognition, and positive regard or appreciation received. People tend to seek admiration from others in their groups (Clarke et al., 2006). Self-esteem can relate to the mastery of skills or attention and recognition from others (Clarke et al., 2006).

The proposed hierarchy above was developed based on the multifaceted results in the factor analysis, compared and fitted to Maslow's theory. While the factor analysis of the importance and the satisfaction of financial needs give somewhat different results, the similarities between the two allow a broadly consistent hierarchy to be extracted. This study uses the literature review of hierarchy of human needs (Maslow, 1954, 1943) and the results from factor analysis of financial needs satisfaction as the primary source to split the variables into factors (Table V-7), with the additional use of factor analysis of financial needs importance (Table V-10) to clarify the details and give greater confidence in the broad categorisation. This approach is used, for instance, where there are crossloading items that appear in two factors. Matching the elements of both importance and satisfaction of financial needs should provide a better understanding of how participants categorise their needs. It also provides an insight into whether certain items of needs that are important to individuals are being satisfied at the same time or not.

One notable difference between the factor analyses of financial needs satisfaction and importance is that the latter groups money for education, educational aspirations, and healthcare together in a separate factor, whereas the former puts education and healthcare within the ‘finance for existence’ level and educational aspirations within the ‘finance for self-actualisation’ level. This may reflect that education and healthcare are primarily state funded in the UK, where most, but not all, participants are from, which could have led some participants to have interpreted the question differently to others. For example, some may view it as relating to money to fund private education or healthcare above that which the government provides, whereas others may view it in relation to their satisfaction or importance of their own or family’s education and healthcare more generally. The proposed hierarchy uses financial needs satisfaction as the primary factor analysis, an interpretation that is also consistent with existing literature on the hierarchy of needs more generally. However, it is important to acknowledge that the results together
are less conclusive on how education and healthcare fit into a hierarchy of financial needs when most of the participants are state funded.

6.3.1.2 Qualitative Findings

In support of the quantitative findings, the qualitative findings provide evidence of a blurred line between basic financial needs and higher-level needs such as financial security and enjoyment. For example, for MAF, her main financial priority is to “plan for retirement” while also having other financial priorities such as “paying bills, saving for vacation, children’s education”. Whilst for another participant, OLF, her main financial priority is “to increase my income. I mean ideally to save a bit, but also to be able to contribute more to household expenses […] It would be nice to be able to put more into a pension”. These participants have a simultaneous mixture of finance needs, including ‘basic needs’ (e.g. paying bills, household expenses) and ‘financial maintenance’ (e.g. saving for vacation, buying a car, helping out with their children’s education). Those who have a ‘planning ahead’ mind-set, tend to have both basics needs and financial security needs for their retirement in long-term.

This finding was in line with the analysis from the quantitative data which suggests the lowest level of ‘basic needs’ is in the same hierarchical tier of high-level financial needs. Some learners claimed that their financial priorities are both what they needed and wanted. This could explain why people had different levels of needs simultaneously. The mixture of these financial needs or priorities may indicate that individual financial needs do not always conform to a hierarchy. The qualitative findings also support the view that people categorise their financial needs into a number of ‘pots’ clustering their money for different purposes. These ‘pots’ are consistent with a hierarchical structure from ‘paying bills’ to ‘saving for vacation’, but the evidence is not conclusive.

Other studies have found household financial needs are hierarchical when corresponding with an increase of family financial resources (Xiao and Noring, 1994). On the other hand, Hilgert et al. (2003), cited in Dew and Xiao (2011), suggest a hierarchy of financial management behaviours with cash management, credit and savings at the lowest level, and investment management at the highest
level. The evidence of a hierarchy of financial needs and behaviour can be seen in the qualitative findings. For example, one participant (OLF) indicates that if she had an increase in income, she would not only contribute more to household expenses but also use the extra money to satisfy higher needs of financial security such as save more and increase pension contributions. This example also demonstrates hierarchical financial behaviour, from managing daily expenses to putting money towards a pension for a future date.

6.3.2 Conceptualisation of Financial Needs Satisfaction: Financial Freedom is Not at the Top of the Hierarchy

This study theorises financial freedom as being the highest level of the hierarchy of financial needs satisfaction (see Figure III-2). This is based on the concept of FWB proposed by Brüggen et al. (2017) that relates to the ability to have financial freedom of choice and sustain a desired lifestyle. However, the results from the factor analysis indicates otherwise. Financial freedom is viewed by the participants to be in the same level as other financial security needs (see Table V-7). It appears that when their finances are deemed to be secure, people tend to perceive that they have financial freedom. This result means that financial freedom is not at the top of the hierarchy of financial needs satisfaction.

Overall, the results suggest that the factors of financial needs satisfaction can fit in a hierarchy structure similar to the framework proposed, and to Maslow’s broader hierarchy of human needs theory, though the evidence is not sufficient to state that this is conclusively so. However, even without applying a hierarchy, there can be benefits in thinking of the factors as distinct groups of financial needs. This approach reflects how people cluster their financial needs into different classes/categories. Categorising financial needs and putting them into groups accords with personal financial practice where individuals set aside money for different purposes from ‘daily expenses’ to ‘emergencies’ (Xiao and Noring, 1994).

6.3.3 Financial Needs Satisfaction: An Alternative Indicator of Financial Wellbeing
In this research, financial needs satisfaction is used together with Perceived FWB to explore another aspect of FWB. The qualitative findings in this research endorse financial needs satisfaction as a good indicator to assess individual FWB. Interventions that target financial capacity, behaviour, and subjective financial literacy, can enhance an individual’s financial needs satisfaction and wellbeing.

The qualitative data suggests that financial needs satisfaction is linked to participants’ perception of their financial circumstances. For example, achieving financial needs makes the participants feel “a sense of achievement and relief”, “feel good”, “happy”, “feel obliged and kind of more at ease with my finances” or “satisfied”.

By contrast, if they were not able to achieve financial needs, it may cause undesirable feelings such as being stressed, feeling anxious, insecure or worried about the future. There were two examples of those who did not think that they had enough financial capacity to satisfy their financial needs. The first example relates to MAF, who is from St. Lucia. When asked if she had enough money to achieve these financial priorities, she said: “Not at the moment. Well I think that I could probably secure a loan, although that’s not what I really want to do […] I feel anxious”. By contrast, having resources to cover her financial needs would make her “feel good, happy”. Similarly, in the second example, OLF from the UK, when thinking about her inability to meet her financial needs, commented: “I suppose it makes me slightly anxious sometimes more kind of insecure or worried”. Being able to satisfy her financial needs would make her feel “more secured and less anxious”.

This section has explored the qualitative data that implies financial needs satisfaction influences on an individual’s perception of FWB. This finding suggests that financial needs satisfaction can potentially be used as an alternative indicator of FWB.

6.4 Conclusions

In summary, the results from both the quantitative data and qualitative data shed light on financial capacity as the key determinant of both Perceived FWB and
financial needs satisfaction, almost to the exclusion of other factors such as financial behaviour. Linking this finding to the nature of financial needs satisfaction, it offers a potential explanation for why financial needs are hierarchical. This could be that an individual’s financial needs satisfaction progress in accordance with the level of their financial capacity. Future studies might examine further the link between the hierarchy of financial needs satisfaction and the level of financial capacity.

By contrast, financial attitudes, perceived financial capability, subjective financial literacy, and financial behaviour, have much smaller and less robust direct effects on FWB. The hierarchy of determinants of Perceived FWB can be categorised as: (1) material wealth/income (financial capacity), (2) action-based financial capability factors (financial attitudes and perceived financial capability), and (3) knowledge-based financial capability factors (subjective financial literacy). Financial behaviour has not been allocated a definitive place within this hierarchy as the evidence shows two possibilities. The evidence is consistent with financial behaviour being either a part of category two, or as a separate category in that may be driving the wealth outcomes in category one. When examining the underlying factors of financial attitudes and behaviours, the attitude of ‘being in control’ and ‘saving and investment’ behaviour, appear to be the primary drivers of FWB.

Addressing category two of the research questions in relation to how these determinants affect FWB, the quantitative findings suggest that financial capacity influences individual FWB through financial needs satisfaction and Perceived FWB. This finding stresses the important role of money or financial resources in determining an individual’s FWB. This result contrasts with previous literature that focuses on happiness as being the main factor that really matters to FWB (e.g. see Porter and Garman, 1993). The participants in the interview report that financial capacity influences their perception of being in control of their finances, a key driver of financial attitudes and Perceived FWB (Vlaev and Elliott, 2014). In addition, being able to meet their financial needs would make them feel ‘good’, ‘happy’, or ‘satisfied’. Otherwise, being unable to meet these needs may cause undesirable feelings such as stress, feeling anxious or being insecure or worried about the future.

Having defined Perceived FWB and financial needs satisfaction as two components of FWB, the findings in this study reveal that varied factors are driving different
aspects of FWB. The findings emphasise the complexity of FWB. It is important to stress that all variables used in this study only explain 31.6% or less of Perceived FWB. This means that 68.4% of the variance of Perceived FWB have not been explained by this study. There are as yet unidentified factors that decide individual Perceived FWB. Therefore, further research is needed to explore the factors that account for the 68.4% of the variance of Perceived FWB. Therefore, a combination of interventions is needed to target more than one variable simultaneously, to create a stronger impact on FWB.

The evidence from both the quantitative data and, to a lesser extent, the qualitative data, suggest four groups of financial needs satisfaction can be fitted in a hierarchy structure when compared to Maslow’s hierarchy (1954). The quantitative findings provide evidence for four categories of financial needs satisfaction: finance for existence, finance for security, finance for enjoyment, and finance for self-actualisation. Although the evidence for these categories being distinctly hierarchical is not conclusive, the results and their interpretation are both in line with existing research on Maslow’s general hierarchy (1954). These findings have provided the answers for category one of the research questions which focuses on the nature of FWB.

It should be noted that the limitations of the data might have influenced the findings. The results of this study apply to a specific population of online financial education learners drawn from the UK, elsewhere in Europe and, in small numbers, from the rest of the world. The results in this research are interesting and promising but should be validated by future research using other (and larger sized) population samples.

The next chapter compares the findings of this thesis with the literature on FWB and capability in order to highlight the contribution of this research. The research findings and implications could be of interest to various parties, such as social marketers, financial advisers, counsellors, policymakers, and educators. The findings can help the design and use of interventional tools to promote FWB. The research limitations of this thesis and suggestions for future research are also covered in the discussions chapter.
VII. RESEARCH DISCUSSIONS AND IMPLICATIONS CHAPTER

7.1 Introduction

This chapter discusses the key findings of this research, starting with the key determinants of FWB in the literature that relate to the findings of this research. The chapter compares the research findings with the literature to clarify the contributions of this study to the literature of FWB and capability. The chapter also reviews the nature of financial needs satisfaction.

Both the findings from the quantitative and qualitative data are used to support the discussions. The research implications for intervention development and interest groups, such as educators, social marketers, and policymakers, are discussed at the end of this chapter. For example, having found the determinants of Perceived FWB and financial needs satisfaction, this knowledge can be translated to practice promoting Perceived FWB. Furthermore, the limitations of this study are reviewed and suggestions for future study are proposed.

7.2 Determinants of Financial Wellbeing

7.2.1 Financial Capacity: The Fundamental Driver of Subjective Financial Wellbeing and Financial Needs Satisfaction
Financial capacity was found to be the key determinant of both Perceived FWB and financial needs satisfaction in this study. This section discusses how this finding fits in with the literature and the implications for theory or practice.

The result contributes a clearer understanding of the role of financial capacity as a key determinant of FWB through its relationships with Perceived FWB and financial needs satisfaction. This finding endorses the concept of FWB proposed by Zemtsov and Osipova (2015) which describes financial capacity as an objective feature of FWB (Zemtsov and Osipova, 2015). This finding also reflects the connections between financial capacity and wellbeing proposed in the literature where financial capacity is also an element of FWB (CFPB, 2015). Having the financial capacity to withstand a financial shock is one of four elements of FWB concept introduced by the CFPB (2015). Financial problems stem not just from difficulties in managing money, but in the need for increased income, resources, and assets, and an understanding of financial services (Despard et al., 2012).

When reviewing certain aspects of the literature, the finding of financial capacity in this study is supported. Firstly, the literature reviews the issues that influence an individual's FWB, such as low-income, financial shocks, and over-indebtedness. Lower-income households are often struggling with limited financial resources. Having a low-level income prevents people from saving or adjusting spending in order to become more resilient (MAS, 2015), whilst financial shocks (e.g. job loss, income fall, credit withdrawn, or major expenses) are linked to over-indebtedness (Gathergood, 2012). Debt is an important element that is associated with financial stress and the FWB of families (Joo and Grable, 2004; Xiao et al., 2004). An individual who has high financial capacity is more likely to be able to solve these financial issues than those who do not. Hence, it is understandable that financial capacity can enhance individual FWB in respect of dealing with these financial issues.

Secondly, financial capacity as a key determinant of financial needs satisfaction corresponds with the narrative in the literature that income and its relative capacity is to fulfil economic needs or individual lifestyle (Rickel et al., 1984). In addition, Plagnol (2011) points out that income, an element of financial capacity,
has the expected positive capacity to increase financial satisfaction. Financial satisfaction serves as an important mediating factor between income and subjective wellbeing (Diener and Biswas-Diener, 2002). The adequacy of income is important in the consideration of the ability to meet financial needs.

Thirdly, reviewing previous studies, financial capacity is considered to be an objective measure of FWB and financial satisfaction. The measures of financial capacity used in this study reflect the roles of financial capacity in shaping financial needs satisfaction. The first two components, ‘perceived adequacy of family income’ and ‘perceived net worth’ adopt the measures of perceived attributes of the financial domain attribute (PAFDA) from Porter and Garman (1993, p. 145). The two components – “perceived adequacy of family income” and “perceived net worth” – identify the relationship between human needs and income, and how income meets needs or wants. “Perceived adequacy of family income” focuses on individual economic needs or lifestyle, while “perceived net worth” emphasises the balance sheet or making ends meet after spending on needs or wants. In addition, the third component of the measures of financial capacity in this study, “duration of financial capacity”, indicates how long an individual can sustain their living standards and financial responsibilities if faced with an unexpected drop in income without borrowing (Atkinson et al., 2006).

This study found financial capacity to be the main driver of Perceived FWB and financial needs satisfaction, but it explains less than a quarter of their variation ($R^2$, see Table V-32, Table V-33). This suggests there is much more to FWB and satisfaction than financial capacity, even if it is the primary determinant. For example, for those who have the same income levels, people who prudently save/invest for the future are more satisfied with their lives than those who do little saving/investing (Netemeyer et al., 2018; Chancellor and Lyubomirsky, 2011).

It is also worth mentioning that despite financial capacity playing an important role in determining FWB, money worries can affect employees regardless of their level of pay (FinCap, 2020). In a report carried out by Salary Finance between 2018-2019 on UK employees’ FWB, it was discovered that the two employee groups that had
the most money worries were those earning at the lowest (£10,000 to £14,000) and highest level (> £100,000) (FinCap, 2020).

In a study in the US, Kahneman and Deaton (2010) found that an increase of income does improve emotional wellbeing (i.e. the emotional quality of an individual's everyday experience) but there is no further progress beyond a benchmark of an annual income of $75,000. The authors suggest that low-income compounds other emotional misfortunes, for example, divorce, ill health, and loneliness. They found an association between low income and low emotional wellbeing and low life evaluation. They concluded that high income buys life satisfaction but not happiness (Kahneman and Deaton, 2010). Similarly, Netemeyer et al. (2018) also found income is not a straightforward positive predictor of overall well-being but moderates the effect of current money management stress on well-being instead. However, the negative effect of money management stress on well-being decreases when income levels increase (Netemeyer et al., 2018). Income tends to have serious effect on well-being among low-income group than higher income group. In addition, in the Money Advice Service’s ‘financial capability survey’ among the UK adult population, the participants were clear that their FWB was not solely based on income (MAS, 2015). This implies that apart from financial capacity, there are other key determinants that play a significant role in enhancing FWB.

This result could have implications for the development of interventions to promote FWB. In order to have a major impact on individual FWB, the interventions need to change material outcomes, such wealth or other aspects of financial capacity. This might be achieved through improving financial capability, attitudes, or behaviours which could encourage a person to save more, improving their wealth status and the length of time they are able to meet their financial commitments without borrowing (these being an aspect of financial capacity). The assessment of such an impact needs to take a long-term approach to observe the accumulation of wealth through savings (if one’s income has not increased). However, as with the other aspects of financial capacity related to income or wealth, the effect of the interventions on financial capacity may be limited. In other words, the intervention that aims to improve perceived financial capability, attitudes, and behaviours, does
not usually aim to raise participants’ income. Without such an increase in income, the impact the intervention can have on individual FWB may be limited.

This finding implies that it is necessary to explore other factors that are related to, but are more intervenable, than financial capacity. It means that instead of focusing on income improvement as an outcome, the intervention should target action-based outcomes, such as spending within means, making ends meet, managing bills and credit commitments without borrowing and so on. These alternatives are explored in this thesis, including action-based financial capability factors (such as perceived financial capability), attitudes, behaviours, and knowledge-based financial capability factors (such as subjective financial literacy).

Overall, the finding in this study endorses the literature which asserts that financial capacity is the key determinant of two components of FWB: Perceived FWB and financial needs satisfaction. Interventions aimed at enhancing FWB should take into account this driver in their actions to achieve stronger outcomes.

7.2.2 Financial Attitudes: A Secondary Driver of Subjective Financial Wellbeing

In this study, financial attitudes have been found as a secondary driver of Perceived FWB. This finding is in line with previous studies but goes beyond those focusing on financial attitudes by considering attitudes in conjunction and comparison with other potential drivers of FWB, and by examining different aspects of FWB. This section discusses this finding by reflecting on the literature.

This finding is in line with a previous study conducted by Vlaev and Elliott (2014). In their study on FWB components in relation to financial attitudes, Vlaev and Elliott (2014) found that ‘being in control’ was the most important determinant of financial satisfaction. The study was carried out on two population groups, which included young workers and families with young children in the UK, who were tested for FWB components in relation to their financial attitudes. Vlaev and Elliott's study (2014) used a more general sample than the participants of this study who opted to take financial education, and thus different financial attitudes might be expected.
However, this study reaches a similar finding to Vlaev and Elliott's study (2014) that the “being in control” factor is the key attitude-based driver of FWB among online learners with diversified demographic characteristics (see Table IV-2). Other authors also agree that being in control of an individual’s financial situation is one of core elements that defines FWB (Salinac et al., 2019).

There was a minor difference between this research and Vlaev and Elliott's study (2014). Firstly, the measures of Perceived FWB in this study and financial satisfaction in Vlaev and Elliott's study (2014) were different. This study measured subjective wellbeing in relation to feelings with overall financial circumstances including ‘satisfaction’, while Vlaev and Elliott's study (2014) used three measures of wellbeing: (1) satisfaction with overall financial circumstances, (2) a MacArthur-type ladder of self-positioning, and (3) FWB ‘having enough money left over for non-essentials to live one’s life’. The difference in the measures of Perceived FWB between the two studies could be one of the reasons why the item ‘I adjust the amount of money I spend on non-essentials when my life changes’ associated with subjective wellbeing in Vlaev and Elliott's study (2014) but the same result did not find in this study. However, this item was not found as a key component of FWB in Vlaev and Elliott's study (2014). Therefore, the difference in relation to this point in the two studies is not a major concern.

Another reason for the differences between the findings of the two studies might relate to the different characteristics of the samples used. The population in the previous study is more selective (e.g. young workers and families with young children) while this study is more explorative and open to investigating the diversity of online participants. This study investigates online learners who proactively took part in an online financial education programme. By contrast, Vlaev and Elliott (2014) gather primary data from two sub-groups of the population who were invited to participate from a commercially available database which was representative of the UK population. In addition, Vlaev and Elliott focus on young workers and families in the same country, while this study examines online learners from different countries.
To some extent – having found the same result that “being in control”, an element of financial attitude, is the key component of FWB amongst different populations – this study adds credibility to the initial and similar finding from Vlaev and Elliott's study (2014). The fact that this study adapts different measures of FWB carried out on a different population but arrives at the same result as Vlaev and Elliott's study (2014), adds weight to the idea that the ‘being in control’ factor is a key driver of financial attitudes that determine FWB.

Similarly, the FairBanking research also shows that the most important driver of financial well-being is ‘being in control of finances’ (Elliott et al., 2010). The authors suggest that this driver is made up of behaviours and attitudes from both the ‘making ends meet’ and ‘keeping track of your finances’ components of financial capability (Elliott et al., 2010). Therefore, any intervention focuses on FWB should consider enhancing individual attitudes of ‘being in control’.

On the other hand, this study did not find strong evidence of financial attitude being a key determinant of financial needs satisfaction which literature review suggests otherwise. This finding does not support previous studies that suggest that money attitudes have an impact on financial needs satisfaction (Amani and Shabahang, 2017). Attitudes towards money can affect the satisfaction of psychological and physical needs (Amani and Shabahang, 2017). Furthermore, Maslow’s needs are strongly correlated with money attitudes (Oleson, 2004). Even though the results did not indicate a direct link between financial attitudes and financial needs satisfaction, financial attitudes may still play a role through other factors such as financial literacy or financial capacity. This is because financial attitudes are mediating the influence of financial knowledge on financial behaviour (Potrich et al., 2016; Xiao et al., 2011; Norvilitis and Maclean, 2010). Hence, it is possible that financial attitudes influence financial needs satisfaction through financial behaviour. In addition, Gasiorowska (2014) found that two dimensions of money attitudes – perceived financial control and money anxiety – affect the subjective perception of objective wealth, which is open for further research. Financial attitude has a considerable effect on overall individual financial literacy (Bhushan and Medury, 2014). This indicates that financial attitude empowers and reflects individual financial literacy as well as financial behaviour. The literature
provides an explanation for why financial attitudes are more significant in relation to Perceived FWB than subjective financial literacy and behaviour.

Overall, the significant role of financial attitudes in defining Perceived FWB is in line with the literature (Salignac et al., 2019; Vlaev and Elliott 2014). It is also important to stress that the ‘being in control’ factor is the key attitude-based driver of financial attitudes that determine Perceived FWB. Being the secondary key driver of Perceived FWB, financial attitudes seem to be a good potential choice in order to target an intervention. This implies that any intervention that enhances the ‘being in control’ of finances could be beneficial to promote FWB.

On the other hand, financial attitudes are not a determinant of financial needs satisfaction, as it is mainly explained by financial capacity. Hence, financial attitudes may have a limited impact on financial needs satisfaction. To some extent, financial attitudes offer a more unique contribution to explaining Perceived FWB than subjective financial literacy and financial behaviour.

### 7.2.3 Perceived Financial Capability: Another Factor of Perceived Financial Wellbeing

Similar to financial attitude, perceived financial capability was found as a determinant of Perceived FWB in this study. However, the same significant role was not observed in relation to financial needs satisfaction. This section discusses how this finding links to existing knowledge and its implications for theory or practice.

The result of this study agrees with the literature. The significant role of perceived financial capability towards FWB has been widely recognised in previous studies. Vosloo et al., (2014) found that perceived financial capability has a strong positive relationship with FWB. Perceived financial capability reflects individual self-assessment of the ability to manage and take control of personal finances (Taylor, 2010). Perceived financial capability helps people manage their money to achieve FWB (Lown, 2011). The ability to manage money on a day-to-day basis, plan ahead and financial outcomes (financial resources/wealth) contribute to individual FWB (Fritz and Berger, 2015).
In contrast to the literature, perceived financial capability was not found to be a key determinant of financial needs satisfaction. This result does not fit with the theory, as previous studies suggests that financial capability is a mediator of financial satisfaction which is closely related to subjective wellbeing (Vera-Toscano et al., 2006). To some extent, the finding from the current study suggests that financial needs satisfaction and subjective wellbeing are different concepts as their determinants are not the same. Even though there is a positive correlation between two variables when other factors are not included (see
Table V-28), perceived financial capability appears to not play a significant role in determining financial needs satisfaction.

In conclusion, the findings of the relations between perceived financial capability and two components of FWB are mixed. Having found perceived financial capability as a key factor of Perceived FWB is in line with the literature. On the other hand, the insignificant role of perceived financial capability in relation to financial needs satisfaction is inconsistent with the existing theory. It would be useful for future research to explore whether perceptions of financial capability cause Perceived FWB. Moreover, even if they do not seem to relate to a higher FNS, the two variables might be linked because people whose finances have turned out well tend to report highly in both areas.

### 7.2.4 Financial Behaviour: A Key or Insignificant Determinant of Financial Wellbeing?

The results from the stepwise regression and SEM do not find robust or consistent evidence of financial behaviour having a significant impact on FWB, suggesting financial behaviour plays a less significant, or even insignificant, role in determining
FWB than other factors. The stepwise regression indicated that financial behaviour becomes a significant factor determining FWB when the wealth-factor, financial capacity, is removed (see Table V-36, Table V-37). This finding suggests that financial behaviour could be an important driver of financial needs satisfaction; for example, it may be acting through financial capacity. However, the results from the SEM analysis do not support it having an indirect effect in this way, and do not find evidence of any robust, significant effect of financial behaviour on either measure of FWB. The findings from this study indicate the dominant roles of financial capacity and followed by subjective financial literacy, financial attitudes, Perceived FWB over financial behaviours. This is an important contribution of this study to the literature. Furthermore, to the extent that financial behaviour could influence FWB, the ‘saving and investment behaviours’ were found to be the key factor of financial behaviours that may play a role. This section is going to discuss the implications of these findings and its contribution to the literature.

a. Financial Behaviour is not a Significant Determinant of Perceived Financial Wellbeing and Financial Needs Satisfaction

This findings from this study do not reflect the concept of FWB in the literature review, where FWB is described as an outcome of financial behaviours (Kim et al., 2003; Kim, 2000). Positive financial behaviours tend to reduce financial stress and increase financial satisfaction (Lyons et al., 2008; Xiao et al., 2006). Hence, it was expected to be a significant driver of Perceived FWB and financial needs satisfaction. However, the results from this study that suggest an insignificant role of financial behaviour contrast with both Brüggen et al.’s FWB framework (2017) (see in Figure II-2) and the MAS’s financial capability outcome framework (Bagwell et al., 2014) (see Figure II-6). Financial behaviour is at the heart of Brüggen et al.’s framework (2017) and is an outcome of financial capability in MAS’s framework. They both argue that FWB has a direct impact on FWB. The wealth factors, such as income, accumulated savings, and wealth, are categorised under ‘personal factors’ (i.e. socio-demographics) in Brüggen et al.’s FWB framework (2017). In this model, financial capacity and financial attitudes are not as important as financial behaviours. Furthermore, financial means or capacity is thought to be a fundamental influence on FWB but it is not at the centre of the MAS’s financial
capability outcome framework (Bagwell et al., 2014). In the MAS’s framework (Bagwell et al., 2014), financial attitudes are an element of financial capability that influence financial behaviour directly while it also influences FWB indirectly through financial behaviour.

b. The Relationship between Financial Behaviours and Financial Needs Satisfaction

The literature suggests a common nature of financial behaviour (Dew and Xiao, 2011; Hilgert et al., 2003) and financial needs (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994) is hierarchical. In this study, financial behaviour became a significant determinant of financial needs satisfaction, certainly the strongest determinant, when financial capacity was removed from the model to prevent potential bias (see Table V-36, Table V-37). Likewise, the result from SEM analysis also suggested financial behaviour is an insignificant determinant of financial needs satisfaction (see Figure V-1). In addition, the ‘savings and investment’ was found as the key factor of financial behaviours that account for financial needs satisfaction. This section discusses how these findings are supported by the literature and the contribution to the literature.

The literature endorses this result through the lens of consumer behaviour. Reviewing the literature on an individual’s spending money behaviour to satisfy their financial needs such as consumption for their lifestyle, would offer an explanation why financial behaviours can influence financial needs satisfaction as found in this study. A previous study found that inappropriate purchasing patterns cause issues in managing money (Lea et al., 1995). People get into financial difficulties due to treating the goods for social display as necessities goods. Some people regard certain kinds of expenditure on children (e.g. fashion goods and substantial Christmas gifts) as a necessity, which can contribute to serious debt problems (Lea et al., 1995; Walker et al., 1992). They are prepared to run up debt in order to maintain this need. In contrast, many people would classify these goods as luxuries. This classification of goods as necessities or luxuries has its consequences for purchasing behaviour (Livingstone and Lunt, 1992b).
The above examples in the literature suggest a link between financial needs and financial behaviours, such as overspending or unnecessary spending where people live beyond their means. The examples also show a conflict between satisfying a financial need for lifestyle but compromising a financial need for financial security. When assessing financial needs satisfaction as a sum of various financial needs, some of these needs may have a negative impact on an individual’s FWB, such as serious debt problems. For those who have undesirable financial needs to live beyond their means, the total score of their financial needs satisfaction may be high but it may not reflect a positive FWB. Their needs of consumption may be satisfied in the short-term, but may might cause a negative outcome on their FWB in the long-term due to debt burdens.

This study implies that consumer desirable financial behaviours may somehow not only have a positive influence on the financial needs satisfaction index but also FWB in long-term. Desirable financial behaviours lead an individual to live within their means. Accordingly, people who have a limited financial capacity would have to adjust their spending for lifestyle needs to be able to fulfill the need of savings for financial security. Adjusting their spending is how desirable financial behaviours might be able to mediate the balance between fulfilling a financial need for lifestyle but not compromising a financial need for financial security to achieve a positive level of financial needs satisfaction as a whole. This is possibly the way to explain how financial behaviour becomes significant to financial needs satisfaction in the absence of financial capacity. This topic could be further explored.

Furthermore, this study found three factors of financial behaviours: factor one (‘savings and investment’), factor two (‘cash management’), and factor three (‘credit management’). This finding is in line with a previous study carried out by Dew and Xiao (2011). The theory of financial behaviour describes how people plan and organise their income in order to fulfil their financial needs (Arifin, 2017). Hence, one possible explanation of the result is that the ‘savings and investment behaviour’ factor could affect financial capacity, as the mechanism for financial behaviour influences financial needs satisfaction.
This study contributes to the concept of a hierarchy of financial behaviour, which endorses the importance of developing a high level of financial management behaviour. The finding in this study is in line with previous studies which endorse that savings and investment behaviours are a higher level of financial behaviours following a hierarchical pattern of financial management behaviours (Dew and Xiao, 2011; Hilgert et al., 2003). Hilgert et al. (2003), cited in Dew and Xiao (2011), suggest that the hierarchy of financial management behaviour follows the order where the lowest level relates to cash management, credit, and savings, and the highest level relates to investment management. This finding suggests that an intervention for enhancing desirable financial behaviour should aim to develop the higher level of financial management behaviours, such as savings and investment.

c. Financial Behaviour Plays a Less Significant Role than Financial Attitudes in Relation to FWB

This study found that the role of financial attitudes is more significant than financial behaviours in relation to FWB. There is a kind of overlapping variance between these two variables. This reflects the rule in stepwise regression, when two variables have a lot of overlap information in contribution to the equation, one of them will be excluded (Fritz and Berger, 2015). This could be one of the reasons why the financial behaviours variable was removed from the stepwise multiple regression in this study.

The literature also offers an explanation of overlapping variance between financial behaviours and financial attitudes. Some authors consider financial attitudes as the outcome of certain behaviours (Rai et al., 2019; Ajzen, 1991). By contrast, other authors consider financial behaviours as the outcome of financial attitudes (Zemtsov and Osipova, 2015). This outcome between the two variables could be the reason why financial behaviours and attitudes explain a similar variance in driving FWB. This means that only one of them – whichever is more significant – stays in the equation. In this study, financial attitudes stayed in the equation of Perceived FWB whilst financial behaviours were excluded.
7.2.5 Subjective Financial Literacy: a Consistent Driver of Financial Wellbeing

In this study, subjective financial literacy is not seen to be a key driver of perceived FWB but a contributing and consistent factor of financial needs satisfaction. Subjective financial literacy plays a less important role than financial capacity but on a similar level to the other determinants. However, having found not being a driver of perceived FWB, the result does not entirely fit with the theory that stresses the important role of subjective financial literacy in driving FWB. For instance, CFPB (2015a) proposes that FWB is the ultimate measure of success for financial literacy efforts. This section sheds some light on the findings of the relationship between subjective financial literacy and FWB, and how these fit in the literature.

The literature has argued that financial literacy training enhances FWB (Osteen et al., 2007). The results in this study support the finding from a previous study carried out by Xiao et al. (2014). They also found that subjective financial literacy contributes positively to financial satisfaction. Xiao and Porto (2017) also propose that financial literacy may affect financial satisfaction, a subjective measure of FWB. Haynes et al. (2011) proposes that an increase in financial knowledge could increase overall financial wellbeing. Financial knowledge, along with attitudes, has a positive impact on financial behaviour (Potrich et al., 2016). Gerrans et al. (2014) stresses the importance of financial behaviour and financial knowledge in driving individual FWB. In social marketing, financial education has been used as an intervention that supports and nudges people to make a desirable change in their financial behaviour which enhances their FWB (Darnton, 2008). Financial education has been promoted as the key intervention of FWB (Brüggen et al., 2017). Financial education helps enhance financial self-efficacy, which results in an improvement in FWB (Xiao and Porto, 2017). Financial education has found a role in improving financial capability. Financial education might improve individual financial literacy (knowledge, skills), encouraging a positive change in financial behaviour (Cole et al., 2012; Willis, 2011, 2009; Lyons et al., 2006) to achieve a better financial capacity, which results in improving FWB (Shim et al., 2009; Xiao et al., 2009; Xiao et al., 2006).
The finding from this study implies that subjective financial literacy might enhance financial needs satisfaction but not so much Perceived FWB, which has the multi-dimensional construct of perceptions of financial status (Xiao and Porto, 2017). This study supports the finding from a previous study carried out by Xiao et al. (2014), who also found that subjective financial literacy contributes positively to financial satisfaction.

Even though it has been argued that financial literacy is able to influence financial behaviour, a causal relationship between overall financial literacy and behaviour has not been identified by Allgood and Walstad (2016). This study found a correlation between subjective financial literacy and financial behaviour, but it was not a causal relationship. Furthermore, Vieira and Mendes-Da-Silva (2016) found that financial attitudes mediate the influence of financial knowledge on behaviour. Ibrahim and Alqaydi (2013) argue that education can improve personal financial attitudes, such as reducing dependence on credit cards. Bhushan and Medury (2014), cited in Rai et al. (2019), point out that developing favourable financial attitudes can enhance financial literacy for generations. A link between financial attitudes and financial literacy among the youth was found in previous studies (Rai et al., 2019; Kasman et al., 2018; Grable and Lytton, 1998). This could be the reason why subjective financial literacy was excluded from the Perceived FWB equations. Subjective financial literacy lost its significance in the presence of either financial attitude or behaviour, or both of them. When applying the findings in this study and the literature to a FWB model, it seems that both (subjective) financial literacy and financial attitude play as input elements which results in an output element of financial behaviour and FWB is the outcome. Since both financial literacy and financial attitudes are input elements of FWB, (subjective) financial literacy, which had a less significant contribution than financial attitudes, was not needed in the equation.

On the other hand, financial needs satisfaction is a part of financial satisfaction and Xiao and Porto (2017) suggest that financial literacy is one of the factors affecting financial satisfaction, a subjective measure of FWB. Therefore, the authors (Xiao and Porto, 2017) propose using financial education to influence financial literacy,
financial behaviour, and financial capability to enhance individual financial satisfaction. The findings from this study endorse this suggestion from the literature as subjective financial literacy was found to be one of the determinants of financial needs satisfaction. However, the findings from this study also reflect that financial needs satisfaction and Perceived FWB are not the same concepts.

In general, the result of this study implies that subjective financial literacy may play a role in defining FWB through its relation to financial needs satisfaction. This result is in-line with previous studies which found that financial literacy is one of the factors that affect financial satisfaction (Xiao et al., 2014; Xiao and Porto, 2017). A causal relationship between subjective financial literacy and behaviour is not identified in this study, which is consistent with the literature (Allgood and Walstad, 2016). It seems that the link between (subjective) financial literacy and financial attitude (Rai et al., 2019; Kasman et al., 2018) could be the reason why subjective financial literacy is excluded from the Perceived FWB stepwise multiple regression. The finding also indicates that financial needs satisfaction and Perceived FWB are two distinct concepts. Finally, interventions that target subjective financial literacy may enhance individual financial needs satisfaction. However, it does not necessarily mean subjective financial literacy would improve an individual’s perception of their overall FWB.

7.3 The Nature of Financial Needs Satisfaction

To provide the answer to the research question “what is the nature of financial needs satisfaction, as a component of FWB?”, this study examines how the participants satisfied financial needs and whether a hierarchy exists. No study to date has examined the hierarchy of financial needs satisfaction. This thesis has made a significant contribution to the theory of financial needs and financial needs satisfaction. Being one type of human needs, financial needs inherit some characteristics of human needs such as being hierarchical or having different categories or growth or life cycle as found in previous studies (Kiymaz and Öztürkkal, 2019; Xiao and Anderson, 1997; Xiao and Noring, 1994). This study adapts Maslow’s theory (1943, 1954) to develop the concept of financial needs, financial needs satisfaction and conceptualises it as a component of FWB (Howell
et al., 2013). This study does not use Maslow's framework directly but adapts this framework to draw insights into financial needs and its satisfaction.

Taken as a whole, the categories of financial needs satisfaction in this research fit in Maslow's general hierarchy. However, that the results do not conform with Maslow's five level theory of needs (1943, 1954), a feature adapted into the proposed hierarchy of financial needs presented in 3.2.2, but suggest a four-level hierarchy of financial needs satisfaction. This four-level hierarchy roughly corresponds to the things we need now (e.g. housing and food), the things we need in the future (e.g. a pension), the things we want, and our long-term goals and aspirations (e.g. educational aspirations and philanthropy).

This section examines the findings of the nature of financial needs satisfaction (see Figure VI-2) and makes a comparison with Maslow's hierarchy of needs (1943, 1954) (see Figure II-4). The section also examines the theoretical framework of financial needs proposed in this research (see Figure III-2). By comparing this study's results with financial practice, this section contributes a clearer understanding of the hierarchy of practical financial needs in relation to family financial capacity (Xiao and Noring, 1994) and a hierarchical pattern of financial management behaviours (Dew and Xiao, 2011; Hilgert et al., 2003).

7.3.1 A Comparison with Maslow’s Hierarchy of Needs

This section compares the original theory with five levels of Maslow's hierarchy of human needs (1943, 1954) (see Figure II-4). The findings in this research indicate that the factors of financial needs satisfaction fit in Maslow's general hierarchy. Nevertheless, it suggests the boundaries of some needs are inexact, particularly towards the top of the hierarchy. This finding is inline with previous studies which found Maslow's hierarchy is overlapping and not completely hierarchical (Gollwitzer et. al, 2012; Wahba and Bridwell, 1976). Since this study specifically focuses on financial needs, many aspects of Maslow's hierarchy do not apply. For instance, notably, parts of love and belonging or self-esteem do not link to finance. Consequently, different emphases and terminology have been used in this study. However, in general, the concept of certain categories in Maslow's model and the
categories of financial needs satisfaction in this study are the same. For example, this can be seen in Maslow's physiological need category and the 'finance for existence' need category in this study. One of Maslow's physiological needs relates to having a place to live, while this study has a similar need that relates to having enough money to buy or rent a house, which is included in the 'finance for existence' category. The similar need has an identical position in both hierarchies (hierarchy of human needs and financial needs satisfaction), which adds weight to both theories.

While there is a close match between the category of finance for 'existence and security' in this study and Maslow's physiological, safety, and security needs, the findings in this study suggest the distinction is primarily based on the time horizon. For instance, 'finance for existence' relates to immediate needs and 'finance for security' relates to future needs, whereas Maslow's hierarchy has a slightly different emphasis on financial security as a whole (e.g. employment, social welfare). Moreover, the results in this study suggest those who have opted into taking financial education, view the 'safety' aspects of finance being of part of finance for existence, such as money for healthcare, education, and insurance.

The finance-related aspects of love and belonging in Maslow's hierarchy match closely to the finance for enjoyment category. In addition, while combined elements of esteem, it emerges that self-esteem in this study and self-actualisation in Maslow's hierarchy also match in broad terms. However, the boundaries are more fluid; it appears that participants divide Maslow's self-esteem category into self-esteem and self-worth or wealth. The wealth that directly links to an individual's self-esteem. Perception of self-worth is being actively respected by society due to their wealth or being proud of their wealth. Also, being able to use their wealth to benefit other people can enhance a sense of personal worth and self-esteem, which in turn can increase the sense that life is meaningful (Klein, 2017). Self-worth and self-esteem are critically determined by social acceptance (Klein, 2017; Leary and Baumeister, 2000; Leary, 1999). The reputational benefits of prosocial behaviour are likely to increase individual self-worth (Klein, 2017). This fits with self-actualisation in the highest category of financial needs satisfaction hierarchy of this study as well as Maslow’s hierarchy. On the other hand, spending money to possess
materials can also enhance feelings of self-worth (e.g. buying designer clothes to feel good about yourself). From a consumer psychological perspective, the possession of materials represents the important domain on which a person perceives their self-worth (Ferraro et al., 2011). In a global culture of consumption, materialistic behaviours and attitudes are seen as determinants of self-worth. Self-worth encourages youths to use credit cards for consumption to enjoy a lifestyle and show the power of prestige, status, symbols, and brands (McNeill, 2014). This can be seen among the participants in this study who view self-worth in relation to them having money for enjoyment or lifestyle. Self-worth for doing good deeds can be seen in the top four categories of financial needs satisfaction in this research, ‘finance for self-actualisation’ and ‘self-actualisation’ in the top five levels of Maslow’s hierarchy.

Even though there is a blurred line in some categories such as basic financial needs and financial security, there are common categories between the hierarchy of financial needs satisfaction in this research and Maslow’s hierarchy of needs (1943, 1954), as seen in Figure VII-1. By contrast, both Maslow (1943, 1954) and Taormina and Gao’s (2013) models propose five levels, while this research found four categories of financial needs satisfaction. The discussions of the similarities and differences can be summarised as follows:
(1) **Finance for Existence** relates to physiological needs in Maslow's hierarchy with additional elements of the immediate financial safety and security needs, such as housing, insurance, basic education, and healthcare.

(2) **Finance for Security** relates to the rest of financial safety and security needs (e.g. savings, pensions, resilience to unexpected expenses) in the Maslow's hierarchy. These are the things that need to be done to secure a financial future. However, for some people, they tend to live for today and let the future take care of itself, thus they put off these needs as they are not immediate. They may even put a significant emphasis on life enjoyment, such as lifestyle and what they want before satisfying financial security needs. In these cases, life enjoyment often relates to the immediate desires that a person's psychological biases want them to satisfy, whereas future needs can be put off. Accordingly, for the individuals, their immediate desires lead their choices to spend money to satisfy their prioritised needs. These are the differences between the hierarchy of importance and the satisfaction of human needs.

(3) **Finance for Enjoyment** corresponds to love and belonging in Maslow's hierarchy, but is secondary to esteem. Finance for enjoyment covers the elements of lifestyle that relate to what people want rather than need. In Maslow's theory (1943), love and belonging needs relate to having affectionate relations with people, such as receiving love, support, warmth, and affection from a wide-ranging social circle. In this study, this relates to people spending money to maintain love and belonging needs, such as socialising and special occasions with their love ones. This also includes spending money on lifestyle, which is shared within their social circle. Being able to spend money on themselves and others, can enhance self- and social-esteem.

(4) **Finance for Self-actualisation** relates to two levels of esteem needs and self-actualisation in Maslow's hierarchy. Esteem needs in Maslow’s theory include
two components: self-esteem and esteem from other people (Taormina and Gao, 2013; Maslow, 1943). Self-esteem focuses on self-worth, self-respect, and positive self-regard while social esteem relates to being admired by others, such as prestige, respect, esteem, recognition, and positive regard or appreciation. Self-esteem can be the mastery of skills in areas that are important or pleasurable to them (Clarke et al., 2006), while self-actualisation is an ongoing process to satisfy the need to be ‘what one was born to be’ (Clarke et al., 2006, p. 936) to fulfil self-fulfilment, self-acceptance, enjoying life, living life fully, doing what you want, and satisfying your desires (Taormina and Gao, 2013; Maslow, 1962). The category of esteem and self-actualisation in this research has similar elements to Maslow’s theory, but the emphasis is on finance such as respect and pride from wealth, educational aspirations. While social esteem can be seen in supporting social networks and charity. The category of esteem and self-actualisation in this research covers self-actualisation and the positive aspects of esteem. Whereas Maslow’s esteem is mostly focused on self-worth, there are aspects of this that are more akin to fame, to being recognised, known, and respected positively, which sit on the boundary between esteem and self-actualisation. Self-actualisation is an aspiration, what we hope and strive to be, which for many people is about improving themselves (e.g. educational aspirations) or helping others and giving beyond our immediate families. An individual’s perceived pride and respect for wealth is achieved by making contributions to a charity or carrying out philanthropic works that help the wider community. As a result, the person becomes known, rewarded and respected for their good deeds, which is a sign of them being the ‘best self’ that one can achieve.

The findings from the factor analysis in relation to the importance of financial needs shows that the finances for existence and security are grouped together, suggesting that people see these as being of similar primary importance, even though their sense of satisfaction and actions in satisfying them are different. This structure fits in Maslow’s hierarchy, though it suggests the boundaries of some needs are inexact, a point highlighted by the qualitative results. For instance, some specific needs and desires are often linked to two adjacent ones.
(e.g. finance for existence and finances for security), and with some potential classifications putting certain needs in different category in the hierarchy.

Perhaps the hierarchy in both this research and Maslow’s theory is not a well-defined set of discrete steps. Hence, even though this research found four levels of financial needs satisfaction rather than five levels (as proposed in Maslow’s theory), this does not constitute a fundamental difference. It is a subtle difference in relation to where precisely the boundaries appear to be in finance in comparison to general human needs. For example, aspects of love and belonging relating to the family can fall into safety and security, with other aspects of positive relationships linking to respect and esteem. Similarly, aspects of esteem seem to fall into the lifestyle category, and what people want, where people have a need to feel self-worth, that we matter in some way, to ourselves and those nearest to us, which is driven by our base desires in the same way as love and belonging. By contrast, the desire for particularly notable levels of esteem, such as fame, pride, and respect for being wealthy, seem to fit more comfortably into the self-actualisation category. Another example of the difference between the categories of financial needs satisfaction in this study and Maslow’s model is the split of immediate and higher-level of needs is similar, but not entirely the same as in Maslow’s psychological and safety and security needs. Lastly, the differences may also be linked to the sample in this study, as people who actively chose to take financial education may view financial needs differently than a more general audience.

7.3.2 A Comparison to the Proposed Theoretical Framework of Financial Needs

The proposed framework is drawn from Maslow’s framework, hence the discussion in the above section applies, with the notable exception of ‘financial freedom’ (see Figure VII-2). The most significant difference between the proposed theoretical framework of financial needs and the tested hierarchy of financial needs satisfaction relates to the top category ‘financial freedom’. Financial freedom is conceptualised as the highest level of financial needs satisfaction based on the concept of FWB (Brüggen et al., 2017). The top level
of financial needs is financial freedom as a key to self-actualisation (Clarke et al., 2006). However, the findings in the factor analysis of financial needs satisfaction, discovered that financial freedom remains within the ‘financial security’ category. This finding is consistent, as it is in line with a previous study that found that people perceive FWB when they have a sense of material security, such as feeling satisfied with their income and savings (Strumpel, 1976).

This could also be because financial freedom is often talked about in relation to the financial goals of saving to pay off debts, owning one’s house, or being able to spend money on things wanted rather than needed. In terms of importance, financial freedom is weakly associated with lifestyle with a factor loading of 0.255 (seen Table V-10). Hence, it could be seen as a link between these two factors. Otherwise, it could be that some participants answered the question with the broad idea of freedom in mind (e.g. being able to do what they want); hence, placing financial freedom within the category of lifestyle (e.g. spending on the things they want). By contrast, others had in mind a more specific concept of ‘financial freedom’, that which is free from financial burdens and debt; hence, they considered it as a future need in relation to saving for pensions, savings, and unexpected expenses.

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7.3.3 Hierarchy of Financial Needs Satisfaction Reflects Financial Practice

While the results from this research did not suggest a hierarchy of five levels of human needs satisfaction as found in a previous study (Taormina and Gao, 2013), they do follow a similar pattern, with subtle differences relating to the specific nature of financial needs and a natural fluidity between tiers. Financial needs involve financial matters such as debts, savings, and retirement which Taormina and Gao’s (2013) traditional human needs model did not focus on. Maslow’s hierarchy of human needs is heavily involved with aspects of consumption (Lea et al., 1995), while the financial needs model in this study expands it to demands in personal finances, that is financial security or consumption of financial products and services, such as insurance and saving for retirement.

The lowest level of finance for existence and the next level, finance for security, were equally ranked in importance to participants, though this was not the case when they came to satisfy these needs, which reflects both real life financial practice.
and the nature of human behaviour. For example, it could be seen that participants perceived the importance of saving and planning ahead as equivalent to the importance of their immediate needs, even though they tended to satisfy their immediate needs first and did not always achieve the same level of satisfaction with their long-term security needs. Furthermore, how people perceive the importance of specific financial needs is linked to the way they manage their money for different purposes in practice. This finding is reflected in the behaviour of the participants in this research who actively chose to undertake financial education, which could mean that they view financial needs differently than a more general audience. The general public might be less inclined to group immediate needs and planning ahead in terms of their importance.

In the UK, people are encouraged by government agencies and personal financial experts to 'plan ahead' and to set financial priorities. Planning ahead is important preparation for the long-term (e.g. 12 months) to allow for unexpected expenditure or a drop in income (Nguyen, 2017). For instance, putting money into different 'pots' (e.g. insurance, pension, and savings) can help provide for a rainy day or a change in financial circumstances. The concept of 'pots' indicates an element of planning for the future: an attempt at ensuring that one type of expenditure does not lead to other types of expenditure having to be curtailed (Vlaev and Elliott, 2014).

In financial education, people are encouraged to set up practical 'pots': for bills, for retirement, for saving for a specific goal, or for discretionary spending and so on. These financial practices are based on a different concept in relation to the hierarchy of financial needs. The financial practices focus on how to help people make good active decisions about where to spend their money but in some ways is linked to the hierarchical categories such as discretionary spending for enjoyment. The needs of having money to put in these pots in financial practice, very much relates to certain financial needs examined in this study (i.e. saving for a rainy day or saving for unexpected expenses). While being able to afford to have a positive behaviour of putting money in these pots would satisfy these financial needs. This supports the idea of using the hierarchy of financial needs satisfaction practically. This is because allocating 'pots' for financial needs motivates planning ahead to achieve higher FWB. Planning ahead could help address the gap between an individual's
perception of the importance of satisfying immediate financial needs, and could help them work towards long-term needs for financial security. For example, justifying priorities and setting aside financial resources for different ‘pots’ for immediate financial needs in conjunction with the needs of financial security and enjoyment.

The banking system is another type of financial practice that may influence the way people classify their money for different purposes or the needs of having money for these purposes. Banks encourage their customers to place their money into ‘pots’, such as opening three separate accounts for different purposes: paying bills, spending money, and saving money (Dolan et al., 2012).

The allocation of money for different purposes is a useful way of making ends meet and to build savings for managing expenses. Customers establish goals for pots such as rainy day and an emergency fund that do not have a specified use (Dolan et al., 2012). Placing money in ‘pots’ has been found to be a statistically significant determinant of financial satisfaction (Vlaev and Elliott, 2014) and financial well-being (Elliott et al., 2010). Having a ‘planning ahead’ mindset to ensure financial security in the long-term is a basic or standard financial need. This could be the reason why basic needs and financial security were in one category and there were only four levels of financial needs satisfaction found in this study. Saving or planning ahead is something intrinsically hard for humans to do psychologically, as it involves giving up spending that makes us happy in the present to fund future benefits. This maybe why the participants viewed it as similar importance to immediate needs but is not reflected in their behaviour or perception of satisfaction.

In addition, a previous study found that household practical financial needs are hierarchical in corresponding to an increase in family financial resources (Xiao and Noring, 1994). They observe what is predicted by Maslow’s (1954) theory, that when families increase their financial resources, such as income, assets, and net worth, they are likely to move onto more and higher-level needs. Financial needs move up the hierarchy from ‘daily expenses’, ‘emergency’ to ‘retirement, children, and growth’ (Xiao and Noring, 1994). Furthermore, when the household financial needs move up the ladder to saving for emergencies and investment for growth, it is likely that their financial management behaviours are also required to become equipped for
higher levels of financial needs, such as saving and investment management. A previous study found a hierarchical pattern of financial management behaviours where cash management behaviour came first, followed by credit, savings, and investment management (Dew and Xiao, 2011; Hilgert et al., 2003). These findings are in accordance with the findings of a hierarchy of financial needs satisfaction in this study. For instance, daily expenses are included in the finances for the existence category while emergency and retirement savings are part of a higher level of financial security. This point was exemplified in one of the follow-up interviews when a participant indicated that if she had an increase in income, she would not only contribute more to household expenses but also use the extra money to satisfy the higher needs of financial security, such as save more and increase pension contribution.

The upper level of finance for enjoyment covers spending on children. While Xiao and Noring (1994) suggest that spending on children is a higher level of financial need, another study found otherwise. Brambley et al. (2019) found that when needing to cut spending, participants, particularly mothers, report that spending on children is the last thing they would cut. This suggests that while money to plan to have children may be higher on the hierarchy, money to spend on one’s children is much closer to the basic needs level (Brambley et al., 2019). The relationship between the hierarchy of financial needs and the development of an individual’s financial behaviours could be further explored in future study.

In conclusion, this section reviews how different categories of financial needs satisfaction fit in Maslow’s hierarchy of needs (1943, 1954) and the proposed theoretical framework of financial needs in this study. When comparing this study’s results with the theory, similarities and differences exist. A distinction has been found between the categories of financial needs satisfaction and Maslow’s general hierarchy in a number of levels, where some of the boundaries between the categories are inexact. The top category ‘financial freedom’ presents the most significant difference between the proposed theoretical framework of financial needs and the categories of financial needs satisfaction found in this study. Previous studies undertaken refer to financial freedom as the highest level of financial needs satisfaction (Brüggen et al., 2017). However, by contrast to the previous literature,
many participants in this study linked financial freedom to ‘financial security’. This finding supports the idea that people perceive FWB when they have a sense of material security, such as feeling satisfied with their income and savings (Strumpel, 1976).

The results provide a new insight into the relationship between financial needs and human needs. Since this study focuses on financial needs (e.g. debts, savings, and retirement) which do not focus on the many unrelated financial aspects of human needs in Maslow’s hierarchy, there are different characteristics of financial needs satisfaction and human needs satisfaction. This study suggests the distinction is primarily based on the time horizon of immediate financial needs and future financial needs. The participants in this study view some financial security aspects fit into existence. Another possible explanation for the distinction is that the hierarchy in both this study and Maslow’s theory is not a well-defined set of distinct steps. Hence, although this research found four levels of financial needs satisfaction rather than five levels as theorised in the literature (Taormina and Gao, 2013; Maslow, 1943 1954), this does not amount to a fundamental difference. Finally, by linking the categories of financial needs satisfaction to financial practice, this study also explains the nature of financial needs in relation to financial planning. This research endorses the idea of using the hierarchy of financial needs satisfaction practically to promote the behaviour of allocating money into ‘pots’ for future financial planning. This is in agreement with the hierarchy of household practical financial needs (e.g. from ‘daily expenses’, saving for emergencies to ‘retirement, children, and financial growth’) (Xiao and Noring, 1994) and a hierarchical pattern of financial management behaviours (from cash management to credit, savings, and investment management) (Dew and Xiao, 2011; Hilgert et al., 2003).

### 7.4 Research Implications

Understanding the key determinants of Perceived FWB and financial needs satisfaction is useful to help inform interested parties to develop interventions to promote FWB. If these determinants, such as financial capacity, perceived financial capability, and financial attitudes, are negative, it is likely to have an undesirable impact on FWB. This is when an intervention is needed. The findings in this research
might have some important implications for intervention development in order to enhance individual FWB. This section offers some implications. The first implication relates to the potential use of financial needs satisfaction as an additional indicator to assess FWB. The second implication is for intervention development with the use of partnership-based approaches to support different driving factors of FWB. Further important implications could apply to some specific stakeholders, such as financial educators, social marketers, and policymakers.

**a. The Use of Financial Needs Satisfaction as an Additional Indicator to Assess FWB**

One of the contributions of this study is that it fills the gap of inquiry to find an underpinning theory to develop the measure of the concept of FWB that focuses on consumer lifestyle and needs, and ability to meet their needs and wants (Brüggen et al., 2017; CFPB, 2015a). Financial needs satisfaction and Perceived FWB are used to explore subjective aspects of FWB in this research. This prompts the question of whether financial needs satisfaction is useful as an additional indicator to assess FWB? This section discusses how the use of a financial needs satisfaction concept can be applied to different research contexts to assess individual FWB.

The concept of human needs, such as Maslow’s hierarchy of needs (1943, 1954), can be useful in studies on FWB. Maslow’s model provides underpinning theory to explain consumer behaviours that relate to FWB, such as spending, shopping, and saving. This model also helps to understand why satisfaction with financial circumstances as a whole tend to be connected to a person’s financial needs satisfaction. Nevertheless, prior to this study, there has been limited studies on FWB interventions that examine target audiences’s financial needs and satisfaction. To promote financial behaviour and wellbeing, social marketing needs to explore other concepts or theories in marketing that are more relevant to personal finance. For example, Maslow’s hierarchy of needs (1943, 1954) could be one of these theories, which relates to human demand, spending, consumption, and living standards. Furthermore, people may have similar financial needs but their capabilities to meet these needs are different. Having a low financial capability to satisfy these needs might influence a person's perceived FWB negatively or vice versa. On the other
hand, some undesirable financial behaviours that may lead to negative FWB, such as over-spending or over-borrowing for 'consumption' for lifestyle (e.g. food, clothes, cars, luxury goods, holiday). Therefore, using Maslow’s hierarchy of needs (1943, 1954) offers an opportunity to explore an individual’s FWB in a new perspective.

In the FWB concept of Brüggen et al. (2017), a desired living standard refers to an individual preference for their quality of life. Many people's household financial decisions and planning relate to their preference of living standards. Maintaining a specific standard of living is closely related to behaviour and goals, such as spending money on travelling, housing, cars, and education, or planning for retirement to meet the desired lifestyle (Meyer, 1996). Brüggen et al. (2017) argues that an individual must be able to meet his or her desired standard of living to be able to perceive FWB. Their concept of FWB recalls Maslow’s hierarchy of needs (1943, 1954) and the importance of satisfaction of needs to human wellbeing (Howell et al., 2013). The concept of human needs (such as Maslow’s hierarchy) should be included in studies on FWB in order to understand consumer behaviour (e.g. spending, shopping around, and saving) and their financial needs satisfaction.

Understanding the needs, FWB and characteristics of a population who are actively seeking help from online intervention to manage their money is essential to help them achieve their goals. This research aims to inform the interested parties of useful insights to guide their work in order to support this population to achieve better FWB. The research focuses on a target audience who have taken advantage of an online educational intervention to achieve better outcomes of FWB. One of the main contributions of this study is to provide the stakeholders with insights on this specific population to develop effective FWB interventions.

The answer to the question – ‘can financial needs satisfaction be used as an additional indicator to assess FWB?’ – is not straightforward. It is valuable to use financial needs satisfaction in a study that focuses on consumption and wealth aspects and how it influences FWB. In addition, some related industries such as financial services can use financial needs satisfaction concept to understand consumer financial needs, behaviours and the decision-making process related to purchasing financial products and services.
On the other hand, Perceived FWB that focuses on emotions/feelings cannot be replaced by financial needs satisfaction, as it measures different aspects of FWB. Furthermore, the key drivers of Perceived FWB and financial needs satisfaction are not the same. Perceived FWB in this study relates to a mixture of positive and negative emotions in all aspects of personal finance, while financial needs satisfaction only focuses on material and consumption aspects.

In summary, using the financial needs satisfaction concept that examined in the study to assess individual FWB might be beneficial to different research contexts, such as investigating consumer FWB in related industries such as financial services. Assessing one's financial needs satisfaction is useful for understanding how it influences FWB, and how it can be intervened to achieve better outcomes. Interventions that target financial capacity, behaviour, and subjective financial literacy can enhance financial needs satisfaction and wellbeing.

b. Intervention Development with Partnership-Based Approaches

The result of this study suggests that financial capacity is the most significant contributor to Perceived FWB. The relationship between FWB and its determinants can be reversible. For example, a correlation between financial capacity and Perceived FW suggests that Perceived FWB could also cause financial capacity. However, in the literature, FWB is often examined as an outcome of financial capacity (CFPB, 2015; Bagwell et al., 2014). This is also the direction this study takes. Also, the additional SEM analysis indicates that this direction makes sense with valid models of FWB components acting as outcome variables. Hence, the research implications focus on the direction where FWB is an outcome variable, though it is important to not that relationships could conceivably go in either direction.

Material wealth/income is seen to be more important than psychological or subjective factors, such as attitudes and perceived financial capability in driving individual Perceived FWB. In the context where other influential factors are
controlled, helping people to overcome low financial capacity may potentially enhance their FWB.

Research supported by the JPMorgan Chase Foundation reviews how low-income households are currently being supported to manage their money, save for the future, and deal with financial problems in the UK (Gibbons et al., 2016). Low-income groups are most likely to experience problems: the recipients of benefits (some on universal credit), social and private housing tenants, those of black and minority ethnic (BME) origin, young adults (aged 18–24), and older people in retirement (Gibbons et al., 2016). Many low-income households have existing debts (Gibbons et al., 2016) which cause financial strain and undesirable FWB (Shim et al., 2009).

Arguably, interventions that target the aspects of financial capacity related to income or wealth may be limited. In other words, interventions that aim to improve perceived financial capability, attitudes, behaviours, do not often aim to improve participants’ income. It is suggested that partnerships are necessary to deal with low financial capacity, as it a complex matter (Gibbons et al., 2016). This study endorses the partnership-based approach, as dealing with existing debts requires funding programmes to offer both crisis assistance and debt and benefits advice. Gibbons et al. (2016) suggest a partnership-based approach in order to help people deal with financial shocks and debt problems, and also to help them plan for their financial future and build up savings. In addition, providing help to improve financial knowledge and skills, and motivate people towards longer-term goals also is needed.

Below are some suggestions for partnership-based interventions to overcome low financial capacity:

- Workplace FWB programmes to offer a wide range of services and types of support. Access to financial education and guidance is often at the core of these programmes (FinCap, 2020). Employers can also support their staff’s FWB by providing a range of other types of support: access to regulated advice; financial products and services (e.g. payrolls savings); cost reduction schemes (e.g. payrolls savings).
travel card loans, discounted memberships) and low-cost loans or grants to manage short-term money emergencies (FinCap, 2020).

- Employability programmes to provide support to help people obtain the required skills in order to find work, or a better-paid job.
- Financial services could play a significant role to assist households to: manage their cash-flow; pay for goods and services safely and efficiently (for example, by facilitating on-line purchases), or provide insurance against common risks (e.g. critical illness insurance).
- By providing credit, or conversely by helping households to build up savings and pensions, can help households raise capital for investment (e.g. their education, skills, and housing) and provide for a decent standard of living in retirement (Gibbons et al., 2016). As a result, low-income people would not have to borrow money from organisations such as payday, or door to door money lenders to meet their credit needs. Financial needs of low-income people should be taken care of. More co-operation is needed between financial service providers and financial support services to design products that are appropriate to the needs of those with low-income (Gibbons et al, 2016).
- Regulations to protect consumers are undoubtedly needed. For instance, StepChange, the debt advice agency has called for the Financial Conduct Authority to cap unauthorised overdraft charges whilst Citizens Advice has pushed for a cap on the total cost of rent to own agreements.
- Working with FinTech companies to help design new apps and test how they can help improve budgeting skills and encourage savings. Specific funding needs to be provided to support the establishment of partnerships between FinTech companies, financial capability providers, and affordable lenders (Gibbons et al, 2016).

Based on the understanding of key drivers of FWB, this study agrees with the partnership-based intervention approach in Gibbons et al.’s study (2016). Integration of interventions is required to handle multiple factors that control Perceived FWB and financial needs satisfaction. Interventional strategies should be designed to tackle all determinant factors to promote individual Perceived FWB. Furthermore, the interventions would need to positively impact both financial capacity and financial needs satisfaction. As it would be difficult for any intervention
to affect FWB directly so the most rational choice is to focus on the more intervable factors, such as financial attitudes and behaviours, which can impact on FWB (Rai et al., 2019).

In the case where a partnership-based intervention approach to deal with low financial capacity is not possible, due to a lack of resources or networking, it is necessary to explore other factors that are more intervable than financial capacity. This means that instead of focusing on income improvement as an outcome, the intervention might target action-based outcomes, such as spending within means, making ends meet, keeping up with the bills, and dealing with credit commitments without borrowing.

It is important to clarify which factors, beyond financial capacity, can be intervened and should be targeted by the interventions. The findings of this research suggest that financial attitudes and behaviour and perceived financial capability could be targeted in any intervention to promote Perceived FWB. Subjective financial literacy can also enhance financial needs satisfaction and wellbeing. The choices of targeted factors for interventions are explored in this study that including action-based financial capability factors, such as perceived financial capability, attitudes, behaviours, and knowledge-based financial capability factors (subjective financial literacy).

When thinking of designing an intervention to support low-income groups, it is useful to recognise that ‘lower-income households’ are not homogenous. They can be categorised into subgroups with different needs and characteristics, such as financial services requirements, planning priorities, and support needs at different times (Gibbons et al., 2016). Financial behaviours of households with similar demographic characteristics can be different, and it is important to understand their attitudes and motivations to make changes (Gibbons et al., 2016).

Overall, the findings of this study endorsed the literature review which reassures that financial capacity is the key determinant of both Perceived FWB and financial needs satisfaction. Interventions aimed at enhancing FWB should take into account this driver.
c. Implications for Educators and Online Education

Financial education is not the subject matter but the context mainly in this thesis. This study does not focus on or draw insights about financial education. However, the key findings from this research can be applicable in practice to financial educators who promote (online) financial education to enhance an individual’s FWB. This section discusses how to apply the knowledge from this research in combination with the literature to increase the effectiveness of financial education in promoting FWB.

Online financial education has been used to positively influence undesirable financial behaviour and to promote FWB (Miller et al., 2014). Focusing on online financial education, part of the motivation of this study is to inform the interested parties – educators, learners, social marketers, and other stakeholders – on how to make use of interventions to promote desirable financial behaviour change and FWB. This study attempts to answer the question: how should online financial education be developed to deliver effective intervention?

Some studies on interventions of financial behaviour use the segmentation discipline to tailor financial education material to meet individual consumer needs of learning (Xiao et al., 2016; West, 2012). A single online financial education programme does not fit all segments of a population with specific needs. It is important to design diverse programmes based on assessing the entry levels and the needs of participants. It can start with a foundation level that offers basic financial knowledge and skills in all areas of personal financial management. Then, offering more personalised courses for different segments that focus on different needs of financial education such as savings, managing debts, pensions, insurance etc. for low-income participants. Whilst the other specifications are required for higher-earning participants who are more interested in managing and investing for their wealth etc. The common practices, such as saving for rainy days or emergency funds should be promoted to all segmentations. In addition, personalised courses for people who have certain conditions, such as a learning disability, are useful as they may have limitations in their financial capacity, as well as their capacity to make changes. For example, one participant (OLF) in the MMM course suggested that it might be helpful to include more diversified case studies to make the course
applicable to those who have slightly different life course such as not having a job or children. If someone has a disability, they may not be able to work; hence, diversified financial scenarios and coping strategies are essential.

By contrast, for pensioners financial educational information targeted at young people might not be applicable to them. They may skim through the contents quickly, such as buying their first house or issues relating to university or college fees. Pensioners may only be interested in financial advice that is directly applicable to them. For those who have a pension and are on a fixed income, they may have an interest in how to manage that fixed income.

It is valuable to include a section about FWB as a part of the course contents. This would create awareness and prompt participants into taking action by discussing what form FWB, its influential factors, and how to achieve better FWB. For instance, it is helpful for participants to understand the hierarchical nature of financial needs and how it shapes individual FWB. It is important to stress the necessity of setting priorities among varied financial needs at different stages of life. When prioritised financial needs are met; they are likely to achieve financial satisfaction.

Setting objectives to measure the impact of the intervention should be based on the individual capacity for change, and perhaps other influential factors found in this study. The expectations in relation to the impact of positive financial interventions needs to be realistic. The interview data suggests that individual financial needs are influenced by individual financial capacity, lifestyle, and life cycles. This study suggests that evaluating the impact of an online educational intervention should be based on the segmentation of those who have similar economic demographics (age, financial capacity etc.). This is because people that have different economic demographics might have different financial priorities, needs and wants. Economic demographics also influences the ways they manage their money, and what changes need to be made might be different and sometimes incomparable. Furthermore, setting objectives for the interventions should be based on understanding the segments of participants that have different levels of financial resources to define their capacity to make positive changes. Previous studies found that financial education significantly impacts financial behaviour and financial
literacy but is less effective for low-income clients or low- and lower-middle-income economies (Kaiser and Menkhoff, 2017). Low income is a challenge that financial education might not be able to overcome (Kaiser and Menkhoff, 2017; Fernandes et al., 2014). Hence, small changes should be considered for those who have a low capacity of change when evaluating the impact of an intervention.

The findings from this study could be used to develop case studies for financial planning, behavioural intervention, and counselling courses that enhance FWB. For example, it is useful to utilise online financial education as a first step to attract potential audiences that may need help to improve their FWB. During the first step (pre-programme) on a general financial education course, the programme organisers could evaluate the participant’s FWB and its determinants – such as capacity levels with financial attitudes, behaviours, and perceived capability – to explore their interventional needs. The second step could offer specific programmes to meet their needs and decide whether the focus of the intervention is on the single determinant of FWB or adopt collaborative interventions to deal with multiple determinants at the same time to create a more significant outcome.

d. Implications for Social Marketing and Other Stakeholders

Similar to financial education, this study does not focus on variables derived from social marketing. However, the key findings from this research can be applied in practice to social marketers who promote desirable financial behaviour change to enhance an individual’s FWB. Social marketers use marketing principles and techniques to promote the adoption of behaviours that improve the health or wellbeing of the target audience or society as a whole (Kotler and Lee, 2011; Nedra Weinreich, 2011). Therefore, understanding key determinants of FWB and their relationship with FWB can inform social marketers in their works to encourage desirable changes to enhance an individual’s FWB. Accordingly, this section discusses how social marketers can apply the knowledge of financial behaviour and other determinants of FWB from the literature and this research to develop the ideas for FWB interventions.
It has been stated that barely any literature has focused on social marketing products (Glenane-Antoniadis et al., 2003). No study to date has looked at whether financial education intervention can be used as a social marketing product to promote financial behaviour change and wellbeing. A creative approach is needed in the use of financial education intervention as a social marketing product for FWB intervention for social good. This social marketing product has different types such as face-to-face or online financial education interventions that can be part of the social marketing-mix to promote FWB.

Looking at the consumer perspective, social marketing for the promotion of social change involves the understanding of the needs of key stakeholders which can be achieved by segmenting the markets into homogeneous targets. The formation of interventional strategies should be based on generating satisfying and meaningful ‘exchanges' with the target groups (Hastings et al., 2000). The markets can be segmented by demographics, geography, nationality, ethnicity, income, and so on, and then the potential of each market segment can be assessed to determine the most suitable ones to target (Klinger and Schündeln, 2011).

In addition, understanding the hierarchical nature of financial needs of the participants and segment them following their needs would be useful. Segmentation by financial needs provides a better understanding of people’s needs in financial matters to provide adequate financial services and products (Fünfgeld and Wang, 2009). Segmentation allows financial service providers to recognise patterns of financial behaviour in order to group individuals according to their financial product needs (Harrison, 2000). Segmentation identifies different levels of financial competence and needs for financial products (Fünfgeld and Wang, 2009). This approach is important when designing a product for commercial marketing but has not been widely used in designing an intervention for social marketing.

By segmenting respondents on the basis of a broader range of financial attitudes and behaviour, this can be helpful in identifying those people most in need of professional financial advice (Fünfgeld and Wang, 2009). Fünfgeld and Wang (2009) found that private individuals differ in their day-to-day financial behaviour, and this has an influence on the choice of tools used to transform their financial
behaviour. It is beneficial to offer a more professional approach by taking into account specific segments and serve these needs to attract clients. A segmented approach can increase customer satisfaction and reduce costs by responding specifically to different segments. Instead of providing standard products to individual investors, investment programmes can be designed and tailored to specific groups. A better understanding of the determinants of differences in financial attitudes and behaviour allows the financial service to be more effective.

Social marketing products or services that promote financial behaviour change and wellbeing often start with customer-based research on market segmentation to understand better and serve their wide-ranging needs and various behaviours (Speed and Smith, 1992). This section has examined the features of online financial education through the lens of social marketing product. This study suggests social marketer using the segmentation process when designing an intervention by categorising the population into segments based on their financial capability and FWB. This suggestion is a contribution of this study to literature in social marketing.

This study provides empirical evidence that online education could benefit individual financial behaviour change, which has been found in formal face-to-face education. Online financial education can be used as an entry step to categorise participants in different segments following their mutual financial needs, financial capability, wellbeing and readiness to make a change. The next step would be to offer them additional interventions that are developed based on the understanding of the insights of each segmentation.

It is also useful to adopt communication tools in social marketing to encourage individuals to prioritise their financial needs and their behaviours based on their financial capability to achieve better financial satisfaction. It is also important to understand the financial security needs of target audiences, such as saving for rainy days or an emergency, and to measure learners’ desired level of savings. This information can be used to inform an objective of an intervention. People are likely to accept interventional ideas if it is related to their immediate savings goals.
This study suggests that educators, social marketer, and financial services providers, can work together to enhance the individual capacity of change (Gibbons et al., 2016). For example, offering an incentive for making a behaviour change. This incentive can be financial products that benefit participants in their progress of making a change. For instance, free budgeting tools linked to their bank accounts to help them manage their money more effectively, or tools that help them set up a reminder to pay off debt. These budgeting tools linked to the digital reports from individual bank accounts can be useful to objectively examine the changes in an individual financial position. Special financial products for low-income participants can help encourage participants to pay off high-interest debts using very low-interest loans. Another incentive for those who have a very small amount of savings is offering better interest rate if they increase their savings amount to a certain percentage in a specific period after the intervention. Using a partnership-based intervention to run these programmes would be useful (Gibbons et al., 2016).

Improving financial capacity is found to be important part that shapes individual FWB, as well as their capacity for change. There are limitations to what financial educational intervention can do to help low-income participants to increase their financial capacity and be able to make changes. Policymakers can help citizens by increasing minimum wages to ensure individual basic needs are met so that their FWB can be improved.

In conclusion, the findings from this study offer some useful implications to social marketers, educators, counsellors, policymakers, and financial services providers. This research endorses the use of financial needs satisfaction as an alternative indicator to assess FWB and recommends a partnership-based to tackle the complex issues surrounding FWB. This research also encourages interested parties to take advantage of online financial education as an important part of FWB interventions. Online financial education can potentially play a partial role in intervention programmes to promote FWB.

7.5 Limitations of the Study and Future Research
Although this thesis has made some research contributions to the literature, there is still room for improvement. It is plausible that a number of limitations could have influenced the results obtained. This section reviews the research limitations and proposes the direction for future research.

### 7.5.1 Research Limitations

This research has some limitations. The first limitation relates to low response rates in the post-surveys, and the consequential lack of data caused issues in the quality of the data. The second limitation relates to restraints in the sampling. First, this study was unable to assess individual financial literacy objectively, due to the limited responses to the quiz, which was embedded in the course contents. A lack of an objective element to measure financial literacy index might be the reason that subjective financial literacy was not shown to be a driver of Perceived FWB in this study. Having both measures of subjective and objective financial literacy would be beneficial to assess the impact of financial literacy. This also applies to financial behaviour and capability; the objective measures of these variables were not covered in this study. Another limitation of this study relates to there being a lack of items to measure the basic financial needs.

To some degree the lack of demographic data, such as age, gender and income, prevented this study from exploring the role demographics factors on individual FWB. It also was impossible for this study to compare the levels of FWB and other relevant variables (e.g. financial needs importance and satisfaction, financial behaviour, and financial capacity etc.) among the participants from specific populations.

Another limitation of the sampling relates to the low response rate of the post-surveys. This prevented testing the findings in different time periods to observe the change of the research variables. There was also a lack of dataset to compare the results to a different population. Having another set of samples for confirmatory factor analysis would have been useful to measure scale and theory development. Further data collection would be needed to determine the exact key determinants of FWB. It would be beneficial to retest, on larger sample sizes and different
populations, the findings relating to financial behaviour to determine if it is a insignificant driver of Perceived FWB, and a hidden but important driver of financial needs satisfaction.

Another limitation of this study is that it was unable to match the identity of participants between the surveys and post-interviews. Due to data protection and privacy policies of the gatekeeper, this research was not allowed to identify participants across the three sources of data collection. This raises issues in relation to running research in collaboration with a gatekeeper. Having limited access to the participants was a challenge in this study. These constraints were difficult to overcome, since the gatekeeper chose the online survey platform and created and sent out the online surveys, thus only a restricted number of emails were allowed to be sent to the participants. This lack of control had an undesirable impact on the effectiveness of this research, especially/particularly relating to the low response rate.

A further limitation relates to the timing and availability of the case study. The case study, the MMM course, started in January 2018, which was the final run of the course. A pilot study was carried out before Christmas and the official pre-survey delivered in the second week of January. Preparation in the short time between the surveys was an issue to obtain a higher level of response rate for the pilot survey. There was also limited time to run an analysis on the pilot data and revise the pilot questionnaire. When designing mixed methods studies, there needs to be sufficient time to for a pilot study, pre- and post-data collections and analysis.

In addition, measuring FWB is complex and cannot be explained by simple and fixed response sets. This study examined FWB in relation to positive and negative feelings and financial needs satisfaction. These two measures of FWB captured different forms of emotions, such as general feelings, as well as feelings on specific aspect of financial behaviour, such as financial needs satisfaction. Furthermore, assessing financial needs satisfaction was considered in relation to the importance of each financial needs to an individual. Lastly, the results of this study apply to a specific population of online financial education learners. In order to provide more robust evidence, further research is needed to explore different populations.
7.5.2 Future Research

After highlighting this study’s contributions, its implications and limitations, the research has also helped identify some areas for further investigation. The suggestions for further research focus on specific aspects relating to scale development, validation, research methods, and areas for further investigation.

Firstly, future studies might explore more objective measures of research variables, so that the results do not rely solely on subjective self-report from the participants, for example, objective measures of financial capability, its components, and their lifestyle. Objective measures of financial capability could be calculated using financial statements or account balances (e.g. savings, investments, and pension fund). Based on participants’ financial statements, it might be useful to analyse financial ratios, including the liquidity ratio, the debt-to-asset ratio, and the investment ratio (Tenney and Kalenkoski, 2019). Defining the concept and measurement of financial capability and FWB is complicated. Hence, it is not reasonable to measure individual FWB through a single question with a few items using the same scales to measure all aspects that form FWB. On the other hand, a long questionnaire would not be beneficial to the response rate of the participant. A long questionnaire often puts participants off. Hence, future research needs to justify and decide measures that are able to identify individual FWB and its determinants.

Secondly, future research might consider designing in similar settings with this research but with the inclusion of a control group to assess the impact of online financial education on research variables rigorously and unbiased. It is useful to have more datasets to conduct confirmatory factor analysis for scale and theory development. Nevertheless, the results of this study are promising but only apply to a specific population of online financial education’s learners. The results could be validated by a larger sample size with a different population. Future research could examine different sets of samples to run a confirmatory factor analysis. This is to test the scales of research variables, such as financial needs importance and satisfaction.
The findings in this study suggest some opportunities for future research. First, this study suggests that individual financial needs are not always fitted in a hierarchy like structure and a hierarchy of five levels of financial needs was not found. This study suggests future research improves the design of the questionnaires. In addition, in the questionnaire of this study, there was only one item to measure the “basic needs” level. This limitation might be the reason why the “basic needs” level mixed with the items in the higher levels of financial needs such as financial security in the factor analysis. Hence, it would be useful for future studies to have the basic financial needs that are unpacked to include specific items, such as money to pay for food, bills and transportation to distinguish this level with financial security for instance. Future studies could further examine the link between the hierarchy of financial needs satisfaction and the level of financial capacity. This helps to understand whether individual financial needs satisfaction progress in accordance with the level of their financial capacity.

The findings in this study are limited to the populations mainly living in the UK and Europe and inadequate for cross-cultural generalisability. Hence, it would be useful for future studies to replicate the findings in this study to developing countries. Future work should concentrate on the relationship between financial behaviour and capacity. The results indicate that an intervention towards financial behaviour might have an impact on financial capacity which results in an improvement in financial needs satisfaction. However, the evidence in this study was not robust enough to generalise this finding. Future work should target on this as it is a fruitful topic.

This study found that perceived financial capability had an insignificant role in relation to financial needs satisfaction. This is inconsistent with the existing theory; therefore, it is recommended that further research could explore whether perceptions of financial capability cause Perceived FWB. Finally, another important matter to resolve for future studies is the 65% or more variance of Perceived FWB cannot be explained by the independent variables in this study. Future research should explore further these unidentified factors that decide individual Perceived FWB.
In summary, this section has discussed the research limitations and opportunities for future research. A number of limitations have been revealed: low response rates that resulted in a lack of datasets for the data analysis; a lack of demographic data; an inability to match participants’ identities across surveys, and the timing and availability of the case study. The limitations could have influenced the research findings. This research will serve as a basis for future studies on financial needs satisfaction hierarchy, FWB and its determinants in the context of online financial education.

Future studies can learn from these limitations while further investigating important key findings in this research. Further research could be undertaken to validate the findings in this study on a larger scale and a different population. Future work could concentrate on scale development in relation to financial needs in order to examine individual financial needs satisfaction and its hierarchy. Future studies might also include a control group to evaluate the impact of online financial education on other research variables. Finally, to generalise the finding of the relationship between financial behaviour and financial capacity in this research, future studies could examine whether an intervention towards financial behaviour might have an impact on financial capacity which results in an improvement in financial needs satisfaction.

### 7.6 Conclusion

In summary, this chapter has clarified the key contributions of this study. The first contribution of this study proposes an underpinning theory to develop the instruments to measure the concept of FWB that focuses on consumers’ lifestyle and financial needs (including financial freedom) (Brüggen et al., 2017; CFPB, 2015a).

The results provide further evidence of the role of financial capacity as a key determinant of FWB, which endorses the concept of FWB proposed by Zemtsov and Osipova (2015). The significant impact of financial capacity on FWB is so strong that it almost excludes other variables such as financial behaviour. By contrast, financial attitudes, perceived financial capability, subjective financial literacy, and financial behaviour, have a less robust direct impact on FWB. This finding is in
contrast to previous studies which argue that financial behaviour has a significant influence on FWB, whilst other variables, such as financial attitude and capacity, play a less significant role (Brüggen et al., 2017; Bagwell et al., 2014).

Secondly, this thesis has made a contribution to the theory of financial needs satisfaction by using Maslow’s hierarchy of needs (1943, 1954) in order to explore the nature of the satisfaction of financial needs as a component of FWB (Howell et al., 2013). The categories of financial needs satisfaction in this research fit in Maslow’s general hierarchy. However, the results do not coincide with Maslow’s five-level hierarchy of needs (1943, 1954) but instead suggests a four-level hierarchy of financial needs satisfaction. Another contribution is to financial practice, this thesis provides a clearer understanding of the hierarchy of practical financial needs in relation to family financial capacity (Xiao and Noring, 1994) and provides a hierarchical pattern of financial management behaviours (Dew and Xiao, 2011; Hilgert et al., 2003).

This study also makes a practical contribution by providing a case study for social marketing. This study examines the features of online financial education through the lens of a social marketing product and categorises the population into segments based on their capability and wellbeing. Lastly, one of the main contributions of this study is that it provides the stakeholders with insights on a specific population, online financial education participants. Understanding the financial needs, FWB and characteristics of a population who actively seeks help from online intervention to manage their money is essential. The knowledge informs the interested parties and guides their works to support this population to achieve better FWB through online financial education.

This study has provided some research possibilities for intervention development for interested groups, such as educators, social marketers, and policymakers. It is recommended that they work together to deal with various factors that influence FWB. It has been argued that online financial education would have a stronger impact if integrated with other forms of intervention.
The limitations of this study were reviewed, relating to low-response rates and not having a control group to compare the results. This study has suggested some areas for future study, such as scale development and validation for financial needs satisfaction, retesting the hierarchy of financial needs satisfaction, the inclusion of a control group to evaluate the impact of online financial education and the relationships between financial behaviour, financial capacity and financial needs satisfaction.

**VIII. CONCLUSION CHAPTER**

FWB has been found to have a strong impact on people’s lives in relation to their quality of life, happiness, general wellbeing, success, physical and mental health, and the quality of their relationships (Hubler et al., 2016; Dunn and Mirzaiel, 2012). Interventions have been developed to bring about positive FWB. Understanding what needs to be intervened is essential. This study adopts the two conceptions of
wellbeing, hedonic and eudaimonic, to construct two components of financial needs satisfaction and FWB determinants. This research has contributed to the knowledge of the nature of FWB through exploring financial needs satisfaction and FWB determinants. These determinants are categorised as: (1) material wealth/income (financial capacity), (2) action-based financial capability factors (financial attitudes, perceived financial capability and financial behaviour) and (3) knowledge-based financial capability factors (subjective financial literacy). This study also found that hedonic and eudaimonic views of FWB are distinguished concepts, but they have similar determinants such as financial capacity and financial behaviour.

Exploring the determinants of FWB, the results did not find evidence to support hypotheses five, six or seven. This study has found that financial capacity is the key determinant of FWB. Whilst financial attitudes, perceived financial capability, subjective financial literacy, and financial behaviour, have much smaller and less robust impact on FWB. Particularly, the stepwise regression analysis indicated financial behaviour is a hidden factor that explains FWB through its relation to financial needs satisfaction in the absence of financial capacity. Whilst SEM analysis suggested financial behaviour is an insignificant determinant of FWB. ‘Being in control’ of finances is a key factor of financial attitudes that is also a determinant of Perceived FWB. ‘Being in control’ was also found a key factor in the previous study (Vlaev and Elliott, 2014) but this study reinforces the finding in the context of online education with a wider range population.

Examining financial needs satisfaction, this study did not find evidence to support the conceptualisation which proposes that ‘there are five distinct categories of financial needs satisfaction’. Instead, the study identified: four categories of a hierarchy of financial needs satisfaction: finance for existence, finance for security, finance for enjoyment, and finance for self-actualisation. The results and their interpretations are both in line with existing research on Maslow’s general hierarchy (1954). By contrast, this study offers evidence to support the conceptualisation that proposes that the categories of financial needs satisfaction fit in a hierarchy structure like Maslow’s hierarchy of needs. However, this result was not conclusive, as individual financial needs satisfaction does not always follow a hierarchical order.
of five items. Finally, the result did not endorse the conceptualisation which proposed that financial freedom is at the top of the hierarchy.

The implications of these findings are that an individual’s financial needs might have a negative impact on their FWB if what they want lies outside of their financial capacity, or they cannot meet their needs financially. Having a low financial capacity might constrain on what an individual could do to enhance their financial capability after the intervention. Financial capacity determines individual financial self-control and confidence. A mixture of interventions with partnership-based approaches would be beneficial to tackle the constraints of financial capacity and other determinants of FWB. Previous studies found that financial education plays an important role in encouraging financial behaviour change (Cole et al., 2012; Willis, 2011, 2009; Lyons et al., 2006). However, this study implies that interventions should be expanded in their scope to take into account other factors, such as financial attitudes, as this might make more of a significant contribution to FWB than financial behaviour.

When concluding the results in this study, it is important to acknowledge the limitations of research methods (i.e., multiple regression, common method variance etc.) and potential endogeneity bias. For instance, the findings only apply to the set of variables in this study with an assumption that all other omitted variables are controlled. The relationships between two components of FWB and other five variables are reversible. However, as the centre of this study is exploring the two components of FWB as an outcome and other variables as influential factors, the interpretations highlight this side of the direction mainly.

Online financial education can be a useful part of interventions that promote FWB. This study examined learners and found their positive feedback on online education which could benefit their FWB. Educational interventions need to be realistic in terms of setting objectives. There are limitations in this study that require further research exploration. For example, it is beneficial for future research to develop objective measures of key drivers of FWB, use more datasets to test the research frameworks, and include a control group to assess participant changes after an intervention has been applied. Finally, the findings in this study are expected to
inform educators, social activists, and policy makers in relation to their social change programmes for enhancing the FWB of society. A collaboration of diversified approaches at different levels is required in order to achieve more significant outcomes for FWB.

IX. REFERENCES


Um, M., Yun, H., Jeong, C.S and Heo, J.H. (2011) ‘Factor Analysis and Multiple


**APPENDIX**

**Appendix A: Demographic Characteristics of Participants**
### A.1 Pre-Survey

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
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</tr>
<tr>
<td>18-25</td>
<td>5</td>
</tr>
<tr>
<td>26-35</td>
<td>19</td>
</tr>
<tr>
<td>36-45</td>
<td>12</td>
</tr>
<tr>
<td>46-55</td>
<td>17</td>
</tr>
<tr>
<td>&gt;65</td>
<td>13</td>
</tr>
<tr>
<td>Unknown</td>
<td>318</td>
</tr>
</tbody>
</table>

### Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
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</tr>
<tr>
<td>Male</td>
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</tr>
<tr>
<td>Unknown</td>
<td>303</td>
</tr>
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</table>

### Accommodation

<table>
<thead>
<tr>
<th>Accommodation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with parents</td>
<td>43</td>
</tr>
<tr>
<td>Living with partner in their own house</td>
<td>8</td>
</tr>
<tr>
<td>Own outright</td>
<td>47</td>
</tr>
<tr>
<td>Own with a mortgage</td>
<td>84</td>
</tr>
<tr>
<td>Rent from a housing association or other social landlord</td>
<td>29</td>
</tr>
<tr>
<td>Rent privately</td>
<td>70</td>
</tr>
<tr>
<td>Shared house of multi-occupancy</td>
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### Type of Household

<table>
<thead>
<tr>
<th>Type of Household</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple non-dependent children</td>
<td>12</td>
</tr>
<tr>
<td>Couple with children</td>
<td>95</td>
</tr>
<tr>
<td>Couple, no children</td>
<td>76</td>
</tr>
<tr>
<td>Single, children</td>
<td>21</td>
</tr>
<tr>
<td>Single, no children</td>
<td>59</td>
</tr>
<tr>
<td>Unrelated adults</td>
<td>16</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
</tr>
<tr>
<td>Sources of Income</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Salary</td>
<td>212</td>
</tr>
<tr>
<td>Self-employment</td>
<td>40</td>
</tr>
<tr>
<td>Pension</td>
<td>29</td>
</tr>
<tr>
<td>Family aid</td>
<td>25</td>
</tr>
<tr>
<td>Property investment</td>
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<tr>
<td>Benefits</td>
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<td>Child support</td>
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<tr>
<td>Student loans</td>
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<td>Others</td>
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<table>
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<th>Level of Education</th>
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<tbody>
<tr>
<td>GCSE/Vocational/ O level</td>
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<tr>
<td>A level or equivalent</td>
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</tr>
<tr>
<td>Degree or higher</td>
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<table>
<thead>
<tr>
<th>Employment</th>
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</thead>
<tbody>
<tr>
<td>Employed full-time</td>
<td>28</td>
</tr>
<tr>
<td>Employed full-time e</td>
<td>1</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>12</td>
</tr>
<tr>
<td>Full-time student</td>
<td>4</td>
</tr>
<tr>
<td>Looking for work</td>
<td>5</td>
</tr>
<tr>
<td>Not working</td>
<td>4</td>
</tr>
<tr>
<td>Retired</td>
<td>7</td>
</tr>
<tr>
<td>Self-employed</td>
<td>11</td>
</tr>
<tr>
<td>Unemployed</td>
<td>9</td>
</tr>
<tr>
<td>Volunteer</td>
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<table>
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<tr>
<td>Accountancy banking and finance</td>
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<td>Charities and voluntary work</td>
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</tr>
<tr>
<td>creative arts and culture</td>
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</tr>
<tr>
<td>Category</td>
<td>Count</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Energy and utilities</td>
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<td>Engineering and manufacturing</td>
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<td>Environment and agriculture</td>
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<tr>
<td>Health and social care</td>
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<tr>
<td>Hospitality tourism and sport</td>
<td>1</td>
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<tr>
<td>IT and information services</td>
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</tr>
<tr>
<td>Law</td>
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</tr>
<tr>
<td>Marketing advertising and PR</td>
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</tr>
<tr>
<td>Media and publishing</td>
<td>2</td>
</tr>
<tr>
<td>Property and construction</td>
<td>3</td>
</tr>
<tr>
<td>Public sector</td>
<td>5</td>
</tr>
<tr>
<td>Recruitment and PR</td>
<td>1</td>
</tr>
<tr>
<td>Retail and sales</td>
<td>8</td>
</tr>
<tr>
<td>Science and pharmaceuticals</td>
<td>1</td>
</tr>
<tr>
<td>Teaching and education</td>
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**Income**

<table>
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<tbody>
<tr>
<td>£0-£11,499</td>
<td>67</td>
</tr>
<tr>
<td>£11,500-£19,999</td>
<td>50</td>
</tr>
<tr>
<td>£20,000-£29,999</td>
<td>34</td>
</tr>
<tr>
<td>£30,000-£50,000</td>
<td>44</td>
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<tr>
<td>Over £50,000</td>
<td>24</td>
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<table>
<thead>
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<th>Income Range</th>
<th>Count</th>
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<tbody>
<tr>
<td>£0-£11,499</td>
<td>29</td>
</tr>
<tr>
<td>£11,500-£19,999</td>
<td>33</td>
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<tr>
<td>£20,000-£29,999</td>
<td>21</td>
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<td>£30,000-£50,000</td>
<td>40</td>
</tr>
<tr>
<td>Over £50,000</td>
<td>61</td>
</tr>
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</table>

*Table A.1-1: Demographic characteristics of participants*
### A.2 Follow-up Interview

<table>
<thead>
<tr>
<th>Participants</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Employment</th>
<th>Household</th>
<th>Country</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS</td>
<td>Female</td>
<td>45-54 years</td>
<td>O level</td>
<td>Home duty</td>
<td>Couple with two children</td>
<td>Australia</td>
<td>Salary 150,000 pounds - household annual income</td>
</tr>
<tr>
<td>HEN</td>
<td>Male</td>
<td>55-64 years</td>
<td>Degree or higher</td>
<td>Retired</td>
<td>Couple with two children (one adult child left home)</td>
<td>UK</td>
<td>Income from properties or investments £0-£11,499</td>
</tr>
<tr>
<td>MAF</td>
<td>Female</td>
<td>55-64 years</td>
<td>Degree or higher</td>
<td>Employed full-time</td>
<td>Couple with two children</td>
<td>St. Lucia</td>
<td>Salary 19,000-20,000 pounds</td>
</tr>
<tr>
<td>MR</td>
<td>Female</td>
<td>Over 64</td>
<td>Degree or higher</td>
<td>Retired</td>
<td>Single</td>
<td>UK</td>
<td>Pension and rental income. 30,000 to 50,000.</td>
</tr>
<tr>
<td>OLF</td>
<td>Female</td>
<td>25-34 years</td>
<td>Degree or higher</td>
<td>Unemployed</td>
<td>Me and my parents</td>
<td>UK</td>
<td>N/A</td>
</tr>
<tr>
<td>TJL</td>
<td>Male</td>
<td>45-54 years</td>
<td>Degree or higher</td>
<td>Employed full-time</td>
<td>Couple with two children (one adult child left home)</td>
<td>UK</td>
<td>Salary Over £50,000</td>
</tr>
</tbody>
</table>

*Table A.2-1: Demographic data of participants in the follow-up interview.*

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### Appendix B: Questionnaires

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B.1 Pre-Survey Questionnaire

Welcome
Thank you for taking the time to complete this FutureLearn pre-course survey.

We'd like to find out more about you and your reasons for taking this course. Your answers help us to understand our audience and to keep improving FutureLearn and our courses.

This survey should only take about 20 minutes to complete and all the questions are optional.

This is one of three optional surveys that you will have the opportunity to complete as part of this course. The other two are the post course survey which you will receive a link to at the end of the course and a follow-up survey which will be emailed to you six months after the course has finished. Everyone who completes the three questionnaires will be entered into a prize draw with an opportunity to win one of five £100 Amazon vouchers (see terms and conditions), courtesy of the Open University.

The data from this survey will be shared between FutureLearn and the Open University. The data of this survey will be disseminated in a PhD for a student at The Open University.

Your responses will be associated with your FutureLearn account but will not impact your progress on any course. For more information about how responses are used, please take a look at our Privacy Policy and Terms and Conditions.

PART 1: FUTURE LEARN QUESTIONS
The data from part 1 was not used for data analysis in this study as it was designed by Future Learn for their research purposes.

I. Your Goals

1. Which of the following best describes why you want to take this course?
I want to take this course in order to...

☐ explore future career or study options
☐ prepare for or support a specific work or study goal (e.g. a job interview, exam, assignment or objective)
☐ advance, develop or stay up to date in my profession or field
☐ understand, fix or manage an event or situation in my personal life and finances (i.e. debt, a lack of saving)
☐ to change my financial circumstances
☐ learn from other participants’ experience to deal with my financial issues
☐ to change the way I manage my money
☐ flourish personally and improve my wellbeing
☐ complement my personal hobbies or voluntary activities
☐ vitalise my mind, learn for pleasure or satisfy intellectual curiosity
☐ other (please specify in text box) […]

2. What do you hope to achieve by taking this course?

Having a personal goal can help you feel motivated throughout this course. This can be an area of interest you want to learn more about, a specific question you would like to be able to answer or a new skill you hope to achieve (please specify in text box) […]

II. Social Learning

FutureLearn encourages learners to learn from each other.

3. Which of the following social learning activities would you like to do during or after the course? *Select all that apply*

☐ share my expertise with other learners
- Find learners who I'd like to follow on Futurelearn
- Help other learners (e.g. by answering questions)
- Share my personal experiences and perspectives with other learners
- Get feedback on my work or ideas
- Share what I learn with my community, friends, family or colleagues
- Learn from the expertise of other learners
- Talk about the course generally with other learners
- Network with professionals and experts taking the course
- Take part in a group activity or discussion
- Learn from the personal experiences and perspectives of other learners
- None of these
- Other (please specify in textbox) […]

### III. Your Previous Experience of The Subject

#### 4. What previous experience, if any, do you have in this subject area? (Select all that apply)

- I work in a related field
- I'm training to work in a related field
- I used to work in a related field
- I'm currently studying for a degree in this subject (at any level)
- I've previously studied for a degree in this subject (at any level)
- I'm currently studying for another type of qualification in this subject
- I've previously studied for another type of qualification in this subject
- I've taken a short course (or some short courses) in this subject
- It's a personal interest or hobby
- I have no previous experience in this subject
- Other (please specify in textbox) […]

#### 5. How well do you feel you currently understand the course subject?

- Not at all
- A little
- Fairly well
- Very well
- Not sure

### IV. Working in A Related Field
On the previous page you told us that you work in a field related to the course subject.
6. Please tell us your job role in text box […]

V. Training to Work in A Related Field
On the previous page you told us that you are training to work in a field related to the course subject.
7. Please tell us the role you are training to work in […]

VI. Studying in A Related Field
On the previous page you told us that you are currently studying this subject.

8. What are you hoping to do or become after you finish your current studies?
For example, once you graduate, what job role would you like to do? please specify in text box […]

VII. Recommending The Course To Others

9. Based on what you know about the course so far, how likely are you to recommend this course to someone you know?

0 - Not at all  |  1  |  2  |  3  |  4  |  5  |  6  |  7  |  8  |  9  |  10 - Extremely likely / I have already

10. If you know of somewhere (e.g. a website or journal) that you think FutureLearn should be promoting this course, please let us know. please specify in text box […]

PART 2: THIS RESEARCH QUESTIONS
1. Which of the following do you expect from the Managing My Money course? (please tick all that apply)
   - The contents are well designed and easy to understand
   - Provide me with new and useful knowledge and skills in managing my finance
   - The use of case studies that relate to my financial circumstances
   - To keep me up to date with personal financial matters
   - Easy access to online learning support services during the course (i.e. instant feedback)
   - The platform is well designed and is technically and functionally advanced (i.e. mobile friendly, site navigation, browsing speed)
   - The option to have discussions with mentors and other participants
   - The opportunity to obtain a certificate at the completion of the course
   - Other (please specify in text box) […]

2. Do you currently have any financial goals? Please tick the option that best applies to you.
   - No
   - Yes, I have financial goals and a written plan for achieving it
   - Yes, I have financial goals but I haven't got a written plan for achieving it

3. What are your financial goals relating in the followings?
   - Scales (1-5): Less than 1 month / 1-5 months / 6-12 months / 1-5 years/ Over 5 years
   - I have goals that relate to savings, pensions
   - I have goals that relate to paying off debts
   - I have goals that relate to spending (holiday, buying a car etc.)
   - I have goals that relate to making some changes in managing my money
   - I have goals that relate to my investment
   - I have other financial goals (please specify in the box) […]

4. People often seek help from their social networks while dealing with their financial matters (i.e. dealing with debts or changing their undesirable behaviours). How well do these statements describe you?
Scales (1-5): Does not describe me / Describes me somewhat well / Describes me moderately well / Describes me very well / Describes me extremely well

- There are family who could help me financially (i.e. get rid of debts)
- There are friends, or co-workers who could help me financially (i.e. get rid of debts)
- There are family who could help me deal with the stress of managing my money
- There are friends, or co-workers who could help me deal with the stress of managing my money
- My friends and relatives let me know they are there to help me
- I rely on my social networks (i.e. family, friends) to meet future anticipated expense
- I rarely discuss my personal financial matters with family or friends
- I have someone to call if I needed to talk about my plan of changing my behaviour
- There are counsellors to help me
- There are organisations that I can go to for advice
- There are others I could talk with who have gone through similar experiences with changing their behaviour or getting out of financial trouble like me
- I do not trust anyone can help with my financial matters but myself
- It’s important for me to be able to rely on friends and family for financial assistance

5. Have you ever done any financial education before? (including formal and informal education, i.e. self-study from other sources of information)
   - Yes
   - No

6. What types of financial education do you have and when did you have it? (display this question if select “yes” in the previous question) (Tick all that apply)
   - Formal education (schools, colleges, universities)
Informal education (short courses with no qualification, training at work, workshops etc.)
Self-study through social media (websites, blog, YouTube, forums etc.)
Learning through financial digital platform (i.e. tracking money or savings apps, bank apps, money gamification
Self-study through reading books, magazine or TV etc
Learning from social networks (family, friends, colleagues)

7. When was the last time you had that type of financial education? (i.e. 1999, 2017)
Please specify in the drop box []

8. How would you assess your financial knowledge and skills in following areas?
Scales (1-10): 1=very low and 10=very high
Financial Planning for the future
Household budgeting
Consumer credit and borrowing
Mortgages/home loans
Debt management
Savings
Pensions
Insurance

9. In general, please indicate the extent to which you agree or disagree with the following statements about your ability to manage your finance?
Scales (1-7): Strongly disagree / Somewhat disagree / Disagree / Neither agree nor disagree / Somewhat agree / Agree / Strongly agree

- I’m good at managing my money day-to-day
- I’m good at planning ahead for future

10. How well would you say you have managed financially over past six months?
Would you say you are...

- Living comfortably
11. Would you say that you are better off, worse off or about the same financially than you were six months ago?

- A lot worse off
- A little worse off
- Just about the same
- A little better off
- A lot better off

12. How would you rate your current income?

- Not at all adequate
- Can meet necessities only
- Can afford some of the things I want
- Can afford just about everything I want
- Can afford everything I want and still save

13. How would you describe your financial situation over the last 6 months?

- Have something left over
- Break even
- Be in debt
- I don’t know

14. How long could you keep up with the following financial situations without borrowing (including credit card) at the moment?

*Scales (1-5): 1- Less than one week / Less than one month / Less than six months / Less than twelve months / 5- Twelve months or more*

- Length of time I could make ends meet if faced unexpected drop in income without borrowing is...
Length of time I could make ends meet if faced an unexpected major expense without borrowing is...

Length of time I could keep up with my bills and credit commitments without borrowing is...

15. Thinking about your personal finance, how do you feel about your overall financial circumstances? Please choose the adjectives and its scales that best describes the intensity of those feelings.

* Scales (1-5): 1-Not at all / A little / Fair / Very / 5-Very much (* reversed scores)

Happy - Nervous* - Worried* - Anxious* - Angry* - Frustrated* - Hopeless* - Lonely*- Depressed* -Satisfied - Tense* - Confident

16. Please indicate how often have you engaged in the following activities in the past six months?

* Scales (1-5): 1-Never / Seldom / Sometimes / Often / 5-Always / Not applicable (N/A)

(* reversed scores)

- Comparison shopped when purchasing a product or service
- Paid all your bills on time
- Kept a written or electronic record of your monthly expenses
- Stayed within your budget or spending plan
- Paid off credit card balance in full each month
- Maxed out the limit on one or more credit cards*
- Made only minimum payments on a loan*
- Began or maintained an emergency savings fund
- Saved money from every pay-check
- Saved for a long-term goal such as a car, education, home, etc.
- Contributed money to a retirement account
- Bought bonds, shares or put money in investment funds

17. Please indicate the extent to which you agree or disagree with the following statements

* Scales (1-7): 1-Disagree strongly Disagree / Somewhat disagree / Neither agree nor disagree / Somewhat agree / Agree / 7-Strongly agree
I feel I am on top of my monthly outgoings
I know the detail of my financial situation at all times of the month
I feel comfortable dealing with financial matters
I only spend within my means
Borrowing makes me feel uncomfortable*
I am comfortable with borrowing for something that I consider to be essential*
I find it difficult to resist pressure to “keep up with the Joneses”*
In order to keep in touch with friends, I spend money that I would rather not spend on going out*
I always use credit for non-essential items*
I think it is easy to get into debt because banks and shops make it too easy to get credit*
I adjust the amount of money I spend on non-essentials when my life changes
I tend to live for today and let tomorrow take care of itself*

18. Thinking about changing the way you manage your finance, please indicate the extent to which you agree or disagree with the following statements.

Scales (1-7): 1-Disagree strongly / Disagree / Somewhat disagree / Neither agree nor disagree / Somewhat agree / Agree / 7-Strongly agree

□ Nothing I do will make a big difference to my financial situation
□ I feel insecure with any change in my financial decision making as I am not confident that I have the adequate knowledge and skills to deal with my financial matters
□ Changing undesirable behaviours in managing my money is good for me
□ I intend to make a positive change(s) in the way I manage my finances
□ I am not concerned about changing the way I manage my money because I have other means to fall back on (i.e. family, benefits…)
□ Most people who are important to me think that I should change the way I manage my money
□ I am doing well with my money so I do not need to change anything
Whether or not I make a change in the way I manage my money is completely up to me

I'm confident that if I wanted to, I could easily change the way I manage my money

I feel that I have the necessary knowledge and skills to manage my finances

19. Thinking of the importance and satisfaction of your current financial needs, please choose the following that best applies to you

a. *Scales - Importance* (1-5): 1- Not at all important / Slightly important / Moderately important / Very important / Extremely Important.


- Having enough money to pay for my basic needs such as food, clothes, rent and bills, transportation etc.
- Having enough money to pay for my education
- Having enough money to pay for my health care
- Having enough money to buy a house (mortgage & bills)
- Having enough money to pay for insurances (i.e. house, car, motorbike etc.)
- Having enough money for special occasions (wedding, birthday, Christmas etc.)
- Having enough money to save for rainy days
- Having enough money to save for unexpected major expenses
- Having enough money for my pension fund or/and invest for wealth
- Having enough money to pay for my lifestyle (i.e. eat out, luxury goods, hobbies, holidays etc.)
- Having enough money to buy things I don't really need but I want to have it
- Having enough money to pay for social activities and maintain my social connections
- Having social networks that I can count on for financial support
- Having enough money to support my family/partners/friends
- Having spare money to donate for charity
- Having enough money to pay for my educational inspirations
To master my knowledge in managing my finance
- Respected by others thanks to my wealth
- Proud of my wealth
- Having the wealth to help others make money for non-profit purposes (i.e. philanthropist: create jobs, invest to improve life quality for the poor, life-changing maker etc.)
- Having the freedom to do what I like without worrying about money

20. Did you have any life events in the past six months that had an impact to your financial circumstance? Please tick all that apply.

- Finished my education
- My partner or I started full-time education
- Got married or started living with partner
- Had a child
- Moved to a new house
- Bought property for the first time
- Changed job to work for different employer
- Started work
- Loss of income (redundant or lost job)
- Pay cut
- Pay rise
- Loss of family member
- Divorced or separated
- Health issues
- Retirement
- Started to have debts or more debts
- Bankruptcy
- Others (please specify in the box) [...]
☐ Self-employment
☐ Income from properties or investments
☐ Financial aid from family
☐ Pension
☐ Others (please specify in the box) […]

22. What is your personal and household annual income? (please ignore this question if you prefer not to say)

Scales (1-5): £0-£11,500 / £11,500-£20,000 / £20,000-£30,000 / £30,000-£50,000 / Over £50,000

☐ Your personal annual income
☐ Your household income (if your finance associates with your partner/spouse or family member)

23. What is your housing status?

☐ Own outright
☐ Own with a mortgage
☐ Living with parents
☐ Living with partner in their own house
☐ Rent from a housing association or other social landlord
☐ Rent privately
☐ Shared house of multi-occupancy

24. Who is in your household?

☐ Single, no children
☐ Couple, no children
☐ Single, children
☐ Couple with children
☐ Couple non-dependent children
☐ Unrelated adults
☐ Other (please specify in the box) […]
B.2 Interview Questions

I. Previous financial education
1. Have you had any financial education or been on any courses to help with your finances before taking this course? [Prompt: family, self-study, apps, internet/ If yes, follow up].

II. Learning motivations
1. What prompted you to take part in the “Managing My Money” course? (prompt: any specific financial concerns: debts, lack of savings)

2. If not already mentioned did you feel that you need to make some changes in the way you manage your money? (for example, budgeting, saving, borrowing, investing, pension, insurance)?

3. How did you expect the course to help you? (prompt: any learning goals and specific knowledge/skills)

4. Did the content and design of the course meet your expectations?

5. Has this course motivated you to learn more to help manage your finances?

III. Learning achievements
1. Did you apply the knowledge from the course to make a change in the way you manage your money? (i.e. budgeting, saving, borrowing, debts, pension, investment, financial planning, insurance).

   IF NO

2. Why not? are there any barriers you must overcome to make these changes? (i.e. knowledge, cost, time, income, never thought about it, life style, life events etc.)

3. Have your views about the above barriers changed since taking the course? [Probe as necessary].
IF YES
4. What are the motivations that encourage you to make these changes? (having financial goals, social networks)

5. Have your views about the above motivations changed since taking the course? [Probe as necessary].

6. Were there elements that you have found useful/ those you found less useful/ those you haven’t used yet but might use in the future? [Probe as necessary].
7. Overall, what did you gain from doing this course? (Prompt: know how, confidence, being in control etc.)

8. What suggestions would you offer to improve the “Managing My Money” course?

9. How important do you think online financial education courses are in helping to manage your money?

IV. 6 Stages of Behaviour Change
1. In the past 12 months have you changed the way you manage your money? (prompt: budgeting, saving, borrowing, debt management or putting money in pension funds)

IF YES,
2. What changes did you make? (prompt: start budgeting, save more, borrow less, pay off debt or put money in pension funds etc.)
3. How long a go did you make these changes? (prompt: less than 30 days, 1-6 months, 7-12 months, over 1 year)
4. What were the reasons that prompted you to make these changes? (prompt: financial difficulties, life events, family influence etc.)
5. Would you say that you are now better at managing your money than before the course? (prompt: budgeting, saving, borrowing, debt management or putting money in pension funds)
6. Thinking back the time when you made these changes, what was your life like for you at the time? What were you going through? (prompt: stress, relationships, life style, life events etc.)

7. How long have you maintained them? (prompt: less than 30 days, 1-6 months, 7-12 months, over 1 year, still doing it now)

8. How easy or difficult were they to maintain these changes?

9. Why was it easy or difficult for you? (prompt: have sufficient knowledge, support from family, feeling motivated / lack of motivation or support, life events, stress, time, money, bad influence etc.)

IF NO,

10. Since completing the course have you thought about making any changes in the way you manage your money? (prompt: start budgeting, save more, borrow less, pay off debt or put money in pension funds etc.)

IF YES,

11. Do you have a timeframe to start making any changes? (prompt: less than 30 days, 1-6 months, 7-12 months, over 1 year etc.)

V. 10 processes of behaviour change

(Prompt: Yes/No and frequency: Seldom, Sometimes, Often, Always)

Consciousness raising

1. Before the course, did you ever look for information related to budgeting, saving, borrowing, investing, pension? If yes, how often?

2. Do you do this more often after the course?

Self-liberation

3. Before the course, did you ever think that you were able to change your financial behaviour if you want to? If yes, how often?

4. Do you think this more often after the course?

Social liberation

1. Before the course, did you ever notice that there is advice available that helps the public to change undesirable behaviours when managing money? If yes, how
often? (Prompt: Step Change (debt advice), Martin Lewis (budgeting, saving), money advice services)

2. Do you notice this more often after the course?

Self-re-evaluation

1. Before the course, did you ever feel disappointed in yourself for not putting more effort into doing budget, save, payoff debt, contribute to pension regularly? If yes, how often?
2. Do you feel this more often after the course?

Environmental re-evaluation

1. Before the course, did you ever think that your family/dependents would have more stability if you changed how you manage your money? If yes, how often?
2. Do you think about this more often after the course?

Counterconditioning

1. When you felt stressed about changing your financial behaviours, did you ever tell yourself it is going to be worth it in the end? (i.e. to be debt free, having some savings and pensions) before the course? If yes, how often?
2. Do you feel this more often after the course?

Stimulus control

1. Did you ever stay away from people, places, and things that make it difficult for you to making changes in budgeting, saving, paying off debt, contributing to pension regularly, before the course? If yes, how often?
2. Do you do this more often after the course?

Reinforcement management

1. Before the course, did you ever give yourself an inexpensive reward or family/partner provide encouragement to you when you reached small goals such as saving more, paying off debt? If yes, how often?
2. Do you do/have this more often after the course?
Dramatic relief
1. Before the course, were you ever upset realising how much of your income was paying for interest on your debt or not be able to pay bills or you couldn't save at the end of the month,? If yes, how often?

2. Do you feel this more often after the course?

Helping relationships
1. Before the course, did you ever talk to or seek advice generally about money matters (e.g. partner, family, friends, colleagues, advisory services, internet)? If yes, how often?

2. Do you do this more often after the course?

VI. Financial Needs and Capacity and Satisfaction

1. What is your main financial priority at the moment? (is it what you need or what you want?)

2. What other financial priorities do you have? [Prompts, e.g. short-term, such as paying bills; medium term, such as saving for a holiday, replacing an appliance, or paying off credit cards; longer term, saving for a dream holiday or new car].

3. Do you have enough money to achieve these financial priorities?
   IF NO
   4. How do you feel about it? (Prompt feelings of happy, upset, stressful....)
   5. How do you go about getting the money together to meet these priorities? [Prompt budgeting and saving behaviour].
   6. Have there been any changes to how you do this since doing the course? [Prompt budgeting, saving and borrowing behaviour].
   7. Would the achievement of these financial priorities decide how you feel when thinking about your finance? (prompt feelings of happy, upset, stressful....)

8. Have your financial priorities changed since doing the course and, IF YES [Probe the reasons for any changes in their priorities].

9. Have the changes in your financial priorities influence how you feel about your financial circumstance? (Prompt feelings of happy, upset, stressful....)
10. How would you describe your financial satisfaction? (Prompt: achieve the main financial priority, other financial priorities, achieve what you need, what you want, financial freedom…)

11. Do you feel more satisfied with your finances now than before the course? (why? why not?)

VII. **Confidence in Managing Money (Self-Efficacy/Perceived Control)**
Understanding learners’ confidence in managing their money and exploring their role in managing household finances before and after the course

1. Who manages the finances at home and what is your role?
2. How confident do you feel about managing your money? (Score in 1-10)
3. To what extent do you feel in control of your finances? [Probe the reasons].
4. Are there any differences in how confident you are managing your money after the course? [Probe as necessary].

VIII. **Basic Demographics and Living Situation**

1. What is your gender?
   (Male / Female / Other)
2. What is your age?
   (18-24 years / 25-34 years / 35-44 years / 45-54 years / 55-64 years / Over 64)
3. What is your highest level of formal education?
   (GCSE-Vocational- O level / A level or equivalent / Degree or higher / None of above / Other (please specify))
4. What is your employment status?
   (Employed full-time / Employed part-time / Self-employed / In education / Unemployed / Retired / Full time parent-carer / Other (please specify))
5. Who is in your household?
   (Single, no children / Couple, no children / Single, children / Couple with children / Couple non-dependent children / Unrelated adults / Other (please specify))
6. Country of living
7. What is your personal and household annual income? (please ignore this question if you prefer not to say)
   (£0-£11,499 / £11,500-£19,999 / £20,000-£29,999 / £30,000-£50,000 / Over £50,000)
8. Where does your income come from?
   (Salary / Student loans / Benefits / Child support / Self-employment / Income from properties or investments / Financial aid from family / Pension)
Appendix C: Ethical Approval of The Research

Human Research Ethics Committee (HREC)

From  Dr Louise Westmarland  
The Open University Human Research Ethics Committee  
Email  louise.westmarland@open.ac.uk  
Extension  (6) 52462  
To  Tam Nguyen  

Project title Social marketing promotes financial well-being: Exploring the impact of online educational interventions towards financial behaviour change and well-being: Evidence from the True Potential PUFin Educational Programme "Managing My Money".

HREC ref  HREC/2592/Nguyen  
AMS ref  

Date application submitted: 30/05/2017  
Date of HREC response: 09/06/2017  

Memorandum

This memorandum is to confirm that the research protocol for the above-named research project, as submitted for ethics review, has been given a favourable opinion by HREC Chair’s action.

Please note the following:

1. You are responsible for notifying the HREC immediately of any information received by you, or of which you become aware which would cast doubt on, or alter, any information contained in the original application, or a later amendment which would raise questions about the safety and/or continued conduct of the research.

2. It is essential that any proposed amendments to the research are sent to the HREC for review, so they can be recorded and a favourable opinion given prior to any changes being implemented (except only in cases of emergency when the welfare of the participant or researcher is or may be effected).

3. Please include your HREC reference number in any documents or correspondence, also any publicity seeking participants or advertising your research, so it is clear that it has been reviewed by HREC and adheres to OU ethics review processes.

4. You are authorised to present this memorandum to outside bodies such as NHS Research Ethics Committees in support of any application for future research clearance. Also, where there is an external ethics review, a copy of the application and outcome should be sent to the HREC.

5. OU research ethics review procedures are fully compliant with the majority of grant awarding bodies and where they exist, their frameworks for research ethics.

6. At the conclusion of your project, by the date you have stated in your application, you are required to provide the Committee with a final report to reflect how the project has progressed, and importantly whether any ethics issues arose and how they were dealt with. A copy of the final report template can be found on the research ethics website - http://www.open.ac.uk/research/ethics/human-research/human-research-ethics-full-review-process-and-proforma#final_report.

Best regards

Dr Louise Westmarland  
The Open University Human Research Ethics Committee

www.open.ac.uk/research/ethics/  
January 2017
Appendix D: Disseminating the Research at Conference

A part of this thesis have been published in the following peer refereed publication:
Paper 60 (Nguyen-Cousin et al., 2019, p. 105-109)
INTERVENTION / CASE STUDY

Why A Change in Financial Behaviour Does Not Always Trigger A Change in Financial Well-Being?

Conference Track: Promoting and safeguarding financial literacy and wellbeing

Authors: Tam Nguyen-Cousins, Martin Upton, Helen Roby

Aims and Objectives

The main purpose of this study is to explore how to make use of online financial education to promote desirable financial behaviours and financial well-being. This study considers online financial education as a potential social marketing product that can be embedded in the theory of behaviour change and social marketing to enhance financial well-being behaviour change. The study seeks to inform the interested parties in applying online financial education in changing unhealthy financial behaviour and promoting financial well-being in designing their intervention strategies. This paper does not focus on assessing the outcomes of the intervention but drawing the relationship between people’s financial education and well-being, the factors that influence financial behaviour, behaviour change and well-being. The financial education intervention was the online Managing My Money course (MMM), which aimed to educate people, giving them knowledge and skills to manage their personal finances. The course offered free access to seven major steps run over 11 weeks that equipped learners with knowledge and skills in (1) Financial planning and the life-course; (2) Income, taxation and benefits; (3) Expenditure and budgeting; (4) Debt and borrowing; (5) Savings and investments; (6) Housing and the household balance sheet; (7) Pensions; (8) Insurance. These steps were developed to support the change in unhealthy behaviours such as overspending, under-sparing, under-saving, lack of forward planning and irrational or uninformed choices of financial products.

Key behaviours

Four in ten people in the UK cannot manage their money. 8 million people are in serious debt while 16 million working age people have less than £300 in savings (The Money Advice Service, 2018). According to The Money Charity statistic, total personal debt in the UK in September 2018 was £1,605 trillion; the average total debt per UK household including a mortgage was £39,028; and the total credit card debt in 2017 was £72.4 billion or £2,683 per household (The Money Charity, 2018). These issues are commonly considered a result of low financial literacy levels in the ability to use knowledge and skills to manage financial resources effectively (Collins and Holden, 2013). The lack of adequate financial skills is also a cause of poor personal savings rates; high levels of consumer debt; and increases in personal bankruptcy filings (Bell and Larnam, 2005; Lyons et al., 2006; National Endowment for Financial Education, 2004). Hence, this paper focuses on saving and borrowing behaviours to understand why improving individual financial well-being matters.

Target group focus, segmentation and insight

The course targeted those who need online and open access to learn the essential knowledge and skills to manage or change the way to manage their finances effectively. The course was specifically designed for the UK market but did not limit access to worldwide learners. 9,918 learners joined the course when it started in January 2018. However, only 59.50% of them were active during the course. 12% of learners were social learners who took part in the online discussion platform. 125 of 398 learners who took part in the research also engaged in online discussions during the course. A small number, 7.40% of learners, completed 50% or more of the learning steps in the course. This suggests that most of the learners had a specific learning need for one or more course topics. Hence, they only took part in the steps needed rather than completing all the steps. This paper examined two key segments. Firstly, those who have the attributes of debtors and are more risk seeking. People in this first group tend to feel more comfortable with borrowing for something that they consider to be essential or often use credit for non-essential items (Wisew and Elliott, 2014). Whilst the second group are likely to be savers. They are more risk-averse. Borrowing makes them feel uncomfortable. They only spend within their
means and adjust the amount of money they spend on non-essentials when their life changes (Vlae and Elliott, 2014). In addition, this study found two segments that really need financial education. The first group is the most vulnerable population. They have a low financial capacity (income, assets, family or social help etc.) and undesirable behaviours in managing their money. In contrast, the second group includes those who, despite having higher capacity, did not save as much as they should be able to.

Citizen Orientation

In 2015, 27 million people did not have sufficient savings buffer to allow them to cope with a significant income shock (Financial Capability Strategy for the UK, 2013). In a recent progress report of Financial Capability Strategy for the UK in 2017, there were around 10 million working-age adults, have less than £300 in savings and 8 million people in debt. The financial data is a good example of the issues of equity in financial education; with the hope that open access to financial education offers better opportunities to the disadvantaged population in the UK.

The Social Offering

Social inclusion is an important aim of the intervention. The intervention seeks to tackle social issues in financial capability. It offered an 8-week course with the support of mentors to listen, guide and encourage people at risk of financial difficulty to improve their financial knowledge and skills. This potentially helped them to review their financial matters and to make a future informed decision. The course encouraged learners to save small amounts as a cushion against financial shocks and balance between paying off debt and saving more. The course combined financial knowledge, skills and encouraged learners changing undesirable behaviours. Using the insights from marketing and behavioural science in the course design, people were nudged towards better financial habits rather than requiring them to improve their knowledge. Many authors agreed that social capital can contribute to personal well-being (Zoronto-Rodríguez et al., 2016; Costanza et al., 2007). The online discussion platform embedded the course social engagement between learners and mentors. In other words, the intervention created and offered the social capital to learners. It improved their financial well-being by creating a sense of an online community, where people connected and offered their social support to tackle financial issues of their own and others in that community. For those struggling financially, the successful stories offered financial support, encouragement and hope for a better future. While the unsuccessful stories showed people which paths not to follow and the importance of keeping up with desirable behaviours of budgeting and planning ahead. The intervention created an open source of knowledge that brings people together to tackle a social issue.

Competition Analysis

The Open University is a leading educational institution for offering online financial education to the public in the UK. While there are various organisations also offering some sources of free financial education to the public including the Money Course (themoneycourse.org), the Money Charity (themoneycharity.org.uk) or Learn My Way which is owned by Good Things Foundation (learnmyway.com). The Money Course and the Money Charity offer face-to-face courses at schools, colleges, universities, work environment, community centres etc. In contrast, Learn My Way is more like Future Learn, offering free access to online courses. The common benefits that these organisations offer the public are free courses covering various subjects, including financial knowledge, skills, tools and guidance to better manage individual personal finances and to improve individual financial well-being. The face-to-face training model from The Money Course and the Money Charity have a different method of engaging with target audiences and works well for those who prefer not to learn online. However, this model has limited access to wider audiences and more time-constraints than the online courses from Learn My Way and Future Learn. Likewise, the M&M course on Future Learn has benefits that Learn My Way courses do not have. The unique selling points of the M&M course is the online mentors and discussion platforms with facilitators to encourage learners to engage with the course. This online learning environment creates a sense of being part of a community. It makes people feel more interactive and inspires learners to share their issues or learn from others unsuccessful or successful stories in managing their money. Learners can access the M&M Online any time, anywhere for eight weeks. It is also important to stress that PuFin did not set out to compete with other courses. It purely set out to benefit the public by filling the gap in financial education needs. The unique value in competition in social marketing in comparison to commercial marketing is that all organisations usually do not try to compete with each other, but work together to achieve the same goals of promoting a large desirable change in personal finance.

Integrated Intervention Mix

This integrated intervention mix includes product, price, place, promotion, people and social co-creation in designing the course.

Product and Service: The intervention focused on changing saving and borrowing behaviours. Using the insights from marketing and behavioural science to select useful information, practical skills and other techniques to make small changes. It helps in improving individual confidence as well as nudging them towards better financial habits and behaviour rather than just improving knowledge. The service delivered by mentors that provides learners with guidance to deal with their financial issues.

Price: This financial education intervention was free, hence, there was not a ‘price’ that the participants had to pay but there might be other obstacles they might have to overcome. This might be time investments, practice, financial capacity, change of lifestyle or more when it involves spending and borrowing less but saving more. The organisers covered all the costs of running the intervention to offer the benefits to target audiences. This is the pure ‘social’ value in this educational intervention.

Place: The online Managing Your Money courses offered open access to the public with the expectation that an easy availability of the product would attract the participants (Strand, Rothchild, & Nevin, 2004, see Edgar, Huhman and Miller, 2015). The intervention also created an online market place where target audiences exchanged their knowledge and experience in making a change in their cognition, behaviours and well-being. They give and take tips from each other on how to save or survive a financial difficulty.

Promotion Through Internal and External Channels

The intervention was promoted through internal and external channels. The marketing team at Future Learn and Open University advertised the course to their databases of their existing learners in the UK and worldwide for months before the course started. Public relations management was outsourced to an external agent who dealt with media relations. For external channels, they used both free and paid channels, such as BBC radio, printed magazines and newspapers. The information about the course was shared with their partners such as the UK universities, colleges, British Council and other financial advice sites, such as money-savingexpert.com. Traditional media channels such as BBC radio, printed magazines and newspapers were used. While social media channels such as Facebook or recruitment websites were also used. Other referral channels such as search engine optimisation (SEO) techniques were also useful to promote the course on Google, Yahoo etc.

People and Co-creation through Online Social Markets

People are one of the key values of this intervention. The design and process of delivery of the intervention involved the contributions from both the organisations and the target audiences. While the course leader and mentors who are experts in the field offered the knowledge, skills and guidance in managing personal finance effectively, learners contributed their own useful knowledge and experience. By sharing their own case studies, gave advice, or encouraged each other to make a change, the learners together with the mentors created the value to the course through communications in the online social market.

Systematic Planning

Financial well-being (FWB) is very much in an early stage. Studies to develop new tools and practices to measure FWB as well as interventions to improve FWB and financial behaviour are needed (Brüggen et al., 2017). Using other disciplines such as psychology, sociology and marketing studies for financial education (Brüggen et al., 2017). Especially, how social marketing can promote financial well-being at the individual level needs to be further explored. It
was found an educational intervention does not always result in behaviour change (Selting and Shookley, 2006). More empirical evidence of the internal and external factors that promote or constrain the impact of online financial education towards behaviour change is required. A range of behaviour change theories were considered, including: the theory of planned behaviour (Ajzen, 1986; Fishbein and Ajzen, 1975); stages of behaviour change (Prochaska and Norcross, 1984); financial attitude (Yener and Elliott, 2014, OECD, 2011; Raina et al. 2011; FGA, 2006; Atkinson et al., 2006); financial needs and satisfaction (Mason, 1985; Tay and Cleeper, 2011, Melcov, 2017).

Figure 1: The systematic planning process

Results and Learning
In this study, there was a low response rate of the post and follow-up survey. To address this, providers from a range of different datasets have been used to determine whether a change in behaviour occurred. These include literacy quizzes, tests, surveys, interviews and online platforms. These datasets provide an in-depth understanding of our target audience and fill the gap of missing data from one data collection method. There were 396 responses in the pre-data survey. In addition, there were four sources of data that showed the small-scale impacts of the intervention including (1) fourteen responses in the post-survey, (2) twenty-six responses in the follow-up survey, (3) six interviews and (4) four online discussions where learners shared how the course had changed in different ways. This paper uses some data from these sources to explore the impact of the intervention.

Results
1. The associations between financial well-being and influential factors

The results from various regressions revealed the relationships between perceived financial well-being and influential factors such as financial, behaviours, abilities and attitudes. Perceived financial well-being defined as the feelings of learners when they think about their overall financial situation. For example, the more often learners “put money in emergency savings fund” or “saved money from every pay-check” the happier they felt about their income or the more often they stayed within budget the less nervous they felt about their finance and vice versa. Those who less often “use credit for non-essential items” tend to feel less nervous, tense or worried. In contrast, learners who felt more “comfortable with borrowing for something that I consider to be essential” also felt more anxious and worried. Moreover, the longer they could make ends meet if faced an unexpected drop in income without borrowing the more satisfied they felt about their finances and less anxious, worried, nervous and vice versa. The findings repeated in two or three surveys from small to large sample scales before and after the follow-up the intervention.

2. Stages of behaviour change

The survey used 14 items measured participants’ financial management behaviours in the past six months in four domains: consumption, cash management, savings and investment, and credit management from previous studies (Dew and Xiao, 2011). The response set for these questions ranged from 1 (Never) to 5 (Always) and Not applicable. This study translated the five scales to five stages of behaviour change as Pre-contemplation →Never (1); Contemplation→Seldom (2); Preparation–Sometimes (3); Action–Often (4); Maintenance–Always (5). Statistic analysis found 17 learners moved to a new and positive stage of behaviour change with the higher scores in their financial behaviour reported following the intervention. Furthermore, learners were in different stages of behaviour change for individual financial behaviours. They had both desirable and undesirable behaviours. For instance, some learners often “saved money from every pay-check” while also regular “made only minimum payments on a loan” and vice versa. The data from the online discussion revealed that some learners also recalled their decision making of paying off debt over saving more such as clear off their debts before starting saving. It means they could not have both desirable saving and pay off debt at the same time due to a limitation in financial resources. These measures did not cover the relapse stage of behaviour change before the intervention. The transtheoretical stages of change model suggests that as people make progress towards changing their behaviour, they move in a set order through the various stages of change from pre-contemplation to maintenance, although during relapse, it is possible for individuals to revert to a previous stage (Prochaska et al., 2006). Through online discussion, we learned that they relapsed and then went back on track again after years of dealing with challenges. For instance, a learner (age range 56-65, British, single, no children, house owner) disclosed that she had relapsed in saving behaviour due to unexpected changes in circumstances “I had a different, well-paid job and had saved quite a bit. Then my mother got cancer and I became her carer. Then I lost my job. I was unable to work for over three years after mum died, and my savings dwindled”. After that relapse period she now has a fulfilling part time job, but earn much less and as fast as I save a little, it is swallowed by the next emergency. I budget carefully and am thankful that I have so far avoided the electricity situation”. This study suggests that the relapse period is sometimes triggered by an out of control and unexpected individual financial situation, rather than purely because of the matter of convincing themselves about the desirability of changing behaviour and maintaining saving itself as suggested by some authors (Kaye et al., 2002). Another learner had to live on their savings after losing their job. Those who are in this situation need more than a behavioural intervention. They will also need support in finding a way to deal with financial difficulties and a shortage of financial resources.

3. Risk attitude and financial attitude

This paper defines financial attitude as individual attitudes towards managing their finances. Risk-averse can be influenced by individual risk preferences or life stage (Atkinson et al., 2018). Using the qualitative data from online discussion, the keyword “risk-averse” was coded following learner ID number then exported to SPSS to run statistical analyses. A regression found that the more risk-averse attitude the learners had the more resilience they developed to resist pressure to “keep up with the Joneses”. Interestingly, many of risk-averse learners suggested that they would take more risks with their money if they have much more money. Some of the risk-averse learners realised that they should learn to make an informed decision to take reasonable risks so that they can make more money than keep it in savings accounts that are gradually devalued. They also anticipated the needs and wants while spending and budgeting their expenses to prevent being trapped in debt. They were enthusiastic to learn how to save more to buy a house, how to make informed decisions about borrowing, considering the priority between paying off debt or saving more, how to make the most of their savings wisely or where to start planning for their pension etc.

Evaluation Outcomes
The changes of some key variable are reviewed to assess the outcomes of the intervention including financial behaviour/attitudes, attitudes towards making a change, knowledge, capacity and well-being.

1. Changes in financial behaviour

A pair sample t-test was carried out to explore the changes in financial behaviours of learners before the intervention and followed up six months after the intervention. The value of t was negative in the test which suggests that the follow-up scores were higher than before the intervention. Some changes in financial behaviours before and after the intervention were found significant among learners. As a result, learners more often when shopped around for financial products and services after the intervention (t=−3.049, p=0.05, df=19). Learners were putting money in emergency savings fund (t=2.298, p=0.05, df=19) and saving for a long-term goal (t=−2.305, p=0.05, df=15) more regularly after the intervention. However, a significant change in borrowing behaviour or paying off debt was not found.

2. Changes in financial attitudes

The changes in financial attitudes six months after the intervention were exposed by a pair sample t-test. It was suggested that the follow-up scores were higher than before the intervention as the t value was negative. The p value <0.05 means the changes were significant. Learners agreed that they felt top on their monthly overtrading (t=−2.915, p=0.05, df=17), knew the detail of their financial situation at all times of the month (t=−2.298, p=0.05, df=17) and felt confident dealing with financial matters (t=−2.496, p=0.05, df=17) more strongly than before the intervention.

3. Changes in attitude towards making a change in financial behaviour

When learners were asked to think about changing the way they manage their finances before and after the intervention, learners agreed that they felt that they had the necessary knowledge and skills to manage their finances (t=−2.803, p<0.05, df=17) more than before the intervention.
INTERVENTION / CASE STUDY

4. Changes in financial knowledge

4.1. Self-assessing financial knowledge

There were changes in the self-assessments of learners towards their financial knowledge as a result of a t-test. Six months after the intervention, learners evaluated their knowledge significantly better in Financial Planning for the future (t=2.543, p=0.05, df=20), Consumer credit and borrowing (t=3.265, p<0.05, df=20), Mortgages/home loans (t=3.167, p<0.05, df=20), Debt management (t=3.133, p<0.05, df=13), Savings (t=2.726, p<0.05, df=20), Pension (t=2.227, p<0.05, df=20), and Insurance (t=4.132, p<0.001, df=20). The improvement in the knowledge of insurance was the most significant.

4.2. Assessing financial knowledge objectively using quiz and test

The financial knowledge of learners was assessed objectively using the quiz and test. This method required a repeated measure before and after the intervention. Hence, the questions in the quiz were selected from the questions in the tests at the end of the weekly step. The quiz was embedded as a part of the course contents and learners were encouraged to complete the quiz at the very start of the weekly step. Each quiz had between 1 to 3 questions selected from the weekly tests. The scores from the quiz measured learners' financial knowledge before the intervention while the result of these weekly tests was considered as a measure of learners' financial knowledge post the intervention. It is important to stress that learners had to pay a small fee to upgrade to gain access to complete weekly tests and obtain a certificate of achievement. This might be the reason for the limited responses to the weekly tests which resulted in the lack of post data while assessing learners' financial knowledge before and after the intervention. There were only 14 people upgraded but not all of them completed all the tests. As a result, there is inadequate data to run a t-test on the objective changes in financial knowledge using the quiz and tests. Only the first step of “Financial planning and the life-course” found a significant change and positive improvement in financial knowledge after the intervention (t=2.197, p<0.05, df=13).

5. Changes in financial capacity

A change in the financial capacity of learners was also found in a t-test. Learners revealed that length of time they could make ends meet if faced by an unexpected drop in income without borrowing was longer than before the intervention (t=2.111, p<0.05, df=18). This might be a result of better ability to manage finances thanks to an improvement in financial knowledge, behaviours and attitudes.

6. Changes in financial well-being

There was not any significant change in perceived financial well-being before and after the intervention. This may be caused by insufficient changes in the influential factors. Furthermore, it requires more financial behaviours to be changed simultaneously to perceive a significant positive change in perceived financial well-being such as “happy”. For instance, the regression found that after the intervention, a positive improvement in learners’ behaviour of “paid all your bills on time” and “paid off credit card balance in full each month” could predict an improvement in feeling “happy” among learners. However, the changes in these two behaviours after the intervention were not statistically significant; hence, a significant change in feeling “happy” also did not happen. Furthermore, there was not a significant change in satisfaction in the financial needs of learners after the intervention.

Learning outcomes

Studying behaviour change and financial well-being requires long-term observations to assess rigorously the impact of an intervention such as financial education. The challenge of a longitudinal study is a lack of follow-up responses from participants. Without full participation of audiences in all stages of data collection, it is very difficult to assess the impact of the intervention on an individual and the audiences as a whole. A flexible approach in dealing with data collection is important. Using a mix of research methods to make use of different relevant sources of data is needed to fill the gap in data as much as possible.

Conclusions and Recommendations

Conclusion

Understanding financial well-being and its influential factors are challenging due to the complexity of associations between a variety of elements. There is not a straightforward answer as to why there were some changes in behaviour, attitudes, attitudes towards making a change, knowledge, capacity, but these did not result in a significant change in financial well-being. It might be that the level of change in the influential factors was not large enough to trigger a change in financial well-being. It could be that some changes in the influential factors are not enough to transfer to a significant change in financial well-being. It might require a change in all indicators in each influential factor. A lack of post-data makes it difficult to justify the causes of this result.

Recommendations

There are some ideas for the course managers to improve the impact of the intervention. Firstly, designing follow-on online bespoke courses to tackle the specific needs of different segments. By categorising learners’ stages of behaviour change to promote other interventions to target individual behaviours. People need financial education at all stages of behaviour change. However, it is especially important to those at Pre-contemplation, Contemplation and Preparation stages. The educators should consider offering a free tool to build budgets or manage money that has app and web access. This would be a useful channel to maintain the relationship with their target audiences. It also helps measure the impact of an educational intervention, as well as designing new courses based on reports on data collected through the tool. Educational programmes should add in steps to support behaviour change. More tools and information showing real examples of people from different backgrounds, such as those on low-income and the youth, who have made positive steps forward should be included. Encouraging more learners to be involved and engaged with the course to make it useful and applicable to them is crucial. Interventional product development which offers flexible choices of learning, allowing learners to pick and choose partial or full courses, that are applicable to their individual circumstances or levels of knowledge and different stages of behaviour change, would be beneficial to all the segments. Additionally, specific courses or different ways of attracting people from different segments, such as for low-income individuals, pensioners or the youth, may be appropriate. The behavioural change sessions also should be designed for different behaviours. The behaviour sessions cover the financial knowledge and tools to support an individual during the stages and processes to make a behaviour change. The challenge and how to overcome it to achieve the rewards of having an improvement in personal finances and financial well-being.

References


Number: 86
Social Marketing to Change Gift Giving Behavior, Decrease Consumption and Improve Well-Being
Conference Track: Global climate change, environment protection, consumption and sustainability
Author: Kelley Dening, New Dream Advisory Committee, New Dream, USA

Abstract
Research has shown that not only does decreasing consumption support the environment; it is also good for our health and well-being (Kasser, 2002). New Dream’s mission, as a national non-profit organization, is to empower individuals, communities and organizations to transform their consumption habits to improve well-being for people and the planet. In collaboration with New Dream, the overall goal of this project was to use social marketing to learn how best to motivate individuals to shift some purchases from material gifts to experiential gifts during the 2017 winter holidays. Specifically, the purpose of this study was to explore the attitudes, awareness, barriers, benefits, and any existing behavior around the topic of giving experiential gifts and how those results would inform the intervention. Survey respondents were segmented into six groups – participate in outdoor activities, green-minded, happiness level, minimal, income level, and race/ethnicity. Overall, study findings support that those with less material things are happier. In addition, significant differences between segments were found, so multiple messages, graphics and interventions were used to appeal to different priority groups. Although cost was not a top challenge, creating and sharing inexpensive experiential gift ideas was important as those with a high income were more likely to give an experiential gift than lower income individuals. Also, messaging around both top benefits associated with experiential gifts (e.g., lasting memories and uniqueness) was included in the intervention material as it varied between whites and non-whites. Survey results showed that millennials were willing to use an online wish-list to share their gift requests with family. This was also part of the campaign strategy. The campaign included a Simplify the Holidays pledge where individuals committed to giving at least one experiential gift instead of a material gift. In early January of 2016 we sent a post-pledge survey to the 241 Simplify the Holidays pledge takers to ask questions about how their experiential gift giving activity went. Sixty-nine post-pledge surveys were received. The results showed that 83% followed-through on their pledge and gave an experiential gift; 56% of gifts were given to family; 42% of experiential gifts were done within 2 weeks of giving and 33% increased their satisfaction with life after the holidays, but 28% had their satisfaction with life go down after the holidays. Additional research around this topic could include: 1) barriers to giving an outdoor experiential gift, 2) the role of social norms, 3) lasting a public health messaging frame, and 4) how to decrease consumption as income increases. The results of this research support the social marketing body of knowledge for use with waste reduction and its effect on the environment and health.

Aims and Objectives: The document, Principles of Ethical Practice of Public Health, describes how people and their physical environment are interdependent - People depend on natural resources and a damaged environment has an adverse effect on health. However, people also effect the environment through consumption of resources and generation of waste (Public Health Leadership Society, 2002). The goal of this social marketing campaign was to motivate individuals to shift some purchases from material gifts to experiential gifts during the winter holidays, thus increasing time spent with friends and family and in the out-of-doors leading to a boost in long-term happiness and overall well-being, along with supporting the environment by decreasing consumption.

New Dream has a very popular winter campaign called Simplify the Holidays because more waste is generated during that time of the year. The behavioral objective for this campaign was to have a holiday gift giver present at least one experiential gift to a friend or family member during the 2017 winter holidays. Experiential gift examples include: going somewhere with friends or family like to a winery, concert, sporting event; getting out in nature by camping, painting, skiing, or traveling to a nearby city. This might also include doing a class together like cooking, painting, willow/flower identification, etc.

Target group focus, segmentation and insight:
The project’s priority audience was millennials or green-minded individuals. Research shows that green-minded individuals do not do pro-environmental behaviors consistently, so this intervention could help (Binder, 2017). In addition to running the demographics on several questions we also created a few indexes based on a series of questions asked within the survey. So segment responses by those that do outdoor activities, those that are “green-minded” and their personal happiness level were also calculated.

For the research noted below, millennials were more likely to create an online wish list to share with a family member, more likely to say they would be happier if they could buy more things and less likely to carry a reusable bag. Those at higher income levels were more likely to give an experiential gift and less likely to wear thrift store clothes and use cloth towels. Those with less income were less likely to have taken a trip in the last year. Non-whites were less likely to eat out, less likely to carry a refillable bottle and more likely to use cloth towels versus paper towels. They also differed in their belief of the top benefit to giving an experiential gift to a friend. They believed it would provide lasting memories, whereas non-Hispanic whites felt the top benefit was that it would be unique. Non-whites’ thought the top challenge to giving an experiential gift to a family member would be that it is hard to think of an age-appropriate experiential gift versus non-Hispanic whites saying the top challenge is that it is hard to schedule a joint activity as an experiential gift.

For the three indexes we created there were some statistical differences. If you ranked higher on the happiness scale you felt less need for material things. Those that do outdoor activities were different than other responders, but if you were someone that didn’t do outdoor activities you were more likely to want to eat out, take a trip, go to the movies and carry a refillable bottle or mug. Finally, the hypothesis was that if you were green-minded you would have a higher environmental ethos and have statistically significant responses. That was true. However, even green-minded individuals have room for improvement. They do not “always” pick the most environmentally friendly action.

Citizen Orientation
The research included a scientific literature review and four focus groups (one specifically with millennials).

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<th>Sample Size</th>
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<td>Literature Review</td>
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<td>Focus groups – all ages regarding gift giving behavior</td>
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<td>Convenience sample from</td>
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<td>North Carolina, one in Virginia, and one in Louisiana</td>
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<td>Focus groups – millennials regarding gift giving behavior</td>
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<td>Focus groups – all ages regarding gift giving behavior</td>
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Two surveys were conducted to better understand the barriers and benefits associated with experiential gift giving and the types of waste prevention activities currently being conducted.