

Young consumers' emotions towards emerging e-banking technology: A multi-perspective approach

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To my incredible brother and sister, Mohsen and Malihe:
Your unwavering support and love have been the fuel of
this journey.

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Glossary of abbreviations

Automatic teller machine (ATM)
Appraisal-tendency framework (ATF)
Average variance extracted (AVE)
Confirmatory factor analysis (CFA)
Combination of TAM and TPB (C-TAM-TPB)
Decomposed theory of planned behaviour (DTPB)
Internet banking (IB)
Innovation diffusion theory (IDT)
Information technology (IT)
Mobile banking (MB)
Motivational model of computer use (MM)
The model of PC utilization (MPCU)
Personal computer (PC)
Partial least squares structural equation modelling (PLS-SEM)
Technology acceptance model (TAM)
Planned behaviour (TPB)
Theory of reasoned action (TRA)
Social cognitive theory (SCT)
Structural equation modelling (SEM)
Unified theory of acceptance and use of technology (UTAUT)

Abstract

Banks appear to be interested in enhancing their effectiveness and efficiency by developing e-banking technology, i.e., the provision of banking products and services through electronic channels. However, the successful implementation of e-banking technology depends on how consumers perceive such technology and how they are probably provoked to adopt it. Considering emerging e-banking technologies, knowledge of the salient influential factors affecting consumer adoption is crucial for banks. Studies have analysed these factors from different perspectives, such as attribute- and barrier-based perspectives. Attribute-based factors pertain to the perceived or expected characteristics of e-banking technology, whereas barrier-based factors refer to factors that can hinder or delay the adoption of e-banking technology. Despite the absence of consensus on these factors, there is a predominant focus on the functional aspects of this technology, often neglecting the emotional experience of consumers.

Consumers' emotions in the e-banking context mainly refer to hedonic motivation, defined as positive emotions such as fun, pleasure, and enjoyment arising from the usage of e-banking technology. While examining hedonic motivation has provided valuable insights into the adoption of such technology, further studies are required to examine the relationship among consumers' emotions, particularly negative ones arising from different kinds of appraisals. Accordingly, this thesis aims to examine the influence of consumers' emotions towards emerging e-banking technology on their intention to adopt such technology, with a specific emphasis on negative emotions from attribute and barrier-based perspectives.

Applying Structural equation modelling (SEM), the empirical results draw attention to the influential role of different types of negative emotions in the adoption of emerging e-banking technology. From the attribute-based perspective, the empirical results demonstrate an

association between loss emotions and consumers' behavioural intention to adopt emerging e-banking technology, through effort expectancy and performance expectancy. From a barrier-based perspective, the results indicate that deterrence emotions can be positively associated with consumers' perceived risk. This, in turn, influences their behavioural intention to adopt emerging e-banking technology. The results also reveal the influence of deterrence emotions on consumers' perceived risk, even in the presence of positive emotions. These results suggest the importance of considering various categories of negative emotions when examining consumers' intention to adopt emerging e-banking technology.

Summary in Swedish

Som många andra företag strävar banker efter att förbättra sin effektivitet genom att tillhandahålla produkter och tjänster via elektroniska kanaler. Samtidigt beror implementeringen på hur konsumenter uppfattar e-banktekniken och i vilken mån de vill använda den. Med tanke på framväxande e-bankteknologier, som mobila plånböcker och digitala valutor, är det av betydelse vilka faktorer som påverkar konsumenterna och tidigare studier har analyserat olika faktorer från olika perspektiv. I sammanhanget avser attributbaserade faktorer uppfattade eller förväntade egenskaper hos e-banktekniken medan hinderbaserade faktorer hänvisar till faktorer som kan fördröja eller hindra intentionen att använda digitala banktjänster.

En begränsning är att tidigare studier inom bankområdet ofta fokuserat på den funktionella aspekten och försummat konsumenternas känslomässiga upplevelser. I en e-bankkontexten kan det förekomma positiva känslor såsom spänning, tillfredsställelse och vad som kallas hedonisk motivation (som avser känslor kopplade till glädje, njutning och nöje). Likaså kan negativa känslor, som ångest och ilska, ta överhanden när tekniken inte är användarvänlig eller inte fungerar som den ska. Syftet med denna licentiatuppsats är därför att undersöka hur konsumenters känslor i förhållande till den framväxande e-banktekniken relateras till intentionen att använda denna teknik. Särskild tonvikt läggs på negativa känslor (såsom förlustkänslor och avskräckande känslor) från såväl ett attribut- som ett hinderbaserat perspektiv.

Strukturell ekvationsmodellering (SEM) användes för att testa uppställda hypoteser. Från ett attributbaserat perspektiv visar de empiriska resultaten ett samband mellan förlustkänslor och konsumenternas avsikt att använda den framväxande e-banktekniken genom en förväntad ansträngning och en förväntad prestation. Från ett hinderbaserat perspektiv indikerar resultaten att avskräckande känslor kan vara förknippade med konsumenternas upplevda risk. Det påverkar

i sin tur deras avsikt att använda den framväxande e-banktekniken. Licentiatuppsatsen visar också ett samband mellan avskräckande känslor och upplevd risk, även i närvaro av positiva känslor. Ett av bidragen är att kommande studier med fördel kan undersöka olika typer av negativa känslor eftersom resultaten från de två studierna i denna licentiatuppsats visar att förlustkänslor och avskräckande känslor har olika inverkan på konsumenternas intention att använda e-bankteknik. Detta såväl från ett attribut- som från ett hinderbaserat perspektiv.

List of studies

The following two studies form part of this thesis research.

Study 1

Title: Negative emotions and consumer behavioural intention to adopt emerging e-banking technology

Authors: Masoome Abikari, Peter Öhman, and Darush Yazdanfar

Status: Published in *Journal of Financial Services Marketing*,

Vol 28, pp. 691-704.

Study 2

Title: Emotions, perceived risk, and intentions to adopt emerging e-banking technology among educated young consumers

Author: Masoome Abikari

Status: Online published in *International Journal of Bank Marketing*,

<https://doi.org/10.1108/IJBM-01-2023-0004>.

1 Introduction

1.1 Background

The advance of information technology has caused dramatic changes in the banking business (Gan et al., 2006; Thornton & White, 2001). This ongoing progress has caused banks to offer continuous innovations to respond to competition in the market and guarantee the interactions between banks and their consumers (Anouze & Alamro, 2019). Banks have made significant long-term investments in technology to achieve maximum returns (Laukkanen, 2016). These investments resulted in the introduction of electronic banking, also known as e-banking, which has quickly spread and developed over the past few decades (Ngugi et al., 2020). E-banking implies technology-based financial services supplied by banks and other financial service providers, including Internet banking (IB) and mobile banking (MB) (Abbad, 2013; Daniel, 1999; Gan et al., 2006; Giovanis et al., 2019; Nitsure, 2003).

Given the technological complexity and diverse range of services available, e-banking research has made significant strides in learning more about the factors influencing e-banking adoption. This progress has been achieved through using technology adoption models, such as the technology acceptance model (TAM) (Davis, 1989; Davis et al., 1989) and the unified theory of acceptance and usage of technology (UTAUT) (Venkatesh et al., 2003, 2012), primarily developed in the contexts of information systems and information technology (IT). Many studies have applied either extensions or variations of these models to better explain e-banking adoption. These attempts have resulted in the specifying of factors influencing the adoption of or resistance to e-banking technology. Different variables of technology adoption models, such as perceived usefulness and ease of use (Arora & Sandhu, 2018; Jahangir & Begum, 2008; Wan et al., 2005), effort expectancy and performance expectancy (Kaabachi et al., 2019; Raza et al., 2019; Yaseen & El Qirem, 2018),

facilitating conditions, compatibility, price value, and hedonic motivation (Alzaidi & Qamar, 2018; Hanafizadeh et al., 2014a; Poon et al., 2009; Souiden et al., 2021) have been reported as functional/instrumental factors affecting e-banking adoption.

Researchers have also tried to expand technology adoption models in the e-banking context by adding other factors, such as relative advantages (Ayo et al., 2016; Kolodinsky et al., 2004; Liao et al., 1999), perceived risk (Martins et al., 2014), trust (Alalwan et al., 2014, 2015; Sánchez-Torres et al., 2018), self-efficacy and awareness (Alalwan et al., 2015; Anouze & Alamro, 2019), and government support (Sánchez-Torres et al., 2018). While there appears to be a lack of consensus on influential factors in e-banking adoption (Salimon et al., 2017), there is a noticeable overemphasis on examining factors related to the functional aspect of this technology. Reviewing the results of the IB literature reveals this (Alzaidi & Qamar, 2018; Hanafizadeh et al., 2014b; Kesar & Pandey, 2018), and Souiden et al. (2021) have addressed it in the MB context. Souiden et al. (2021) argued that while the functional aspect of MB has been given attention, the emotional aspect of these technologies has been overlooked. They highlighted the important role of emotional values in consumers' behaviours and choices alongside the functional aspect. Additionally, they introduced attribute- and barrier-based perspectives to categorize research in the field, emphasizing the insufficient attention paid to the emotional experiences of consumers. Attribute-based factors (e.g., effort expectancy and performance expectancy) refer to perceived or expected characteristics of e-banking technology (Souiden et al., 2021). The barrier-based perspective is based on factors (e.g., perceived risk) that can hinder, prevent, or delay the adoption of e-banking technology (Cunningham et al., 2005; Dimitrova et al., 2022; Giovanis et al., 2019; Martins et al., 2014; Souiden et al., 2021).

The lack of attention to emotions in adoption behaviour was initially addressed in the IT context. Beaudry and Pinsonneault (2010) argued that

various technology adoption models focus on perceptions and beliefs regarding the attribute-based nature of technology, disregarding the complex and multifaceted nature of technology adoption and usage. They discussed emotions as one of the crucial determinants of behaviour, drawing on theories of emotion in psychological research. Theories of emotion emphasize that various sets of emotional responses could be evoked by facing a new event (Bagozzi et al., 1999; Beaudry & Pinsonneault, 2010; Han et al., 2007). The evoked emotions affect an individual's thinking, attitudes, actions, and decision making (Mehrabian & Russel, 1974). Emotions play a fundamental role in decision making since they can provide inner motivational energy (Bagozzi et al., 1999; Lerner et al., 2015). Adoption behaviour as a deliberate and conscientious choice requires this inner motivational energy (Valor et al., 2022). Accordingly, emotions play a significant role in technology adoption, and addressing different emotions that drive or hinder adoption can be crucial for the success of new technology. Returning to the context of e-banking, review studies, such as those of Shaikh and Karjaluoto (2015), Souiden et al. (2021), and Tam and Oliveira (2017), have highlighted this matter. Wu et al. (2017) suggested the need for research in financial contexts to examine affective factors, such as negative emotions, that can improve the prediction of user adoption behaviour.

However, in models of e-banking adoption, the concept of emotions has mainly addressed positive emotions derived from using e-banking technology and services. Most previous research has analysed the role of positive emotions, i.e., hedonic motivation, in terms of perceived enjoyment, fun, and pleasure derived from the usage of e-banking services (Abbad, 2013; Alalwan et al., 2015; Gupta & Arora, 2019; Makanyeza & Mutambayashata, 2018; Odumeru, 2012; Raza et al., 2019; Salhie et al., 2011; Yaseen & El Qirem, 2018). Also, some studies have investigated a particular negative emotion, i.e., anxiety, which also refers to fear and

nervousness associated with using e-banking technology (Ngugi et al., 2020; Saprikis et al., 2022; Yuen et al., 2010).

Consequently, it seems that the concept of emotions in e-banking adoption mainly pertains to those derived from the use of such technology. These emotions can be categorized according to the attribute-based perspective of e-banking adoption, which concerns the perceived or anticipated characteristics of e-banking technology. Although attribute-based aspects can serve as a significant stimulus for emotions, it is crucial to highlight that different emotional reactions can arise based on different appraisals. For instance, Chaudhuri (1998, 2002) discussed how the emotions evoked during a trial and demonstration period could be derived from consumers' prior knowledge of the relevant product or service class. Given a risky situation, Lerner and Keltner (2000, 2001) argued that different emotions of anger and fear could be activated sharply based on an appraisal of certainty and control. In the IT context, Beaudry and Pinsonneault (2010) suggested that emotions are triggered in the anticipation period based on users' expectations of how new IT events will influence their performance.

Building on this background, the aim of this thesis will be presented in the following section, taking into consideration Wu et al.'s (2017) suggestion to examine affective factors, with a focus on negative emotions.

1.2 Aim and research question

The thesis aims to examine the influence of consumers' emotions towards emerging e-banking technology on their intention to adopt such technology,¹ with a specific emphasis on negative emotions. The two studies of this thesis were proposed based on consumers' emotions, according to the attribute- and barrier-based perspectives on e-banking adoption, following the suggestion of Souiden et al. (2021) and Wu et al.

¹ Such as digital wallets and digital currency; see section 2.1.

(2017). These studies were conducted to answer the following research question:

RQ: From the attribute- and barrier-based perspectives, how are consumers' emotions associated with their behavioural intention to adopt e-banking technology?

From an attribute-based perspective and given the prominent examination of positive emotions in models of e-banking adoption, the first study aims to investigate the influence of a broad range of negative emotions on consumers' behavioural intention to adopt emerging e-banking technology. Accordingly, the study empirically examines the association between negative emotions, the attribute factors influencing e-banking adoption, and, subsequently, consumers' intention to adopt emerging e-banking technology.

Taking into account the limited attention paid to both negative and positive emotions in the barrier-based perspective, the second study aims to examine the influence of a broad range of negative and positive emotions on consumers' behavioural intention to adopt emerging technology. This study empirically examines the association between negative and positive emotions, the barrier factors influencing e-banking adoption, and, in turn, consumers' intention to adopt emerging e-banking technology.

1.3 The focus and structure of the thesis

Figure 1 illustrates the focal point of this thesis. In light of the attribute-based perspective, the first study dives into different models of technology adoption in the IT context to detect the attribute factors of these models most strongly related to emotions. The object is to become aware of the possible relationship between emotions and the attribute factors of these models. Considering the barrier-based perspective, the

second study focuses on influential barrier factors in the e-banking adoption context reported in the e-banking literature.

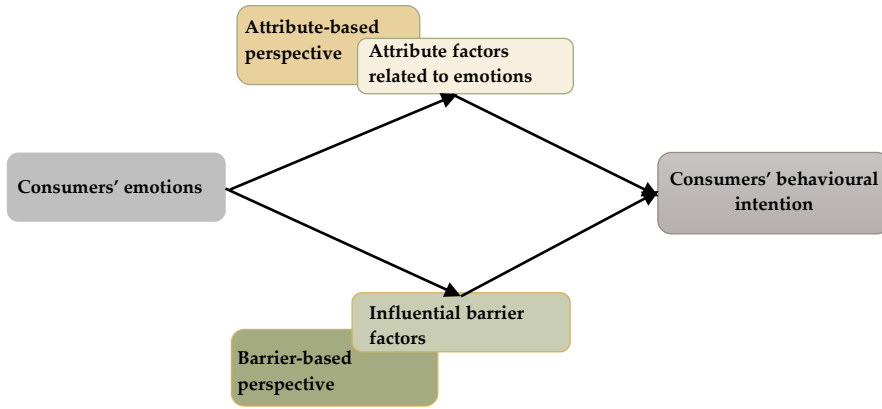


Figure 1. The focal point of this thesis.

The remainder of this thesis is structured as follows: Chapter 2 presents the theoretical framework, building on theoretical assumptions and previous study findings. Chapter 3 describes the methodological considerations, encompassing the research design and quality of this thesis. It includes an explanation of the sample, measurement instruments, data collection, data analysis, validity, reliability, and ethical considerations. Chapter 4 provides an overview of the two constituent studies of this thesis. Finally, Chapter 5 presents the main findings, theoretical contributions, managerial implications, and limitations of this thesis. It also suggests directions for future research.

2 Frame of reference

This chapter begins with a brief overview of the evolution of e-banking, in section 2.1. Section 2.2 presents a comprehensive overview of the attribute factors influencing e-banking adoption with a focus on emotions. Section 2.3 introduces the concept of perceived risk as a prominent barrier factor (2.3.1). This section also presents a definition of perceived risk (2.3.2), along with an explanation of the relationship between it and emotions (2.3.3). The chapter ends with section 2.4, which presents the general research model of this thesis.

2.1 E-banking evolution

E-Banking is the outcome of various generations of electronic transactions. The initial e-banking products were the automated teller machine (ATM), phone banking, and personal computer (PC) or house banking (Mia et al., 2007). The ATM was the first well-known machine that supplied electronic financial services to consumers. Phone banking allowed consumers to conduct banking transactions by calling their bank's computer system on their ordinary phone. PC banking let consumers use banks' services by means of a computer connected to the phone network via a dial-up modem connection (Mia et al., 2007). The use of IT commenced in the 1990s when the very first IB projects were launched by American banks (Keskar & Pandey, 2018). Since then, the Internet has revolutionized the financial and banking sector and radically transformed banking services into newly advanced delivery channels such as IB and MB (Gan et al., 2006; Nitsure, 2003).

IB refers to using a bank's website to carry out various banking transactions such as checking account balances, getting online statements, transferring funds, making investments, and paying bills (Alalwan et al., 2018). MB allows consumers to access their bank accounts through mobile devices to conduct banking transactions (Al-Sharafi et al., 2022; Shaikh &

Karjaluoto, 2015). These service channels have facilitated banking transactions by offering faster and more convenient services for consumers and by providing more efficient and cost-saving channels for banks (Hanafizadeh et al., 2014b; Nitsure, 2003; Tan & Teo, 2000). In addition, there are other emerging e-banking technologies such as digital wallets and digital currency. A digital wallet is a virtual storage system installed on a mobile phone that captures one's identity and digital credentials, enabling consumers to engage in electronic purchases (Hassan & Shukur, 2019). Digital currency, such as Bitcoin, was introduced in 2009 as a new kind of money and payment network. Dauda and Lee (2015) and Ozili (2023) discussed digital currency as a future bank service categorized under IB services. Accordingly, the focus of this thesis is on IB and MB as forms of e-banking technology, presenting digital wallet and digital currency as two examples of emerging e-banking technology.

2.2 Attribute perspective on e-banking technology adoption

2.2.1 Technology adoption models

Theories and models of technology adoption have progressed over the years in the IT context. The theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) is one of the forerunners and most-used theories of human behaviour. It was also the point of departure for developing TAM (Davis, 1989; Davis et al., 1989) and the theory of planned behaviour (TPB) (Ajzen, 1991). To provide a more comprehensive framework for technology adoption, different combinations of TAM and TPB were developed, among them the decomposed theory of planned behaviour (DTPB) and combinations of the TAM and TPB models (C-TAM-TPB) (Taylor & Todd, 1995a, 1995b). Other examples are the model of PC utilization (MPCU) (Thompson et al., 1991), the motivational model (MM) of computer use

(Davis et al., 1992), the innovation diffusion theory (IDT) (Rogers, 1995), and the social cognitive theory (SCT) (Bandura, 1986). The UTAUT model was developed based on eight alternative theories and models of technology adoption to reach a favoured model. It compressed 32 of the variables used in the TRA, TAM, TPB, C-TAM-TPB, MPCU, MM, IDT, and SCT models into four variables (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) and four mediated variables (i.e., age, gender, experience, and voluntariness of use). The first UTAUT model (Figure 2), created by Venkatesh et al. (2003), predicted approximately 70% of an individual's behavioural intention to use technology and 50% of technology use in organizational contexts. These percentages suggested a significant improvement over previous models (Dwivedi et al., 2019; Oye et al., 2014).

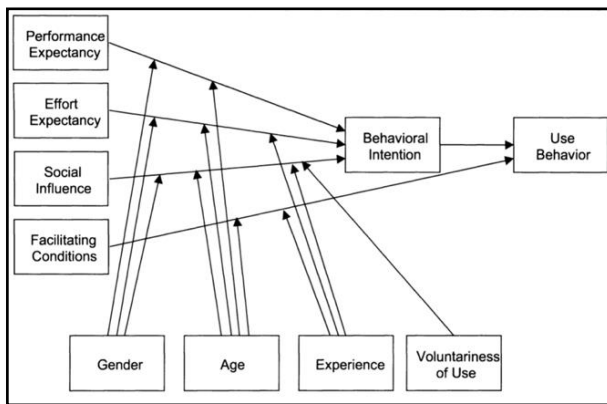


Figure 2. The UTAUT₁ model (Venkatesh et al., 2003).

The second UTAUT model (Figure 3) added three variables (i.e., hedonic motivation, price value, and habit) and dropped voluntariness of use as a mediating variable (Venkatesh et al., 2012).

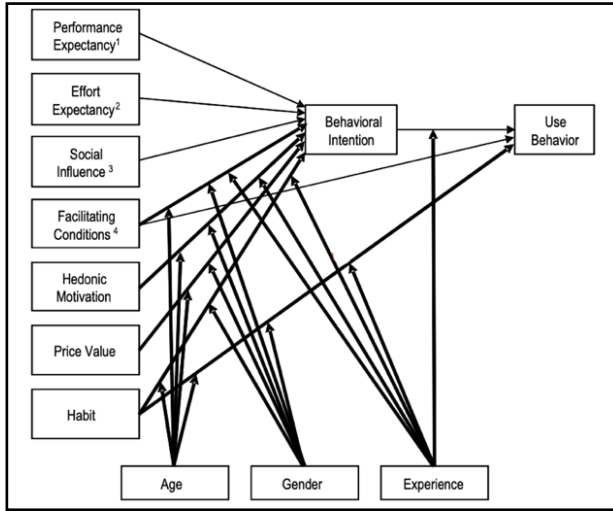


Figure 3. The UTAUT₂ model (Venkatesh et al., 2012).

The two UTAUT models rely on intentionality as a fundamental theoretical mechanism that drives behaviour. They define behavioural intention as a measure of the strength of an individual's intention to engage in usage behaviour (Venkatesh et al., 2012). This definition originates from social psychology models such as the TRA, TPB, protection motivation (Rogers, 1975), and interpersonal behaviour (Triandis, 1977) models. These models explicitly propose that behavioural intention serves as an immediate determinant of behaviour. Notably, Wu and Du (2012) discussed how the correlation of behavioural intention with perceived ease of use and perceived usefulness (i.e., effort expectancy and performance expectancy) is higher than that with usage.

The mentioned technology adoption models serve as the foundational frameworks used in the context of e-banking adoption (Hanafizadeh et al., 2014b; Souiden et al., 2021). Despite a huge number of studies applying these models, there is no apparent agreement as to which attribute factors of these models are the most important predictors of the adoption of e-banking technology (Salimon et al., 2017). The next section presents a detailed review of these attribute factors in the e-banking context.

2.2.2 Attribute factors influencing e-banking technology adoption

Arenas-Gaitán et al. (2019) discussed the lack of agreement as to the predictors of behavioural intention to adopt IB. The same argument can be seen in review articles in the e-banking and MB adoption contexts (Alkhowaiter, 2020; Dahlberg et al., 2015; Shaikh & Karjaluoto, 2015).

Some review studies provided classified reports of influential factors based on their frequencies. Tam and Oliveira (2017) examined the fluctuation in the results of MB adoption based on 64 articles published between 2002 and 2016 and showed that perceived ease of use and perceived usefulness were the most often used attribute factors. Along the same lines, Malik (2020) reviewed 29 articles published from 2015 to 2020 in developing countries, finding that the variables of the UTAUT model (i.e., effort expectancy, performance expectancy, social influence, and facilitating conditions) were the most common ones affecting the adoption of IB and MB. Alzaidi and Qamar (2018) examined 122 papers published between 1999 and 2015 and reported that ease of use and usefulness were the most important attribute factors of IB adoption without considering region or country limitations. Alkhowaiter (2020) used weight analysis and meta-analysis to look into the literature on e-banking in the Gulf countries and found that hedonic motivation, performance expectancy, effort expectancy, social influence, perceived ease of use, and perceived usefulness were frequent attribute factors when examining e-banking adoption. Arenas-Gaitán et al. (2019) argued that literature reviews of IB adoption allow us to observe different results using the UTAUT model. However, based on 76 articles published in top-ranked journals mainly between 2017 and 2019, Souiden et al., (2021) showed that the most common approach in the literature on MB adoption was the attribute-based perspective, including attribute factors such as perceived usefulness, perceived ease of use, and hedonic motivation.

Considering the above-mentioned disagreement in determining the attribute factors influencing e-banking adoption, this thesis pushes the inquiry forward and conducts a literature review to identify the attribute factors of technology adoption models that might be related to emotions. The intention is to draw readers' attention to the role of emotions in the context of e-banking adoption. To determine the attribute factors related to emotion, it is necessary to look at the definition and function of emotions in the IT and e-banking adoption contexts, as presented in the following sections.

2.2.3 Definition of emotion

Emotion is a term rooted in French and assimilated into English in the seventeenth and eighteenth centuries. Various emotion-related terms, such as passion, affection, and affect, have been the subject of theoretical analysis since ancient Greece, resulting in the development of diverse insights into the nature, definition, and function of emotion. Despite the diversity of these theories across different disciplines, such as neuroscience, psychology, and philosophy, there is some agreement as to the definition and function of emotions. One such point of agreement, which serves as the basis for appraisal theories in defining emotion, is that emotions typically involve appraisals of the significance of the stimulus situation (Scarantino & De Sousa, 2018).

Researchers from different disciplines have taken their point of departure in appraisal theories when defining emotion. In marketing, Bagozzi et al. (1999) defined emotion as a mental state of readiness that cultivates behavioural actions and helps individuals organize their behaviour in response to stimuli. In the field of risk assessment and decision making, Lerner et al. (2015) considered emotions to be multifaceted reactions comprising cognitive, experiential, and behavioural elements. Tompkins et al. (2018) argued that different emotions are characterized by differentially appraising or assessing an

event along with various cognitive dimensions; in the IT context, Beaudry and Pinsonneault (2010) applied the same definition.

Accordingly, a variety of appraisal dimensions have been proposed in these disciplines to determine various categories of discrete emotions (Beaudry & Pinsonneault, 2010; Lerner & Keltner, 2000, 2001). The main argument behind these proposed appraisal frameworks is that emotions arise as a reaction to an appraisal of an event comprehended as relevant and important to an individual (Bagozzi et al., 1999; Beaudry & Pinsonneault, 2010; Lerner & Keltner, 2000).

To avoid confusion about emotion-related concepts such as affective, attitude, and mood, this subsection also clarifies the meaning of these concepts. Affective is an umbrella term that refers to a set of concepts related to emotions, moods, and feelings. Thus, affective is a broader concept than emotion and points to a set of concepts that can differ from one another (Russell, 2003; Zhang, 2013). Affective-related concepts such as attitude, satisfaction, emotional usability, computer playfulness, cognitive absorption, and computer anxiety have been studied not only in the IT context (Zhang, 2013) but also in the e-banking context (Santini et al., 2019).

Attitude is a kind of judgment based on an individual's evaluations, including readiness to respond, while emotions are a response to a stimulus and are not as stable as attitude. For instance, an individual may or may not like something that touches on her/his attitude, while emotions, such as anxiety, are evoked in response to a particular subject and its stimulus (Bagozzi et al., 1999; Fishbein & Ajzen, 1975). Thus, various cognitive and non-cognitive factors can influence an individual's attitude. The difference between emotions and moods can be explained as follows: moods are measured over a longer period (i.e., hours or days), while emotions are measured in seconds or minutes. In other words, the mood is the ongoing state of the individual and does not rely on a particular stimulus (Bagozzi et al., 1999).

2.2.4 Emotion and technology adoption

Emotion-related models in the technology adoption context have a history related to computer use. Some studies have focused on the influence of computer anxiety on the usage of computers (Compeau & Higgins, 1995; Todman & Monaghan, 1994). Studies using the technology adoption models are mainly limited to examining relationships between computer anxiety, perceived enjoyment, and perceived ease of use (Beaudry & Pinsonneault, 2010; Partala & Saari, 2015). Studies applying the TAM model have showed that computer anxiety may have a significantly negative influence on perceived ease of use (Brown et al., 2004; Donmez-Turan, 2019; Venkatesh, 2000). Using the first UTAUT model, Venkatesh et al. (2003) reported an influence of computer anxiety on users' behavioural intention through effort expectancy. Using the second UTAUT model, Venkatesh et al. (2012) considered the model's use of hedonic motivation, which refers to the fun, pleasure, and enjoyment that come from using a certain technology. Reviewing these cited studies in the technology adoption context reveals the relationship between some attribute factors of these models, i.e., perceived ease of use, effort expectancy, and hedonic motivation, and emotions.

Beaudry and Pinsonneault (2010) argued for these relationships in their comprehensive study and demonstrated that research on user adoption of new information technologies has paid little attention to emotions. Therefore, they developed a framework of four categories of negative and positive emotions in the IT context to describe how emotions can be associated with the adoption and usage of new IT applications (see Figure 4).

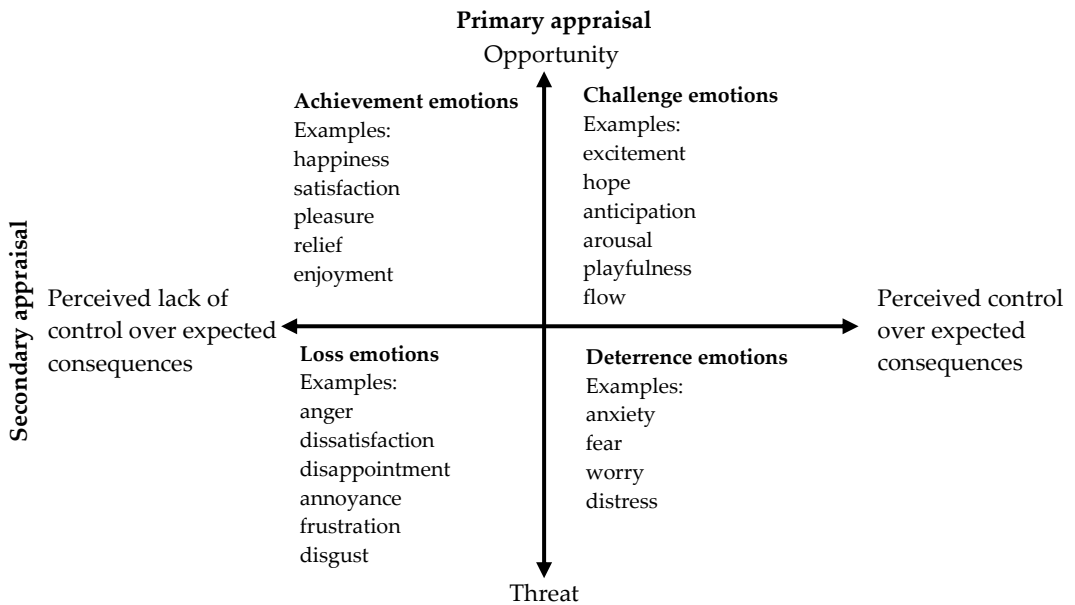


Figure 4. The emotional framework (Beaudry & Pinsonneault, 2010).

The categories in Figure 4 are labelled achievement emotions (e.g., happiness, satisfaction, pleasure, relief, and enjoyment), challenge emotions (e.g., excitement, hope, anticipation, arousal, playfulness, and flow), loss emotions (e.g., anger, dissatisfaction, disappointment, annoyance, frustration, and disgust), and deterrence emotions (e.g., anxiety, fear, worry, and distress). The framework was conceptualized based on the dimensions of primary and secondary appraisal. Primary appraisal refers to whether an individual perceives a new IT event as an opportunity or a threat. Secondary appraisal refers to an individual's perception of control over the expected outcomes of a new IT event. Beaudry and Pinsonneault (2010) emphasized that anxiety in the deterrence emotion category could indirectly and positively influence IT use through prompting a search for social support, which provides a clue to the relationship between negative emotions and social influence.

While reviewing research on technology adoption models in the IT context, it is apparent that there are some relationships between emotions and attribute factors, such as effort expectancy and social influence. However, a precise determination requires reviewing the results of the relationship mentioned in the literature on e-banking adoption, as outlined in the following section.

2.2.5 Emotion and e-banking technology adoption

A limited number of emotions (e.g., enjoyment and anxiety) have been applied and analysed in models of e-banking technology adoption, and the results of the impact of these emotions on consumers' e-banking adoption have been found to vary. Some researchers have supported the role of emotions in predicting consumers' behavioural intention to adopt e-banking technology, while others have not. Table 1 provides an overview of studies that have investigated the role of emotions in the e-banking adoption context. These studies were identified by searching on Google Scholar, Emerald, and ScienceDirect based on five selection criteria, i.e., emotions, technology adoption models, e-banking, IB, and MB.

Results presented by Salhieh et al. (2011) and Odumeru (2012) identified the influence of enjoyment on consumers' intention towards e-banking adoption. Their argument was as follows: When consumers find the use of different channels of e-banking to be an enjoyable experience, they will probably accept using e-banking services. Based on a meta-analysis of 142 articles in the banking context, Santini et al. (2019) reported that perceived enjoyment has an impact on consumers' attitudes towards and behavioural intention to use new e-banking technology. The influential role of enjoyment has also been supported when using the UTAUT model. Alalwan et al. (2015, 2017), Makanyeza and Mutambayashata (2018), Oliveira et al. (2016), and Raza et al. (2019) suggested that the hedonic motivation has positive effect on consumers'

Table 1. Emotions in the e-banking context.

Authors	Year	Country	Related significant relationships	Sample
Yuen et al.	2010	USA, Australia, Malaysia	Anxiety is not a factor influencing behavioural intention to use IB services in developing and developed countries.	766 IB users
Salhie et al.	2011	Jordan	Enjoyment influences consumers' acceptance of e-banking channels.	60 bank managers, 30 IT managers, and 150 bank customers
Odumeru	2012	Nigeria	Perceived enjoyment influences the acceptance of e-banking.	258 bank customers
Abbad	2013	Jordan	Enjoyment influences the perceived usefulness, perceived ease of use, intention to use e-banking directly, and intention to use e-banking through perceived usefulness and perceived ease of use, respectively.	319 non-users of e-banking services
Alalwan et al.	2015	Jordan	Hedonic motivation is a factor influencing behavioural intention to use IB services.	348 banking customers
Oliveira et al.	2016	Portugal	Hedonic motivation is not a factor influencing behavioural intention to use MB services.	301 students and alumni from universities
Alalwan et al.	2017	Jordan	Hedonic motivation is a factor influencing behavioural intention to use MB services.	343 banking customers
Salimon et al.	2017	Nigeria	Hedonic motivation plays a mediating role among perceived usefulness, perceived security, and e-banking adoption.	266 users of e-banking in Nigeria
Farah et al.	2018	Pakistan	Hedonic motivation is the strongest determinant of behavioural intention to adopt MB services.	385 bank customers
Makanyeza and Mutambayashata	2018	Zimbabwe	Hedonic motivation is a factor influencing behavioural intention to adopt plastic money usage.	528 consumers
Yaseen and El Qirem	2018	Jordan	Hedonic motivation is not a factor influencing behavioural intention to use e-banking services.	348 bank customers who are using e-banking services
Kwateng et al.	2018	Ghana	Hedonic motivation is not a factor influencing behavioural intention to use MB services.	300 users of m-banking
Merhi et al.	2019	Lebanon, England	Hedonic motivation is an insignificant determinant of behavioural intention to adopt MB services in both countries.	901 m-banking users who were either Lebanese or English
Raza et al.	2019	Pakistan	Hedonic motivation is a factor influencing behavioural intention to use MB services.	299 users of Islamic banks
Santini et al.	2019	Brazil	Enjoyment perception is a factor influencing behavioural intention regarding banking services.	Meta-analysis of 142 articles
Gupta and Arora	2019	India	Hedonic motivation is a weak determinant of behavioural intention to use mobile payment systems.	267 mobile payment users
Ngugi et al.	2020	USA	There is a statistically significant relationship between anxiety and effort expectancy.	63 SME users of IB
Saprikis et al.	2022	Greece	Anxiety has a significant negative effect on behavioural intention.	837 smartphone users

intention to adopt and use e-banking technology such as IB and MB. Farah et al. (2018) reported that hedonic motivation is the strongest determinant of consumers' behavioural intention towards the adoption of MB. However, Kwateng et al. (2018), Mehri et al. (2019), and Oliveira et al. (2016) found that hedonic motivation does not play an influential role in the prediction of behavioural intention to use MB, and Yaseen and El Qirem (2018) found that hedonic motivation does not influence behavioural intention to use e-banking services. Gupta and Arora (2019) found that this factor is a weak determinant of mobile payment system adoption.

Regarding negative emotion, Yuen et al. (2010) found no relationship between anxiety and behavioural intention to use IB in their samples from developed and developing countries, while Saprikis et al. (2022) argued for the significant negative influence of anxiety on behavioural intention to use MB among Greek users.

Studies have also examined the influence of negative and positive emotions on the intention to adopt e-banking technology through the attribute factors of technology adoption models, using the theoretical foundation from the IT context. Abbad (2013) not only supported a direct influential role of enjoyment but also an indirect impact of enjoyment on consumers' behavioural intention to use e-banking through perceived ease of use and perceived usefulness. Salimon et al. (2017) argued that hedonic motivation plays a mediating role between perceived ease of use and e-banking adoption. Ngugi et al. (2020) discussed how anxiety is significantly related to behavioural intention to adopt IB through effort expectancy.

Apart from the diverse findings concerning the impact of negative and positive emotions on consumers' behavioural intention to adopt e-banking technologies, it appears that the relationship between emotions and the attribute factors of e-banking adoption aligns with the

foundational arguments presented in section 2.2.4. Accordingly, the next section specifies the attribute factors applied in this thesis.

2.2.6 Attribute factors with respect to consumers' emotions

Considering the arguments above and according to the results of technology adoption models in the IT context, this thesis considers effort expectancy, performance expectancy, and social influence to be the attribute factors most strongly related to the concept of emotion.

Moreover, the findings of the literature review show that hedonic motivation is one of the most strongly related attribute factors of UTAUT models. Findings indicated that it has positive direct and indirect influences on consumer behavioural intention to adopt e-banking technology. While this thesis acknowledges hedonic motivation as an attribute factor, it views hedonic motivation as positive emotions derived from using e-banking technology. This consideration provides a possibility to compare this prevalent factor in the e-banking adoption context with negative emotions arising from other appraisals, as suggested by Beaudry and Pinsonneault's (2010) emotional framework.

By identifying the attribute factors of the research models, the following section will delve into the second part of the research in this thesis, focusing on the barrier perspective of e-banking technology adoption.

2.3 Barrier perspective on e-banking technology adoption

2.3.1 Perceived risk as a prominent barrier factor

Perceived risk has been highlighted as a prominent barrier factor in e-banking adoption. Numerous studies under different models of technology adoption such as the TAM and UTAUT_{1&2} models have determined the gravity of this factor to be a barrier to the adoption of e-

banking technology (Alalwan et al., 2014; Giovanis et al., 2019; Hanafizadeh et al., 2014a; Kolodinsky et al., 2004; Kugler et al., 2012; Lee, 2009; Liao et al., 1999; Martins et al., 2014; Roy et al., 2017; Wu et al., 2017). Martins et al. (2014) indicated that considering perceived risk to be a barrier factor can significantly increase the predictive power of consumers' behavioural intention to adopt IB. Likewise, Baptista and Oliveira (2016) and Souiden et al. (2021) suggested that perceived risk is the most important variable in the barrier-based perspective of MB adoption.

2.3.2 Definition of perceived risk in e-banking adoption

The concept of perceived risk has been conceptualized as different terms such as discomfort (Kolodinsky et al., 2004), insecurity and uncertainty of outcomes (Farah et al., 2018), security, privacy, and monetary risks (Thakur & Srivastava, 2014), external and internal risks (Roy et al., 2017), and privacy risk (Wu et al., 2017). Previous literature has advanced this concept as a multi-dimensional factor (Featherman & Pavlou, 2003; Kaur & Arora, 2021; Martins et al., 2014; Yang & Chu, 2018). Empirical studies (e.g., Farah et al., 2018; Kolodinsky et al., 2004; Roy et al., 2017; Thakur & Srivastava, 2014; Wu et al., 2017) mainly follow Featherman and Pavlou (2003, p. 454) and define perceived risk as "the potential for loss in the pursuit of a desired outcome of using an e-service". Moreover, perceived risk is decomposed into two main categories: performance-related and psychosocial risks. Performance-related risks, i.e., performance, financial, privacy, and time risks, have been discussed as salient dimensions of perceived risk. Psychosocial risks include social and psychological risk. social risk has been omitted due to its insignificant role while psychological risk has been argued a less important dimension of perceived risk (Featherman & Pavlou, 2003).

Psychological risk might be considered a dimension of perceived risk that incorporates negative emotions. It refers to the consumer's potential loss of self-esteem or peace of mind due to the possible negative influence

of the performance of the product. Likewise, Martins et al. (2014) developed this concept by adding frustration arising from not achieving a buying goal (Martins et al., 2014).

While treating perceived risk as a multi-dimensional factor, including psychological risk, is an attempt to encompass nearly all its aspects, these dimensions do not cover all concerns, particularly regarding the influence of emotion on perceived risk. The definition of psychological risk presented by Featherman and Pavlou (2003) highlights perceived risk, including psychological risk, comes from a logical analysis. This definition suggests assessing the performance of new e-services, i.e., the attribute aspect of e-banking technology. Additionally, while psychological risk pertains solely to frustration, it fails to encompass the various types of emotions arising from different appraisals. In the context of e-banking adoption, few studies have examined perceived risk as a factor influenced by both negative and positive emotions, as highlighted by Wu et al. (2017). Additionally, a greater emphasis has been placed on studying positive emotions, particularly hedonic motivation, than negative ones (Koenig-Lewis et al., 2015; Wu et al., 2017).

To comprehend the relationship between perceived risk and emotion, the next section delves into their connection within the fields of risk judgment, decision-making, and consumer behaviour.

2.3.3 Perceived risk and emotion

Generally, the origin of the identified relationship between perceived risk and emotion can be traced back to early psychometric studies of risk perception (Wilson et al., 2019). In a laboratory experiment, Johnson and Tversky (1983) indicated that the perception of risk was not just a cognitive inference about a particular risk, but also aroused emotions via information that led to a sense of vulnerability. Slovic (1987) argued that the feeling of dread plays a determining role in the risk perception of various hazards.

Researchers in the field of judging and decision-making such as Loewenstein et al. (2001) and Slovic et al. (2004) have investigated risk perception based on the two processes of feeling and analysis. They argued that risk is judged based on two qualitatively different modes of information processing called “risk as feelings” and “risk as analysis”, which are important in making good decisions about risks. These processes happen as people need to assess risks rapidly and simultaneously to control their current situation (Lerner & Keltner, 2000; Slovic et al., 2004).

Lerner and Keltner (2000, 2001) extended the concept of “risk as feeling” by investigating the impact of discrete emotions. They demonstrated that anger and fear exert opposite influences on people’s risk assessment and perception. They proposed the appraisal-tendency framework (ATF) based on an appraisal of certainty and control, noting that appraisals of low certainty and low individual control arouse fear in individuals, whereas appraisals of high certainty and high individual control arouse anger. Whereas fearful people make pessimistic risk estimates and risk-averse choices, angry people make optimistic risk estimates and risk-seeking choices. Likewise, Druckman and McDermott (2008) found that different negative emotions have opposite effects on risk perception. Thus, emotions need to be differentiated beyond their positive or negative valence. Sjöberg (2007) further developed this notion, arguing that positive emotions are important in risk perception, but negative emotions play an even more important role. Tompkins et al. (2018) provided an overview of research, highlighting the role of affect and emotions in risk perceptions. Tompkins et al. (2018) discussed the relationship between discrete emotions (e.g., anger and fear) and perceived risk. They also argued that experiencing mixed emotions (e.g., comprising sadness, anxiety, fear, anger, worry, and stress) is common, especially when people consider their feelings about technologies.

In the context of consumer behaviour, Bauer (1967) noted that perceived risk can be “traumatic” for high-priced products such as automobiles. This observation hints at a relationship between perceived risk and emotion in this context. Chaudhuri (1997) argued that emotions evoked during consumption can be considered a means of gaining knowledge of products and services. These emotions as a kind of knowledge can affect consumers’ perceived risk. These evoked emotions, particularly negative ones, are strong determinants of consumers’ perceived risk, even stronger than rational processing. Chaudhuri (1998, 2001) investigated the influence of negative and positive emotions on the risks consumers perceive in different classes of products. The results indicated a link between emotions and perceptions of risk in products. In particular, it is argued that negative emotions arising from product consumption lead to perceptions of risk in the product, and the level of perceived risk is different between different classes of products. In a similar vein, Parrott (2017) reviewed the two theories of risk as feeling and ATF, arguing for the significant role of emotions in consumers’ perceptions of the risks and benefits of products.

As a result, the relationship between perceived risk and emotions has evolved across various disciplines. Building on the aforementioned theoretical discussions, the following section introduces the theoretical framework and research model of this thesis.

2.4 Theoretical framework and research model

Figure 5 shows the general research model used in this thesis. As discussed, various emotional appraisals have been developed in different contexts. Regarding e-banking technology in the realm of IT, this thesis applies the emotional framework developed by Beaudry and Pinsonneault (2010). Two categories of negative emotions from this framework, i.e., loss emotions and deterrence emotions, are included in the general research model.

From the attribute-based perspective, the first study of this thesis applies attribute factors of the UTAUT_{1&2} models, i.e., effort expectancy, performance expectancy, and social influence. This selection is based on reviewing related literature in the IT and e-banking contexts examining the relationships of these attribute factors with emotions. Hedonic motivation, a key attribute factor related to emotions in the UTAUT₂ model, was excluded from the first study of this thesis due to its extensive examination from the attribute-based perspective on e-banking adoption.

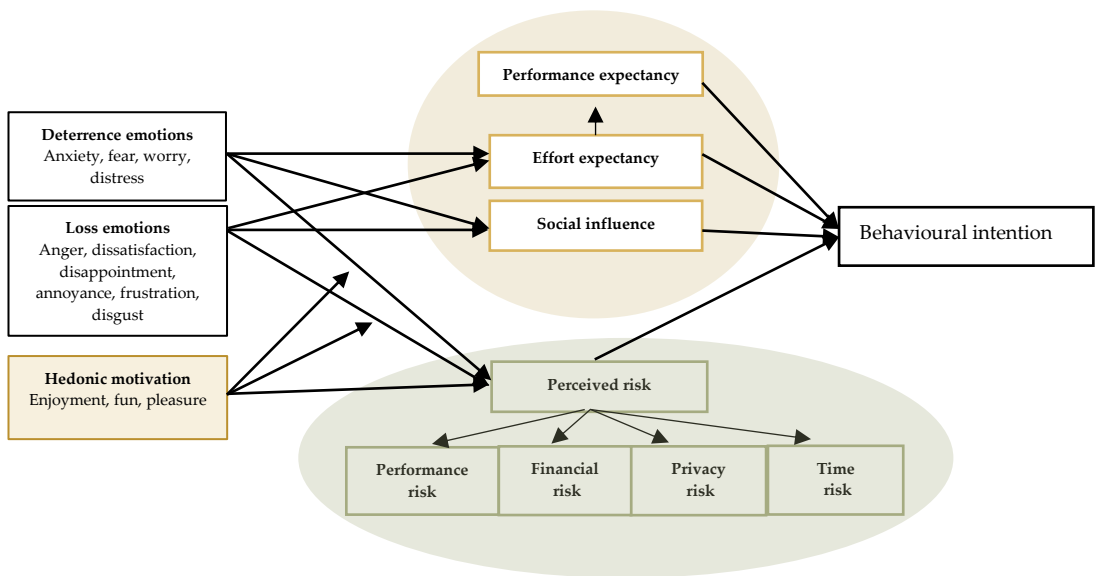


Figure 5. The general research model of this thesis.

Note: ■ Attribute-based perspective ■ Barrier-based perspective

As depicted in Figure 5, the first research model under the attribute-based perspective illustrates the association among two categories of negative emotions (e.g., deterrence and loss emotions), effort expectancy, and social influence. Effort expectancy exerts an influence on performance expectancy, and three variables in the general model are expected to be

positively and directly related to behavioural intention to use emerging e-banking technology.

From the barrier-based perspective, the second part of the research model applies perceived risk. This thesis follows Featherman and Pavlou (2003) and Martin et al. (2014) and considers four main performance dimensions of perceived risk. According to Featherman and Pavlou (2003), performance risk concerns performance risk, financial risk, privacy risk, and time risk. Martins et al. (2014) confirmed this argument and identified these four dimensions of performance risks as the most salient ones for perceived risk in IB adoption.

Additionally, the second study examines hedonic motivation alongside negative emotions, as illustrated in the general research model, for two reasons. First, hedonic motivation has received limited attention from the barrier-based perspective on e-banking adoption. Second, the consideration of hedonic motivation contributes to a more comprehensive understanding of emotions in relation to perceived risk in e-banking adoption. Reflecting on Wu et al.'s (2017) suggestion, which highlighted the role of hedonic motivation in reducing consumers' perceived risk, the second study examines the influence of negative emotions in the presence of hedonic motivation.

As shown in Figure 5, deterrence and loss emotions are expected to be positively related to consumers' perceived risks and, subsequently, their intention to adopt emerging e-banking technology. Additionally, it depicts hedonic motivation as a moderator between deterrence and loss emotions, and perceived risk.

The factors applied in the general research model are defined as follows. Performance expectancy emphasizes the individual's belief about the degree of benefit obtained by using a particular technology for certain activities. Effort expectancy refers to the level of ease associated with the use of a new technology. Social influence refers to the level to which an

individual perceives others' opinions or beliefs as important for the use of a new technology.

Featherman and Pavlou (2003) defined the four main dimensions of perceived risk as follows: (i) performance risk refers to failing to deliver the desired benefits due to the possibility of the results not being as they were intended; (ii) financial risk refers to the potential monetary loss from the initial outlay of purchasing the product, and to the possible cost of its subsequent maintenance; (iii) privacy risk refers to the possible loss of personal information without the person's knowledge; and (vi) time risk refers to the probability of losing time because of replacing the product or learning how to use it when it does not perform to expectations.

In line with other studies in the e-banking adoption context, this thesis considers hedonic motivation in terms of enjoyment, fun, and pleasure emotions derived from using emerging e-banking services (Salimon et al., 2017; Venkatesh et al., 2012; Yaseen & El Qirem, 2018; Wu et al., 2017). This thesis treats hedonic motivations as positive emotions derived from consumers' prior knowledge of using e-banking technology and also considers negative emotions derived from the appraisal of emerging e-banking technology.

This consideration draws readers' attention to emotions aroused by different appraisals. Indeed, considering emerging e-banking technology as a stimulus, consumers' emotions can arise from both their prior knowledge and their appraisal of emerging e-banking technology. Beaudry and Pinsonneault (2010) argued that emotions are probably triggered in the anticipation period based on users' expectations of how a new IT event will influence their performance. Due to consumers' prior knowledge of a category of products or services, consumers' emotions can even be evoked during trials, demonstrations, or purchases of products and services (Chaudhuri, 2002).

Finally, behavioural intention is a well-established part of the UTAUT_{1&2} models in the prediction of user behaviour.

3 Method

3.1 Methodological considerations

The concepts examined here can be discussed in relation to the nature of social reality, reflecting the thesis's ontological assumptions and informing its epistemological approach. This thesis primarily adopts a functionalistic paradigm. This paradigm encourages the generation of empirical knowledge, i.e., a positivist approach (Morgan, 1980).

The ontological and epistemological foundations of this thesis align with the underlying assumption of technology adoption models in the IT context. Technology adoption models have been developed based on the functionalistic paradigm. These models are rooted in the TRA model (Fishbein & Ajzen, 1975), which assumes that individual actions can be predicted. This predictive approach comes from the assumption that people choose rational actions when they face new, risky, and technological events (Silva, 2007).

Regarding the concept of emotion, this thesis assumes that emotion is an intrinsic and natural phenomenon whose expression, but not reality, might be influenced by norms, values, culture, and time. This assumption maintains the crucial relationship between biology and physiology attendant on emotions while rejecting the view that emotions are determined by cultural and social norms. The main argument of this standpoint is that cultural and social norms exist, but that they are just the surface of emotions as a phenomenon. Kemper (1981) discussed this matter and emphasized that despite this disagreement between positivist and social constructionist perspective, they align in certain areas, such as the "organismic approach" presented by Hochschild's (1979). According to the organismic approach, emotions are automatically triggered once a social stimulus is properly defined in a place.

This argument underscores the consensus among philosophers that emotions always pertain to something or someone, regardless of

examining them objectively or subjectively (Solomon, 2008). In line with this approach, this thesis considers emerging e-banking technology to be a stimulus. The emotional reactions to this stimulus are categorized as affective, intuitive, and automatic phenomena that can be reported by individuals due to their self-awareness (Baumeister et al., 2007).

However, asking consumers to report their emotions can give rise to concern regarding the objective analysis of emotions. This critique also applies to the concept of perceived risk since both concepts can be argued to be inherently subjective. Within the functionalist paradigm and in alignment with Mitchell (1999), this thesis acknowledges the subjective impression of these observable phenomena and argues that it is important to conceptualize and measure them. This conceptualization and measurement provide the opportunity to address how to manage consumers' emotions and perceived risk in the context of human interaction with new technology (Qinghua & Qin, 2011), which is a central part of this thesis.

3.2 Research design

3.2.1 Population and sample

Figure 6 shows the sampling process of this thesis. The general population can be defined as consumers who are familiar with e-banking services. Banerjee and Chaudhury (2010) defined the general population as a group of potential participants about whom some information is required if they are to be identified. This general population must be narrowed down to a target population, which is determined by refining the general population based on specific attributes of interest and relevance to a particular study (Asiamah et al., 2017). Tan and Lau (2016) recognized young consumers as the group showing the strongest preference for emerging e-banking technology.

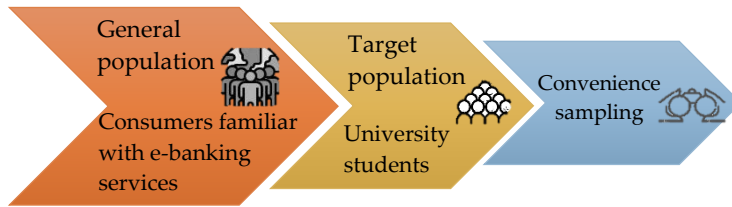


Figure 6. The thesis’s sampling process.

While many young consumers may already utilize e-banking services and are familiar with e-banking’s purpose and functionality, they may require additional information to differentiate between current and emerging e-banking technology (Arias-Oliva et al., 2019; Nourallah & Öhman, 2021). To ensure that the participants are relatively young with some level of technological knowledge and also have a reasonable understanding of emerging e-banking technology, university students were selected as the target population (cf. Asiamah et al., 2017). After determining the target population, convenience sampling was used to reach university students. This refers to a kind of non-probability or non-random sampling that considers geographical proximity, availability at a given time, and easy accessibility when selecting participants from a target population (Etikan et al., 2016). In this thesis, convenience sampling was applied due to the researcher’s access to email addresses and social media groups of students studying at Swedish universities. While the sampling process was carried out in Sweden, the goal was to include both Swedish and international students to minimize bias. However, it is important to note that this sampling process has certain limitations, which are further discussed in section 5.4.

Table 2 presents the demographic profile of the participants in this thesis research, derived from 252 responses and utilized in the two studies

included. In both studies, almost six out of ten were females and the vast majority were between 18 and 35 years old.

Table 2. Profile of the participants.

Demographics	Study 1		Study 2	
	Number	Percentage	Number	Percentage
Gender				
Female	137	58.54	132	58.59
Male	95	40.59	90	40.17
Gender variant	1	0.42	1	0.44
Preferred not to answer	1	0.42	1	0.44
Age				
Under 18 years	1	0.42	1	0.44
18–25 years	97	41.45	93	41.51
26–35 years	113	48.29	109	48.66
36–45 years	21	8.97	20	8.92
Over 45 years	2	0.85	1	0.44
Education				
Bachelor's degree	89	38.03	83	37.05
Master's degree	118	50.42	115	51.33
PhD	27	11.53	26	11.60
Citizenship				
Domestic	97	41.45	89	39.73
International	137	58.54	135	60.26
Income per month (SEK)				
<10,000	127	54.27	125	55.80
10,000–19,999	43	18.37	39	17.41
20,000–29,999	44	18.80	42	18.75
>30,000	12	5.12	11	4.91
Preferred not to answer	8	3.41	7	3.12
Total	234		224	

Note: The percent values per category do not sum to 100% because of rounding errors.

The sample of the first study, i.e., from the attribute-based perspective, included students at the bachelor's (38%), master's (50%), and PhD (12%) levels. In the sample of the second study, i.e., from the barrier-based perspective, approximately 37% of the participants had a bachelor's degree, 51% a master's degree, and 11% a PhD. In both studies, over half of the participants were international students, and the vast majority of them had a monthly income of less than 10,000 Swedish kronor, i.e., the Swedish currency (SEK).

3.2.2 Measurement instrument and data collection

To test the theoretical constructs, a survey was conducted. Considering time limitations, an online questionnaire based on constructs and indicators in the literature was developed to collect data (see Appendix). The first part of the questionnaire covered demographic information, i.e., gender, age, education, citizenship, and income. The second part consisted of general questions related to emerging e-banking technology. These questions were asked to identify and exclude participants who were unfamiliar with emerging e-banking technology, such as mobile wallets and digital currency. The third part asked questions about negative emotions towards emerging e-banking technology, attribute factors affecting technology adoption, hedonic motivation, and perceived risk dimensions.

The questionnaire was initially created in English and the final version was translated into Swedish. Most Swedish universities have international students, and as the target population was university students, both English and Swedish versions of the questionnaire were sent out. This helped to increase the number of participants and to reduce language biases. A pilot survey with 30 participants (not included in the study) was conducted to test the reliability and validity of the items and the whole questionnaire. The pilot survey improved the questionnaire in terms of

wording, phrasing, and comprehensibility for Swedish and foreign students.

Online web surveys provided by Google Forms and Survey Monkey are arguably the most frequently used data collection methods in academic research (Gupta & Arora, 2019). A hyperlink to the Google survey form was sent via email. The link was also posted on different social media channels and groups on Facebook, WhatsApp, Instagram, and Telegram. Considering the number of members of social media groups and the number of email addresses, the hyperlink to the Google survey was sent to 850 students. To ensure that only students participated, an alarm message was designed asking people to ignore the post if they were not students at Swedish universities. To exclude students who had never heard about new e-banking technology mentioned in the survey, two relevant questions were included in the survey. Accordingly, the sample can be said to represent young individuals familiar with emerging e-banking technology.

Data were obtained over six months from April to September 2020. In the first round, 112 responses were received. A postcard reminder was emailed to the participants after one month, and message reminders were sent every month to all online social media groups and channels. In total, this resulted in 252 responses, i.e., a 29% response rate. Of these responses, ten were removed because the respondents answered that they had never heard of the new e-banking technologies mentioned. Moreover, eight cases in the sample used in the first study and 18 cases in the sample used in the second study were excluded because the participants did not answer all questions properly. Eventually, 234 valid questionnaires out of 252 responses for the first study and 224 valid questionnaires out of 252 responses for the second study were considered for further data analysis.

3.2.3 Data analysis

The thesis applied structural equation modelling (SEM) to estimate the data. SEM is the most appropriate statistical method when a researcher has multiple independent and dependent constructs captured by several measured indicators (Hair Jr. et al., 2014a). SEM provides the opportunity to simultaneously examine a complex model encompassing multiple dependent and independent relationships. The construction of these relationships between constructs and indicators relies on theoretical and empirical considerations, resulting in two types of measurement models, reflective and formative. In line with theoretical considerations, both measurement models in this thesis are defined as reflective models. In such models (see Figure 7), latent constructs exist independently of indicators, with the causality direction running from constructs to indicators. Moreover, the indicators share a common theme, display high positive intercorrelations, and are changeable. These characteristics are assessed with empirical tests such as Cronbach's alpha, factor loadings, and convergent and discriminant validity. Moreover, a reflective measurement model identifies all the errors associated with the indicators, thus representing measurement errors in the latent constructs (Coltman et al., 2008).

Two popular SEM approaches, i.e., variance-based SEM, or partial least squares SEM (PLS-SEM), and covariance-based SEM (CB-SEM) (Collier, 2020) were used in this thesis to analyse the data. PLS-SEM was used to analyse the research model and test the hypotheses of the first study. This selection was based on the non-normality of the data for the three constructs of consumers' emotions, attribute factors of e-banking technology adoption, and consumers' behavioural intention.

Hair Jr. et al. (2014b) discussed how the PLS-SEM approach is suitable for evaluating non-normal data, as in the case here. It is also suggested that the PLS-SEM approach is appropriate for small sample sizes. In addition, PLS-SEM is suitable for explanatory and predictive purposes

when examining path models with typically more than five constructs and small samples (Reinartz et al., 2009; Sarstedt et al., 2014). The research model used in the first study included more than five constructs. As suggested by Ringle et al. (2015), smart PLS V 3.3.2 software was applied to evaluate the research model.

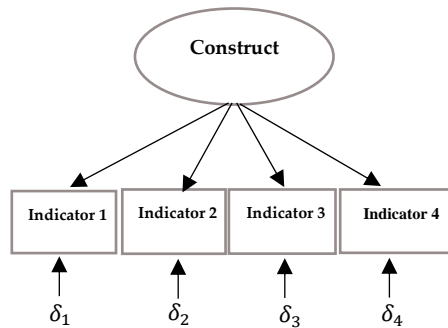


Figure 7. Reflective models.

Note: The error terms, δ_i , associated with the indicators represent measurement error in the latent construct.

In pursuit of diversity in statistical methods, the second study applied the CB-SEM approach and AMOS software. A test of normality was conducted to evaluate the normality of data distribution for perceived risk, consumers' emotions, and behavioural intention. Given a normal data distribution, SEM requires careful consideration of sample size and missing data as they can profoundly influence the results (Hair Jr. et al., 2014a). Therefore, a test of communities was performed to examine sample size using SPSS 28.0 software. Using SPSS AMOS 26.0 software, confirmatory factor analysis (CFA) was then applied to assess the psychometric properties of perceived risk as a second-order construct. CFA enables the researcher to investigate how well the indicators represent the constructs (Hair Jr. et al., 2014a). Then, perceived risk as the higher-order construct was included in the research model. The research model was further tested for its overall fit, reliability, and validity. Finally, the research model was evaluated to estimate the hypotheses.

3.3 Research quality

3.3.1 Reliability and validity

Given the application of SEM for data analysis, examining construct reliability and validity serves to demonstrate internal reliability and validity. Regarding the reliability of constructs, Cronbach's alpha and composite reliability tests are applied in both studies. Reliability refers to the extent to which a construct is free from errors and consistently measures the "true" value. In other words, a reliable measure will display consistency when applied repeatedly (Hair Jr. et al., 2014a). The constructs in both studies had Cronbach's alpha and composite reliability values exceeding the 0.7 threshold, signifying satisfactory reliability and verifying the reliability of the measurements in both studies (Hair Jr. et al., 2014a).

Validity refers to the extent to which a measure is free of non-random or systematic errors and accurately represents the concept under study (Hair Jr. et al., 2014a). Two widely accepted types of validity are convergent validity and discriminant validity. Convergent validity evaluates the degree of correlation between two measures of the same concept, while discriminant validity examines the extent to which two conceptually similar concepts are distinct and not overly related (Hair Jr. et al., 2014a). Convergent validity and discriminant validity were examined by applying the average variance extracted (AVE), Fornell-Larcker, and cross-loading criteria. Both studies reported AVE values greater than 0.5 for all constructs, indicating the good convergent validity of the measurement (Hair Jr. et al., 2014a). Considering the Fornell-Larcker criterion, the results of both studies indicated that the square root of AVE for each construct is higher than the correlation coefficients of all the other constructs (cf. Fornell & Larcker, 1981). The cross-loading criterion in both studies also showed that the loading of each measurement item is greater than all other cross-loadings (cf. Chin, 1998).

Accordingly, the discriminant validity of the measurement was confirmed in both studies.

In terms of external validity, following Findley et al. (2021), this thesis explicitly identified its own scope, allowing for a comprehensive understanding of the potential limitations of its results and arguments. The scope includes the identification of the population and sample (see Figure 6), highlighting limitations in both generalizability and transportability, as discussed in Section 5.2.

3.3.2 Ethical considerations

Ethical aspects as integral to all phases of research are important when specifying the quality of research. Both studies in this thesis consider ethical principles, including the confidentiality of the information and informed consent (Braun & Clarke, 2013). Since the data were gathered using an online questionnaire, a friendly message was attached to the online questionnaire explaining that participation in the survey was voluntary. The questionnaire was designed to respect participant privacy and avoid asking questions that might disclose the participants' personal identity.

Furthermore, the primary data gathered were exclusively applied in this thesis. Utilizing SEM, the results are presented openly and candidly, tables and figures being used to enhance data clarity and transparency. The results are conveyed in an informative manner, ensuring that the author provides enough information for readers to independently re-evaluate the summary results. Moreover, the presentation of the results shows the author's conscientious effort to correctly identify and address any errors in measurements, calculations, and numerical reporting. Additionally, the author made a concerted effort to avoid any exaggeration when reporting the results (Panter & Sterba, 2011).

4 Overview of the two studies

4.1 Study 1

The first study, entitled “Negative emotions and consumer behavioural intention to adopt emerging e-banking technology”, examines the influence of consumers’ negative emotions towards e-banking technology on their behavioural intention to adopt emerging e-banking technologies, using the UTAUT_{1&2} models as the framework.

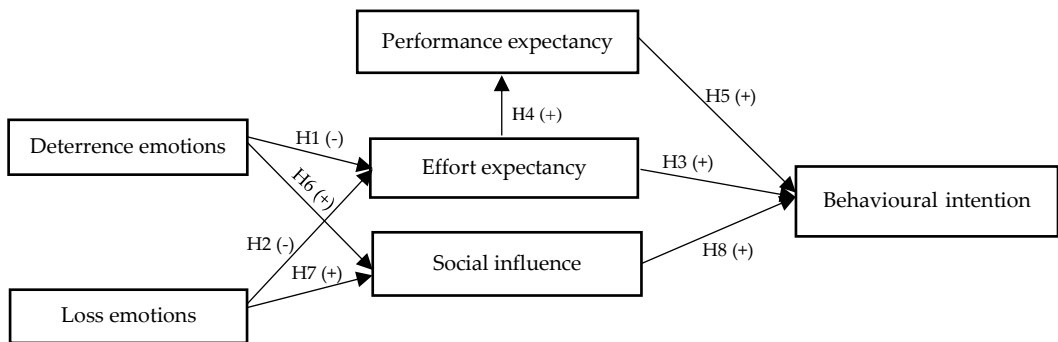


Figure 8. The research model of study 1.

Drawing on the literature review related to the concept of emotions in the IT and e-banking adoption contexts, a research model with eight hypotheses was developed (see Figure 8). The research model illustrates how each of the deterrence and loss emotions is associated with three main variables from the UTAUT model, i.e., effort expectancy, performance expectancy, and social influence. The model also shows the assumed positive and direct influence of the three main variables on the behavioural intention to adopt emerging e-banking technology.

The hypotheses were tested using the PLS-SEM bootstrapping approach with a resample of 5000. The *t*-statistic and *p*-value were considered when testing the hypotheses (cf. Hair Jr. et al., 2014b).

The results reject H1, not supporting the relationship between deterrence emotions and effort expectancy. H2, regarding the relationship between loss emotions and effort expectancy, is supported. The results support the relationships between effort expectancy and behavioural intention (H3), between effort expectancy and performance expectancy (H4), and between performance expectancy and behavioural intention (H5). While H6, considering the relationship between deterrence emotions and social influence, is supported, H7 and H8 are not (see Figure 9).

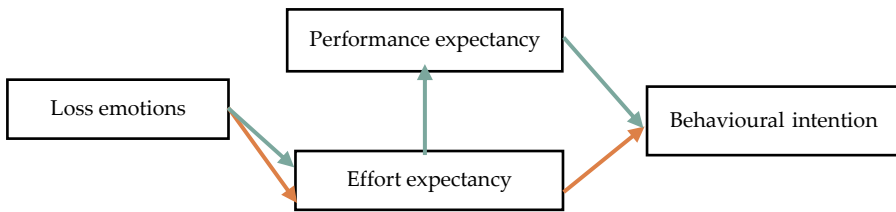


Figure 9. The indirectly supported association between loss emotions and behavioural intention. Note: Follow the paths indicated by the colours of the arrows.

Overall, the results indicate two indirect associations between loss emotions and behavioural intention: via effort expectancy and via effort expectancy and performance expectancy. The empirical results highlight the importance of consumers' loss emotions for their behavioural intention to adopt emerging e-banking technology. Contrary to previous studies (Brown et al., 2004; Donmez-Turan, 2019; Saprikis et al., 2022; Venkatesh, 2000; Venkatesh et al., 2003), this study shows that deterrence emotions are unrelated to effort expectancy. This underscores the importance of examining various types of negative emotions.

4.2 Study 2

The second study, entitled “Emotions, perceived risk, and intentions to adopt emerging e-banking technology among educated young consumers”, examines the influence of consumers’ negative emotions towards e-banking technology on their perceived risk and, subsequently, their behavioural intention to adopt such technology. This study further investigates the relationship between hedonic motivation and perceived risk, while also examining the moderating influence of hedonic motivation on the association between the two types of negative emotions and perceived risk.

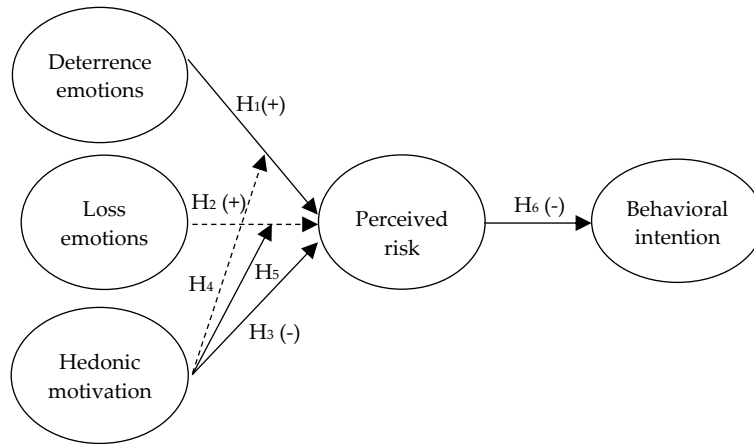


Figure 10. The research model of study 2.

Note: The dashed arrow indicates an association hypothesized to be significant but found to be insignificant.

Drawing on the literature review related to the concept of emotions in the fields of risk assessment and decision-making, e-services, and e-banking, a research model with six hypotheses was developed. The research model illustrates the associations among deterrence and loss emotions, perceived risk, and consumers’ behavioural intention to adopt emerging e-banking technology. Additionally, the model indicates the

direct influence of hedonic motivation on perceived risk, as well as its moderating influence through deterrence and loss emotions.

Applying covariance-based SEM, the model was examined using SPSS AMOS 29.0 software to test the hypotheses. The results support H1, i.e., the relationship between deterrence emotions and perceived risk. H2 regarding the relationship between loss emotions and perceived risk is not supported. The results support the relationships between hedonic motivation and perceived risk (H3) and between perceived risk and behavioural intention (H6). The moderating analysis results (H4, H5) reveal that hedonic motivation might moderate the association between loss emotions and perceived risk. However, hedonic motivation does not moderate the association between deterrence emotions and consumers' perceived risk (see Figure 10).

Overall, the results indicate an association between deterrence emotions, hedonic motivation, and perceived risk. The empirical results of the second study emphasize the importance of consumers' deterrence emotions in influencing their perceived risk and, subsequently, their behavioural intention to adopt emerging e-banking technology, even in the presence of hedonic motivation. In line with the first study, the results of the second study highlight the importance of distinguishing among various types of negative emotions (i.e., deterrence and loss emotions).

5 Concluding remarks

5.1 Main findings

This thesis empirically examined the influence of emotions towards emerging e-banking technology on consumers' behavioural intention to adopt this technology from two analytical perspectives, i.e., the attribute- and barrier-based perspectives. The primary results show the influential role of negative emotions on behavioural intention to adopt emerging e-banking technology from both perspectives.

Considering the main research question – RQ: From the attribute- and barrier-based perspectives, how are consumers' emotions associated with their behavioural intention to adopt e-banking technology? – the following can be reported.

From an attribute-based perspective, the empirical results highlight the significance of consumers' loss emotions for their behavioural intention to adopt emerging e-banking technology. Whatever the reasons, such negative emotions are suggested to influence consumers' behavioural intention via effort expectancy and performance expectancy. In contrast to most previous studies (Brown et al., 2004; Donmez-Turan, 2019; Saprikis et al., 2022; Venkatesh, 2000; Venkatesh et al., 2003), the results highlight the dominant role of loss emotions over deterrence emotions in the adoption of emerging e-banking technology.

From a barrier-based perspective, the empirical results indicate that deterrence emotions such as anxiety, fear, worry, and distress towards emerging e-banking technology can positively influence consumers' perceived risk and, subsequently, their behavioural intention to adopt such technology. However, loss emotions are not associated with perceived risk. In addition, the empirical results reveal that while hedonic motivation does not play a significant moderating role in the association between consumers' deterrence emotions and their perceived risk, it might play a moderating role in the association between loss emotions and

perceived risk. Along with Lerner and Keltner (2000, 2001), these results suggest that different categories of negative emotions might have different influences on consumers' risk assessment and perception of emerging e-banking technology.

Overall, this thesis presents several key findings. First, it underscores the importance of considering a broad range of negative emotions, rather than concentrating solely on anxiety as a negative emotion, as has been done in previous research (Ngugi et al., 2020; Saprikis et al., 2022; Yuen et al., 2010). The findings reveal that different categories of negative emotions, i.e., deterrence and loss emotions, can be notably associated with behavioural intention from both the attribute- and barrier-based perspectives. Additionally, the results emphasize the importance of investigating emotions derived from different appraisals, as an alternative to the predominant focus on emotions that arise from the use of e-banking technology. Finally, from the barrier-based perspective, the findings highlight the influential role of negative emotions in consumers' intention to adopt emerging e-banking technology, even in the presence of positive emotions, i.e., hedonic motivation.

5.2 Theoretical contributions

This thesis makes theoretical contributions to the fields of IT and e-banking. From an IT perspective, and in light of the concept of emotions developed in this context, the thesis emphasizes the importance of incorporating a broad range of negative emotions with different appraisals in models of technology adoption. This is especially critical when the users are consumers with decision-making power. Integrating a broad range of negative emotions contributes to the evolution of the traditional cognitive-based models of technology adoption. This approach is also applicable to the e-banking adoption literature, offering a multi-perspective approach to the adoption of emerging e-banking technology, in line with Souiden et al. (2021).

The findings also contribute to the e-banking literature by looking at the other side of the emotion coin. First, they emphasize the importance of considering a broad range of negative emotions, going beyond the sole focus on specific emotions such as anxiety. Second, they underscore the importance of considering different appraisals that can trigger emotions, moving away from simply focusing on the use of e-banking services as a stimulus. Third, this thesis highlights the powerful influence of negative emotions through examining the moderating role of hedonic motivation in the association between negative emotions and perceived risk. These findings add to previous research, such as that of Koenig-Lewis et al. (2015) and Wu et al. (2017), concentrating solely on positive emotions derived from using e-banking technology.

The theoretical contribution can also be discussed in relation to the psychological dimension of perceived risk. Featherman and Pavlou (2003) and Martins et al. (2014) argued that consumers may experience psychological risk when frustration, derived from not achieving their buying goals, negatively affects their self-esteem. However, the empirical findings of this thesis show that frustration – categorized as a loss emotion – is not associated with perceived risk, while deterrence emotions are. These results suggest that it may be beneficial to consider a range of negative emotions arising from different appraisals when examining the psychological dimension of perceived risk.

5.3 Managerial implications

The suggested relationships among consumers' negative emotions, effort expectancy, and performance expectancy indicate that bank consumers' perceptions of the ease of using emerging e-banking technologies may be jeopardized by negative emotions. Therefore, managers and policy-makers should put effort into improving consumers' effort expectancy (cf. Beaudry & Pinsonneault, 2010). From a technology investment perspective, Cenfetelli (2004) suggested that it would be beneficial to

design technology that does not trigger negative emotions. Considering the reasons for the influence of consumers' negative emotions on their effort expectancy, i.e., the threat perception and the feeling of lack of control over the consequences of using unknown technologies, it might be cheaper to avoid triggering negative emotions than to ensure positive ones, i.e., hedonic motivation (Cenfetelli, 2004). Providing high-security platforms and networks as well as convenient and accessible solutions, as suggested by AbuShanab and Pearson (2007), Raza et al. (2019), and Tan and Lau (2016), would probably help decrease the threat perception towards emerging e-banking technology. Moreover, emphasizing the benefits and advantages of using emerging e-banking and showing consumers how they can gain comprehensive control over their financial activity by using such technologies may help to reduce the feeling of lack of control over their consequences.

This study also illustrates the role that negative emotions play in associations between consumers' perceived risk and their behavioural intention to adopt e-banking technology, even in the presence of positive emotions. Wu et al. (2017) suggested incorporating exciting usage incentives, such as gifts or discounts, to ease consumers' perceived risk. However, according to the findings of this study, it is even more important to address their negative emotions towards e-banking technology. Therefore, managers and practitioners should prioritize strategies that minimize the activation of negative emotions, such as offering money-back guarantees or prominently displaying consumer satisfaction guarantees (Martins et al., 2014).

5.4 Limitations and suggestions for future research

While this thesis contributes to the existing body of knowledge in the e-banking context, it does have limitations. Like most quantitative studies in the social sciences, it is subject to methodological limitations concerning

the sampling process. This thesis employed a convenience sampling of university students, which may limit the generalizability of the findings (cf. Peterson & Merunka, 2014). Therefore, it is important to acknowledge that the results may not be applicable to different populations. The samples used consisted of young and educated students. Replicating this study with samples of consumers who are older and less educated could provide valuable insights. Moreover, taking consumers' experiences into account could provide a different perspective on the influence of consumers' negative emotions towards emerging e-banking technology.

Given the affective framework, this thesis suggests examining other related concepts, such as consumer feelings, moods, and a wide range of positive emotions arising from different appraisals, beyond the use of e-banking technology. Comparison of these concepts could offer valuable insights for future research. It is worth noting that the applied emotional framework in this thesis was primarily developed in the IT field. This framework was developed by Beaudry and Pinsonneault (2010) using a quantitative method in an organizational context with employees as the sample. Accordingly, future studies are encouraged to employ different research methods, such as qualitative or mixed methods, to adapt the framework to the e-banking consumer context. If this is done, this approach could explore other potential appraisals underlying consumers' emotions towards new technology in general, and particularly towards emerging e-banking technology.

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Appendix

The questionnaire

Part one: Demographic information			
Gender	Age	Education	
Female	under 18	Bachelor	
Male	18–25	Master	
Transgender male	26–35	PhD student	
Transgender female	36–45		
Gender variant/not-confirming	≥45		
Not listed			
Prefer not to answer			
Income (SEK)			
<10,000	10,000–19,999	20,000–29,999	>30,000
Citizenship			
Domestic student	International student		

Part 2: General questions	
Have you ever heard about new (emerging) e-banking technologies such as digital currency (e.g., Bitcoin) and mobile wallets?	Yes No
Have you ever used a kind of new (emerging) e-banking technology such as digital currency (e.g., Bitcoin) and mobile wallets?	Yes No

Part 3: Main items		
Constructs	Items	Sources
Deterrence and loss emotions	Please rate the degree to which you felt each emotion when you encountered new (emerging) e-banking technologies such as digital currency and mobile wallets.	(Beaudry and Pinsonneault, 2010)
Performance expectancy	PE1: I think using emerging e-banking technology such as digital currency and mobile wallets would be useful in my daily life. PE2: Emerging e-banking technology such as digital currency and mobile wallets would help me to accomplish things more quickly. PE3: Emerging e-banking technologies such as digital currency and mobile wallets would increase my productivity.	(Venkatesh et al., 2003)
Effort expectancy	EE1: It's easy for me to learn how to use emerging e-banking technologies such as digital currency and mobile wallets. EE2: Using emerging e-banking technologies such as digital currency and mobile wallets is clear and understandable for me.	(Venkatesh et al., 2003)

	EE3: It is easy for me to become skilful at using emerging e-banking technologies such as digital currency and mobile wallets.	
	EE4: Using emerging e-banking technologies such as digital currency and mobile wallets is easy.	
Social influence	<p>SI1: If people who influence my behaviour think I should use emerging e-banking technologies such as digital currency and mobile wallets, I will use them.</p> <p>SI2: If people who are important to me think I should use emerging e-banking technologies such as digital currency and mobile wallets, I will use them.</p> <p>SI3: If people whose opinions I value think I should use emerging e-banking technologies such as digital currency and mobile wallets, I will use them.</p>	(Venkatesh et al., 2003)
Hedonic motivation	<p>HM1: Using new e-banking technologies such as digital currency and mobile wallets is fun.</p> <p>HM2: Using new e-banking technologies such as digital currency and mobile wallets is enjoyable.</p> <p>HM3: Using new e-banking technologies such as digital currency and mobile wallets is entertaining.</p>	(Venkatesh et al., 2012)
Performance risk	<p>PR1: New e-banking technologies such as digital currency and mobile wallets might not perform well and create problems with my credit.</p> <p>PR2: The security systems built into new e-banking technologies such as digital currency and mobile wallets are not strong enough to protect my money.</p> <p>PR3: The probability that something's wrong with the performance of new e-banking technologies such as digital currency and mobile wallets is high.</p> <p>PR4: Considering the expected level of service performance of new e-banking technologies such as digital currency and mobile wallets, it would be risky for me to use them.</p> <p>PR5: Servers of new e-banking technologies such as digital currency and mobile wallets may not perform well.</p>	(Featherman & Pavlou, 2003) (Martins et al., 2014)
Financial risk	<p>FR1: The chance of losing money is high if I use new e-banking technologies such as digital currency and mobile wallets.</p> <p>FR2: Using new e-banking technologies such as digital currency and mobile wallets subjects my money to potential fraud.</p> <p>FR3: Using new e-banking technologies such as digital currency and mobile wallets would lead to a financial loss for me.</p> <p>FR4: Using new e-banking technologies such as digital currency and mobile wallets subjects me to financial risk.</p>	(Featherman & Pavlou, 2003) (Martins et al., 2014)

Time risk	<p>TR1: I think that if I use new e-banking technologies such as digital currency and mobile wallets, then I will lose time due to having to switch to a different payment method.</p> <p>TR2: Using new e-banking technologies such as digital currency and mobile wallets would lead to a loss of convenience for me because I would have to waste a lot of time fixing payment errors.</p> <p>TR3: Considering the time that I would invest to switch to (and set up) new e-banking technologies such as digital currency and mobile wallets, it would be risky.</p> <p>TR4: The possible time loss from having to set up and learn how to use new e-banking technologies such as digital currency and mobile wallets is high.</p>	(Featherman & Pavlou, 2003) (Martins et al., 2014)
Privacy risk	<p>PR1: The chances of using new e-banking technologies such as digital currency and mobile wallets and losing control over the privacy of my financial information is high.</p> <p>PR2: Using new e-banking technologies such as digital currency and mobile wallets would lead to a loss of privacy because my personal information would be used without my knowledge.</p> <p>PR3: Internet hackers (criminals) might take control of my money if I use new e-banking technologies such as digital currency and mobile wallets.</p>	(Featherman & Pavlou, 2003) (Martins et al., 2014)
Behavioural Intention	<p>BI1: I intend to use new (emerging) e-banking technologies such as digital currency and mobile wallets in the future.</p> <p>BI2: I plan to use new (emerging) e-banking technologies such as digital currency and mobile wallets in the future.</p> <p>BI3: I predict I will use new (emerging) e-banking technologies such as digital currency and mobile wallets in the future.</p>	(Venkatesh et al., 2003)

The studies