THE UNIVERSITY OF HULL

The impact of electronic customs on business performance of SMEs in Vietnam

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ABSTRACT

A number of projects regarding e-government and the public administration digital transformation has implemented over the past two decades. Unfortunately, most of them have been unsuccessful at the initial stage. E-customs has been evaluated as the first and the most significantly successful project towards digitalising and modernizing the administrative system in Vietnam. This study is implemented with the aim of dealing with the question "How can Vietnam as an emerging economy achieve the greater success in further implementation of e-government in relation to the National Single Window (NSW) and ASEAN Single Window (ASW)?"

E-customs emerged from concepts and practices unfamiliar to businesses and officials. With three stages of development, including a trial basis national expansion and evolution by the General Department of Vietnam Customs (GDVC) from 2005 to the present, Vietnam Customs demonstrated that e-customs could be implemented feasibly in an emerging country with a low-technology environment such as Vietnam. Furthermore, a number of benefits that e-customs provide for individuals, businesses, customs officials and other stakeholders were confirmed in the process of customs modernization, for example, time savings, cost reduction, reducing the requirements of data re-entry, fewer data errors, the burden of administrative documents reduction, convenience through a 24/7 system, enhancing risk management and advance clearance.

Combination between elements of the Diffusion of Innovation (DOI) theory, Institutional theory and prior scholars has established a conceptual framework in this study. Particularly, three additional factors, including culture, legislation, finances and human resource, that influence e-customs implementation in Vietnam are also suggested and supplemented in this research based on institutional theory and prior scholars. Information and data collected from various and inconsistent sources are interpreted, reconciled, summarised and synthesised with review and synthesis analysis as the research method of this study. Furthermore, the primary data are obtained via questionnaire survey related to stakeholders' perceptions. Then, these data are analysed with factor analysis and statistical techniques using structural equation model (SEM). An empirical study with both sides of business and customs officials was carried out in order to achieve comprehensive viewpoints of stakeholders regarding the e-customs implementation in Vietnam and its impact on business performance. The outcomes of this research identify the enablers and inhibitors influencing e-customs implementation in Vietnam. In particular, an explorative element examined culture and other factors of DOI theory, and the following relative advantages and observability were claimed as the drivers, while incompatibility, complexity and the new exploring factors of legislation deficiencies, difficulties in finances and human resources were discovered as the barriers. Moreover, the five cultural dimensions of Hofstede (2011) were applied in e-customs as the specific area in Vietnam appeared to have some differences with prior literature. Meanwhile, uncertain acceptance, low power distance and individualism were pointed out as encouragement elements for e-government and innovation by previous scholars; uncertainty avoidance and collectivism, as cultural attributes of Vietnam, stimulated e-customs deployment. In terms of international integration, the dimension of high-power distance and short-term orientation of Vietnam was changed into long-term orientation and low-power distance between customs administrators/officials and businesses. In addition, the impact of e-customs implementation on firm performance was proved to be significant. The results of this study also agree with the business performance examination from comprehensive approaches with financial and strategic efficiency.

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LIST OF ABBREVIATIONS

AGFI	Adjusted goodness-of-fit index
AMOS	Analysis of Moment Structures
AVE	Average variance extracted
CFA	Confirmatory factor analysis
CR	Composite reliability
E-customs	Electronic customs
EDI	Electronic Data Interchange
EFA	Exploratory Factor Analysis
E-government	Electronic government
GDVC	General Department of Vietnam Customs
GFI	Goodness-of-fit index
GOF	Goodness-of-fit
ICT	Information Communications Technologies
IRU	Information Communication Technology
ML	Maximum likelihood
RMSEA	Root mean square error of approximation
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Sciences
SRMR	Standardised root means square residual
TAM	Technology Acceptance Model
TLI	Tucker-Lewis's index
TRA	Theory of Reasoned Action

CHAPTER 1 INTRODUCTION

1.1 RESEARCH PROBLEM

The significant development of Information Technology (IT) has contributed to and reformed a number of sectors even public administration including electronic government (e-government) in general and electronic customs (e-customs) in particular. Anthonette (2007) and Prins (2001) indicate that IT adoption makes the delivery method of customs services changed way from direct to indirect communication (online communication). Globally, e-customs applications have provided a range of benefits for not only the USA, the EU, Japan and Korea but also emerging Asian nations such as Thailand, Singapore, Malaysia and Indonesia. According to Bhatnagar (2004b); Chan, Lau, and Pan (2008) and Grunlund (2002), with e-customs implementation, the time and financial costs for government agencies, enterprises and individual citizens enable to be reduced as well as transparency, convenience and consistency can be increased. These reflect the profits of e-customs.

According to Heeks (2008), 50% of the reviewed customs reform projects failed partially, 35% failed completely and just 15% were successful. In the 1995 to 2005 period, although the significant attempts of Vietnamese government to apply Information and Communication Technologies (ICTs) in the public sector were made with the purpose of reforming and modernising public administration, most of these projects failed in the initial stage. Nguyen-Thanh-Tuyen and Nguyen-Thi-Thanh-Hai (2006) gave an example about Project 112. Particularly, this project regarding state administration computerisation was launched in 2002 and its failure was confirmed in 2007 (GDVC, 2010). Another evidence was Project 30. It aimed to simplify the administrative procedures. However, it brought opposite results with contribution to delays and inefficiencies in public administration. Until appearance of an e-customs trial project from 2005 to 2012, some achievements have been obtained with Japanese government's support. The e-customs trial project has established a milestone for customs transformation.

In recent years, Vietnam has been known as one of the emerging developing economies in the world and joined Agility's top ten emerging market logistics index in 2021, moving from 11th to 8th place. Furthermore, the position of Vietnam in the World Banks's Logistics Performance Index (LPI) in 2018 went up 25 ranks

to 64th on the list. Customs reform and modernisation have contributed to this success. Regional and international integration as well as the power of the nation have been promoted by digital transformation in customs. In particular, openness of the nation to international trade and investment has been increased as well as private incentives are allowed to play a greater role in driving productivity growth. The General Department of Vietnam Customs (GDVC) reported that the proportion of exports and imports reached approximately USD 300 billion in 2014, compared with USD 111 billion in 2007, after e-customs was implemented in 2005. This figure continued growing in 2017 to approximately USD 426 billion, representing a 21% increase (Tu & Giang, 2018). In spite of the severe influence of the pandemic, the value of imports and exports reached USD543.9 billion in 2020, representing a 5.1% increase (Vietnam General Statistics Office, 2020). With the aim of handling a huge amount of import and export goods, the average time of the post-clearance audit has been decreased meaningfully from 42 hours 7 minutes 40 seconds in 2013 to 34 hours 32 minutes 14 seconds in 2014 for imported goods, and from 16 hours 36 minutes 10 seconds to 6 hours 58 minutes 55 seconds in 2013 and 2014, respectively, for exported goods. This was achieved by cutting 3 declarations and simplifying 42 formalities. In 2020, the time for clearance has been cut to just 10 minutes at Noi Bai International Airport (GDVC, 2020). Consequently, enterprises relative to import and export procedures can save time and finance as well as customs procedures and process can be facilitated to carry out flexibly and conveniently with the support of e-customs. This demonstrates the positive influence of e-customs on the performance of firms. However, the massive transformation of the customs decision-making for businesses has increased transition costs and required them to invest in IT equipment and expend on consultant support while increasing the risk rate, which has a negative impact on firms' efficiency.

Moreover, businesses related to import and export procedure implementation in general and SMEs, in particular, are stakeholders who are directly affected by the effectiveness of the e-customs system. Hence, the business performance of SMEs and e-customs implementation have a relationship that has not been discussed by prior scholars. In addition, the essential role of SMEs is increasing, not only in developed countries but also in developing economies. According to Ilegbinosa and Jumbo (2015), SMEs' contribution to rate in GDP, the number of SMEs participating in the economy and amount of career opportunities that SMEs

provide have demonstrated their key role. A number of studies of Acs and Audretsch (1990), Storey (1994) and Johnson and Loveman (1995) also support this viewpoint. The supporters agree SMEs as the crucial determinant that enhances the growth of economy, promote employment, accomplish competitive markets, innovate technology and develop others in the social and economic fields. Based on the report of Canetti (2003), SMEs have occupied 95% of enterprises registered in the world. In particular, 99.8% of businesses in the European Union are SMEs and they possess 76 million labours that represent for 67.4% of the workforce in 2010. In the United States of America, China and India, the number of SMEs accounts for 98% and generate 65% of new jobs. With the context of Vietnam, the statistics of Ministry of Justice (2014) illustrates that 97% of companies are SMEs who dominate the private sector. According to Uyen. H.P. Phan et al. (2015), SMEs provide over half a million career opportunities accounting for more than 51% of workforce and contribute 40% of GDP.

Based on the above discussion and the foregoing literature on e-customs, the benefits that e-customs provides to the economy in general as well as enterprises in particular should be emphasized. Particularly, clearance time reduction, cost savings in administration, storage, transportation and lobby, deduction of the administrative document burden, convenience through the 24/7 system and advanced clearance are described as the advantages of e-customs. Therefore, customs modernisation was an essential and compulsory duty for all countries, including Vietnam, in order to integrate international trade effectively and enhance competitive national advantages. Before touching on the achievements, there are a lot of challenges in e-customs that must be mentioned. Especially Vietnam, an emerging economy with less experience and a low technological environment, had to face more difficulties in digital transformation, for example, resource constraints including technology, finances and human resources under the pressure of such a rapid development of import and export proportion (Agility, 2021; GDVC, 2017). After a number of failed projects in customs modernisation, the completion of the trial phase and the evolutionary process of e-customs are milestones in the development of Vietnam Customs as well as set a new mission to be completed. However, e-customs implementation in Vietnam still has restrictions in comparison with its neighbours in East Asia, for example, Japan, China, Singapore, Thailand, Malaysia and Indonesia (Arvis et al., 2016).

In conclusion, the previous studies have inconsistency related to identifying enablers and obstacles that affect e-customs implementation as well as the theoretical researches are lack of determining factors of culture, finance & human resources and legislation into two categories above. Furthermore, the gap of relationship between e-customs and SMEs performance have not analysed in academic literature. Accordingly, an academic study that provides an understanding of e-customs in the Vietnamese context with the evolutionary phase and investigates the factors (enablers and inhibitors) influencing e-customs and should be carried out. In addition, how e-customs affects the performance of SMEs engaged in international trade in Vietnam, which has not been mentioned in any research although it should be, is also discussed in this study. From that, recommendations for policymakers and business managers could be made in order to ensure greater success for e-customs in further implementation steps.

1.2 RESEARCH MOTIVATION

Although a range of studies with topic of e-customs adoption investigate inspiration, benefits and difficulties of customs modernisation in developed economies, minority of scholars that defined facilitators and obstacle affecting e-customs implementation still have argument and dissent, especially the researches occurred in phenomenon of emerging countries with constraints of technological environment are lack. In addition, the literature inspecting relationship between e-customs implementation and business performance is absent. Therefore, the need to carry-out an empirical examination and develop a model that explores enablers and inhibitors influencing e-customs implementation and analyses the impact of e-customs on SMEs' performance in Vietnam will help in better understanding customs transformation in a developing economy as well as suggest some recommendations for continuous development and success in further administrative modernisation projects.

Furthermore, personal ambition and experience of researcher also stimulates for the topic choice. The master dissertation discussed about the export ability of textile and garment industry of Vietnam inspirates me to pursue researches related to international trade and import/ export activities. Although Vietnam has geographic advantages to enhance import and export activities, the efficiency of international trade is not commensurate with Vietnam capacity. And what are the reasons and solutions for Vietnam? The answers are suggested with era of ICTs,

administrative procedures and process in general and customs in particular have to innovated and modernised with ICTs application. However, customs transformation is not easy for Vietnam with low technological environment. Hence, series of e-government and e-customs were failed in the initial process. E-customs from 2005 to present set-up the milestone for electronic and digital government in further. Moreover, I have opportunities to gather information about customs procedures and process from 'insiders' who works for Vietnam Customs. Hence, I can obtain updated and deeper understanding about customs innovation that facilitates cross-border trade. As the result, some conference papers and publications discussing about e-customs in Vietnam have been published in NOFOMA or other conferences and Journal of Asian Finance, Economics and Business.

1.3 RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

This study has three principal objectives:

- Provide a deeper understanding of the current e-customs situation in Vietnam;
- Determine the enablers and inhibitors which influence the e-customs implementation of SMEs in Vietnam;
- Determine the impact of e-customs on the business performance of SMEs in Vietnam.
- Suggest some recommendations which can assist policymakers to enhance the efficiency and effectiveness of e-customs as well as support business managers to plan suitable strategies with the aim of improving and developing the turnover of firms.

Based on these objectives and the adoption of the theoretical framework, three research questions are proposed in this study:

Question 1: What are the enablers and inhibitors that influence e-customs for SMEs in Vietnam?

Question 2: What is the impact of e-customs on business performance in Vietnam?

Question 3: What suggestions can be provided to enhance e-customs implementation?

1.4 RESEARCH METHODOLOGY

In order to achieve the targets, this research can apply several analytical techniques. The primary methods adopted are analytical review and synthesis, which represent analysing, conciliating, summarizing and presenting data and information systematically. These methods can be used to obtain a basic understanding of e-customs in Vietnam.

To indicate and measure the elements of e-customs influencing business performance, this research should apply ontology as objectivism and epistemological as positivism. With these approaches, the phenomena can be observed, thereby gaining facts and credible data. That is the reason why quantitative methodology with a deductive approach can be used in this research. Primary data can be collected and examined through questionnaire surveys and statistical techniques. Both customs staff and firm managers can participate in this survey and answer some questions about the quality and accuracy of data, data processing, communication, effective inspection, risk management, infringement detection, personal efforts, financial performance, and customers and employees' satisfaction of firms. The information can be collected from both the administration side and the business view to compare the authentication and accuracy of the data as well as to obtain a comprehensive view of e-customs and its impact on companies' performance. All primary data are examined using applying IBM SPSS analysis (Statistical Package for Social Science) and AMOS version 24.

1.5 STRUCTURE OF RESEARCH

This project is organised into 9 chapters:

Chapter 2 shows the perspective and literature review of e-customs and business performance in the international as well as Vietnamese contexts. Based on the overview of the literature, the study also defines the research gap.

Chapter 3 interprets the theoretical background (e.g., institutional theory, stakeholder theory, Hofstede's cultural dimensions and diffusion of innovation theory), the proposed model and the research hypotheses.

Chapter 4 provides the particular methodology and frameworks used to address

the research questions.

Chapter 5 presents the qualitative analysis with a discussion of the interview outcomes with customs administrators and businesses.

Chapter 6 demonstrates the results of the questionnaire survey conducted from January to March 2018 with business representatives.

Chapter 7 interprets the data collected and analyses the result from the questionnaire surveys with customs officials.

Chapter 8 discusses the outcomes of the survey reported in Chapters 6 and 7. The difference in the impact factors for both sides (customs and business) is shown, which can be used to explore the reasons. Some recommendations are made for not only public policymakers but also business managers to have concordant strategies.

Chapter 9 is the conclusion and summarises the primary findings of this research. Meanwhile, some limitations of this research are illustrated and possible directions for future research are discussed.

CHAPTER 2: BACKGROUND AND LITERATURE REVIEW

2.1 INTRODUCTION

The existing literature about electronic customs (e-customs), business performance and SMEs are discussed in this chapter. Particularly, the development progress of e-customs in global, the conceptions of e-customs as well as discussion regarding e-customs in prior scholars are presented in section 2.2. Additionally, section 2.3 provides the whole picture of e-customs in Vietnam, for example, the initial foundation (the political, legal and technological environment), development process, and the differences between traditional customs and the electronic format. In section 2.4, the theme of business performance relative to the diverse concepts of firm performance, the frameworks used to measure, and the indicators used to build up the companies' performance are clarified. Section 2.5 illustrates picture of SMEs that identify variously. SMEs are demonstrated their significant role and incredible contribution to economy. Furthermore, this part also indicates some of the challenges that SMEs have to face. And the panorama in specific context regarding SMEs in Vietnam is interpreted. Finally, the last section specifies the research gaps in this research based on the literature review.

2.2 BACKGROUND OF E-CUSTOMS

2.2.1 Development of e-customs

Gordhan (2007) suggests that the traditional role of customs as a "gatekeeper" is changing due to recent developments in the international supply chain environment. Such developments include reduced tariff and non-tariff barriers; new models of logistics and the supply chain; crime and terrorism threats; and the increasing use of ICTs in international trade operations. Under the heavy pressure of logistics and supply chain, customs administration has to find out the ways of operation to transform effectively. Consequently, since the 1980s, a number of pioneering countries have tried to transform their paper-based customs processes to ones based on the electronic interchange of export and import data. This initiative has been motivated by presumed control and security improvements, combined with the lowered administrative burden on exporting companies (Henningsson and Bjørn-Andersen, 2009).

The USA began initiatives of e-customs in 1974, with the first application, the Automatic Merchandise Processing System, going operational in Philadelphia,

then nationwide in 1987 (CBP, 2013). In 1978, Japan began to computerise customs procedures, promoted through NACCS (Aoyama, 2008). At a similar time, the Singapore government began to operate their TradeNet system in 1989 (Singapore Customs, 2013). In the 1990s, the UN/EDIFACT Standard was introduced by Australian government and NACCS system of Japan was established. These systems facilitated the customs, bonded warehouses and customs brokers to join and carry out import and export procedures. Moreover, the Electronic Data Interchange (EDI) is also launched by the United States, Canada and Australia. The electronic documents between declarers and customs houses were supported to handle partially via the EDI. At the same time, the computerization of customs administration was assessed as the only way to satisfy the demands of importers, exporters and the general public as well as adapt effectively with changes of international environment by the Korea Customs Service (KCS). In addition, customs administration enables to be deal with while the staff numbers are limited with support of customs digital transformation. Hence, a basic plan on the EDI Customs Clearance System had been drawn up by KCS in 1992 before the system in phases were decided to launch from 1994.

With the aim of catching up with this trend, e-customs had been operated in other South-East Asian countries, for example, Malaysia, the Philippines, China and Brunei since the 1990s and these innovations achieved notable results by 2006 (Amin, 2010; UNPAN, 2012). Subsequently, Vietnam deployed e-customs since 2005. Moving to Africa, e-customs has been applied by African governments in recent years, however, a synthesis of e-customs solutions have not been conducted. Therefore, Henningsson & Andersen (2009) clarify that Africa has to face to a number of challenges in e-customs adoption.

2.2.2 The definition of e-customs

According to Willmot (2007), e-customs is an application of ICTs in public administration, connected with organisational changes and new capabilities of public services. Granqvist, Hintsa and Männistö (2011) define e-customs as the use of ICTs to carry out customs compliance where electronic communications channels replace paper format customs procedures, thus creating a more efficient and modern customs environment. Tan and Klein (2006) suggest that e-customs is simply the transformation of paper-based trade documents to electronic ones in customs procedures. Dam (2013) defines that "*Electronic customs is an example*

of e-government. It involves the use of information and communication technologies by customs authorities and other governmental bodies to administer, through interactions with businesses and other interested parties, the current customs laws and regulations". Furthermore, Elliott and Bonsignori (2019) claimed that e-customs was the acceptance of customs related to electronic data processes to release shipments prior to or immediately upon arrival. These authors also clarified a Customs Capability Index (CCI) with 10 indicators, including electronic customs; other agency inspections do not case delay; de minimis regime; if de minimis, simplified procedures; the threshold for informal clearance procedures; third-party customs broker not required; consular trade documents not required; inspection at operator facility; adapted working hours; and 24/7 automated customs processing.

E-customs is identified as a part of e-government based on the similar conceptual understanding. However, e-customs is different from e-government in some points. First of all, all elements of national administrative system, government bodies, businesses, and citizens are referred in the concept of e-government while a relationship between government bodies and businesses (G2B) is reflected mainly in the e-customs concept. The second difference generally mentions to the domestic relationships among stakeholders, for instance, governmental agencies, business and citizens in a geographical territory are generally mentioned in the concept of e-government rather than external connections. E-customs, on the other hand, not only reflects domestic relationships but is also influenced by the nation's relationships with external bodies. Furthermore, international trade requests to communicate and cooperate among enterprises, traders, banks, government agencies, and global organisations (like the World Trade Organisation). Therefore, e-customs, a crucial/basic activity, supports to transmit information efficiently and enhance international trade as well as contribute to world security.

2.2.3 E-customs in the prior scholars

A difficult requirement for customs authorities is determining 'a delicate balance' (Tan & Slegt et al., 2021). Tan, Andersen, Klein and Rukanova (2011) also pointed out that customs administrations currently have to manage the cross-border flows of products, commit to a revenue budget, and ensure safety and security. On the other side, facilitating trade and enhancing economic growth have become the indispensable mission for customs. ICT application in the customs sector has been

driven by a number of trends and factors. First, it may help to address the burden of administrative documents. There is always an emphasis on accurate, up-to-date and secure customs records. As Holloway (2009) suggested, the customs process naturally involves parties, documents, and data keying. For example, a scholar cited from UNCTAD (2006) calculated that an international transaction may involve 30 parties, 40 documents, 200 data elements. Moreover, this data would require re-coding at least once. Henningson & Henrikson (2011) also found that in the 1980s' European market, a business had to deal with more than 200 different forms to cover various customs procedures in different countries and for different modes of transport. Holloway (2009) also noted that each international trade transaction involves at least two main actors, and that they must communicate and coordinate with each other. The exchange of information regarding the port authority, shippers, banks, insurers, carriers, Customs, and so on, can amount to about 10% of the commercial value of the traded goods. Hendy and Zaki (2021) also emphasised that administrative procedures became a significant challenge in the modern adoption of global sourcing and just-in-time inventories. The burden of administrative documents is particularly onerous in view of the modern practices of global sourcing and just-in-time inventories. According to UNCTAD (2006), about one-third of international trade comprises unfinished goods and components. That is, trade is just part of a global supply chain and a similar percentage represents trade within the same company. It is likely that those percentages have increased since the above report: indeed, the World Customs Organisation (WCO) estimates that the percentage of intra-company trade is now closer to 50% (WCO, 2012). Hence, international trade transactions have been building a sizeable document volume in the customs systems. Electronic records reduce the money and time required to manage the necessary information.

Second, e-customs is also an attractive answer to the increasing demand for information exchange amongst customs, border security and other bodies (WCO, 2012; Aoyama, 2008). International trade divisions of government have had to deal with smuggling, terrorism and environmental issues. The relationships amongst nations in solving such issues require advanced technologies to facilitate effective communication and coordination. Port authorities have also been found to operate differently in many countries. As such, one common supporting tool of the evolution and strategies of port authorities around the world may be ICT infrastructures (Cepolina & Ghiara, 2013).

Third, e-customs offers help in meeting the requirements of risk management (sample checking) in customs. Under the revised Kyoto Convention, limiting the use of intrusive customs examination is recommended. It is also a proposal discussed in the context of WTO trade facilitation negotiations (Laporte, 2011). From the national level, Biljan & Trajkov (2012) suggest that this is a balancing act type of customs management. On one hand, trade facilitation requires inspection to be simplified, standardised and unified in its administration for international supply chains. On the other hand, security and compliance require effective monitoring, controls and interventions. As a result, governments have to limit intrusive examinations while ensuring low risks of security and non-compliance. In such a risk management context, ICTs can play an important role, such as the usage of electronic data exchange and risk analysis (Laporte, 2011).

Fourth, e-customs is a natural step in the interactions and integration of ICT systems between government and industry. The extent and speed of innovation within the ICT industry has greatly reduced the cost of access to ICTs, enhanced their use by individuals, businesses and organizations. International trade, transport and communication have evolved through the increasing use of ICTs by all parties, to the point where closer integration is not only necessary but inevitable. As UNCTAD stated in their 2006 report, 'Government agencies, local traders and transport service providers are increasingly being forced to implement ICT solutions to ensure that national ports and border crossings support efficient supply chain operations' (UNCTAD 2006, p.5).

2.2.3.1 Benefits of e-customs

The benefits of e-customs have been discussed in the studies of Tan and Klein et al., (2006), Raus (2009), Choi (2011), Urciuoli et al. (2013) and Dmitrieva and Rudakova et al., (2021) as follows:

Reduce burden of administrative documents

E-customs is likely to reduce the burden of administrative documents, through the use of e-documents and e-records. Henningsson & Andersen (2009) found that ICT applications in a paperless environment could reduce the typical administrative burden by 25%. Dmitrieva and Rudakova et al., (2021) also confirmed for the Federal Customs Service of Russia that the amount of work can be reduced by document simplification and customs control acceleration. Moreover,

administrative document deduction with customs computerisation could optimize procedures in order to enhance the integration possibility with international systems.

Reduce requirement for data re-entry and fewer data errors

Data re-entry and data errors have decreased because the information and data in the public administration systems have been shared and exchanged in the electronic system. For instance, the eTIR international system deployed and launched in 2003 provided '*an exchange platform'* for stakeholders such as customs authorities, holders and guarantee chains. The data about the international transit of goods, vehicles and containers between national customs systems were exchanged securely in real-time via the eTIR international system. Therefore, customs departments can verify and guarantee the data in advance to improve and speed up procedures (Dmitrieva & Rudakova et al., 2021). Raus (2010), Granqvist, Hintsa, and Männistö (2011) demonstrated that time and costs could be saved by technical processing.

Time savings

With the support of e-customs, businesses can carry out customs procedures quicker in comparison with traditional customs because the time taken to access data, inspect and clear goods can be decreased (King, 1990; Hellberg, 1991; Raus, 2009, 2010; Granqvist, M., Hintsa, J., & Männistö, T, 2011; Choi, 2011; UNPAN, 2012). For instance, European firms can save customs clearance time by 25% to 50% through e-customs. In South Korea, time required for export clearance was cut to about 2 minutes; import clearance to less than 2.5 hours; duty drawback, 5.2 hours; and tax payment, within 10 minutes. These outcomes are evaluated as among the fastest performances among the 175 WCO member countries (UNPAN, 2012). The study of Hendy and Zaki (2021) criticised the significant impact of time taken to trade in Egypt as an emerging country. Especially perishable and seasonal products, agricultural and manufacturing goods were more sensitive to time to trade than others. Therefore, e-customs contributed considerably to reduce the time to trade for export firms.

Additionally, e-customs implementation can help state agencies enhance communication and coordination based on the Electronic Data Interchange (EDI) system with the aim of facilitating information exchange among stakeholders.

Furthermore, updated inspection results, approval of clearance, quarantine verifications and recommendation documents on the system support both businesses and individuals in not having to visit a number of governmental authorities. Therefore, enterprises can save time and costs and increase transparency when conducting customs declarations (UNPAN, 2012; King, 1990; Choi, 2011).

Cost reductions

The various studies agree that ICT adoption in customs can support either firms or public agencies to reduce administrative costs, for instance, paperwork, faxes and phone calls (King, 1990; Hellberg, 1991; Dawes, 1996; Raus, 2009, 2010; Granqvist, Hintsa & Männistö, 2011; Choi, 2011; Overbeek et al.,2011; UNPAN, 2012). Raus (2009), along with Granqvist, Hintsa, & Männistö (2011), suggested that financial savings could be made through the computerisation of repetitive tasks. For example, fewer staff members may be needed, so that personnel costs decrease. Paperless environments could also reduce expenditure on office stationery (UNPAN, 2012). The authors accept that development and set-up costs can be very high initially, but they argue that over time the running costs may be much lower under e-customs. Thus, businesses and customs officers may need to make a big investment in the short term, but in the long term, they could reduce their costs significantly (Granqvist, Hintsa, & Männistö, 2011).

In addition, improved technical connectivity reduces the costs of exchanging data regarding export, transit, or import activities. The EU, Japan, Korea, and Singapore are some examples where ICTs enable the formation of massive networks linking different supply chain players (shipping companies, airliners, forwarding companies, bonded warehouses, bonded transportation, customs brokers, inspection agencies, banks, etc.) that can exchange data through the network in order to expedite logistical flow. In this context, e-customs clearance schemes enable entities to share cargo processing information, thus providing firms in the next logistical step with the necessary data in advance (Hellberg, 1991; Raus, 2009, 2010; Granqvist, Hintsa & Männistö, 2011; UNPAN, 2012). Based on studies of ADB (2005) and Raus et al. (2011), the procedures can be streamlined and logistics flow can be enhanced with the support of these e-customs networks that enable to share data. Thus, stakeholders can save time, costs and increase productivity. ADB (2005) give an example, data saved on the storage network can automate access

into import declaration with a personnel-freeing effect. Hence, time and costs regarding paperwork, communication, trade and logistics document process can be decreased (ADB, 2005).

Improve risk management

Risk management, as applied in the customs sector, involves determining which persons, goods, and means of transport should be examined and to what extent (Gordhan, 2009; Biljan, 2012). ICT application may potentially help customs authorities to achieve faster clearances and may, at the same time, ensure that the risks of non-compliance or illicit trade are kept to within acceptable levels. The use of electronic data exchange enables pre-arrival and/or pre-departure information processing. In turn, this allows customs offices to verify information and perform a risk assessment of the consignment (Holloway, 2009; UNPAN, 2012). Risk management software can assist by continuously collecting and utilising data from recent inspections to adjust decision rules for selecting new subjects for inspection (Choi, 2011; UNPAN, 2012). According to Tan and Slegt et al. (2021), the adoption of ICTs and data analytics in e-customs could be more and more important to support customs administrations to assess risks and supervise their duties in order to handle the extensive capacity of trade. The International Road Transport Union (IRU) and Eurasian Commission of the United Nations Organisation provided the eTIR international system that allowed customs officials to access secured TIR data immediately, such as declaration information, results of checks, and seal numbers. As a consequence, the risk of fraud could be reduced and security could be enhanced through the electronic process (Dmitrieva & Rudakova et al., 2021)

Increase transparency and reduce corruption

E-customs could play a role in anti-corruption efforts in the customs sector due to its automatic and transparent attributes as well as less individual intervention (Holloway, 2009). According to Michael & Moore (2010), the extent of corruption in various customs agencies worldwide was at least $700 billion during the 2000s, compared with about $10 trillion for worldwide corruption in all sectors. Michael (2012) reports that members of World Customs Organisation (WCO) are lose at least USD 2 billion each year on average due to corruption caused by customs. Particularly, this number is USD 334 million in India, USD 223 million in Russia and USD 170 million in China (Michael, 2012). According to Michael and Moore

(2010), a less personal impact with the utilization of e-customs is an efficient solution that support to increase transparency in the public sector in general and customs in particular. Many anti-corruption experts in the field agree that IT helps in the fight against corruption, and that the 'public sector environment' (pay and performance) should provide customs officials with incentives not to take bribes. Computerisation in customs administration began early in countries such as Japan, Singapore, Hong Kong, Malaysia, EU and South Korea. Customs officials had less face-to-face contact with stakeholders. Customs working practices as a whole became more impartial and transparent. Thus, the automation of customs clearance system is seen as having an impact on corruption (King, 1990; Aoyama, 2008; Amin, 2010; UNPAN, 2012).

In summary, the elements including reduction of burden of administrative documents, requirement for data re-entry and fewer data errors, time savings, cost reduction, risk management improvement are performed as factor of the relative advantages belonging category of enablers in the model while increase of transparency and reducing corruption are not put into the propose. Because transparency is shown in barriers of administrative document, data entry online and risk management that are mentioned above. Similarly, decrease of corruption is interpreted indirectly through cost reduction.

2.2.3.2 Difficulties in e-customs implementation

Tan and Slegt et al. (2021) indicated that customs departments nowadays had to cope with concerns of e-commerce, Brexit, new safety and cyber security when supervising products crossing borders. The implementation of e-customs could face challenges and problems, which can hinder operations and lead to failure (Tan & Klein et al., 2006; Raus, 2009; Choi, 2011).

The interoperability of technologies and the need for standards among nations

Enterprises not only implement the e-customs procedure domestically but also forward to international trade. Therefore, compatibility has arisen as a requirement for customs with the aim of enhancing interoperability among the diverse systems of various countries. Based on the studies of Roger (2003), IBM (2008), Tan, Klein and Rukanova et al. (2006), Choi (2011), Urciuoli, Hintsa, and Ahokas (2013), the challenges of e-customs compatibility came from inherent differences between systems (e.g., the syntactic structures, the embedded semantics and the embedded

logic), interchange agreements, firm regulations and the actual practices of the workers. The monolithic system and the existing network of each country required high investment and deployment costs. Hence, conversion into one integrated system among nations becomes difficult and unrealistic. This problem becomes more and more serious when cross-border trade takes place. Tan, Klein and Rukanova et al. (2006) and Urciuoli, Urciuoli et al. (2013) emphasised that international standards were significant in the diverse and distributed environment of the e-customs systems of various countries desiring to gain interoperability. The consistency and compatibility locally and between nations, regional clusters and globally are requirements of these international standards. For instance, EU standards may be used if the trading parties are EU members, however, some specific standards should be attached in case one or some of them are not EU trading partners. Regulations of the different nations should be unified and adjusted in order to prevent conflicts of criteria and facilitate harmonisation. In addition, the World Customs Organisation (WCO) and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) can play the role of referees of international standardisation.

Redesign of the customs system

In the traditional redesign literature, the main stakeholders in the redesign process are usually commercial parties which strive for efficiency gain and the available modelling methodologies are tailored for supporting these demands. The involvement of the government as a party in the redesign process for e-customs introduces additional requirements for control and security, which will need to be considered in the redesign. Therefore, the demand for a new method that ensures a new e-customs processes to take into account both the commercial benefits of businesses and the control and security requirements of government agencies becomes essential. Furthermore, Salehi, Alipour & Yahyavi (2010) ague that legal system relative to e-customs has to be equipped and synchronised if e-customs conducts a redesign.

Financial and human resource requirements

While reductions of recurrent costs are a benefit of e-customs, the prerequisite costs of implementation represent a challenge (Urciuoli, Hintsa, & Ahokas, 2013). It is well known that the introduction of IT systems to exchange data with other businesses and customs administrations is very expensive. This operation is costly

because it implies re-engineering of business processes, education of personnel and training. In addition, technical issues related to the integration of IT systems with existing legacy systems generate higher development and maintenance costs. These high costs may be a barrier for many customs administrations that lack the required budget to invest in modern IT systems.

Another critical inhibitor for e-customs comes from the shortage of employees with IT knowledge and skills. Shalehi (2010) criticised that customs officials and enterprises in Iran only became familiar with implementing customs procedures on existing ICT equipment and software and they found difficulties in changing and getting acquainted with the improved version. Although citizens and businesses receive the benefits of convenience and service accessibility with ICT innovation, employees in customs departments and businesses who do not possess the right skill-set to fit with the new technology fear losing their jobs and changing familiar habits (Raus, 2009). Consequently, e-customs cannot operate effectively.

In summary, a number of studies described the motivation for customs modernisation transformation as well as the benefits that e-customs provide and the challenges of e-customs implementation in leading countries, as this thesis discussed above. A few scholars analysed the facilitators and barriers of e-customs adoption but there is still debate and inconsistency. Raus (2010) conducted his study with two SMEs in Switzerland and pointed out four facilitators of e-customs adoption: (i) benefit potential for the public sector, (ii) procedural improvements and streamlined business process, (iii) avoidance of misinterpretation of standardised regulations and (iv) standardization of processes, messages and data model. There were also three barriers to e-customs adoption: (i) slowdown in regulations execution due to missing procedural templates, (ii) increased complexity in the standardization process itself and (iii) electronification of operations. Furthermore, Urciuoli, Hintsa and Ahokas (2013) explored drivers and barriers influencing the usage of e-customs platforms with different results. Particularly, cost-savings and ease of use were significant enablers while the inhibitors mentioned were technical constraints, cost, trust B2B/B2G and data reliability. Additionally, Davis (1989), Dawes (1996), Rogers (2003), Gilbert et al. (2004), Holloway (2009), Raus et al. (2009) and IDB (2010) also added factors such as reliability based on data quality and accuracy input into an e-customs platform, time-savings and usefulness as the other drivers. On the contrary, the

studies of Baida et al. (2007), Gilbert et al. (2004), Liao & Cheung (2001), Riel et al. (2001), Zhu et al. (2002), Bharosa et al. (2013), Bigdeli and de Cesare (2011), Bwalya (2009), Choi (2011), Dawes (1996), Fichmari (2004), Lyytinen & Damsgaard (2001), Raus et al. (2009), Ajzen and Fishbein (1975) and Rogers (2003) showed that confidentiality, standards and usefulness hindered e-customs adoption. Based on the five stages in the innovation-decision process of Rogers (2003), almost all studies related to e-customs examined acceptance or adoption of e-customs in the third step (decision), while this study focuses on the circumstance of e-customs implementation in the fourth step.

To sum up, the interoperability of technologies and redesign of customs system are illustrated in the factor of Complexity and Incompatibility while the need for standards among nations is latent in incompatibility. Additionally, with the aim of consistency in the background theory and theoretical attributes that are applied in this study named Diffusion of Innovation (DOI), elements of complexity and incompatibility are appeared in the proposed model as the obstacles besides other factors (financial & human resources and legislation).

2.3 E-CUSTOMS IN VIETNAM

2.3.1 Background of e-customs in Vietnam

The political and legal framework of the e-customs implementation

The Vietnamese Communist Party is the highest leader in Vietnam's political system. On October 17, 2000, the Politburo of the Communist Party of Vietnam issued Directive No. 58-CT/TW, "promoting the application and development of information technology for industrialization and modernization" (Directive 58). This serves as the foundation for official decisions and legislation regarding the ICT sector and, by implications, e-government. In 2002, the National Assembly approved the establishment of the Ministry of Post and Telematics, responsible for the development of post, telecommunications and IT. In 2007, the Ministry of Post and Telematics was renamed the Ministry of Information and Communications, and given the additional responsibility of press and publishing. IT departments and units were established in all central ministries and agencies, with six ministries/ministerial-level agencies containing specialized IT departments. Regulation in provinces is implemented by local Departments of Information and Communications. Particularly, the General Department of Vietnam Customs

(GDVC), an agency of the Ministry of Finance, set up the Department of Reform and Modernisation of Customs as a member of GDVC who is responsible for customs digital transformation (Nhat Minh, 2007).

Vietnamese government implemented the completement and improvement in policies and regulations of ICT and e-customs. From 2001 to 2015, a series of legal documents on ICT were promulgated, for example, Electronic Transactions Law 2005, IT Law 2006, Telecommunications Law 2009, Radio Frequency Law 2009, Postal Law 2010 and revised Customs Law 2015. Many Decrees and Decisions of the Government and the Prime Minister regarding post and telecommunications, Internet, information technology, and radio frequency have been issued as well. These documents have created a legal framework that regulates and promotes ICT application and e-customs.

ICT environment of e-customs implementation

The Vietnamese IT sector has developed considerably over the past 10 to 15 years. The average revenue growth of the IT industry was around 20 to 25% per year during the period 2001 to 2009. By the end of 2010, the revenue of the software industry and the digital content industry had reached USD 2 billion; the hardware industry revenue had reached USD 5.6 billion; and the revenue of telecommunications services USD 9.4 billion. As the result, the total revenue of the telecom and IT industry in 2010 reached to USD 17 billion which increased 19 times compared with its total in 2000.As of December 2010, Vietnam had 126 million nationwide telephone subscribers in which included approximately 14.3 million fixed subscribers and around 3.7 million broadband Internet subscribers. Statistics in June 2010 illustrated 12.84% of households with Internet access at home and enterprises with Internet access to serve their business activities reached 90%. After ten years, the number of mobile connections increased dramatically with 154.4 million that accounted for 157.9% population of Vietnam in 2020 (Datareportal, 2021). Additionally, Datareportal (2021) interpret that 70.3% Vietnamese corresponding with 68.72 million people have used Internet and the number of active social media users have achieved 72 million appearing for 73.7% of population. Currently, an Internet connection has been equipped for all schools, colleges and universities in the country. The fixed-line telephones have been expanded 99.7% of communes and most of farmers have mobile phones.

The number of universities increased fivefold, from 42 to 206, and the number of

colleges multiplied sixfold, from 36 to 305. At the end of 2010, the quantity of universities and colleges with IT courses obtained 277 accounting for 73% of university and colleges in Vietnam in which contained 70 different IT professional groups, computer science research, and 59 faculties in electronics and telecommunications. Furthermore, 220 professional secondary and vocational schools specialised IT technician training and 62 institutions educated electronics and telecommunications.

International co-operation

A number of international organisations and other countries have supported Vietnam to develop the ICT sector and deploy e-customs. Projects regarding administrative reform and e-government applications of Vietnam have received sponsor of The World Bank through the provision of credit. Especially, Vietnam government received a USD 60 million loan at concessional interest rates and USD 98 million for a customs modernisation project in 2006 and another project of ICT development in 2010 respectively (WorldBank, 2010).

The bilateral cooperation between Vietnam and other countries, for example, South Korea and Japan, has been developing substantially. Specially, e-government development in Vietnam is strongly supported by South Korea as the strongest assistant. South Korea efforts to help Vietnam with specialist staffs and financial sponsor through ODA in order to complete a feasibility study and build an e-government information centre. Moreover, Samsung Data Systems, a subsidiary of Samsung group, has supported Vietnam to design the Vietnamese Government Web Portal (VGP) (Trinh-Nguyen, 2010). And Da Nang, the biggest city in central Vietnam, has received a great support of the National Information Society Agency (NIA) of South Korea. According to Huong-Giang (2012), a Memorandum of Understanding regarding technology transfer, human resource training, and e-government framework development has been signed between Vietnam and South Korea.

Japanese government has historically supported Vietnam in the areas of healthcare, infrastructure, education and now, public administrative reform. Japan has shared experience on how to develop electronic security reports, annual state budget plans, a real estate register system, and a job register system (Thuy-Dung, 2011). Specially, the current e-customs systems of Japan (NACCS and CIS) has been transferred to the General Department of Vietnam Customs, that has marked a

milestone in customs development and success in Vietnam. And VNACCS/ VCIS of Vietnam customs based on NACCS and CIS of Japan were officially applied in 2014.

The development process of e-customs in Vietnam

The e-customs trial phase 1 was deployed in 2005 by the General Department of Vietnam Customs (GDVC) with the aim of modernising public administration and introducing e-government. The two biggest seaports, Hai Phong and Ho Chi Minh City, were chosen to start an e-customs trial based on Decision No. 149/2005/QĐ-TTg of the Prime Minister. After that, the trial's coverage was expanded to 21 provincial, interprovincial and municipal customs agencies by the end of 2012 as Phase 2 of the trial following Decision No.103/2009/QĐ-TTg of the Prime Minister issued in 2009. A number of substantial achievements witnessed for Phase 2 of the trial from 2009 to 2012 encouraged its application across the whole country in the beginning of 2013 with the promulgation of Decree No.87/2012/NĐ-CP of the Government. From 1st April 2014 until now, the e-customs system of Vietnam Customs has been applying VNACCS/VCIS to the National Single Window (NSW) and ASEAN Single Window (ASW).

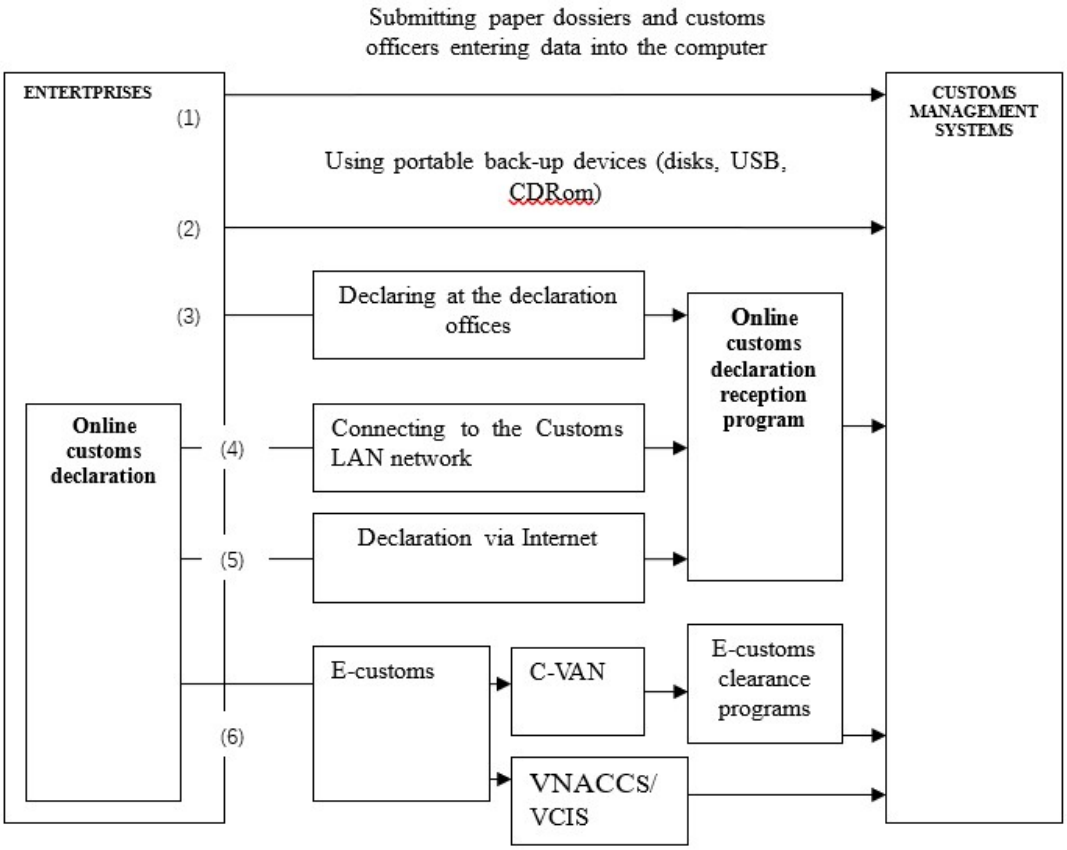
E-customs is not only the first project of e-government deployment but also an outstanding case with significant success in the Vietnam context. The achievements of trial phases witnessed that the conceptions and operation of e-government in general, and e-customs in particular, could be carried out in an emerging country like Vietnam. Dossiers could be submitted through a specialised customs system based on ICT adoption. Subsequently, information and dossiers were received, analysed and operated automatically by the electronic system, the outcomes or invoices could also be delivered in 10 to 15 minutes for many businesses. Therefore, the reduction of time, cost, errors in data entry and inconvenience were benefits that e-customs provided for both businesses and customs officials. As the result, e-customs became an effective choice which more and more enterprises and organisations chose to use in the trial phases. The trial phase from 2005 to 2012 built up a foundation for a modern e-customs system as well as a public administration system in the following period. Traditional customs procedures were changed into e-customs; once an unknown and unfamiliar concept, this was gradually converted to a factual and operating system. In Phase 2 of the trial, the e-customs system handled 90% of the export and import value

declared in the top 21 customs departments of Vietnam. With long-term orientation, e-customs allowed Vietnam to integrate deeply as well as keep up with the customs administration trends of regional and international economies. However, a number of limitations appeared during the trial. The difficulties in this time can be divided into three categories. Firstly, information technology infrastructure was not invested sufficiently. Secondly, laws and regulation governing the customs clearance process are continuously complex. Finally, various stakeholder groups appeared the potential conflicts among the interests.

The development journey of e-customs in Vietnam has gone through three stages. The trial period is from 2005 to 2012, including 2 phases. From 2005 to 2009, as Phase 1 of the e-customs trial, e-customs was piloted in Hai Phong and Ho Chi Minh City, side by side with traditional customs. In Phase 2 of the trial from 2009 to 2012, e-customs expansion was conducted in 21 critical provincial-level customs departments. From 1st January 2013 to March 2014, e-customs was implemented in national wide with 34/34 customs departments covered by e-customs and Vietnam customs also prepared to launch VNACCS/ VCIS. From 2014 until now, VNACCS/VCIS system has been spread and applied at all customs departments across the country (Thang Nguyen, 2014). VNACCS (VietNam's Automated Cargo and Consolidated Port System), a new e-customs system, has been deployed by GDVC and first applied in 2014 with support of Japanese government. This research concentrates on analysing expansion and evolution phase of e-customs in Vietnam from 2014 to the present.

The IT adoption at Vietnam's Customs Departments was classified into six levels. The differences between the six IT application levels reflect the specific attributions of the customs declaration, the document submission process, and the customs technique and system that receives and processes the documents.

Figure 2.1 The level IT application at Vietnam's Customs Departments



Source: Department of IT and Customs Statistics – The General Department of Vietnam Customs 2010

Since no advanced application of ICT is adopted at level 1, customs declarations as the paper-based documents are submitted to the customs officials at customs departments. After that, the data in declarations and dossiers are entered into computers and processed by customs officials manually. At this level, the use of customs office computers to manage data is the only ICT application. And this method of customs processing is considered to be traditional customs approach. At level 2, the simple ICT devices as a further application of ICT, for instance, floppy disks, CD-ROMs and portable hardware devices are used and the data from the businesses' computers are transferred to the customs departments' computers. To achieve compatibility, the electronic document templates are designed by the GDVC and required compulsory use. In comparison with level 1, ICT application at level 2 helps customs officials save time of entering data minimally.

The application of ICT with more advanced connections and software programs

using at the higher level offer the potential achievement of higher efficiency. At level 3, the onsite computers with features installed online declaration software programs, provided by the customs department are used by declarers. At level 4, the business computers can connect to the customs departments' computer through a LAN network. However, in practice, only small and closed areas such as industrial zones or export and processing zones can be applicable and appropriate to this solution of level 4. Consequently, very few local customs departments are able to follow this procedure. At level 5, declaration software programs are similar to level 3 and 4 but the customs department website and the Internet are used to carry out the customs declaration. A wider range of e-customs users are able to participate and implement import and export procedures through WAN (Wide Area Network) at this level. An e-customs software program using at level 5 is known as C-VAN (Customs – Value Added Network) and level 6 is supported by VNACCS/VCIS. E-customs clearance integration of VNACCS/VCIS enablers the entire customs process, from declaration to clearance, to be done electronically.

In summary, the higher levels of e-customs application utilise ICT more extensively. In spite of the convenience and cost effectiveness of level 2, just the first phase of the trial applies the method at this level. Furthermore, the application ICT at level 3 and 4 reveals a number of limitations. For example, the number of onsite computers is not adequate at customs departments. Additionally, declarers spend time and effort travelling to the customs departments and a limited number of users access to LAN networks. This adds to demand for a new method and technology, thus, the GDVC has focused most of its efforts on level 6.

2.3.2 A comparison between traditional customs and e-customs in Vietnam

Firstly, the traditional customs procedures are described in this section. Then, a comparison will be carried out to differentiate clearly between the traditional customs and the various versions of e-customs that have been applied since 2005

2.3.2.1 Traditional customs (level 1)

In this section, we provide a description of traditional customs procedures through the various steps of declaration, inspection, and the clearance and release of goods.

Step 1: Traditional customs declaration

Customs declaration

The customs declaration is conducted at a customs office. First, the declarers collect paper-based forms from the customs branches. They must then submit the documentation, now in dossier form, to the branch in person. Customs officers receive and register the customs file, then issue a receipt to the client. There is then a waiting period while the dossier is processed. In the event that errors are found within the documentation, the declarant is required to return to the branch for correction, sometimes aided by a customs officer. During the processing period, preserving and storing the export or import goods is the responsibility of the customs declarant.

Declarant

Declarants include owners of goods or the means of transport, and persons authorized by such owners to perform customs procedures within the scope of authority to which they are delegated. There are six categories of declarants: owners of export-import goods, organisations entrusted by the owners of export-import goods, legal assignees (applicable to the case of export-import goods for non-commercial purposes), drivers of export-import means of transport, customs agents, and postal and express delivery services providers. Customs agents are business persons who, on behalf of export-import goods owners and following a contract/agreement, do the customs procedures and other duties. A majority of declarers are owners of export-import goods (Customs Law, 2013).

Customs dossiers

Traditionally, customs documents are paper-based. They include the declaration form provided by the Ministry of Finance, commercial invoice, purchase and sale contract, permit of the competent state body for export, import and transit goods, and other documents as required by law applicable to specific types of goods. A paper-based customs dossier is submitted at a customs office (Customs Law, 2013).

Customs branch

Customs branches are at the lowest level of the customs management system. They administer customs procedures at international borders. There are two types of branch offices: (1) offices at border gates, including international seaports, international river ports, international airports, railways stations for international transportation, international post offices and land border gates; and (2) offices

besides border gates, such as bonded warehouses or offices of the customs departments of provinces and central cities.

In principle, customs declarants do not have to go to border gates or seaports to submit their customs dossiers; instead, they can go to the local customs departments or bonded warehouses. For example, an enterprise in Hanoi can declare in Hanoi instead of going to Hai Phong or Lang Son where the seaports or border gates are located. Customs clearance can also be done at bonded warehouses in Ha Noi. This saves time, effort and money for customs declarers. In practice, however, some customs officials in the major seaports of Ho Chi Minh City and Hai Phong play a key role in the final step of customs clearance, so that the above benefits are reduced to some extent.

Step 2: Traditional customs dossier processing and inspection

Customs inspection involves an examination of the customs files and relevant documents and/or physical inspection of goods or of the means of transport, carried out by the customs authorities. Exemption from inspection may be granted to declarants if they satisfy a number of criteria; otherwise, customs inspection is applied.

Inspection of customs dossier

In this process, the customs officers verify the accuracy, completeness and conformity between the information in the customs declaration form and in the accompanying documents, and inspect the compliance with official rules regarding import and export goods, tax and other regulations. There are two levels of customs dossier inspection.

Level 1 is applied to goods owners who comply with all customs regulations. Inspection, in this case, includes the inspection of declared information, quantity and kinds of documents attached to the customs declaration forms. Where no errors are found, a customs clearance order will be issued. These cases are known as being in the Green Channel, which means a customs clearance decision is issued without any further inspection, and the declarants can obtain the release of their goods at any time.

The identification of businesses that comply well with customs regulations is based on Circular 05/2008/TT-BTC. These businesses should meet all three of the

following conditions. First, they have had export-import activities within the past 12 months and are confirmed by the customs authorities as being without fines for smuggling or illegal trafficking across borders; without fine for tax fraud; and without fines for other violations (including false declaration resulting in the reduction of tax or the increase of tax exemption, rebates and refunds) where the fines were made by the Director of the GDVC in accordance with Ordinance for Fines of Administrative Violations, or were fined not more than three times where the fines were made by Heads of Customs Branches. Second, they have no overdue tax for more than 90 days at the time of customs registration. Third, they have paid their value-added tax (VAT). (These criteria were amended by Circular 86/2013/TT-BTC issued in 2013.) In case there is a legal problem, inspection at level 2 is applied.

Level 1 is also applied for goods belonging to the "List of specific goods as stipulated by law". These goods include tax-free machinery and equipment forming the fixed assets of domestic and foreign-invested projects, goods imported into free trade areas, entrepôt ports and bonded warehouses; transit goods; emergency aid goods; goods specifically used for national defence; and humanitarian aid goods. Dossiers for this type of goods, if without legal problems, are also processed in the Green Channel.

Level 2 is applied to goods owners who comply with all regulations but have errors within their dossiers. The customs terminology classifies these cases as the Yellow Channel, where the customs offices check the accuracy of declared information and relevant issues such as a lack of goods documentation or an adjustment to the tax rate of the consignment of goods.

The outcome of dosser inspection at level 2 classifies goods into two types. Type 1 includes lots of goods with relatively minor dossier changes or adjustments. After the declarant completes the adjustments, the customs authority issues a customs clearance decision and allows the release of the goods. In contrast, type 2 is applied to lots of goods with unresolved issues or signs of violation, where the goods will be inspected. The customs terminology classifies these cases as the Red Channel, which means that a physical inspection of goods is applied.

Physical inspection of goods

This is an activity that is carried out by customs officials using machinery,

technical equipment or other technical measures in the presence of the customs declarant or their legal representative after the goods have been taken to the site of inspection.

Physical inspection is applied in the following cases. Firstly, goods owners who have frequently violated customs regulations in the past will have their goods classified under the Red Channel from the beginning of dossier processing. Secondly, goods owners, including those who comply with regulations, whose dossiers have errors (Yellow Channel) that cannot be rectified during dossier inspection must also go through the Red Channel. Thirdly, if customs officers identify signs of violation of customs regulations or if the goods in question indicate the possibility of violations of customs regulations, the case is moved out of the Green Channel or Yellow Channel into the Red Channel. Finally, the physical inspection of a sample (up to 5%) of lots of goods in the Green and Yellow Channels is regularly carried out on a risk management basis.

In cases of dispute between the customs office and the customs declarers, the two parties may agree to choose a professional inspection organisation. Vietnam currently has state-owned and private inspection organisations. Two examples of these organisations are the Quality Assurance and Testing Centre, QUATEST (with branches nationwide), and the Vietnam Superintendence and Inspection Joint Stock Company (with 20 branches nationwide). If the two parties cannot agree on an existing inspection organisation, a temporary body may be established. This body includes representatives from authorized state bodies. If the customs declarers do not agree with the inspection results, they can lodge complaints with competent bodies as stipulated by law.

Step 3: Traditional customs clearance or release of goods

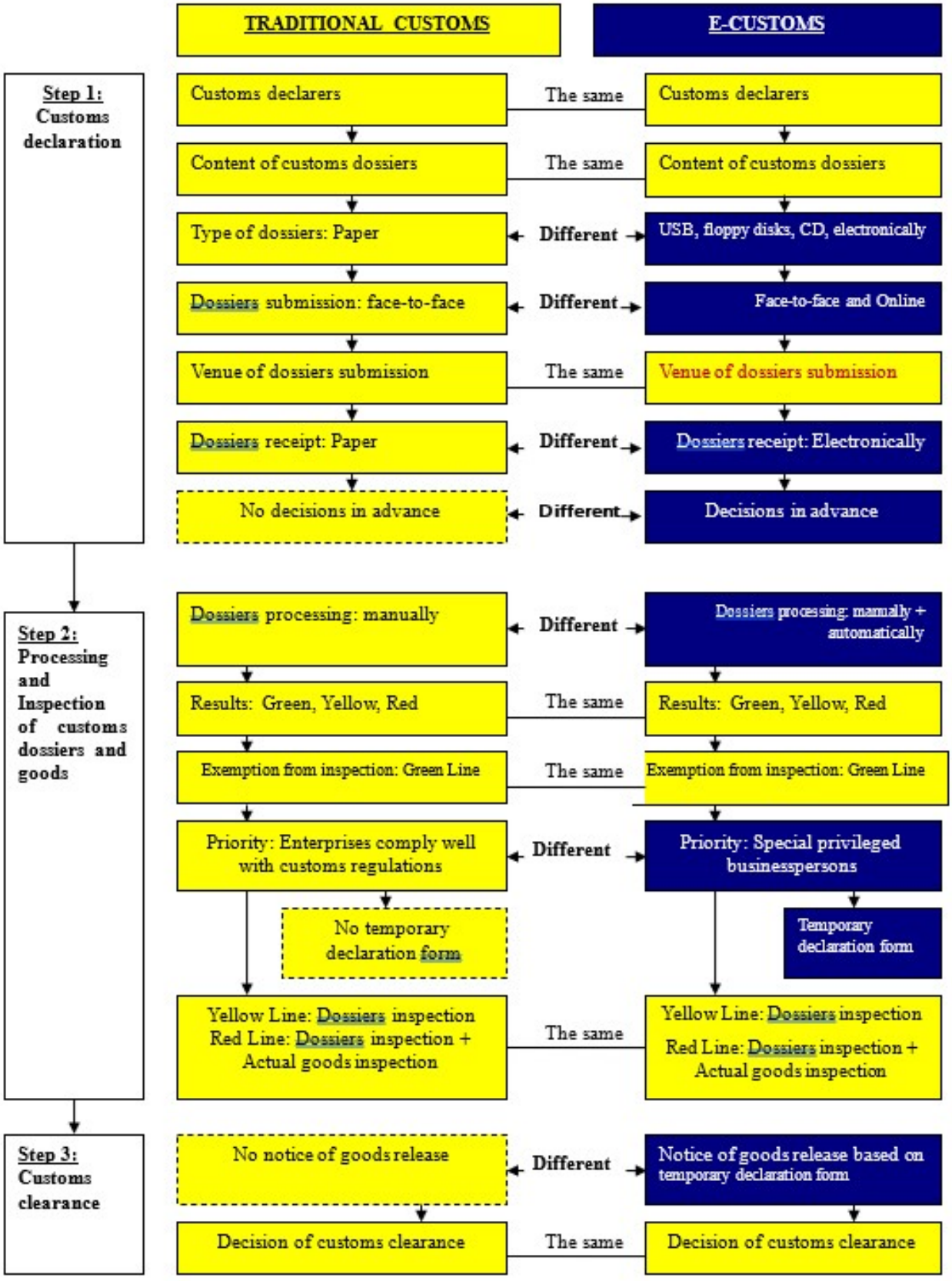
Goods are normally cleared for release after customs procedures are completed, including the payment of the assessed taxes and duties. If customs procedures have not yet been completed, goods may still be provisionally cleared or released in either of the following cases: (1) the customs dossier lacks some documents but the customs office agrees that they can be submitted later; or (2) the relevant imports or exports are eligible for a tax payment grace period as provided by tax laws, or the payable tax amount is not yet fully paid but a credit institution or another institution operating under the Law on Credit Institutions guarantees this payment.

Key characteristics of traditional customs

In summary, several key characteristics are shown in the traditional customs. First of all, an administrative burden for both businesses and customs bodies is created due to the use of paper-based documents of traditional customs. Secondly, customs declarers meet customs officials regularly in order to register, submit and correct customs documents at customs departments. Finally, customs officials involve directly to conduct the processing, physical inspections and the customs clearance on a case-by-case. Thus, the handling of customs formalities considerably relies on personal judgement and corruption is able to occur with high probability.

2.3.2.2 E-customs (levels 2 to 6)

Figure 2.2 Comparison between traditional customs and e-customs



Source: Vietnam General Customs Department (2015)

There are no differences between traditional customs and e-customs regarding the content of the customs dossier. However, the form of the dossier has been changed. Instead of paper-based dossiers, businesses can now submit dossiers in electronic form. The customs declaration form itself is now electronic, which means that declarants can re-open saved forms to make amendments before re-saving or submitting. Supporting documents can also be e-records or e-documents (including scanned documents in PDF, JPG, GIF or PNG formats) that are attached to the main declaration form. Converting paper-based documents into electronic format facilitates the organisation, storage and retrieval of information (MOF, 2012).

The method of submitting customs dossiers is also different. Declarants no longer have to go to the customs office to submit their paper-based dossiers in person. Instead, using the most popular levels of e-customs applications (level 5 and 6), declarants simply create dossiers on their own computers, then submit these dossiers via the Internet or C-VAN to the computer systems at customs offices. In principle, this method for submitting customs dossiers should require almost zero direct contact between customs officers and declarants who utilize higher levels of e-customs application, especially on levels 4, 5 and 6.

The introduction of online submission means that businesses can now have greater flexibility with regard to when they submit customs dossiers. At levels 2 and 3, the timing of dossier submission is the same as in traditional customs, i.e. restricted to business hours, from 7.30 am to 5.30 pm, Monday to Friday, except for public holidays. At levels 4, 5 and 6, the customs electronic documents processing system receives e-customs declaration forms 24 hours a day, 7 days a week.

Under e-customs, an official receipt and notice will be issued electronically following dossier submission, often within 10-15 minutes, compared with a paper receipt and notice being issued hours or days later under traditional customs. The outcome is divided into two cases. If a “notice of rejection of the e-customs declaration” is received, the declarants have to modify and supplement the information in the e-customs declaration form or convert it back to traditional customs by providing explanations under the guidance of the customs office. In contrast, declarants who received a “serial number of the e-customs declaration” and “decision on the form and level of inspection” will know immediately whether their goods are going through the Green, Yellow or Red Channels.

In the Green case, the declarant may simply print out one copy of the e-customs declaration accepted by the customs office for "customs clearance" or "release of goods". In Yellow and Red cases, further interactions between the declarant and customs officers are necessary, as documents in the dossier and/or the goods themselves need to be inspected. While e-documents may be used in the inspection process for Yellow Channel, typically declarants in this situation find it necessary to hold paper-based documents and to produce them in case there is any doubt regarding the authenticity of any such document. In Red Channel cases, where officials are far less prepared to make the presumption of authenticity and accuracy, further processing is essentially the same as under traditional customs, where paper-based documentation is required.

Under e-customs, Vietnam has introduced an innovation, namely Prior (or Advance) Decisions. These decisions may be issued up to 12 months before the actual date of export or import. Each decision clearly states the classification of goods, methods of customs value identification and the origin of the expected import-export goods. Procedures for obtaining a Prior Decision are the same as for normal e-customs declaration and inspection. Prior to the actual export or import, the business may change or cancel the declaration as stipulated. These Prior Decisions help businesses and individuals to gain greater flexibility and efficiency in their export and import activities.

Step 2: E-customs dossier processing and inspection

According to Circular No. 196/2012/TT-BTC of November 15, 2012, the receipt, examination, granting of registration numbers, and channelling of e-customs declarations by the customs office are automatically carried out through the e-customs data processing system. Because the system can detect errors and report them automatically, e-customs offers the potential to reduce the time and labour costs of dossier processing. Specifically, the system is capable of checking information regarding (1) tax calculation, identifying goods eligible for tax exemption, consideration of tax exemption, deduction, refund or non-collection; (2) the payable tax amount, paid tax amount, underpaid or overpaid tax amount (if any), a fine for late payment; (3) the accuracy and (to some extent) the authenticity of supplementary documents in the dossier; and (4) other information on the customs declaration. In contrast, under traditional customs, dossier inspection is conducted manually, which is a much more labour-intensive process.

With the advent of e-customs, Vietnam has introduced an innovation in the way some businesses (those considered to be "special priority cases") can declare and clear their goods. These are businesses with excellent records of compliance and highly stable and predictable flows of goods through customs. They are allowed to complete a Provisional Declaration form to cover, on a monthly basis, multiple consignments of goods that are all from or for the same counterparty, and are of the same customs category. Taxes can be collected provisionally, with the final settlement to be completed after all consignments have been processed. As of November 2013, 22 businesses had been certified in this "special priorities" grouping.

Step 3: E-customs clearance or release of goods

"Special priorities" businesses may also be granted the Provisional Release of goods, with formal customs clearance to be issued at a later date, for example, upon reconciliation for all the relevant consignments provisionally declared and payment of any net amount of tax that may be due. However, for the other businesses, which currently represent the overwhelming majority, there is little or no difference in the practice between traditional customs and e-customs during this last step of customs clearance and release of goods.

Key differences between e-customs and traditional customs

Based on the above analysis, there are differences in several important respects between e-customs and traditional customs in Vietnam. First of all, the updated ICTs are utilised in e-customs. Thus, convenience, efficiency, and accuracy in the customs declaration process from the preparation to submission of the customs declaration dossier is enhanced. Secondly, based on the use of ICT innovation in e-customs, customs officials are able to store and retrieve information more efficiently than before. Additionally, the declaration dossiers are able to be checked automatically with high precision while labour costs can be saved. However, a mechanism to verify via a sampling approach cannot be eliminated, especially, in case the electronic processing system is not able to detect the bogus or tampered dossiers. Thirdly, personal contact between declarants and customs officials is able to be reduced to a minimum by using e-customs (at least in principle). Hence, transparency is possible to be increased and the risk of corruption can be reduced. Finally, e-customs application makes a number of administrations of the customs process innovated. Prior (Advance) Decision, Provisional Declaration, and

Provisional Release of Goods are presented as these innovations of e-customs process that provide business the greater flexibility and cost reductions. Furthermore, the risks of abuse and infringement are also able to be predicted and minimized with the support of these innovations.

2.3.3 Challenges of e-customs implementation in Vietnam

2.3.3.1 Inadequate infrastructure, and ineffective planning and implementation

Poor infrastructure created a range of challenges in the development of e-government in Vietnam from 2000 to 2005. It can be said that Vietnam was not well-prepared in infrastructure to deploy e-government. At this time, websites of the government agencies were not established, which made difficulties in information exchange. According to Rivera et al. (2005), although the websites were launched after that, they did not have a functional design for e-government implementation.

Based on a study of Desai and Magalhaes (2001), some challenges in implementing digital transformation are interpreted. Particularly, stakeholders (government authorities, business and citizen) are reluctant to share information and they also have an over-reliance on outside consultants. Moreover, 49 websites provided by Vietnamese government and state agencies in 2005 were investigated in the separate studies of Pham-Thi-Bich-Hoa (2005) and Minh and Jones (2006). As the results of both projects, only two websites provided online public services relative to issuing business licences and e-customs procedures (Pham-Thi-Bich-Hoa, 2005; Minh & Jones, 2006). Thus, online public services could be found to be very limited at that time. However, actually, registration for business licences was not able to be implemented online because the principal feature of the website was only provision of forms and templates for downloading and individuals still had to submit paperwork in person at a government building (Minh & Jones, 2006). Moreover, Minh and Jones (2006) pointed out the relationship within governmental authorities (G2G) was paid attention much more than provision of effective services for business (G2B) and citizens (G2C) in e-government project in Vietnam

Vietnam has chased the more ambitious goals in e-government implementation since 2009. Particulaly, a vast number of online public services have been provided

within a short period. Although over 100,000 public services have been provided online, only five of them are able to be operated and conducted completely at level 4 that is the highest ICT application of online public service. At this level, whole entire process can be handled via Internet, website and software programs. Out of these five services, one is applied in Hanoi, three of them are operated in Ho Chi Minh City and only one is deployed in nationwide. Therefore, these goals and activities have not been implemented comprehensively or effectively. In a government conference held in November 2010 regarding e-government implementation, leading officials identified that the use of e-government in Vietnam just stood on a basic level and it was important to examine the demands of individuals and enterprises before deploying and conducting new projects or endeavours to improve e-government (Thanh-Ha, 2011).

The Project 112 known as The Master Plan' was fail, that gave obvious evidence in poor planning and implementation of Vietnamese government. In this project, ICTs was applied and state administration activities were computerised based on the G2G model. Project 112 started in 2001 and focused on conducting e-government and the Public Administration Reform (PAR) in the initial stages without careful plan and agenda (Nguyen-Thanh-Tuyen, 2006). As a result, its failure was recorded in 2007. The associated consequences are ineffective use of a large amount of money (approximately USD200 million) and prosecution regarding the 23 members of Project 112 Steering Committee (Hong-Ha, 2010).

2.3.3.2 Corruption

Based on the survey regarding Corruption from the Perspective from Citizens, Firms and Public Officials conducted in 2012 by the World Bank, corruption is concluded as "a serious problem in Vietnam" (WorldBank, 2013, p.93). Vietnamese government has attempted to reduce the rate of corruption and cases of corruption have been reduced. However, attribute of corruption cases becomes more complex.

Although enhancing transparency based on e-government and e-customs is one of the possible solutions with the aim of reducing corruption, Vietnam still face many the challenges to implement. The ability to access information is mentioned to a number of laws, however, specific responsibilities outlined in legislation are still absent. Thus, transparency provisions are implemented unevenly. The need for a monitoring and enforcement system for transparency is impossible to be addressed

by laws. Although 30 laws, rules, and regulations call for access to information in theoretical, these are often not operated seriously. Even if the Anticorruption Law made the progressive clauses on openness and transparency, only information regarding the operations and activities of their organisation where they work or at the commune People's Committee where they reside is entitled to provide for citizens. It is uncertain about citizens' ability to request information on operations and activities of People's Committee Offices at the district level and above. According to WorldBank (2013), if accessibility to information desires to be improved, the existing laws are required a better implementation. Moreover, the widespread legislative changes should be deployed specifically in order to enhance effectiveness of these improvement.

It is clear that e-government with e-customs as the representative could help to increase transparency in public administration, and this makes some stakeholders unready and unwilling to cooperate in sharing information when their profits are influenced. Consequently, the time of e-customs implementation and customs modernisation may be delayed. In addition, the high rate of corruption also affects trust between business and government (B2G). E-customs implementation is possible to cause fear of reducing informal incomes (corruption-based) of customs officials. Consequently, they may create troubles or work against e-customs development to protect their own personal interests and benefits.

In conclusion, e-customs has stood out as one of a small number of cases where e-government projects have not failed outright or partially, but instead have made some notable achievements in the Vietnamese context. Since its introduction on a trial basis in 2005, e-customs has demonstrated that e-government concepts and practices can feasibly be implemented in Vietnam. With the use of ICTs, businesses can submit dossiers via customs websites and many now choose to do so. The electronic system processes the information automatically, in many cases delivering the outcome to businesses in 10 to 15 minutes. Hence, e-customs benefits businesses and customs offices by reducing time, costs, errors in data entry, and inconveniences. Yet a number of important limitations have become apparent during the trial, expansion and evolution phases.

Despite considerable interest from the public and the many reports on e-customs in the daily press and other media, to our knowledge, there has been no published academic research in the public domain regarding Vietnam's e-customs. Searches

on this specific topic were conducted in 18 databases, particularly ScienceDirect and ProQuest central, and hand searches were also made in both English and Vietnamese sources, but no journal article was found. The author could also find no reports or books from international organisations, such as the World Bank, that focus on this topic.

Nevertheless, considerable information on this topic can be extracted from news articles and brief reports provided by news agencies, including domestic organisations (such as Vietnam News Briefs, The Saigon Times, Vietnam Investment Review, Vietnam News Agency, Customs Newspaper, Customs Online, Vietnam Plus, etc.) as well as international news providers (Asia News Monitor, EIU ViewsWire, Asia Pulse, Tribune Business News, The Bangkok Post and US Fed News Service). It is noted that the information provided by international news agencies frequently seems to have come from Vietnamese sources. More recently, there have also been a number of reports from the Vietnam General Department of Customs and the Vietnam Chamber of Industry and Commerce, but each of these typically deals with a specific sub-topic or a rather small set of sub-topics.

In short, three challenges of e-customs implementation in Vietnam including inadequate infrastructure, ineffective planning and implementation, and corruption are revealed through factors and attributes in theoretical models applying in this research. Particularly, the content of inadequate infrastructure is mentioned in factors of complexity e and incompatibility in the conception model. In addition, ineffective planning and implementation are described in element of legislation through questionnaires. When conducting questionnaire survey in the context of Vietnam, the author should get huge difficulties in obtain the valid answers for corruption factor in public sector. Hence, the corruption is discovered through cost savings with the question related to other fees including unofficial costs that enterprises have to pay in implementing import and export procedures.

2.4 BUSINESS PERFORMANCE

2.4.2 Definition of business performance

According to Johnson (1983), Dess and Robinson (1984), Capon et al. (1990), Parnell and Wright (1993), the outcome-based accounting indicators including profitability and growth have been perceived as the definition of business

performance. The statistic figure of Combs, Crook, and Shook (2005) found that 82% of articles published in the Strategic Management Journal used financial performance with accounting indicators to measure firm performance. This fact also is confirmed in the studies of Carton and Hofer (2006) and Richard et al. (2009). However, Keegan et al. (1989), Neely et al. (1995), Bourne et al. (2003), and Antic and Kekulic (2006) argued that these measurement methods based on the accounting and financial figures show some disadvantages, for example, instability; complicacy and difficulty to understand; focus on the short-term and internal environment much more than the external one; and a lack of indicators of future achievement with strategic goals and relation to competitors and customers.

Table 2.1 Financial indicators of firm performance

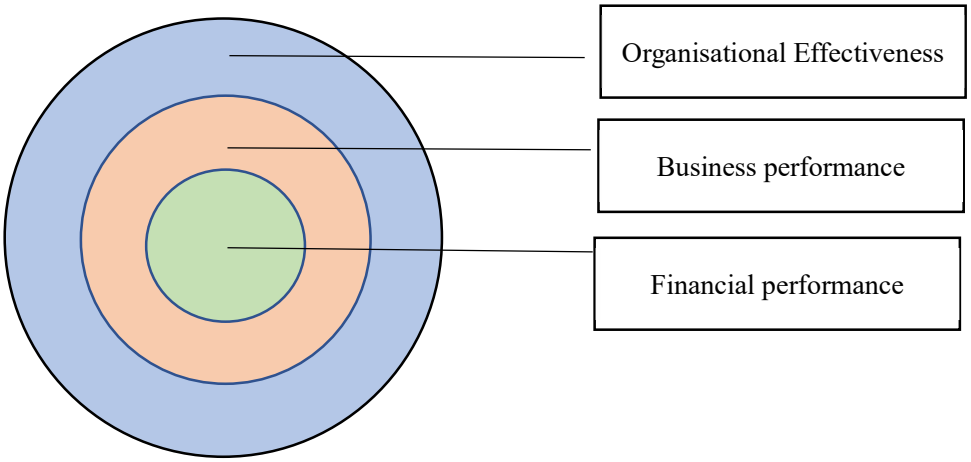
Study	Variables
Dess and Robinson (1984)	Sales, growth, ROA and overall performance
Pearce et al. (1987)	Sale, ROS, ROA, overall performance
Venkatraman and Ramanujam (1987)	Sale growth, net income growth and ROI
Covin et al. (1994)	Sale growth
Dawes (1999)	ROI, ROA and financial performance
Wall et al. (2004)	Profit and productivity

Source: Sandeep Vij and Harpreet Singh Bedi (2016)

The traditional approach of firm performance revealed a range of limitations associated with a failure to cooperate between performance assessment and strategy; lack of non-financial factors such as employee morale, customer satisfaction and quality; a primary analysis of past results, shortage of prediction of future performance; concentration on the short-term; and internal environment analysis leading to issues of innovation (Johnson and Kaplan 1987; Lynch and Cross, 1991; Eccles, 1991; Neely et al., 1994; Ghalayini and Noble, 1996). In addition, the market and stakeholders became focused factors driving the economy in dynamic globalisation. Consequently, a number of researchers developed a new performance measurement approach in the 1980s to replace the inappropriate perceptions of the traditional measurement system (Kaplan and Norton, 1992, 1996; Eccles, 1991; Ittner and Larcker, 1998, 2003; Neely, 1999).

Venkatraman and Ramanujan (1986) draw three overlapping concentric circles with the largest symbolising organisational effectiveness, the medium one representing firm performance and the last one describing financial performance. Cameron (1986) also argued that aspects of organisational function such as internal strain, participation in legal activities, resources and objectives are covered by organisational effectiveness. The conception of Venkatraman and Ramanujan (1986) has been mentioned popularly in various strategic management studies (Carton & Hofer; 2006; Richard et al., 2009).

Figure 2.3 Description of organisational effectiveness, business performance and financial performance



Source: Venkatraman and Ramanujan (1986)

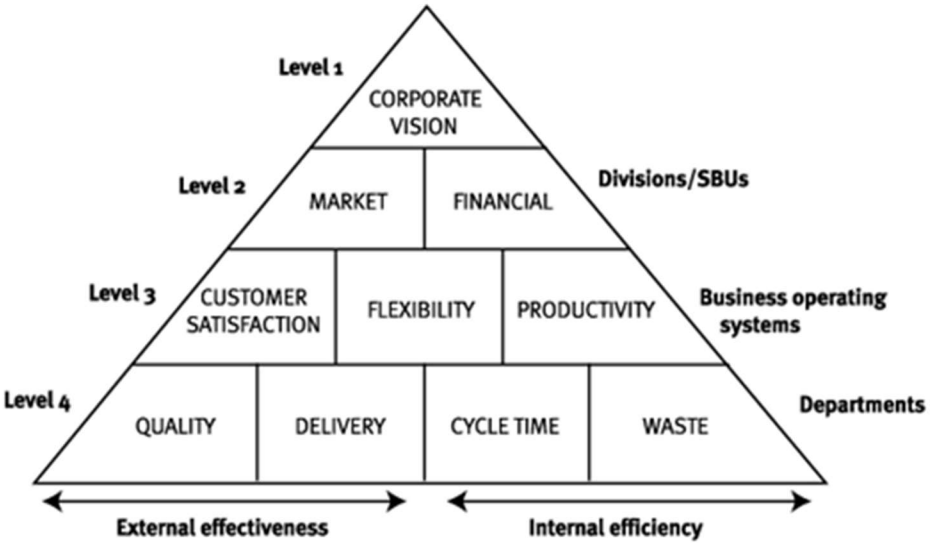
Intangible elements, for instance, customer satisfaction, employee satisfaction, innovation in products and services, new value streams, investment in training, improvement of public image and perspectives, are newly explored factors of the new approach (Ahire *et al.*, 1996; Atkinson *et al.*, 1997; Flynn *et al.*, 1994; Forslund 2007; Fullerton and Wempe, 2009; Maskell, 1991; McAdam and Hazlett, 2008; Kasul and Motwani 1995). According to Yip et al. (2009), a general consensus argues that there is validity and relevance in the traditional financial measurement if the analysis of firm performance can be allied with more external orientation and intangible access. In addition, Kaplan and Norton (2008) also reinforced the perspective of connecting both strategy and organisational operations in the management system to gain effectiveness. Hence, there is a change of firm performance measurement from the stationary indicators of financial performance to the dynamic approach (Barnabe, 2011; Saidi-Mehrabad et al., 2011). According to Kumar and Gulati (2009), the method linking both sides can make managerial operations more efficient and effective. Moreover, when the environment of an organisation changes from the traditional format to a modern and innovative technology business, this approach can determine the demands and possibilities of changing (Silvestro, 2014). Consequently, Cocca and Alberti (2010) emphasized the necessity to broaden the definition of firm performance as the strategic management aspect, which means that business performance can be defined as the overall index of the ability of the firm to satisfy its stakeholders, measured in terms of financial as well as operational indicators.

2.4.3 Frameworks to measure business performance

Various frameworks have been described, for instance, the performance pyramid (Cross and Lynch, 1989), the performance measurement matrix (Keegan et al., 1990), the results and determinants framework (Fitzgerald et al., 1991), SMART pyramid (Lynch and Cross, 1991), the balanced scorecard (BSC) (Kaplan and Norton, 1992, 1996), the macro process model (Brown, 1996), the performance prism (Neely and Adams, 2001; Neely et al., 2002), and the closed-loop management system (Kaplan and Norton, 2008). Most of these frameworks focus not only on the financial aspects of performance but also on the non-financial aspects (e.g., customers, employees, society, etc.), emphasizing that non-financial aspects of performance are the key drivers of the financial results (Neely et al., 2002; Waal and Kourtit, 2013).

According to Keegan, Eiler, and Jones (1989), it is necessary to maintain the balance among the dimensions of the performance measurement matrix which proposes “cost” or “non-cost,” and “external” or “internal”. Neely et al. (1995) reflected that although this perspective is simple and cannot cover enough attributes of the measures, the matrix should satisfy all aspects of performance, which helps an organisation to determine which activities need to be adjusted and measured. Lynch and Cross (1991) promoted the SMART (Strategic Measurement and Reporting Technique) pyramid, which accommodates both internal and external measurement foci. The cascading measurement of the lower team of the organisation is added, which supports assessment at the department and top central levels to achieve the vision of business as well as the internal and external environments.

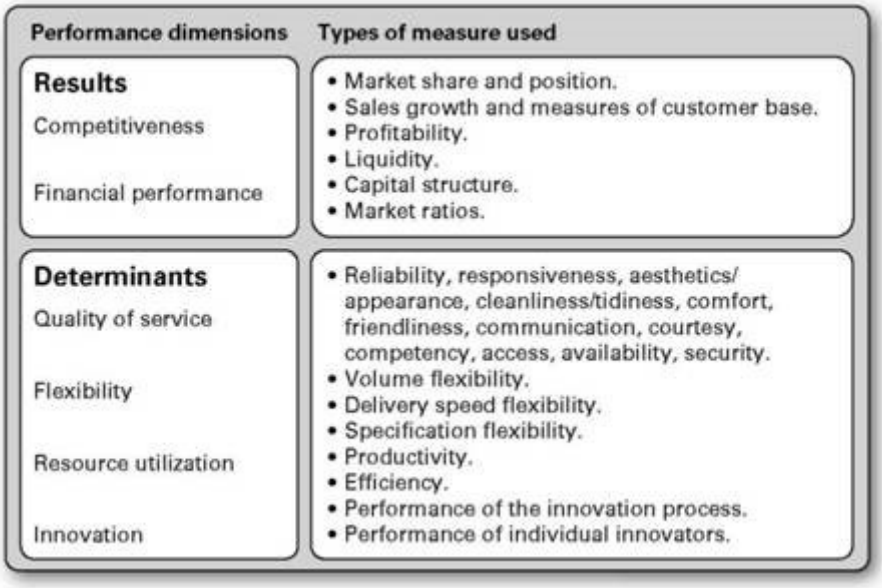
Figure 2.4 Performance pyramid



Source: Keegan et al. (1989)

In terms of the perspective of Fitzgerald et al. (1991), a framework reflected two basic categories which are associated with the results, namely competitiveness and financial performance; determinants of the results including quality, flexibility, resource utilization, and innovation were developed. The perspective of causality concentrated in this model emphasises that results achieved are effects of past performance, which have connections to the determinants. Consequently, the requirement of defining the enablers affecting performance can be considered significant with the aim of enhancing the achievement of outcome performance.

Figure 2.5 The results and determinants framework



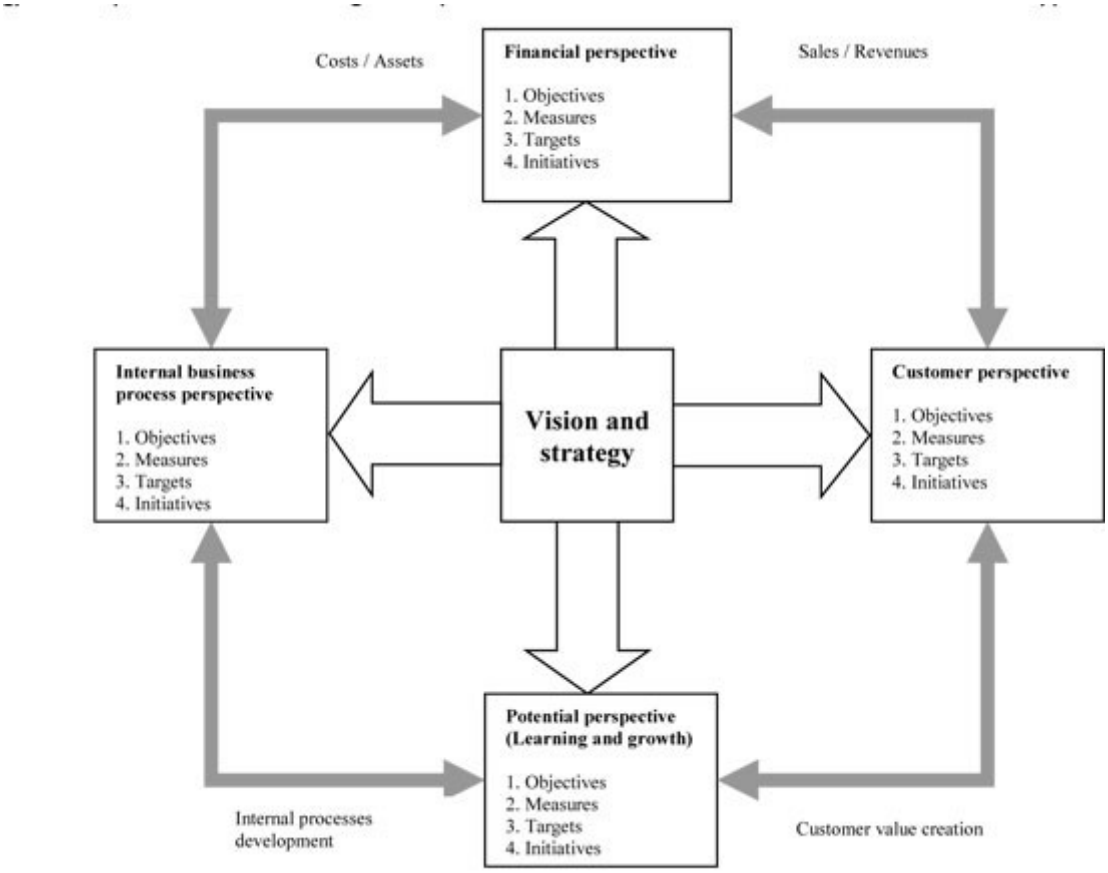
Performance dimensions	Types of measure used
Results	
Competitiveness	• Market share and position. • Sales growth and measures of customer base.
Financial performance	• Profitability. • Liquidity. • Capital structure. • Market ratios.
Determinants	
Quality of service	• Reliability, responsiveness, aesthetics/ appearance, cleanliness/tidiness, comfort, friendliness, communication, courtesy, competency, access, availability, security.
Flexibility	• Volume flexibility. • Delivery speed flexibility.
Resource utilization	• Specification flexibility. • Productivity. • Efficiency.
Innovation	• Performance of the innovation process. • Performance of individual innovators.

Source: Fitzgerald et al. (1991)

Kaplan and Norton (1992 and 1996) developed one of the most popular performance frameworks, known as the balanced scorecard (BSC). In the BSC, four dimensions related to financial, customer, internal business and innovation, and learning perception are explored and analysed as the different viewpoints to measure the firm performance. This framework insists on the equilibrium of financial performance, the drivers of customers and internal operations as well as the dominants of developing performance in the future. The BSC integrates a number of characteristics of other frameworks regarding business performance measurement. However, one of its outstanding benefits shows the relation to the strategy of the firm, which can propose an efficient strategy through examining the organisation's BSC. Kaplan and Norton also determined the condition of BSC adoption, which requires a clear identification of driver performance as well as a transparent relationship between the perspectives (Kaplan and Norton, 1996). Based on the conception of the BSC, Epstein and Manzoni (1997) developed the Tableau de Bord, which reflects hierarchical and cascading measures at various levels of business. On the other hand, some shortcomings of the BSC have been argued. A number of components of previous studies have not been considered comprehensively, for example, a lack of competitiveness element as in results and determinants frameworks of Fitzgerald's et al.'s (1991) (Neely et al., 1995). Furthermore, from the human resources perspective, employee satisfaction,

customer, supplier performance, quality of product/service, and environmental perspective are absent in this module (Ewing and Lundahl, 1996; Lingle and Schiemann, 1996; Brown, 1996).

Figure 2.6 Balanced Scorecard



Source: Kaplan and Norton (1996)

Focusing on financial measures was criticised as the most censure of the traditional performance measure. Although the models which were developed after the mid-1980s became more balanced, there were different approaches to balance between scholars. Particularly, balance between internal and external measures was referred by Keegan et al. (1989) while Lynch and Cross (1991) measured balance with all the different organisational levels. Additionally, relationship between results and determinants was proposed by Fitzgerald et al. (1991). And Kaplan and Norton (1992) paid attention to four different perspectives of balance related to both the nature and the object of the measures including financial and non-financial; internal and external.

The balance models named multidimensional models proposed by Garengo et al. (2005) adopted analysis based on different perspectives and operated them with cooperative approach. Large amounts of data were gathered and elaborated more easily with lower costs based on the innovation of information technology and system. Hence, balanced performance measurement systems could be implemented and used with the support of these innovations. However, an excessive use of measures as an effect of the use of innovative software could be occurred without a planned design. Neely et al. (2000) evaluated that the performance measurement reports which were generated in this case were quite difficult to use and interpret.

When measuring SMEs' performance, balance became a significant issue. In particular, the enterprises focused on aspects of operation and finance or they usually measured only a single aspect of performance, for example, the different elements of the lead time, delivery precision and quality levels (Hvolby and Thorstenson 2000). Despite importance of operational issues of SMEs, Tenhunen et al. (2001) suggested that they should increase their strategic managerial approach to align decision-making processes to strategic objectives; to do so, a balanced performance measurement system could be an important support tool.

Role of stakeholders has been paid attention and increased dramatically in the recent 20 years. The first definition of stakeholders was proposed by Freeman (1984), the groups of people who affect or were influenced by the achievement of a company's objectives were identified as the stakeholders. Consequently, expectations and objectives of stakeholders should be investigated and achieved by an organisation (Atkinson and Waterhouse, 1997). Furthermore, organisational performance was also assessed by the stakeholders as the 'final magistrate' (Dickinson et al., 1998). Creating a sustainable organisation was underlined its importance by Funk (2003). The sustainable organisation was described that its attribute and operation were designed with the aim of leading to a "desirable future state" for all stakeholders'. However, different groups of stakeholders had various needs and levels of satisfaction which companies should pay attention and analyse. In order to obtain this purpose, the stakeholder perspective to measure the business performance has been approached and applied in a number of studies of Atkinson and Waterhouse (1997), Bititci (1994), Kanji (2002), Neely et al. (2002) and Sharman (1995) in recent years. For instance, the Integrated Performance

Measurement Reference Model of Bititci et al. (1997) and Performance Prism of Neely et al. (2000) have concentrated on the demands of stakeholder much more than strategy of enterprises which is considered as the starting point when measuring performance.

According to Barnes et al. (1998), although SMEs started to use the stakeholder approach in studies related to performance measure, literatures interpreted that stakeholders' satisfaction was collected and investigated by only SMEs who took part in the quality awards as the minority. Vinten (2000) stressed that satisfaction of stakeholders in SMEs should be approached in the simple way because SMEs who got difficulties in surviving could not carry-out to consider the variety of stakeholders as the large companies did. Therefore, Thomlison (1992) specified primary and secondary stakeholders that SMEs could adopt.

2.4.4 The indicators to build up the business performance

Considerable empirical researches in the literature have explored a series of components of firm performance based on diversified approaches (Ittner and Larcker, 1998). Both internal components, including strategy, objectives, organisational culture and structure, and external components, such as suppliers, customers, competitors, and legal, social and political factors, have been classified (Chenhall, 2003; Garengo and Bititci, 2007). The operational indicators have been interpreted in the studies of Digalwar and Sangwant (2007), Beamon (1999), Maskell (1991) and include delivery performance, lead times, flexibility and quality performance. In addition, indicators related to human resources such as satisfaction, motivation of employees have been examined (Abbott, 2003; Heskett et al., 1994; Schlesinger and Heskett, 1991; Tuzovic and Bruhn, 2005). Especially, the connection between employee satisfaction and customer satisfaction as well as overall performance has been strongly proved by Fitz-Enz (1993) and Watkins and Woodhall (2001).

Additionally, Connolly et al. (1980), Hitt (1988), and Zammuto (1984) defined the measurement of firm performance through assessing stakeholder satisfaction with the foundation of the stakeholder theory. Although there is a conflict between stakeholder theory with a social viewpoint focusing on the objectives of the firm and the economic perspective, a number of researchers, such as Agle, Mitchell, and Sonnenfield (1999), Clarkson (1995), Kaplan and Norton (1992), Richard et al. (2009), Venkatraman and Ramanujam (1986), Waddock and Graves (1997),

agreed that performance outcomes can be assessed based on stakeholder satisfaction. Using this theory can analyse firm performance comprehensively as well as address the problems between antecedents and results. According to Donaldson and Preston (1995), there are some stakeholder groups listed as following administration, trade associations, communities and political groups. Furthermore, Chakravarthy (1986) claimed that investors can be satisfied by maximised financial performance, reflected in profitability, growth and market value (Cho & Pucik, 2005; Venkatraman & Ramanujam, 1986). Glick et al. (2005) illustrated that ability to achieve returns is defined as profitability. The perspective of Whetten (1987) identified organisational growth as the competence of a firm to develop size, which provides the benefits of economic scale as well as competitive power for firms. Thus, system development can lead to an increase in profitability in the future, which means that profitability and growth have interaction.

Besides, two stakeholder groups have been considered, namely customer and employee, and their satisfaction can become indicators of firm performance. According to Fornell, Johnson, Anderson, Cha, and Bryant (1996), both quality and quantity of goods or services are targets of customers. Barney and Clark (2007) also emphasised that if customers' demands are satisfied, they can enhance their willingness to pay for goods and services. Therefore, capturing customers' needs as well as adding more value to products or services are the top tasks of enterprises. Moreover, employees' satisfaction is known as a factor of human resource influences on organisational operations. Harter, Schmidt, and Hayes (2002) defined some of the interests that this group focuses on as job responsibilities, training, career opportunities, working policies and environment.

Additionally, governments and communities can represent the indirect stakeholders who are influenced by business actions such as social and environmental impacts. According to Chakravarthy (1986) and Waddock and Graves (1997), social and environmental performance reflects that the solutions of firms can protect communities and governments. These stakeholders can be satisfied by some activities regarding conserving the environment, improving the quality of goods with a high level of safety, ethical advertising, creating more jobs for minority and developing social projects (Agle et al., 1999; Johnson and Greening, 1999; Waddock and Graves, 1997).

Based on the conceptualisation as well as frameworks and indicators to measure

firm performance, this study has used the synthesis, including financial (growth and profitability) and strategic performance (market value, customer satisfaction, employee satisfaction, social performance and environmental performance), to measure the business performance as in the table below.

Table 2.2 Indicators using in this study

Financial performance	Profitability	ROA, ROE	Johnson (1983), Dess and Robinson (1984), Capon et al. (1990), Parnell and Wright (1993); Glick et al. (2005)
	Growth	Market share growth; Asset growth; Revenue growth; Net profit growth; Rate of turnover growth	Whetten (1987); Venkatraman and Ramanujam (1987); Covin et al. (1994); Wall et al. (2004); Cho & Pucik (2005); Venkatraman & Ramanujam (1986)
Strategic Management	Environmental performance	Uses of Recyclables	Chakravarthy (1986); Waddock and Graves (1997)
	Social Performance	Minority employment	Agle et al. (1999); Johnson and Greening (1999); Waddock and Graves (1997)
	Customer satisfaction	Value added; Customer retention; Customer loyalty; No complains	Digalwar and Sangwant (2007), Beamon (1999), Lynn et al. (1997), Maskell (1991); Fornell, Johnson, Anderson, Cha, & Bryant (1996); Barney and Clark (2007)

	Employee satisfaction	Investment in employee; Career opportunities; Organizational environment	Abbott (2003); Burke et al.(2005); Heskett et al. (1994); Schlesinger and Heskett (1991); Simmons (2008); Tuzovic and Bruhn, (2005); Harter, Schmidt, and Hayes (2002)

Source: Collection by author based previous researches

In terms of the business performance of SMEs and e-customs, no previous studies discussed the relationship or impact of e-customs implementation on SMEs' performance.

2.5 THEME OF SME

2.5.2 Concept of SME

Although the definition of small and medium-sized enterprises (SMEs) is diverse in various countries, most popular concepts have been classified based on total assets, annual sales and number of employees (Setiowati et al., 2015). According to the definition of OECD (2005), SMEs are perceived as independent firms, i.e. non-subsidiaries that have limitations in the number of employees, and this condition is diversified across countries. According to the OECD (2005), the European Commission limits this to 250 employees in SMEs while others set the scope of 200. However, this figure in the United States reaches 500 employees. Particularly, enterprises with micro and small sizes in the European Community employ less than 10 and 50 workers, respectively (OECD, 2015). Furthermore, the concept of SMEs also depends on the firms' financial assets. Based on the new policy of the European Union in 2005, national and regional aids for SMEs can be much more than large firms, which leads to changes in financial regulations. For instance, EUR 50 million is the financial ceiling of turnover for medium enterprises, while the small ones cannot go over EUR 10 million and EUR 2 million is the limitation for micro-companies.

Table 2.3 Company category

Company category	Staff headcount	Turnover	or	Balance sheet total

Medium-sized	< 250	≤ € 50 m	≤ € 43 m
Small	< 50	≤ € 10 m	≤ € 10 m
Micro	< 10	≤ € 2 m	≤ € 2 m

Source: OECD (2015)

2.5.3 Contributions and advantages of SME in economy

The development of both global leaders and emerging countries such as the United States, China and India has contributed to the growth of SMEs. The obvious evidence includes the economic benefits that SMEs provide, such as an increase in the output of goods and services and employment value creation with a low cost of capital (Imoisi Anthony Ilegbinosa and Ephraim Jumbo, 2015). Particularly, SMEs not only push the service industry to grow significantly and reduce the income gap but also strengthen the huge number of semi-skilled and skilled employees, which builds up the foundations for the development of new industries (Beck, 2005; Li Xue, 2011; Iromaka 2006; Mutula and Brakel, 2006; Metaxiotis, 2009; Federici, 2009; Ramdani, Kawalek, & Lorenzo, 2009). Additionally, SMEs have been considered as a bridge connecting the different economic-social segments, for instance, by enhancing opportunities for new technological adoption.

NUTEK (2004) and Wolff and Pett (2006) identified SMEs as vital actors in the economy. SMEs can be regarded as seeds that can become large firms in the future (Castrogiovanni 1996, Monk 2000). With the dynamism of SMEs, the small-scale industry can grow to contribute to economic development. According to Storey et al. (1987), Castrogiovanni (1996), Clark III and Moutray (2004), the unemployment rate can decrease because of the use of large amounts of labour by SMEs. 95% of businesses registered in the world are SMEs. Specifically, in the European Union this figure is 99.8%, and 76 million employees accounted for 67.4% of those working for these enterprises in 2010 (Canetti, 2010). In addition, the reports of developed countries show that 50% of the Gross Domestic Product (GDP) is contributed by SMEs.

The innovative ability of SMEs can be more active than larger corporations because they can be flexible to achieve the efficient integration of technological inventions (Acs and Yeung 1999, Qian and Li 2003, Verhees and Meulenberg 2004, Timmons 1998). The perception of SMEs as a better performer of innovation has been supported by a number of researchers (Gerorski and Machin 1992, Soni

et al. 1993, Freel 2000, Vermeulen et al. 2005, Westerberg and Wincent 2008, Qian and Li 2003, Verhees and Meulenberg 2004). SMEs' own some attributes that can lead to advantages of SMEs. Particularly, the flatter structure and fewer levels of management make SMEs easy to change and adapt to the new environment (Gourova, 2010) as well as obtain short communication lines across departments with fewer errors (Aragon-Correa et al., 2008). According to Hauser (2005), SMEs can obtain simplicity in management and flexibility in adapting new working solutions due to the small size and organisational structure. Wong and Aspinwall (2004) agreed that the structure of SMEs brings benefits of change implementation. For instance, when an innovative idea is facilitated by the managers, pilot operations can be easy because there are few departments involved. In the research of Acs and Audretsch (1991), the innovation performance of small enterprises was more than twice per employee compared with large firms. Moreover, the rate of innovation per dollar of SMEs' research and development activities (R&D) is two to four times more than monolithic companies (Plehn-Dujowich, 2007). McAdam et al. (2004) examined the influence of organisational size, production process, leadership, culture, information, management perspectives and total quality management on innovation based on cases of SMEs in Northern Ireland.

In fact, innovation adoption via R&D with the aim of enhancing the function and quality of products and services is a smart solution for SMEs to improve the barrier of size limitation (Ebrahim et al., 2008). According to ADB (2009), SMEs have been encouraged to apply new and unpractised technologies in developed countries, which inspires the efficient performance of SMEs. Furthermore, the agility of SME's internal activities and rapid adaption to the conditions of an unstable market can be advantages of SMEs (Lazarica, 2009). Besides, in spite of a small number of customers (Thakkar et al., 2009), the establishment of a close and long relationship with customers as well as the encouragement of personal connections with clients have been the focus of SMEs (Hong and Jeong, 2006). In the project of Bhutta et al. (2007), long-lasting relationships between small firms and customers occur frequently in Pakistan, especially, 10-year relationships between business and customers.

2.5.4 Challenges facing SMEs

The competitive environment in the global market with the increase of customers'

demands, such as products and services with high quality and low price, goods diversity and increased delivery speed as well as technological innovation, present a range of difficulties for SMEs to survive and grow (Chow et al., 2008; Ketchen et al., 2008; Chandra and Kumar, 2000). Globalization has made the life of SMEs tougher and more competitive in seeking new markets, gaining opportunities and achieving excellent international performance (Jonnson & Lindbergh, 2010). Therefore, SMEs that possess a competitive advantage may be able to compete with customers, rivals and other forces (Knight & Kim, 2009; and Ibrahim et al., 2014).

The business sector in the economy has a large share of SMEs who contribute the majority of business turnover. Based on the statistical results of the OECD in 2002, the number of SMEs accounts for from 96% to 99% of the total enterprises in most countries (OECD, 2002). According to the OECD (2005), although SMEs represent a large share of the economy, their performance in world trade is not effective. Nevertheless, SMEs have already found a willingness and a different approach to participate in internationalisation. Particularly, SMEs explore new business opportunities in the value chain, stimulate trade, cluster across borders, and collaborate and ally with subsidiaries, branches and joint ventures abroad with the aim of optimizing international competitive abilities. SMEs can achieve a range of opportunities and benefits, such as exploring and deploying new niche markets, enhancing the ability of financial access and reducing costs.

The difficulties of the domestic market including high production costs, strict laws and regulations as well as opportunities in target markets such as accessing technology, capital, labour, new and larger markets. Meanwhile, enhancing production capacity is identified as the motivator for the internationalization of SMEs (the European Commission, 2004). However, a number of barriers that SMEs have to face when they go through the international process have been found by a number of researchers, for example, the adaptation of products to foreign markets, travel expenses, or business and financial risks; existing law and regulations; product standards; intellectual property rights protection; a lack of capital or finance; a lack of support and advice; cultural and language differences; and a lack of information.

Anja et al. (2009) indicated a few limitations of SMEs in terms of financial capacity and management perception. Moreover, SMEs face restrictions of

information on technological investment (Dyerson et al., 2009) and their technologies are often out of date (Hendrickson, 2009). Quayle (2003) explored customers as the dominant force of SMEs' activities. Additionally, external factors, such as adjustment of the economy, socio-culture, politics, regulations and technology, also create pressure on SMEs (Hashim, 2007).

Based on the concept of the development of SMEs as transitional industries, World Bank (2001) described that SMEs without enough capability trying to transform into large businesses can suffer from difficulties, failure and collapse. Furthermore, almost all SMEs encounter obstacles of funding provision while commercial banks would like to decrease the risk of the investment portfolio, which means that SMEs cannot meet banks' criterion of profitability. Therefore, financial pressure is a considerable burden for SMEs in both developed and developing countries. For instance, in 2003, the Banker's Committee in Nigeria launched the project named "Small and Medium Scale Industries Equity Investment Scheme (SMIEIS)"; however, it could not succeed.

In order to address the shortage of finance, skills, small firms face resource gaps in terms of finances, skills and technology, SMEs have co-operation relationships with suppliers (Park and Krishnan, 2001; Mudambi et al., 2004). According to Koh et al. (2007), based on this collaboration, SMEs can approach the updated technologies and enter with the latest innovations. Lipparini and Sobrero (1994) also supported this perspective, which reflects those alliances with suppliers can link the internal ability and external capacity of SMEs towards promotion. Besides, the supply source can keep stable while the risk of lack of supply can decrease based on the loyal relationship between SMEs and suppliers (Ellegaard, 2006).

In a nutshell, this section provides rationality for SMEs applying e-customs in their supply chain as well as obstacles that SMEs have to face to in the current situation. In term of that, element of finance and human resources is the only internal factor that is put into the conceptual model as one of the barriers.

2.5.5 SMEs in Vietnam

SMEs are considered an important asset to almost all countries, especially the developing countries as they contribute in terms of economy and employment (Mead & Liedholm, 1998; Beck, 2005; Li Xue, 2011). Koh et al. (2007) emphasised the substantial contribution of SMEs to the development of the

economy and employment creation. In addition, Peng (2009) appreciated the role of SMEs as the backbone of the economy in such countries and regions as well as because of their much greater contribution than large companies. Generally, SMEs have been evaluated as dynamic, innovative and flexible and dominate the economies in leading and developing nations.

In Decree 56/2009/ND-CP, the Vietnam Government indicates that SMEs are enterprises who grant the license of business registration following the law. There are three levels of divisions, including "*very small, small and medium according to the sizes of their total capital (equivalent to the total assets identified in an enterprise's accounting balance sheet) or the average annual number of labourers (total capital is the priority criterion)"*

Table 2.4 SMEs in Vietnam

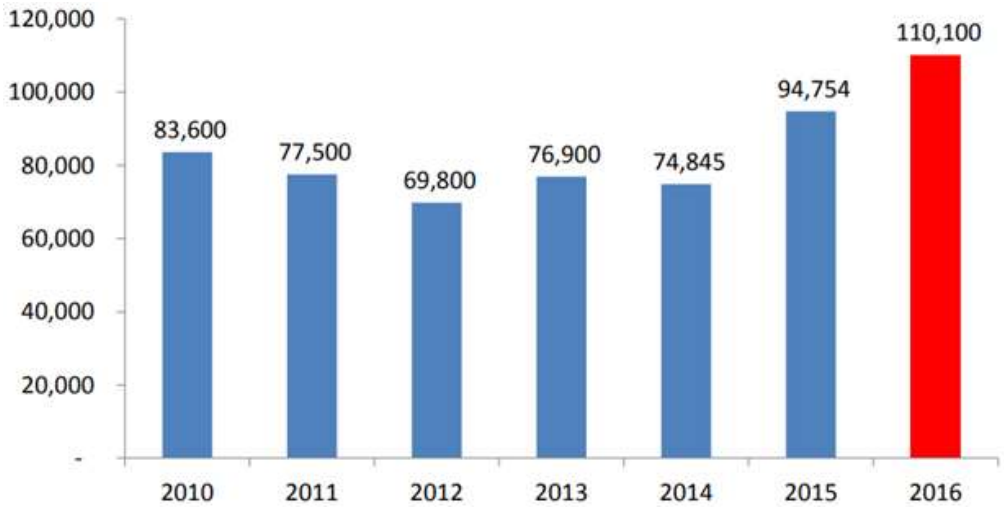
	Very small enterprises	**Small-sized enterprises.**		**Medium-sized enterprises**	
	Number of labours	Total capital	Number of labours	Total capital	Number of labours
Agriculture, forestry and fishery	10 people or fewer	VND 20 billion or less	Between over 10 people and 200 people	Between over VND 20 billion and VND 100 billion	Between over 200 people and 300 people
Industry and construction	10 people or fewer	VND 20 billion or less	Between over 10 people and 200 people	Between over VND 10 billion and VND 50 billion	Between over 200 people and 300 people
Trade and service	10 people or fewer	VND 10 billion or less	Between over 10 people and 50 people	Between over VND 20 billion and VND 100 billion	Between over 50 people and 100 people

Source: Vietnam Government (2009)

Vietnam, one of the developing countries, is on the way towards deep integration into the world economy and has several experienced years in the creation and growth of SMEs. SMEs, comprising 97% of businesses, dominate the private sector (Ministry of Justice, 2014). Over half a million career opportunities are provided by SMEs, which employ more than 51% of the workforce as well as contribute 40% of GDP (Uyen. H.P. Phan et al., 2015). In recent years, there have

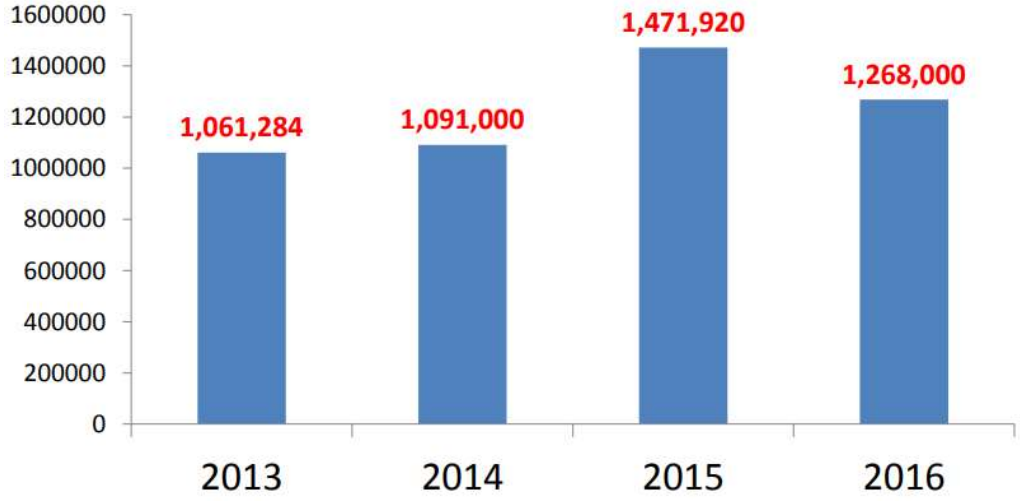
been increases in tax and other fees from SMEs to the state by approximately 18.4-fold. Thus, social affairs and developing projects have been also benefited from the participation of SMEs. In contrast, there are a huge number of obstacles that SMEs in general, and in Vietnam, in particular, have to face. Based on statistics from the Vietnam Ministry of Planning and Investment (2016), the decline in the total number of newly established companies has appeared and occurred continuously from 83,600 in 2010 to 77,500 in 2011 and 69,800 in 2012. After the global crisis, SMEs seemed to recover and come back to growth, which is proved by the 76,900 firms that set up in 2013, an increase of 10% compared with this figure in 2012, which is a positive signal. In addition, the new establishments bounced up to 94,754 in 2015 and 110,100 in 2016 (Figure 2.7), which demonstrates the upward movement of enterprises operating in the market.

Figure 2.7 Number of newly established firms (mainly SMEs)



Source: Vietnam Ministry of Planning and Investment (2016)

Figure 2.8 Registered number of employees of newly established firms



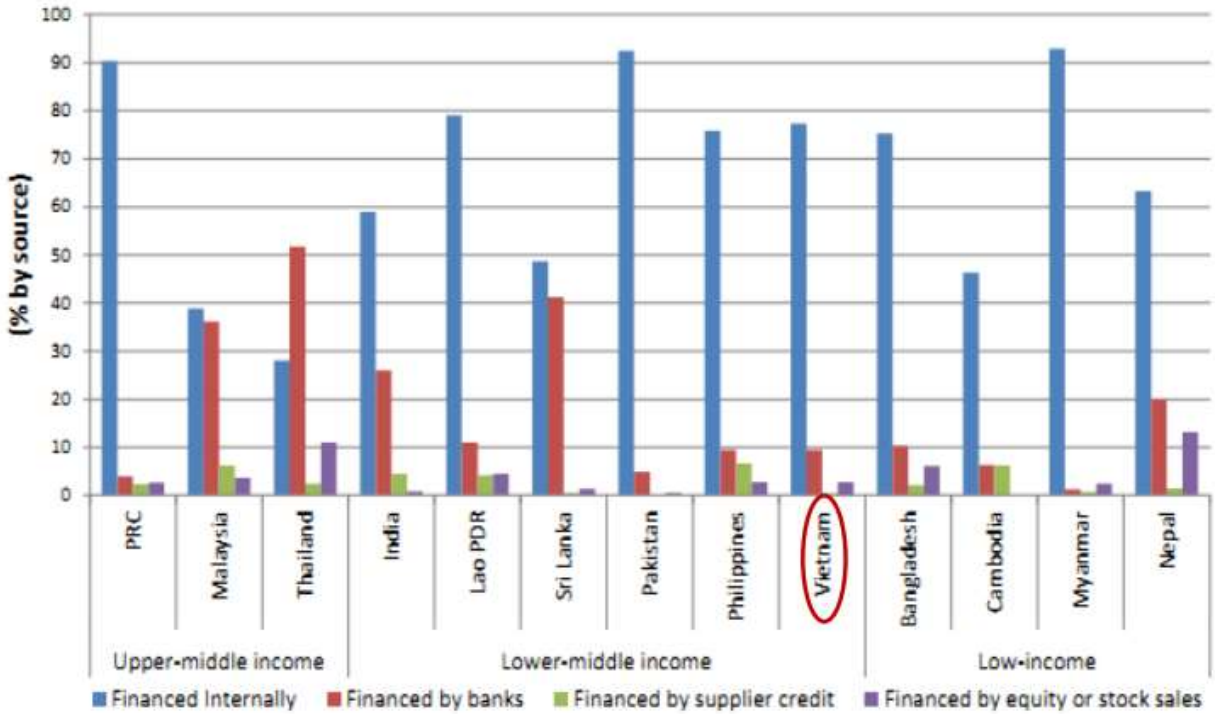
Source: Vietnam Ministry of Planning and Investment (2016)

In addition, SMEs' registered capital was approximately USD 130 billion, equal to one-third of total firms' registered capital in 2016. They also contribute 33% of total state budget revenues, 49% of created added value and 41% of GDP (Can Van Luc, 2017). According to the report of OECD (2021), the data of the World Bank Enterprise Surveys (WBES) show that both product and process innovation with the automation adoption of Vietnam SMEs indicate good performance. However, most innovation of Vietnam SMEs has a characteristic 'frugal nature' due to the investment restriction in R&D. For instance, Vietnam SMEs make small modifications to their current products at a low cost in order to access low-income customers easily. Regarding ICTs, the usage of organisations' platforms by Vietnam SMEs is consistent with the average for ASEAN. However, Vietnam SMEs rarely adopt specialised software programs for export and access to the global supply chain, for example, Enterprise Resource Planning (ERP) or Customer Relations Management (CRM).

Financial issues are one of the primary inhibitors of SMEs globally, and in Vietnam as well. In comparison to the financial funding for SMEs in Asia (Figure 2.9), the external funding sources of Vietnamese SMEs have been little while their funding has been obtained from internal sources (Yoshino and Wignaraja-ADBI, 2015). Besides, troubles of management, as well as the quality of resources related to human resources, also form the barriers of SMEs. Particularly, SMEs have low-quality labour, including managers, which cannot satisfy the requirements of a career as well as influence organisational operations. To Hoai Nam (2014) showed

that 55.63% of administrators of Vietnamese SMEs had an intermediate education and 43.3% of managers had an elementary education while the percentage of employees of SMEs without training or technical expertise reached 75%. In addition, the working environment of SMEs cannot qualify for social insurance and health insurance policies for the employees, which increases the pressure on human resources for Vietnamese SMEs (To Hoai Nam, 2014).

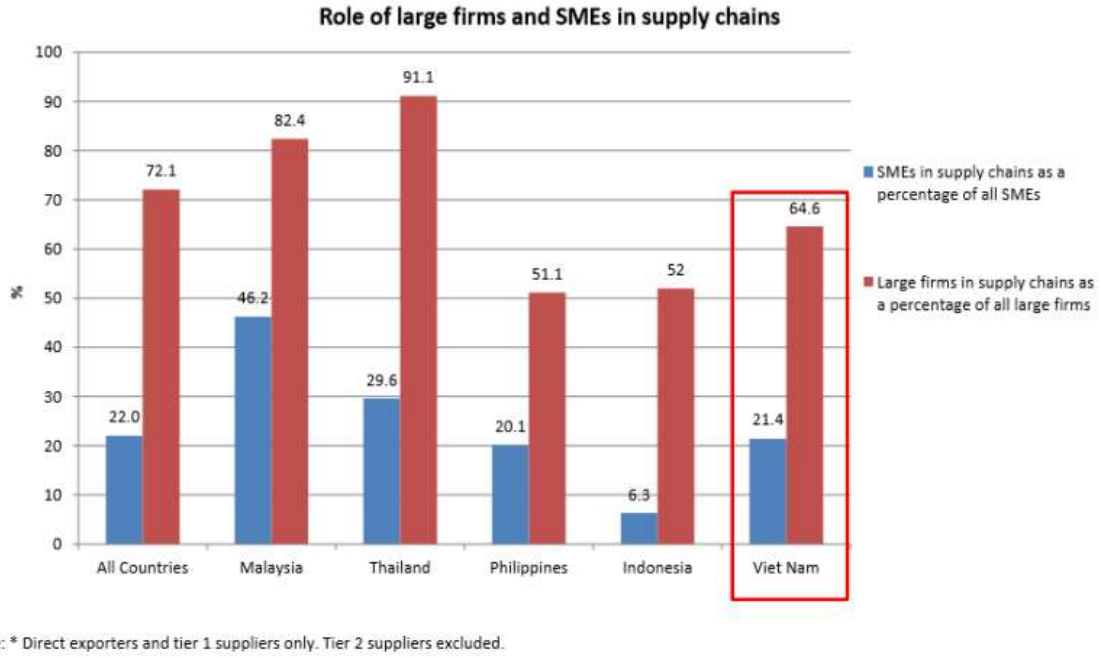
Figure 2.9 Finance for SMEs in Asia



Source: Yoshino and Wignaraja-ADBI (2015)

Furthermore, SMEs in Vietnam have limitations in participating in global value chains, which illustrates that 21.4% of firms as SMEs are in supply chains, which is a third of the figure for large companies (Figure 2.10). SMEs are adequately involved in national exports, but most of them are foreign-owned.

Figure 2.10 Large firms and SMEs in supply chain

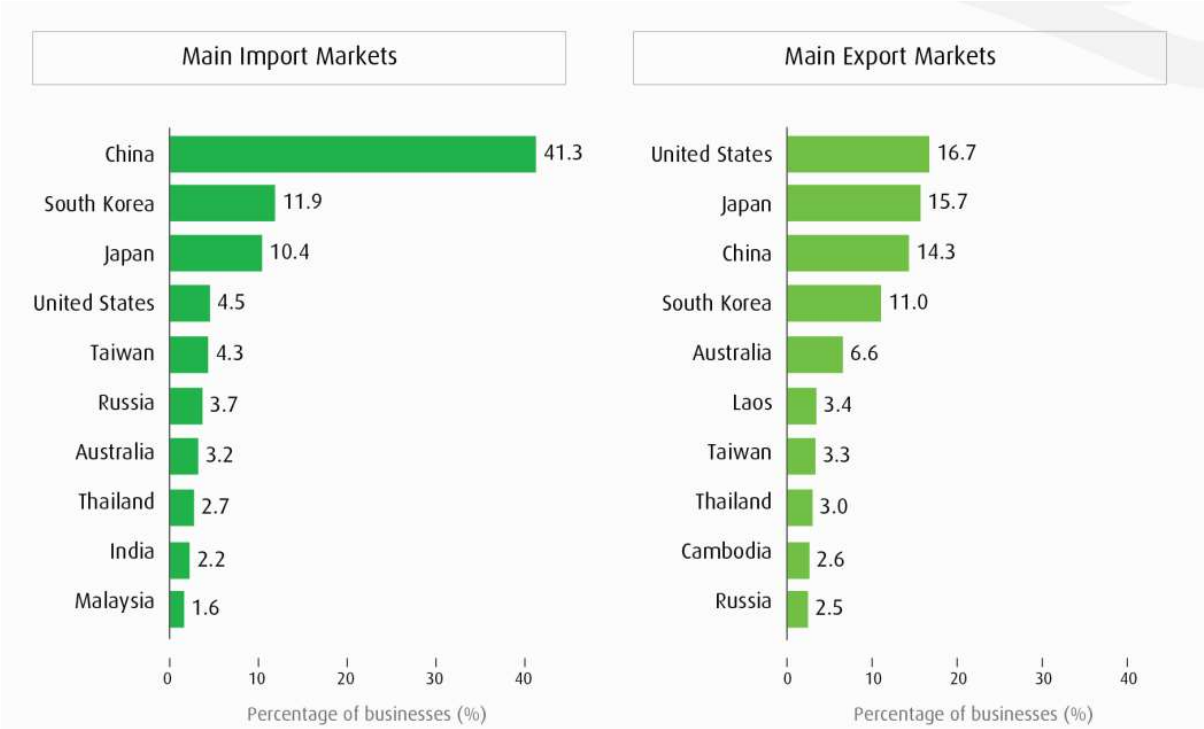


Source: Wignaraja, g. (2013)

Vietnam SMEs operating in the industry generate 68% of national exports, and 86% of the total labour force is used by the exporting companies. SMEs represent 88% of exporting firms and make an appreciable contribution in terms of export, with half of the export output. Although all Vietnam SMEs give their best effort in exporting, almost all foreign-direct-investment (FDI) SMEs who relocated to Vietnam with the purpose of approaching the multinational enterprises (MNEs) as the lead buyers achieve 70% of the export volume.

According to statistical data of the ICTs and Statistics Department of GDVC (2020), the trading partners of Vietnam SMEs show diversity, with 62 countries and territories as the principal import and export markets. Indeed, China represents the largest import market for Vietnam SMEs, with 41.3%, followed by South Korea (11.9%) and Japan (10.4%). The United States ranks fourth in the main import markets and is the most substantial export market of Vietnam SMEs with 16.7%. In addition, Japan (15.7%), China (14.3%), Korea (11.0%) and Australia (6.6%) provide considerable export market for Vietnam SMEs. However, EU economies are still a solid fence for the international trade of Vietnam SMEs due to high entry standards. After the EVFTA Agreements in 2020, various opportunities for Vietnam SMEs to export to the EU market could be implemented.

Figure 2.11 SMEs' main import and export markets



Source: ICT and Statistics Department, GDVC (2020)

2.6 CONCLUSION AND RESEARCH GAP

The international literature is rich with reports and analyses of e-customs efforts around the world. Previous authors have identified some fundamental benefits that may be brought about by these innovations in public administration, as well as a number of difficulties frequently encountered in applying them. Although Vietnam is a developing nation with a relatively low standard of living, a weak ICT infrastructure and modest ICT skills base, the country has pursued ambitious goals in terms of developing its ICT sector and applying ICT in public administration. While considerable progress has been made, in general, e-government projects in Vietnam have not been outstanding cases of success. Indeed, there have been significant failures. including the high-profile Project 112. Against this background, the e-customs adoption and implementation can be seen as one of the more successful ICT projects in Vietnam's public administration. Yet, there has been little systematic information or analysis on this issue. Thus, there are some key gaps in the literature, from our perspective, as presented in the following.

Firstly, there is a dearth of clear, consistent and systematic information about the implementation of e-customs in Vietnam. Although the information has been

provided by a range of news agencies, such reports tend to be narrowly focused on the specific events being reported, so that it is difficult to form a broader, general picture of the entire system. Moreover, it is often necessary for the reader to know all the relevant background before he or she can gain a good understanding of the information presented in these reports. An example of this deficiency is the lack of a concise but informative and up-to-date description of the current state of the e-customs initiative, despite the considerable interest which has surrounded it. Almost all studies about e-customs are in leader economies and at the stage of the acceptance or adoption of innovation. The factors, including the enablers and inhibitors, that influence e-customs have not been investigated clearly and have been debated between scholars. Especially, no prior research has examined these factors in a new phenomenon such as Vietnam, the implementation stage of the innovation process and a new practice for SMEs.

There are a number of studies and analyses of e-customs and SMEs' performance in the international literature. Both crucial benefits and barriers to adopting and applying this innovation in public administration are identified by the previous researchers. Despite considerable interest from the public and the many reports on e-customs in the daily press and other media, to our knowledge, there has been no published academic research in the public domain regarding the relationship between e-customs and firms' performance in general as well as in the Vietnamese context and SMEs' performance in particular, which forms the second gap. Searches on this specific topic were conducted in 18 databases, particularly ScienceDirect, ProQuest central, EBSCO, Emerald, Scopus, and Web of Science, and scholarly and hand searches were also made in both English and Vietnamese sources, but no journal articles were found. The author could also find no reports or books from international organisations, such as the World Bank, OECD and World Customs Organisation, that focused on this topic.

The above discussion leads more generally to a third gap in the existing literature, namely a good summary of the main lessons that can be learned from e-customs (and, more generally, e-government) developments in Vietnam (and, where relevant, overseas). It is essential that such a list of things that should be done (and things that should not be done) be based not merely on the compiler's opinions and preferences but rather on a reasonable interpretation of the assembled evidence. From the three main gaps identified above, the three following research questions

naturally arise (the details of research questions will be discussed in Chapter 4):

RQ1: What are enablers and inhibitors that influence e-customs for SMEs in Vietnam?

RQ2: What is the impact of e-customs on business performance in Vietnam?

RQ3: What suggestions can be provided to enhance e-customs implementation?

CHAPTER 3 THEORETICAL BACKGROUND AND HYPOTHESIS

3.1 INTRODUCTION

This chapter aims to discuss and present the theoretical background that was used to develop the study frameworks. Several well-established theories will be discussed in detail. Next, based on the review of past empirical research, the chapter will extend the argument in order to map the theoretical frameworks to the model that the hypotheses developed.

3.2 INSTITUTIONAL THEORY

According to World Bank (2014), the definition of institutions has been perceived as *"the formal and informal rules of the game for interactions in society" to* promote the growth and development of the economy in the long term. Individuals and groups in society can control their activities through benefits provided by institutions. With the purpose of creating prosperity, increasing efficiency and promoting social welfare, the motivation can be identified to invest in the necessary activities. Particularly, an institutional framework proposes that the new enterprises can register business licences quickly and easily, which motivates newcomers to join the market as well as boost competition, allocate resources comfortably, and enhance the growth of the economy. Based on the literature, the relationship between institutions and development can be analysed and proved, for instance, the correlation between the implementation of property rights and economic improvement or between the educational institutions' quality and educational achievements.

According to Grewal and Dharwadkar (2002), the significance of legitimacy which social stakeholders focus on can be the purpose of institutional theory and institutions can assert their role. In comparison with prior conceptions, others argued that institutions connect to economic suitability, especially accentuating the race for scarce resources, which can emphasise the importance of the institutional environment. Based on the synthesis of Selznick's findings (1949, 1957), institutionalization has been defined as *'a means'* of worth diffusion '*to a structure or process that, before institutionalisation, had only instrumental utility'* (Scott, 1987).

Three dimensions of institutional theory, including ‘coercive, mimetic, and normative’, were explored in previous studies and have been determined as the mechanisms which can enhance the harmony of structure and process through changes of the institution (DiMaggio and Powell, 1983). The stress on organisations is caused by those whom the organisations depend on as well as by expectations of social culture, which can be aspects that the organisations have perceived as coercive isomorphism. The impact of politics and legitimacy can lead to such pressures for the organisations. In addition, administrative departments, clients and other key stakeholders can put stress on the organisation when managing supply. Mimetic isomorphism stems from the uncertainty to engage in supply, which makes organisations imitate the successful experiences of other cases. For example, efficient studies in literature can be interpreted, which can increase imitation. Finally, normative isomorphism refers to regulation, disciplines and professionalization in the industries. For instance, supply management can have pressures that emanate from the establishments and development of institutions such as the Institute for Supply Management (ISM) in the US and the International Purchasing and Supply Education and Research Association (IPSERA) in Europe.

Furthermore, the institutional process with three steps has been updated via the framework of Grewal and Dharwadkar (2002). Firstly, regulating is operated to interact with institutions with the aims of stability protection and social welfare promotion. DiMaggio and Powell (1983) classified that regulating has the same attributes as coercive isomorphism because, in this step, governmental agencies can impose and induce business organisations to manage them. Secondly, validating refers to interactive activities between ‘normative institutions’, including trade associations and professional organisations. The pressures of mimicry and normality are illustrated in the validating step (DiMaggio and Powell, 1983). The final step of the process can be mentioned as habituating, which involves actions appreciated as the standard process of the institution. The repetition of these actions makes them become the base-level patterns that can encourage imitation, for example, cultural norms and shared beliefs. Consequently, Scott (1987) proposed that the structures and processes of organisations reflect as their ingrained foundation ‘taken for granted’, i.e. as the ‘way these things are done’.

Based on the institutional theories of organisations, the pressures of normality and government as the external factors have an impact on organisations (Zucker, 1987). In terms of this perspective, legitimated dominants, such as normative procedures, requirements of government, and professional licences, can instruct and guide the operations of organisations. In order to enhance the possibility of survival, the organisations adopt and implement these legitimated elements, which sets up the institutional environment.

E-customs is the public service that government deployed and e-customs is considered as 'a tool' with regulations and laws (as coercive attribute) of government to facilitate the international trade, individuals, organisations and business in import and export process. Therefore, regulatory of the institutional theory leads the factor of legislation is put in the proposed model. Additionally, element of culture is reflected in attribute of cognitive in the institutional theory. Hence, the cultural dimensions of Hofstede are applied in this study to investigate the impact of culture on e-customs implementation in Vietnam.

Hofstede (1997) determined that the collective awareness programme, which leads to diversification between the members or between human groups, is perceived as the national culture. Five dimensions related to culture are defined in Hofstede's framework. The first concept, known as power distance, refers to the extent of the distribution of power between members of a group or society. The second one is indicated as uncertainty avoidance, which involves the extent of scared feeling of the members of a group or society due to insecure conditions. Moreover, the dimension of individualism and collectivism classify the integration into groups of individuals. The fourth perception relates to masculinity and femininity, which demonstrate the assignment of genders in society. The final definition is associated with long-term and short-term orientation, referring to the objectives of society in looking forward to the future.

Despite the deficiencies of the methodology in Hofstede's measures and concepts (Baskerville, 2003), 60% of the literature adopted Hofstede's cultural dimensions based on the literature review of Leidner and Kayworth (2006). This means that the extent of the influence and application of Hofstede's framework has significance. Based on the study of McCoy et al. (2007), the measurement and perspectives of Hofstede have been practised popularly in such research engaged in culture, encompassing an antagonist to Hofstede's dimensions. In addition, the

study of Warkentin et al. (2002) claimed that the cultural dimensions, including power distance and uncertainty avoidance, have an association with e-government adoption. Furthermore, Hujran et al. (2011) proved that national culture has a positive impact on citizens' adoption of e-government services in the Arab world. Consequently, due to the wide applicability and acceptance of cultural identification and framework in Hofstede's model, this research also chooses Hofstede's cultural dimensions as a theoretical background with the aim of evaluating the culture as one of the factors having an impact on e-customs implementation in Vietnam.

3.3 STAKEHOLDER THEORY

Anthopoulos, Reddick, Giannakidou, & Mavridis (2016) and Pardo & Scholl (2002) identify that handling legal and various benefits for the range of stakeholders often get failure in e-government projects. Pawłowska (2004) mentions to both internal stakeholders such as managers and civil servants and external ones including citizens and business. Moreover, Snider (2005) also identifies ability of conflicts relate to interest among stakeholders. Particularly, Sarkar & De (2010) specify that participation of stakeholders could be deficient in the projects, which also leads to the lack of their influence on requirements. Therefore, Davenport & Horton (2004) underline the significance of discussion regarding managing interests and demands between communities. And Stakeholder Theory of Freeman (1984) is a key theory to address this issue.

Freeman (1984) defines a stakeholder as "any group or individual who can affect or is affected by the achievement of the organisation's objectives". Shareholders and employees have been suggested in the study of Clarkson (1995). In addition, suppliers and customers who have direct interactions with enterprises are referred to as other key stakeholders. Despite their indirect relationship with business, the secondary stakeholders have a significant influence on organisational operation, especially regarding the impact on the society and environment. According to Donaldson and Preston (1995), the government, administrative agencies, trade associations, communities and political groups have been listed as the primary stakeholder groups. Fitzgerald and Storbeck (2003) determined that both firms and stakeholders made alliance strategies to enhance their cooperation and achieve specific goals. With the aim of stable and long-lasting relationships between parties, a solution regarding the identification and adjustment of stakeholders has

been proposed by Mitchell, Agle and Wood (1997). Three perspectives relate to the impacts/pressures of the stakeholders on companies, the requirement of legitimacy, which is the demand of the stakeholders, and the necessity of stakeholders have been classified in this method. Particularly, Donaldson & Preston (1995) indicate three key aspects of Stakeholder theory with original from management theory are following:

- Normative aspect refers to a moral imperative for managers, they not only take action as representatives of enterprise's shareholders but also focus on the legitimate benefits of various stakeholders.
- Descriptive concern relates to detection who stakeholders are as well as cognize their connection, demands and interests.
- Instrumental component is used to discover relationship among stakeholders and manage outcomes of organisation.

In studies of Freeman (1984), Freeman & Phillips (2002) and Freeman, Wicks & Parmar (2004), stakeholder theory involves relationship between social groups who engage in the values of enterprise. The stakeholder theory is developed as the different choice of shareholder perspective to govern corporate, however, its characteristic is not restricted by rationales of seeking profit for private. Additionally, diverse disciplines have applied the stakeholder theory, for example, researches related to information system of Pouloudi & Whitley (1997) and Vidgen (1997), studies in health care management of Blair & Whitehead (1988). The combination ways between detail and overview have been offered in the stakeholder theory. Scholl (2001) clarifies the stakeholder theory has matched with government's objective of providing policies and services for society's stakeholders (citizens and organisations) excepting the original profit focus. Hence, the stakeholder theory can be used to analyse in public sector. The study of Sæbø et al. (2011) demonstrate an adaption of Stakeholder theory in e-government discipline with potential theoretical contribution that can support to develop guidelines in this field. In particular, factors of stakeholder theory can be applied in research of Scholl (2004) to assist to investigate projects which are changed by IT- driven in public sector.

Donaldson & Preston (1995) indicate three elements of stakeholder theory that interrelate each other and support mutually. The ethical and philosophical principles are proposed in the normative assumptions, for instance, what

managers of firms should do and how they can operate their organisation. There is diversity of stakeholders in each organisation, which requires managers not only to carry- out to maximise profit for shareholders but also to understand and appreciate the stakeholders' interests. Denhardt & Denhardt (2007) emphasise that the benefits of stakeholders should be recognised, which is the responsibility of government authorities beyond the political process.

Hendry (2001) points- out three categories of stakeholder engagement including moderate (stakeholders are treated with respect), intermediate (some interests of stakeholder are combined in governance) and demanding (all stakeholders participate in decision processes). Donaldson and Preston (1995) clarify the normative aspect as the core of stakeholder theory which builds-up foundation and shapes other two discipline, instrument and description. In beginning, the stakeholder theory was developed and applied in corporations as the private sector and the normative element is considered as the representative for a new framework which has not represented for management scholar previously. There is less controversy when applying this framework in the public sector where maximising profit is not the primary objective of majority of organisations and ownership is not private. According to the original normative aspect of stakeholder, this element has no purpose of leading to cooperation with the principal values of public organisations. Due to significant difference of normative values between public organisations and private firms, the stakeholder theory should be further developed to fit public authorities.

The ways of illustrating organisations and organisational behaviour are referred as the descriptive aspect of the stakeholder theory. Particularly, the stakeholder theory mentions to key elements of descriptive aspect, for example, concept of stakeholders, methods/ tools to identify and analyse stakeholders. In the study of Sæbø et al. (2011) related to e-participation project, governmental side comprises politicians, administrators and service providers while business side includes citizen as consumers and software venders. In order to analyse relationships among stakeholders, the critical elements are indicated as power, legitimacy and urgency. While the desired results could be achieved by power, actions of a stakeholder which are recognised and assessed that they are legal, appropriate and matched within norms, beliefs and values of society and its

structure are claimed as the legitimacy, and the immediate attention which the stakeholders require reflects the urgency. Thus, the stakeholders who own all three characteristics have more salience than others who possess one or two attributes. The stakeholders with three features are known as the ultimate stakeholders.

E-government is able to support the stakeholders with strong collaboration of power, legitimacy and urgency to obtain their expectation related to normative value. The stakeholder groups who have complemental abilities or potential competition can cooperate to initiate, deploy, conduct and operate the e-government initiatives. The important stakeholders influence in managing the direction and outcomes of projects they participate in. The absence of the salient stakeholders as well as their commitment can lead to negative impact.

The attempt with the aim of investigating the productiveness and success of the stakeholder is referred as the instrumental element of the stakeholder theory. When implementing researches regarding the stakeholder theory, the practical influence of stakeholder management on traditional objectives of companies is analysed. In the same way, the impact of value, belief and choice on e-government projects is investigated.

E-government projects have applied the stakeholder theory frequently. In particular, over 600 studies concerning stakeholders have been found in the e-government Reference Library (EGRL). And a number of publications which write about e- government and use the stakeholder theory obviously have been found in Government Information Quarterly. However, the attention for normative, descriptive and instrumental aspect has not paid equally. Particularly, the study of Esichaikul (2016) indicates stakeholders related to e-government based on descriptive element. Using the stakeholder theory, Silva and Fernandez (2016) carry- out their research related to stakeholder groups who are heterogeneous. Additionally, the research of Sæbø et al. (2011) known as the well-cited literature apply the stakeholder theory to analyse e-participation stakeholders and classify the popular stakeholders. The scholars offer the typology of stakeholders who take part in e-government including government, citizen and business. This list of stakeholders is also divided into diverse sub-categories. Therefore, this study justifies two important stakeholders including the SMEs

and the customs officials.

Although the number of studies regarding the instrumental feature of the stakeholder theory has been found less than literature engaging descriptive characteristic, the instrumental aspect still attracts the range of scholars to discover. As the proof, the stakeholder theory is adopted in the research of Reinwald and Kraemmergaard (2012) to manage stakeholders how to conduct digital transformation for government in Denmark. Another example comes from the study of Lindgren (2014) that guides stakeholders to develop public e-service in Sweden. Moreover, Balta et al. (2015) explore that stakeholders have mutual impact in e-government projects.

In contrast, the normative aspect of the stakeholder theory is just applied in few studies related to e-government discipline. For instance, Fedorowicz, Gogan, and Culnan (2010) discuss and develop the public good when the various stakeholder groups concern of competition. The normative viewpoint is demonstrated in this study, however, the theoretical implications for the stakeholder theory in e-government domain are not clarified. Although the normative perspective lacks of attention in the stakeholder- oriented literature, the e-government studies frequently raise the issues of normative stance as the central position, for example, the significance of citizen commitment in research of Bonsón, Royo & Ratkai (2015) or transparency in discussion of Bekkers and Moody (2011). Nevertheless, the e-government researches also miss the theoretical foundation in order to combine descriptive, instrumental and normative concepts. Thus, factors including legislation, uncertain avoidance and power distance dimension (sub-components of culture) are examined in this study.

3.4 DIFFUSION OF INNOVATION (DOI) THEORY

3.4.1 Overview of DOI theory

DOI theory was first introduced in 1962 to explain the processes of adoption and the diffusion of innovations (Rogers, 2003). Rogers built his theory based on the attributes of innovation and regarded the users' perception of these attributes as a major factor in determining whether an innovation will be adopted. DOI has been applied in a wide range of domains, such as agriculture and marketing, as well as

in specialized IT applications, such as smart card technology, voice-mail, personal workstations, operating systems and e-government (Rogers, 2003; Rana, Williams, Dwivedi & Williams, 2012).

In DOI theory, the concept of innovation is defined as "an idea, a practice, or an object that is perceived as new by an individual or other adoption unit" (Rogers, 2003, p.12). Diffusion is defined as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p.5). According to Rogers (2003), diffusion is indicated as particular progress regarding communication, referring to the information transmission process, in order to distribute and provide the new idea in society with a minimum of uncertainty.

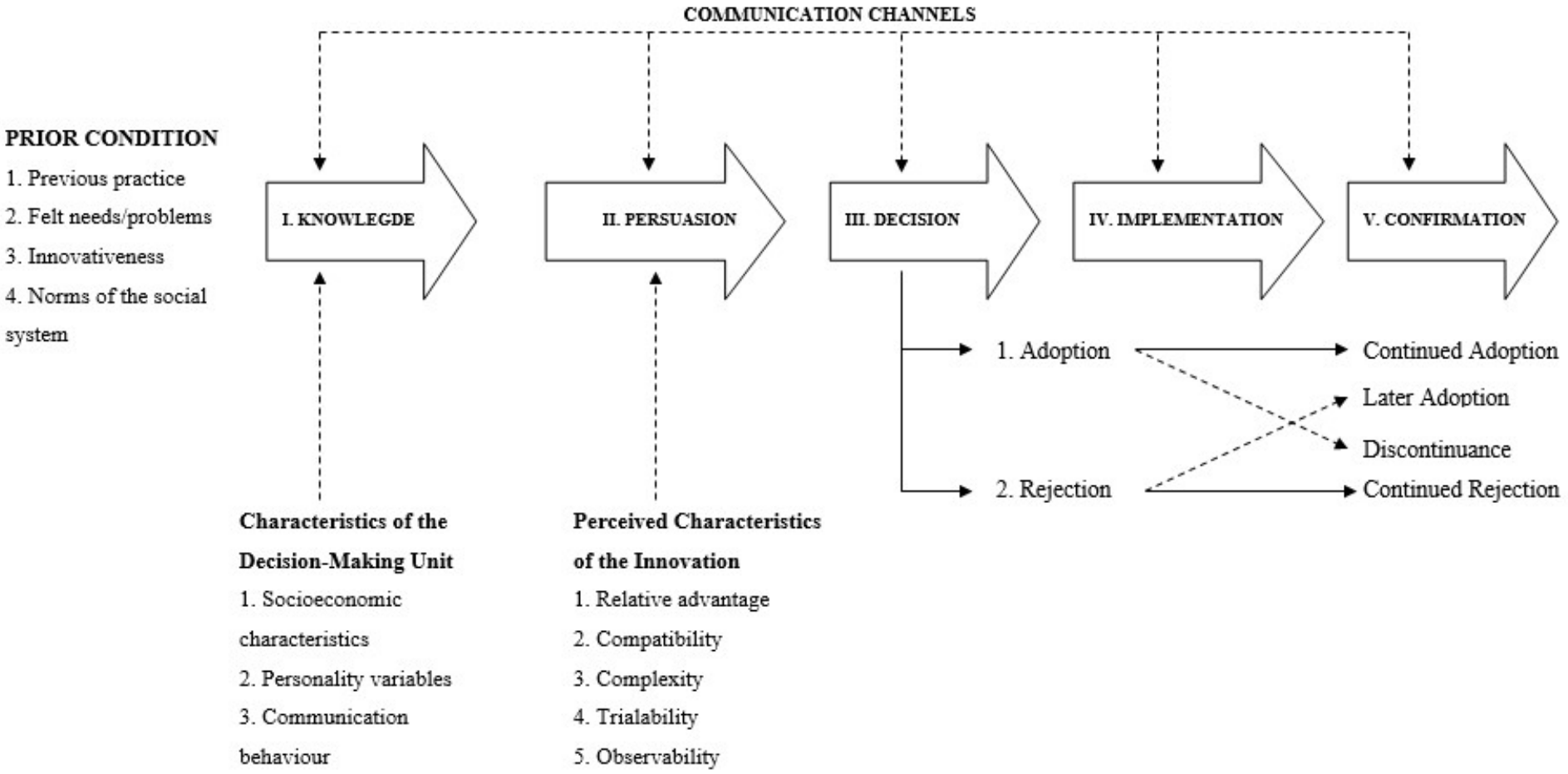
The diffusion of an innovation is considered to be a decision process. Rogers (2003) expressed five steps in the decision-making process associated with innovation (Figure 3.1). When the individuals have the opportunity to approach a new innovation and absorbing awareness about its existence, functions and features, the knowledge has been established. This knowledge may fall into three categories. The first one is *'awareness knowledge'*, which reflects the existence of modernisation. The second type is known as *'how-to knowledge'*, which accentuates the rationale and urgency of innovation adoption. The final group mentions *'principles knowledge'*, referring to the operational description of the innovation and how it works (Rogers, 2003). It is usually possible for an individual to adopt an innovation without principles knowledge.

In the persuasion stage, individuals can hold positive or negative viewpoints related to the innovation. Rogers (2003) figured out that the newly formed attitudes have a significant impact on the potential adopters' reactions; in the case of obtaining the favourable attitude of individuals, the innovation can be analysed and looked at more deeply to find out more information consolidating their perspectives. This study will adopt the five DOI attributes of innovation to capture factors that affect an individual's attitudes toward e-customs application.

In the third step, the potential adopter engaging in activities can make their decisions based on the adoption or rejection of that innovation. Subsequently, the innovation can be implemented and applied in industries. The final step is mentioned as the confirmation, referring to feedback on the innovation, and after that, the technology can continue to be adopted or not (Raus et al., 2009; Rogers,

2003).

Figure 3.1 A model of five stages in the innovation-decision process (Rogers, 2003)



The communication channels, as a part of the decision-making process, also have significance in the diffusion chain. The messages can be transmitted among communicators based on the communication channels, such as the mass media (radio, television, Internet) or interpersonal (face-to-face) (Rogers, 2003). The primary role of communication channels has been emphasised because a number of individuals decide to adopt an innovation based on subjective perspectives, including the experiences of previous adopters, prior to their own adoption.

According to DOI, there are five attributes of innovation, namely relative advantages, complexity, incompatibility, trialability and observability. Firstly, relative advantage is defined as "the degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 2003, p.229). The more the innovation is perceived to offer a relative advantage, the more likely it is to be adopted. Rogers (2003) classified that the level of economic profitability as well as imparting social dignity can be identified as a relative advantage. The essence of innovation is focusing on both the particular subdivisions of the relative advantage, for instance, for economy or society, which can provide the most benefit for adopters and the best attributes of users, thereby influencing the types of relative advantage.

In the context of electronic government adoption, Betrah (2007), Gerpott (2011), Hwang (1999), Lemuria (2008), Raus (2009), Sang (2009), Trkman (2009), and Van Dijk (2008) refined the concept of relative advantage to cover the benefits to the government, citizens, and businesses in terms of lower costs, saved time, convenience, and transparency. In the empirical literature, it has been found that relative advantages represent "one of the strongest predictors of an innovation's rate of adoption" (Rogers, 2003, p.233).

Secondly, complexity is defined as "the degree to which an innovation is perceived as difficult to understand and use" (Rogers, 2003, p.257). The simpler an idea, the more likely it is to be adopted. In contrast, an idea that requires complex skills and knowledge is less likely to be adopted (Goossenaerts, et al., 2006; Rogers, 2003). Although complexity may not be as important as a relative advantage for many innovations, for some, new ideas and complexity could be a very important barrier to adoption (Rogers,

2003).

In the context of e-customs, complexity is usually defined as the difficulty perceived by governmental officials, citizens and businesses in adopting electronic government. Helbig (2009) considered complexity as an important component in e-customs theoretical models. The complexity can directly promote the demand for using e-customs services as well as restrict both the usefulness of e-customs operations and the social expectation of the information technologies. Other scholars, such as Alsheha (2007), Arduini (2010), Betrah (2007), Lee (2009) and Redick (2005) considered complexity as a barrier to e-government adoption.

Thirdly, compatibility is identified as "the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240). An idea that is not compatible with existing values will not be quickly adopted. Compatibility leads the adopters to absorb the new technologies more easily. Moreover, the compatibility of the innovation should be satisfied with the socio-cultural values and beliefs of the adopters. In the context of e-customs, compatibility has been defined as the consistency of new IT applications with the existing administrative and/or technical system (Tung, 2005).

Fourthly, trialability is defined as "the degree to which an innovation may be experienced with on a limited basis" (Rogers, 2003, p.258). A new idea that is easy to be trialled will be adopted more readily than one that is difficult to be implemented in stages or phases. For those who are considering the adoption of an idea, an opportunity to trial the idea to see how well it works under certain representative circumstances will reduce uncertainty as well as the risks associated with committing to major changes immediately (Rogers, 2003). In the context of e-government, trialability refers to the degree to which a governmental officer, citizen or business personnel thinks that there are opportunities to experiment with an IT application on a limited basis (Gerpott, 2011; Lee, 2004; Murphy, 2005).

Finally, observability is defined as "the degree to which the results of an innovation are visible to others" (Rogers, 2003, p.258). Some ideas are easily observed and

communicated to other people, whereas other innovations are difficult to observe or describe to others. Thus, the observability of a new idea and the ability for one to tell others about the idea make it easier for that idea to be diffused (Rogers, 2003). In the context of e-customs, observability is the degree to which a customs officer, citizen or business personnel can observe an IT application and tell others, such as colleagues, relatives, and friends (Gerpott, 2011; Lee, 2004).

To develop the conceptual framework for our analysis, these five attributes of innovation will be highlighted. ~~In so doing, two attributes, namely relative advantages and complexity, will be integrated with two concepts from the TAM, namely perceived usefulness and perceived ease of use.~~ Diffusion is conducted through a chain of communication channels between members in social system with five steps of decision-making process including knowledge, persuasion, decision, implementation and confirmation (Rogers, 2003). Particularly, an innovation starts to approach the individual, however, the information of this innovation is insufficient at awareness or knowledge stage. Furthermore, the individual has not had inspiration to explore more details about this innovation in the initial step. As the following, the individual has changed, he/ she is attracted by the innovation and starts to look for relevant information proactively. Consequently, the individual establishes and recognises the concept of the innovation as well as considers both pros and cons when applying this innovation at the step of persuasion. After that, the individual makes his own decision (adoption or rejection) at decision stage. Rogers (2003) underlines this step as the most difficult moment because the decision depends on the characteristics of each individual. Hence, the empirical studies are essential to be examined to verify the process. In the implementation stage, the innovation is used and applied in different levels that are dependent on the specific circumstances. In addition, either the usefulness or further information of the innovation is also explored during period of implementation. Consequently, the characteristics of innovation in the stage of persuasion are considered to be applied in the step of implementation. Finally, in the stage of confirmation or continuation, the individual finalizes his/her decision to continue using the innovation. This stage is both intrapersonal (may cause cognitive dissonance) and interpersonal, confirmation the group has made the right decision (Rogers, 1962).

3.4.2 Previous studies using DOI

In the context of adoption research on e-government in general and e-customs in particular, DOI theory has been deployed widely. From 434 research articles relating to e-government adoption, from 2002 to 2012, Rana et al. (2012) found that many researchers used DOI constructs, such as relative advantages, compatibility, complexity, trialability and observability, as independent variables to predict the adoption rate of e-customs. In particular, relative advantages and complexity attributes were used most frequently. While the relative advantages variable has a positive association with intention to use, there is generally a negative relationship between complexity and intention to use.

For the compatibility and trialability constructs, the authors tended to find that perceptions regarding these two attributes are positively associated with the rate of ICT adoption. However, the observability construct is often not related (or is sometimes even negatively related) to e-government adoption (Ardis, 2003; Atkinson, 2007; Greers and Murtaza, 2003; Kendall, 2001; Lee, 2004, Raus, 2009 and Rogers, 2003).

3.5 CONCEPTUAL FRAMEWORK AND HYPOTHESIS

Creating a conceptual framework is considered as “a means of simplifying the research task” (Fisher, 2007: 122). A conceptual framework is "a representation, either graphically or in narrative form, of the basic concepts or variables, and their presumed relationship with each other; it is usually best shown as a diagram" (Punch, 2005). The conceptual framework, basically, represents a movement from confusion to certainty (Dwivedi, 2008) and provides clarity, focus and simplicity to the research task (Punch, 2005). Furthermore, it clears away all the issues that are not relevant to the research question and aim (Dwivedi, 2008), helps to make explicit what we already know and think about the research topic (Punch, 2005), and finally, provides structure and coherence to the researcher’s dissertation (Dwivedi, 2008). A conceptual framework is usually based on well-developed theories from previous research. It is a fundamental part of a quantitative research study as it explains the research questions or hypotheses,

while in a qualitative study, it may be less important or less clear in its structure (Collis and Hussey, 2003, Punch, 2005).

Investigating the theories or models used by previous studies to analyse the adoption of new technologies, Rana et al. (2012) found that scholars prefer to combine theories and models of innovation in their studies. According to Rana et al. (2012), TAM and DOI have some similarity and overlap. Particularly, the relative advantages and complexity attribute of DOI and the perceived ease of use (PEOU) and perceived usefulness (POU) of TAM have a similar construct.

For the present purposes, it makes sense to combine elements from both DOI theory, institutional theory, stakeholder theory and Hofstede's dimensions. Based on the literature review, some drivers and barriers of the e-customs system in previous studies have been clarified and are grouped corresponding to the five characteristics of DOI theory, as per the table below. According to Raus (2010) and Holzner et al. (2009), legislation, one of two new factors analysed in this research, has been argued as having a negative impact on the innovation process in general and the customs system in particular. Therefore, this element is arranged temporarily in the barrier category. Moreover, the research on the connection between national culture and citizens' adoption of e-government services in the Arab case found out that culture has a positive influence. However, Raus (2010) emphasized that there are a number of opposite arguments that the two factors have a negative or positive effect on the innovation process as well as e-government. In addition, the two factors have not been found in the analysis of e-customs studies based on the database the author searched. That is one of the rationales for this research in addressing this issue. In this framework, the questionnaire items that contribute to PU and PEOU in Davis (1989) can be adapted for use in designing items contributing to relative advantages and non-complexity here. The framework also incorporates three other perception constructs from DOI theory, namely incompatibility, trialability and observability.

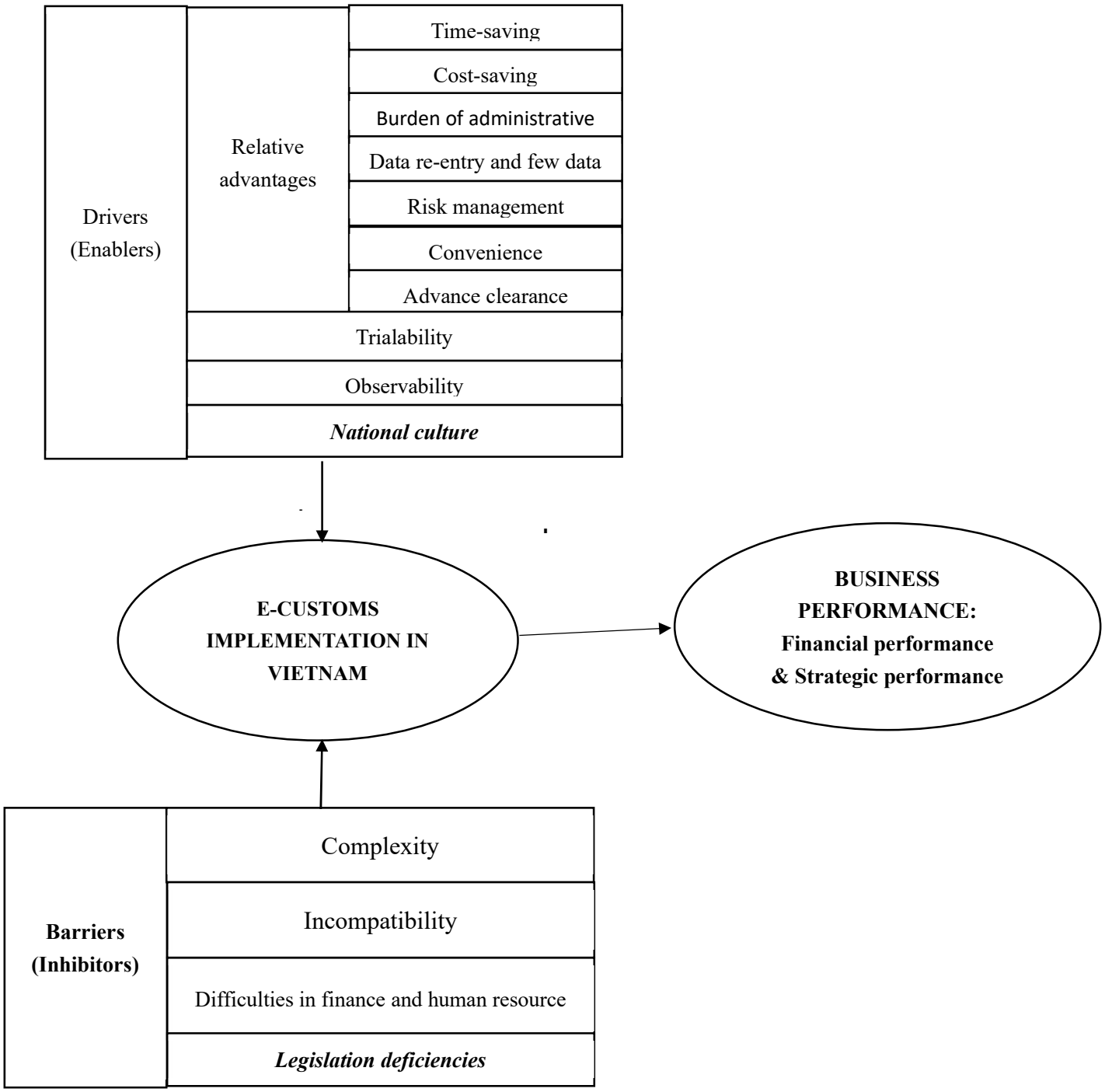
Table 3.1 Drivers and barriers in e-customs implementation

Drivers (Enablers)	Relative advantages (Usefulness)	Time saving	King (1990); Hellberg (1991); Raus, (2009, 2010); Granqvist, M., Hintsa, J., & Männistö, T (2011); Choi (2011); UNPAN (2012)
		Cost-savings	Raus (2009), Granqvist, Hintsa, & Männistö (2011), Urciuoli, Hinsta and Ahokas (2013); King (1990); Hellberg (1991); Raus, (2009, 2010); Granqvist, M., Hintsa, J., & Männistö, T (2011); Choi (2011); UNPAN (2012)
		Reduction of burden of administrative documents	Dam (2013); to Henningsson & Andersen (2009)
		Reduction of requirement of data re-entry and few data errors	Raus (2010); Granqvist, Hintsa, & Männistö (2011).
		Risk management	Gordhan (2009) and Biljan (2012); Choi (2011) and UNPAN (2012); Holloway (2009)
		Convenience	Holloway (2009); King (1990); Aoyama (2008); Amin (2010); UNPAN (2012)
		Advance clearance	Dam (2013)
	Trialability		Raus (2009, 2010); Rogers (2003); Byrne & Golder (2002)
	Observability		Rogers (2003); Nilakanta & Scamell (1990)
	Culture		Warkentin et al. (2002); Hujran et al. (2011)
Barriers (Inhibitors)	Complexity	Data loss over Internet; Complicated e-customs software;	Goossenaerts, Dreverman, Smits & Exel, (2006); Rogers (2003); Raus (2009, 2010)
	Incompatibility	Adequate IT skills and IT equipment; Compatible legacy software; Interoperability of technology; Confidentiality; International standards among nations	Shalehi (2010); Salehi, Alipour & Yahyavi (2010); Rogers (2003); Egyedi & Loeffen (2002); Byrne & Golder (2002); Mustonen-Ollila & Lyytinen (2003)
	Difficulties in Finance and Human resource		Urciuoli, Hintsa, & Ahokas (2013)
	Legislation deficiencies	Laws and Regulations system	Holzner (2009), Raus (2010)

Source: Collected by author

Thus, our conceptual framework comprises three main parts. The first part consists of the enablers with a positive impact and barriers with a negative influence on e-customs in relation to the five attributions of DOI theory. The second part comprises firm performance, which can be analysed using both financial and strategic (non-financial) indicators. The last part can clarify the correlation between e-customs and the business performance of SMEs.

Figure 3.2 Conceptual framework



Following Rogers (2003), it is hypothesised that the rate of adoption of an innovation (e-customs in this case) depends on the perception of the potential adopters regarding

the key attributes of this innovation, including its *Relative advantages, Complexity, (In)Compatibility with prior experience, Trialability, and Observability.* Some studies emphasise the impact of national culture on innovation. In particular, the study of Warkentin et al. (2002) claimed that the cultural dimensions, including power distance and uncertainty avoidance, have an association with e-government adoption. Furthermore, Hujran et al. (2011) proved that national culture had a positive impact on citizens' adoption of e-government services in the Arab world. Consequently, due to the wide applicability and acceptance of the cultural identification and framework in Hofstede's model, this research also chooses Hofstede's cultural dimensions as a theoretical background with the aim of evaluating culture as one of the factors having an impact on e-customs implementation in Vietnam.

Friedmand (1953) stated that the "construction of hypotheses is a creative act of inspiration, intuition and invention". However, he also argued for rigour as "empirical evidence is vital at two different, though closely related stages: in constructing hypotheses and in testing their validity" (Friedman, 1953). Loehlin (1998) noted that "causal models are inherently hypothetical". Further, an essential feature of a causal linkage is the "assumption that a change in the variables at the tail of the arrow will result in a change in the variables at the head of the arrow" (Loehlin, 1998). Thus, hypotheses about latent construct relationships can be derived to determine the validity and strength of the relationships. Causal relationships are denoted by the symbol β for relationships between endogenous latent constructs (Diamantopoulos, 1994).

The more an innovation is perceived to offer a relative advantage, the more likely it is to be adopted. Rogers (2003) classified that the level of economic profitability as well as imparting social dignity can be identified as a relative advantage. The essence of innovation focused on subdivisions of relative advantage, for instance in economy or society, which can provide the most benefit for adopters and the best attributes of users, thereby influencing the types of relative advantage. We thus hypothesize:

H1: Relative advantages positively affects e-customs implementation, i.e., $\beta>0$

Trialability is the degree to which an innovation may be experienced with limited

implementation or knowledge (Rogers, 2003). A new idea that is easily trialled will be adopted more readily than one that is difficult to be implemented in stages or phases. An opportunity to trial an idea to see how well it works under certain circumstances will reduce uncertainty as well as the risks associated with committing to major changes immediately (Rogers, 2003).

In the Vietnamese context, the e-customs trial phase 1 was deployed in 2005 by the Vietnam General Department of Customs (VGDC) with the aim of modernising public administration and introducing e-government. The two biggest seaports, Hai Phong and Ho Chi Minh City, were chosen to start an e-customs trial based on Decision No. 149/2005/QĐ-TTg of the Prime Minister. After that, the trial's coverage was expanded to 21 provincial, interprovincial, and municipal customs agencies by the end of 2012 as Phase 2 of the trial following Decision No.103/2009/QĐ-TTg of the Prime Minister issued in 2009. Several substantial achievements witnessed for Phase 2 of the trial from 2009 to 2012 encouraged its application across the whole country in the beginning of 2013 with the promulgation of Decree No.87/2012/NĐ-CP of the Government. We thus hypothesize:

H2: Trialability positively affects e-customs implementation, i.e., $\beta>0$

Observability is the degree to which innovation results are visible to others (Rogers, 2003). Some ideas are easily observed and communicated to other people, whereas other innovations are difficult to observe or describe to others. Thus, the observability of a new idea and the ability for one to tell others about the idea make it easier for that idea to be diffused (Rogers, 2003).

H3: Observability positively affects e-customs implementation, i.e., $\beta>0$

Warkentin et al. (2002) argued that e-government is associated with the cultural dimensions of power distance and uncertainty avoidance. Additionally, Al-Hujran et al. (2011) found national culture indicated a positive adoption of e-government services in the Middle East. Based on these associations between culture dimensions and e-government related to the context of emerging economies, this study also aims to evaluate national culture as an influencing factor e-customs implementation in Vietnam.

We thus hypothesize:

H4: National culture positively affects e-customs implementation, i.e., β>0

H4a: Uncertain avoidance positively affects e-customs implementation, i.e., β>0

H4b: Low power distance positively affects e-customs implementation, i.e., β>0

H4c: Collectivism positively affects e-customs implementation, i.e., β>0

H4d: Masculine positively affects e-customs implementation, i.e., β>0

H4e: Long-term orientation positively affects e-customs implementation, i.e., β>0

The simpler an idea, the more likely it is to be adopted. In contrast, an idea that requires complex skills and knowledge is less likely to be adopted (Rogers, 2003; Goossenaerts, et al., 2006). While relative advantage has a positive association with intention to use, there is generally a negative relationship between complexity and intention to use. Although complexity may not be as important as a relative advantage for many innovations, for some, new ideas and complexity could be a very important barrier to adoption (Rogers, 2003). We thus hypothesize:

H5: Complexity negatively affects e-customs implementation, i.e., β<0

Rogers (2003) identified compatibility as the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. An idea that is not compatible with existing values will not be quickly adopted. Compatibility leads adopters to absorb the new technologies more easily. Enterprises not only implement the e-customs procedure domestically but also forward to international trade. Therefore, compatibility has arisen as a requirement for customs with the aim of enhancing interoperability among the diverse systems of various countries. Based on Rogers (2003), Tan et al. (2006), Choi (2011), and Urciuoli, et al. (2013), the challenges of e-customs incompatibility came from inherent differences between systems (e.g., syntactic structures, embedded semantics, and embedded logic), interchange agreements, firm regulations, and the actual practices of the workers. We

thus hypothesize:

H6: Incompatibility negatively affects e-customs implementation, i.e., $\beta<0$

While reductions of recurrent costs are a benefit of e-customs, the prerequisite costs of implementation represent a challenge (Urciuoli et al., 2013). It is well known that the introduction of IT systems to exchange data with other businesses and customs administrations is very expensive. This operation is costly because it implies re-engineering of business processes, education of personnel and training. In addition, technical issues related to the integration of IT systems with existing legacy systems generate higher development and maintenance costs. These high costs may be a barrier for many customs administrations that lack the required budget to invest in modern IT systems.

Another critical inhibitor for e-customs comes from the shortage of employees with IT knowledge and skills. Shalehi (2010) criticised that customs officials and enterprises in Iran only became familiar with implementing customs procedures on existing ICT equipment and software and they found difficulties in changing and getting acquainted with the improved version. Although citizens and businesses receive the benefits of convenience and service accessibility with ICT innovation, employees in customs departments and businesses who do not possess the right skill set to fit with the new technology fear losing their jobs and changing familiar habits (Raus, 2009). Consequently, e-customs cannot operate effectively. We thus hypothesize:

H7: Difficulties in finances and human resources negatively affect e-customs implementation, i.e., $\beta<0$

According to Scott (1987), the definition of institutionalisation is associated with the means to diffuse worth toward a structure or process which were simply instrumental utilities before institutionalisation. Based on Zucker (1987), institutional theories of organisations identify normality, government and external factors as legitimating determinants influencing organisations, for example, normative procedures, requirements of governments, professional licences and guide operations that set up the institutional environment for organisations with the aim of enhancing possibility of

survival. Thus, institutional theory forms another theoretical lens for this study. We thus hypothesize:

H8: Legislation deficiencies negatively affects e-customs implementation, i.e., $\beta<0$

A stakeholder is any individual or group who can affect, or is affected by, the achievement of an organisation's objectives (Freeman, 1984). In addition, suppliers and customers who have direct interactions with enterprises are referred to as other key stakeholders. Despite their indirect relationship with business, the secondary stakeholders have a significant influence on organisational operation, especially regarding the impact on the society and environment. According to Donaldson and Preston (1995), the government, administrative agencies, trade associations, communities and political groups have been listed as the primary stakeholder groups. Fitzgerald and Storbeck (2003) determined that both firms and stakeholders made alliance strategies to enhance their cooperation and achieve specific goals. With the aim of stable and long-lasting relationships between parties, a solution regarding the identification and adjustment of stakeholders has been proposed by Mitchell, Agle and Wood (1997). Three perspectives relate to the impacts/pressures of the stakeholders on companies, the requirement of legitimacy, which is the demand of the stakeholders, and the necessity of stakeholders have been classified in this method. Thus, our last hypothesis is:

H9: E-customs positively affects business performance, i.e., $\beta>0$

All hypotheses of this research are presented above to give a demonstration of the linkage between the hypotheses and research questions, which can be illustrated as follows.

Table 3.2 Research questions and hypotheses in this research

Research questions	Hypotheses
RQ1: What are enablers and inhibitors that influence e-customs for SMEs in Vietnam?	H1, H2, H3, H4, H5, H6, H7, H8

RQ2: What is the impact of e-customs on business performance in Vietnam?	H9
RQ3: What suggestions can be provided to enhance e-customs implementation?	Based on the results of H1, H2, H3, H4, H5, H6, H7, H8, H9

This study will test the control variables to examine whether they influence e-customs or not (H1, H2, H3, H4, H5, H6, H7, H8). Meanwhile, the impact of e-customs on business performance will be investigated using H9. Based on the outcomes of these nine hypotheses, some recommendations can be made for customs administrators and firm managers to address the third research question.

3.7 CHAPTER SUMMARY

This chapter explained in detail the theoretical foundations of the current research. In this regard, several theories were discussed in depth. Then, the linkages between the adopted variables were developed. Drawing on the importance of linkage, theoretical foundations, and prior research findings, the research frameworks of the study were outlined. Subsequently, nine general research hypotheses were developed to achieve the research aims and to provide answers to the raised research questions. In the following chapter, the approach and methodology applied in the data collection for the research as well as the analysis techniques selected for the hypothesis testing will be discussed specifically.

CHAPTER 4 RESEARCH METHODOLOGY

4.1 INTRODUCTION

As discussed in Chapter 2, there are several important gaps in the literature regarding e-customs in Vietnam. Section 4.2 will present three research questions that arise naturally from these gaps. In Section 4.3, we will review some theories, including institutional theory, stakeholder theory, Hofstede's cultural dimension and DOI theory. Then we will apply them to develop a conceptual framework that can be used to investigate the association between e-customs implementation and its impact on business performance in section 4.4. Section 4.5 will give an overview of the research methods, data collection and ethical issues to be adopted in addressing these research questions. A summary of the personal plan is provided in Section 4.6.

4.2 RESEARCH QUESTIONS

In Chapter 2, the gaps were identified in the literature regarding e-customs in Vietnam and the relationship between e-customs and SMEs' performance. In detail, these are:

- Although studies related to e-customs are diverse, most of them focus on a specific or single aspect and examine developed economies at the stage of innovation acceptance. A few studies regarding the enablers and inhibitors of e-customs adoption still debate in different ways. In particular, no research has investigated the factors (drivers and barriers) influencing e-customs in the Vietnamese context (new phenomenon), as a developing country with restrictions in terms of technology and innovation, for SMEs (new practice) at the implementation stage of the innovation process;
- None of the prior studies explores the effect of e-customs implementation on SMEs' performance;
- A summary of the key lessons and to-do list for Vietnam Customs is lacking based on factors influencing e-customs implementation and impact of the e-customs implementation of business performance as discussed above.

Therefore, the following three research questions (RQ) will be addressed in this study.

RQ1: What are enablers and inhibitors that influence e-customs for SMEs in Vietnam?

In order to address this question, the systematic perspectives of the efforts of Vietnamese Customs and businesses to introduce and experiment with e-customs since 2014 are examined. Considerable resources have been invested by both the government administration and businesses with the aim of developing a workable, functioning e-customs system. However, significant achievements, as well as the difficulties of Vietnamese e-customs, can facilitate or prevent the e-customs implementation of SMEs. The literature review of the previous studies has declared some enablers (for instance, the reduction of burden administrative documents, the reduction of data re-entry and data errors, time-savings, cost-savings and the usefulness of risk management) and inhibitors such as confidentiality, technical constraints, interoperability of tech, international standards, financial costs and human resources, which can become dominant elements affecting e-customs implementation.

RQ2: What is the impact of e-customs on business performance in Vietnam?

The extent to the e-customs implementation impacts directly on the business performance of SMEs regarding international trade in Vietnam can be evaluated. The sustainable success of e-customs depends considerably on the activities and influence of key stakeholder groups who have the most accurate and honest assessment of the e-customs system and process. In this research, the most important stakeholder groups can be approached following the customs administrators, the customs officials and the businesses. They can provide the answer for a major objective, which is to gain detailed and quantifiable data regarding the value assessment of e-customs' impact on SMEs performance in Vietnam.

RQ3: What suggestions can be provided to enhance e-customs implementation?

Based on the practical viewpoints and analysis, a series of useful recommendations can be determined not only for the administrative authorities to consider in planning and

implementing the further evolution of e-customs but also for businesses to enhance the efficiency and effectiveness of operations related to international trade, which can improve the limitations of SMEs in Vietnam. In addition, the experiences and lessons of e-customs factors can be applied in other domains of e-government to obtain the NSW and ASW.

4.3 RESEARCH PHILOSOPHY AND RESEARCH APPROACH

Guba (1990) accentuated the key components of a paradigm including ontology, epistemology and methodology. The perspectives of individuals related to the nature of reality or being have been identified as the ontology (Saunders, 2009). According to Burrel and Morgan (1979) and Audi (2002), epistemology refers to what establishes knowledge and how the knowledge can be communicated among individuals. Based on these viewpoints, the researchers can perceive the natural world through such diversified methods (Saunders, 2016). Consequently, the ways the researchers can explore and determine the knowledge are referred to as the methodology (Burrell and Morgan, 1979; Guba, 1990). There are a number of supporters stating that epistemology has been influenced by ontology and both otology and epistemology decide the research methodologies (Collins and Hussey, 2009; Sarantakos, 2005; Burrell and Morgan, 1979).

The philosophy of science aims to answer some questions, such as: What makes the distinction between science and what is called non-science? What procedures should be followed by scientists? How can we know that an explanation is scientifically correct? (Newton-Smith, 2000). Collis and Hussey (2003) define research philosophy as “the progress of scientific practice based on people’s philosophies and assumptions about the world and the nature of knowledge” (p.46). Likewise, Saunders et al. (2009) argued that this term relates to developing new knowledge and defined it as “an over-arching term related to the development of knowledge and the nature of this knowledge” (p.107). According to Creswell (2009), a paradigm or “worldview” is “a basic set of beliefs that guide action” that determines the researcher’s view about the world and the nature of knowledge (p.6).

Deshpande (1983) discussed that a paradigm has four objectives (p.102):

1- Works as a guide to benchmark researchers in a specific discipline for the issues and research problems that confront that discipline.
2- Helps in developing an "explanatory scheme" or theories for researchers to solve these issues.
3- Establishes criteria that help in selecting the appropriate research tools that aid in solving "disciplinary puzzles".
4- Builds the main principles, procedures and strategies that might be employed if these issues or similar issues occur again.

Malhotra and Birks (2003) have defined a paradigm as a "set of assumptions consisting of agreed-upon knowledge, criteria of judgment, problem fields and ways to consider them" (p.136). Therefore, it is important to first note that the research philosophy adopted by a researcher carries a number of important assumptions that determine and support the research strategy and methods (Maxwell, 2005, Saunders et al., 2009).

4.3.1 Paradigm assumptions

Guba (1990) accentuated the key components of paradigm including ontology, epistemology and methodology. The perspectives of individuals related to the nature of reality or being have been identified as the ontology (Saunders, 2009). According to Burrel and Morgan (1979); Audi (2002), epistemology is identified what establishes knowledge and how the knowledge can be communicated among individuals. Basing on these viewpoints, the researchers can perceive the natural world through such diversified methods (Saunders, 2016). Consequently, the ways the researchers can explore and determine the knowledge are referred as the methodology (Burrell and Morgan, 1979; Guba, 1990). There are a number of supporters that epistemology has been influenced by ontology and both otology and epistemology decide the research methodologies (Collins and Hussey, 2009; Sarantakos, 2005; Burrell and Morgan, 1979).

According to Saunders (2009), objectivism and subjectivism are two aspects of the ontology being discussed. Supporters for the objectivism position believe that there

is the independent existence of social entities to social actors (Persson, 2005). Objectivists usually appreciate the existence of universal laws, the cause-and-effect relationship, the importance of theories and the hierarchy in organisations (Saunders et al., 2009). In opposition to objectivism, subjectivism refers to the subjective experience of individuals, which means that the perceptions and continuous actions of humans are created factors of social phenomena (Saunders, 2009). The subjectivists focus on the meaning as well as the importance of the inner world of experiences (Persson, 2005).

The epistemological standpoint emphasizes two philosophical approaches following positivism and interpretivism (Saunders et al., 2009). In the positivism stance, Remenyi (1998) noted that researchers are interested in studying an observable social reality by applying physical and natural science. Moreover, they support the belief in the existence of an objective reality that can be investigated by particular objective methods (Bryant, 1985). On the other hand, interpretivism concentrates on analysing the differences between humans as social actors (Saunder et al., 2009). Mangan (2004) also stated that it was impossible to diverge researchers and investigation subjects because of the interrelationship.

There are a number of advocates who show that the methodology applied in positivism stance is quantitative while the qualitative methodology is used by interpretivist researchers (Lincoln and Guba, 2000; Sarantakos, 2005; Saunders, 2009). Based on the opinion of Gill and Johnson (2002), steady-structured methodologies are popular with positivist researchers. Therefore, quantifiable observations of the relationship among variables, hypothesis testing, and interviews are used to analyse data and supervise theories (Sarantakos, 2005; Saunders, 2009). In contrast, the qualitative approach can be shown as a method to understand the meaning of individuals to address social problems (Creswell, 2013). Furthermore, there is a high appropriation in case studies and the interpretation of the social world, such as marketing, human resource management and organisation behaviour, in the interpretivist philosophy.

Table 4.1 Positivism vs. interpretivism Issue Positivism Interpretivism

Issue	Positivism	Interpretivism
Ontology	The researcher and reality are separate	The researcher and reality are inseparable
Epistemology	An objective reality exists behind the human mind	Knowledge of the world exists in the human experiences and social interaction
Research object (the phenomena under investigation)	Has inherent quality that exists independently of a researcher	Usually interpreted according to the meanings developed by the researchers
Truth (beliefs regarding the research findings)	The truth is determined by how it describes and related to the world	The truth is determined when the interpretation coincides with meaning given to the phenomena through the researcher's experience.
Research language	Formal and impersonal	Informal and personal
Value (the relationship between the researcher's value and the research process and research object)	Researcher's values are set aside and established theorical propositions guide the research and removing potential biases is an important task. Value-free= unbiased	Researchers' own values influence how he/she questions, proves and interprets Value-laden= biased
Reliability	The research is reliable if the findings can be replicated	The research is reliable when the researcher can demonstrate interpretive awareness
Validity	The data collected reflects true measures of reality	Researchers are more concerned that their claims about the knowledge they have acquired via their research are defensible
Theory and research design	Simple determinist Cause and effect Statistic research design Context free Laboratory Prediction and control Reliability and validity Representative surveys Experimental design Deductive	Freedom of will Multiple influences Evolving design Context-bound Field/ ethnography Understanding and insight Perceptive decision making Theoretical sampling Case studies Inductive

Source: Malhotra and Birks (2003); Weber (2004)

The selected research paradigm should be translated into an appropriate research methodology to achieve the research objectives. The following section sheds lighter on the different types of research methodology.

4.3.2. The methodological assumptions (qualitative-quantitative dichotomy)

A methodological distinction based on the positivist-interpretivist epistemologies is the quantitative-qualitative dichotomy. The qualitative methodology is based on interpretivism. According to this methodology, the ontological position is to advocate the existence of multiple truths that could be found based on people's construction of reality (Sale et al., 2002: 45). Epistemologically, it is assumed that a person's mind plays a critical job in constituting and forming reality. Moreover, there is high interaction between the researcher and the researched object. Therefore, the results are jointly produced, depending on the contextual situation. On the other hand, the quantitative methodology highlights the ontological position that asserts the existence of only one truth, independent of human perceptions (Sale et al., 2002: 44). Epistemologically, the researcher and the researched object are independent entities, which means that the researcher can only research the phenomenon under investigation without being influenced by and/or influencing it.

Maxwell (2005) attributes the qualitative-quantitative debate to the dissimilarity between two disparate approaches: "variance theory" and "process theory". On the one hand, variance theory is interested in variables and the true associations among these variables through adopting precise measurements. Moreover, this approach highlights the importance of extensive pre-structuring, hypotheses, unbiased sample units, quantitative measuring and analysis, and correlational design. On the other hand, the process theory is interested in events and the processes that connect these events. Furthermore, the process theory is founded on exploring causal processes, since events impact one another. Therefore, and according to Maxwell and Loomis (2003), it is well-matched with qualitative studies.

According to Onwuegbuzie and Leech (2005), argument between quantitative and qualitative is evolved by three principal schools of perspective including purism,

situationalism and pragmatism. Based on viewpoint of purists, the difference ontology and epistemology about the nature of research causes quantitative and qualitative approaches. These paradigms stand in distinct perspectives on how to see the world, so they cannot be mixed. Consequently, mono-method researches are supported by purism (Onwuegbuzie and Leech, 2005). In the similar way, situationalism agree mono-method. Nevertheless, situationalists assumes quantitative method fits with well-definited research questions while qualitative method is relevant to other research questions. Although purism and situationalism represent for separated frames of mind, these two schools of thoughts seem supportive and 'complementary'. Therefore, issues regarding philosophy and techniques are distinguished by Bryman (1984). In particular, questions of ontological and epistemological assumptions are correlated with philosophical issues whereas suitability and advantages of methods in correlation to each other are considered as technical issues. Bryman (1984) indicates "*At the technical level, researchers seek to achieve a degree of congruence between a research problem and a technique, or cluster of techniques, to answer the issue at hand… Indeed, there may be a case for saying that techniques are neutral in respect of epistemological issues and debate".*

Finally, pragmatists, unlike purists and situationalists, argue that "quantitative methods are not necessarily positivist, nor are qualitative techniques necessarily phenomenological" (Onwuegbuzie and Leech, 2005: 378). Therefore, pragmatists promote combining methods within a single study. Moreover, they articulate that researchers might use the strengths of both techniques by combining them in order to better understand any social phenomenon. Thus, pragmatists adopt the epistemology that researchers may determine the method(s) used according to their research questions (Onwuegbuzie and Leech, 2005: 338).

According to Bickman et al. (1998), mixed method is identified as combination between qualitative and quantitative methodologies which are applied in the same research. Tashakkori and Teddlie (1998) discuss the way that a single study or multiple phases researches apply mix method through combining both qualitative and quantitative approaches at the same time or one after the other (parallel and sequential

correspondingly). Particularly, qualitative analysis is adopted with qualitative data and quantitative analysis is operated with quantitative data. In contrary, Sale et al. (2002) ague that "*combining the two methods for cross-validation/triangulation purposes is not a viable option. (Cross validation refers to combining the two approaches to study the same phenomenon), …., Combining the two approaches in a complementary fashion is also not advisable if the ultimate goal is to study different aspects of the same phenomenon because, as we argue, mixed-methods research cannot claim to enrich the same phenomenon under study. The phenomenon under study is not the same across methods. Not only does cross-validation and complementarity in the above context violate paradigmatic assumptions, but it also misrepresents data. Loss of information is a particular risk when attempts are made to unite results from the two paradigms because it often promotes the selective search for similarities in data".*

Morgan (1998), however, suggests that without violating the basic paradigmatic assumptions, qualitative-quantitative mixing or "triangulation" can be achieved on the technical aspect (knowledge generating). He developed a matrix combining the two paradigms on the data collection level. This matrix differentiates between two kinds of decisions: the priority decision and the sequence decision. The priority decision concerns which one should be the primary and which one should be the secondary method, whilst the sequence decision concerns the order in which they will be used, preliminary and follow-up. Table 4.2 shows the priority-sequence model created by Morgan (1998).

Table 4.2 The Priority-Sequence Model

Priority-Sequence Model		Priority Decision	
		Principal method: Quantitative	Principle method: Qualitative
Sequence Decision	Complementary method: Preliminary	(1)Qualitative preliminary Smaller qualitative study helps guide the data collection in a principally quantitative study.	(2)Quantitative preliminary Smaller quantitative study helps guide the data collection in a

		Purpose: can be used for generating hypotheses, construct development, content validity …	principally qualitative study. Purpose: Can be used for guiding a purposive sampling; establishing preliminary results to be studied in depth …
	Complementary method: Follow-up	(3)Quanlitative follow-up Smaller qualitative study helps in evaluating and interpreting findings from a principal quantitative research Purpose: Can be used to provide explanations and interpretation for poorly understood data; explaining and understanding outliers.	(4) Quantitative follow-up Smaller quantitative study helps in evaluating and interpreting findings from a principal qualitative research. Purpose: Can be used to generalise the findings to different sample; testing elements of emergent theories.

Source: Morgan (1998)

Based on Table 4.2, there are two choices. In the first choice, conducting the small-scale preliminary qualitative method aims to provide complementarity for a larger quantitative project. The second choice starts with smaller preliminary quantitative research which supports for larger-scale qualitative study.

Collis and Hussey (2003), based on Easterby-Smith et al. (1991), define four different types of triangulations: 1) Data triangulation (collecting data from different sources and at different times, whether quantitatively or qualitatively or both). 2) Investigator triangulation, which occurs when two or more researchers independently research a phenomenon and then compare their results. 3) Methodological triangulation or employing the qualitative and quantitative paradigms together in one study. 4) Theoretical triangulation, which occurs when the researcher adopts a theory from a specific discipline and uses it to understand a phenomenon in another discipline.

Goerres and Prinzen (2012) discussed that the combination of qualitative and

~~quantitative methods might be advisable under two levels of conditions. The first level underlines two necessary conditions that must be met. For the first-level necessary conditions for employing a mixed-method paradigm, they argue that *"the phenomenon of interest must have an acceptable degree of inertia in the characteristics to be measurable at several points in time, which allows for a sequential application of methods"* (Goerres and Prinzen, 2012). The second first-level necessary condition that must be met is the nature of the research project and questions, which allows the meaningful conducting of qualitative-quantitative research. If these two conditions are met, then "*at least one sufficient condition out of six should be met in order to make a multi-method approach superior to a mono-method approach*" (Goerres and Prinzen, 2012: 419). The following are the second-level sufficient conditions, of which at least one should be met for a mixed-method rationale. "*Varying possibilities of data collection; cases fit the quantitative model to varying degrees; generating or testing a quantitative measurement; generating hypotheses or concepts and testing for scope; unexpected research results in a quantitative study*" (p. 423).~~

~~To sum up, the ongoing research reveals that both quantitative and qualitative are mostly accepted within information systems research (Kaplan and Duchon, 1988). However, the emerging question is which paradigm is relevant to this study.~~

4.3.2. Research approach

The deductive and the inductive are defined as two research approaches. Research following the deductive approach is *"a study in which a conceptual and theoretical structure is developed and then tested by empirical observation; thus particular instances are deduced from general inferences"* (Collis et al., 2003: 15). According to Saunders (2009), deduction is related to theory investigation. Hence, in order to test and verify a theory, the deductive approach can be used to check the hypotheses and research questions by defining concerned elements and variables as well as measuring these (Creswell, 2013).

On the other hand, inductive research is *"a study in which theory is developed from the observation of empirical reality; thus general inferences are induced from particular*

instances" (Collis et al., 2003: 15)

The inductive approach mentions theory establishment and starts to gather information (i.e., observations, interviews), then analyses the data to set up themes, which are the foundation for researchers to discover patterns, generalisations and theories. After that, these theories can be tested by past experience and literature (Collis and Hussey, 2009). Theories are emphasised in the study of Malhotra and Birks (2003: 45), they *"serve as a foundation on which a researcher can organise and interpret the findings… by neglecting theory, the researcher increases the likelihood that they will fail to understand the data obtained or be unable to interpret and integrate the findings of the project with findings obtained by others".*

In the deductive approach, researchers use quantitative data to measure facts. Based on study of Bryman and Bell (2007), the deductive analysis is applied in the researches regarding causal relation, generalisation and measurement concern. In the contrast, Saunders et al. (2009) ague that induction aims to establish theory. The inductive analysis is operationalised in the way that enables facts to be measured qualitatively. With induction, various methods are applied to collect data and researcher can view phenomena with diverse standpoints. Hence, induction starts with data collection as the first step, then these data are analysed in the following step and a theory is developed. Collis and Hussey (2003) demonstrate observation of individual moves to generalisation in process of formulating theory of inductive approach. In particular, the distinction between deduction and induction is illustrated in Table 4.4 below.

Table 4.3 The deductive and inductive approaches

Deduction emphasises	Induction emphasises
• Scientific principles • Moving from theory to data • The need to explain causal relationships between variables • The collection of quantitative data • The application of control to ensure validity of data • The operationalisation of concepts to ensure clarity of definition • A highly structured approach • Researcher independence of what is being researched • The necessity to select samples of sufficient size in order to generalise conclusions	• Gaining an understanding of the meaning humans attach to events • A close understanding of the research context • A more flexible structure to permit changes of research emphasis as the research progresses • A realisation that the researcher is part of the research process • Less concern with the need to generlise

Source: Saunders et al. (2009)

The approach of this study from theoretical reflections to hypotheses generation is appropriate to deduction analysis. Therefore, a framework connecting the individual factors and the contextual factors relative to e-customs implementation and business performance is established based on the deductive approach. Additionally, this approach supports to develop hypotheses, collect primary data from a large-scale sample and examine these hypotheses.

4.3.3 Research paradigm and methodology choice

A paradigm aims to answer how to exam social phenomena, which provides an understanding of the phenomena and reasonable explanations. The research aims to analyse the recent circumstance of e-customs implementation in Vietnam from the perspectives of themes and methodological issues. In addition, the second objective of this research also focuses on examining the influence of e-customs based on the business performance of SMEs regarding international trade. Finally, based on the analysis above, the author can suggest some recommendations for policymakers as well

as the managers of firms to enhance the efficiency and effectiveness of e-customs.

As per the objectives and research questions of the study mentioned in Chapter 1 and section 4.2, this project aims to indicate the factors of e-customs and measure these elements' impact on SMEs performance. Thus, the ontology of this research is approached through objectivism. According to Persson (2005), an objectivist believes that the social entities and social actors exist independently. Law-like generalisations, the relationship between cause and effect, the significance of theories as well as the order of organisations can get high appreciation of objectivism supporters (Saunders et al., 2009). Specifically, the e-customs application process which SMEs have been implementing occurs hierarchically and equally following step-by-step instructions. In other words, although there is a difference between management activities and objectives among firms, all organisations obtain similarities in management functions and compliance with e-customs procedures.

In addition, this research approaches positivism as the majority epistemology. In the stance of positivism, the researcher can observe social reality from the perspectives of physical and natural sciences (Remenyi, 1998). Based on the viewpoints of positivism, observation and measures associated with facts and regularities can be the focus of discovery, and results known as the phenomena provide efficient information (Crotty, 1998). Furthermore, existing literature can establish a solid foundation to develop hypotheses. Causality and law-like generalization are considered as the influencing elements and outcomes, which are the focus of analysis in the research on e-customs' impact on SMEs. The theoretical backgrounds such as institutional theory, stakeholder theory and cultural dimensions are adopted in this study to explore some components of e-customs affecting SMEs' performance as well as figure out some hypotheses to test the literature. As the purpose is related to measuring and evaluating factors, the quantitative method can be a good decision to address the research questions with a positivistic approach in business generally as well as innovation and international trade in particular (Burgess et al., 2006; Mangan, 2004; Saunders, 2009).

With the aim of indicating and measuring elements that have an impact of e-customs on business performance as mentioned above, objectivism is the dominant

approach of the ontology in this research. In particular, the SMEs' process of e-customs application is operated in the hierarchy of the prescribed steps, which are applied popularly with all companies. In other words, although the management operations of enterprises to reach targets may be different, their function and activities may be similar to all organisations. Therefore, it is said that both e-customs and management processes to achieve effective business performance are objective entities. In addition, e-customs application affects the inter-enterprise activities, which exist independent of the social actors. Moreover, the majority epistemological approach applied in this research is positivism. Positivism supplies the researcher with an overview of the nature of reality with the externality of social actors (Saunders, 2009). The research strategy begins with observable phenomena which can provide credible data and facts. In addition, the existing literature also can be a base to collect data and develop hypotheses. The research on e-customs' impact on SMEs focuses on causality and law-like generalization as the effective factors and the result. A number of authors support the use of positivism and the quantitative method for research in business, especially in the international trade field (Burgess et al., 2006; Mangan, 2004; Saunders, 2009). With this approach, the methodology of this study is quantitative research with a deductive approach. It concerns investigating theories and reality by testing relevant variables, in particular, the relationship between e-customs and SMEs' performance.

In more detail, the following points address the rationale for selecting the adopted methodology.

First, according to the methodological assumptions, the situational school of thought relative to the argument between positivism and phenomenological paradigm is adopted in this research. ~~Both qualitative and~~ quantitative analysis are highly appreciated and valuable for this study. Maxwell and Loomis (2003) describe the design of a study as a systemic or interactive model in which five components (research questions, aim, conceptual framework, methods and validity strategies) interact and influence the other design components. However, they emphasise that the research questions play the most important role. Based on report of Onwuegbuzie and Leech (2006), the way of data collection as well as the research paradigm selection are determined by research

questions. They stated that “quantitative research questions, unlike their qualitative counterparts, tend to be very specific in nature. Moreover, most quantitative research questions fall into one of three categories: (a) descriptive, (b) comparative, and (c) relationship” (p.480).

Second, this research aims to provide and examine a theoretical explanation grounded by the institutional theory, stakeholder theory, Hofstede cultural dimensions and DOI theory for the impact of e-customs implementation on business performance. In other words, this research follows a confirmatory strategy of research, which adopts the process of confirming or disconfirming predetermined causal relationships (hypotheses). Hair et al. (2010) emphasise that confirmatory research is used when a researcher seeks to test and/or confirm prespecified relationships.

Thirdly, this research also, principally, used pre-validated instruments adopted from previous studies with the purpose of examining the attributes of the phenomena and the method of data analysis with the structural equation modelling (SEM) was chosen to apply. The existence of pre-validated instruments is the main core of confirmatory research. Furthermore, the researcher validated the research instruments using a variety of techniques such as pre-test interviews and a pilot study. Validation of instruments in MIS is a critical issue from three main respects. First, in general, valid instruments bring rigour into MIS methodology. Second, their use can promote cooperative research among researchers by allowing other researchers to use pretested instruments across heterogeneous settings and time. Finally, it helps to achieve more clarity in the formulation and understanding/explanation of the study questions (Straub et al., 2004).

Fourthly, one of the objectives of this study was to conduct a group comparison and test for moderation. This test requires the use of the structural equation modelling (SEM) advanced statistical technique. Urbach and Ahlemann (2010) emphasise that research that “applies SEM usually follows a positivist epistemological belief” (p.9).

Finally, Creswell (2009) argues that, besides the discipline area and the advisers’ orientation, the researcher’s past experience and preferences are the main factors shaping the selected philosophy. Buchanan et al. (1988: 59, cited in Saunders et al.

2009: 129) state that the “needs, interests and preferences (of the researcher) ... are typically overlooked but are central to the progress of fieldwork”. The researcher has good knowledge and experience with working with statistical analysis techniques, which made it a personal preference.

4.3.4 Data resource

Data collection techniques are most often used with highly structured large samples which can be calculated, meaning approximately from 300 to 500 managers of SMEs would need to be interviewed and do a questionnaire survey. This study is conducted to determine the elements of e-customs that have an impact on the turnover of SMEs in Vietnam. With the aim of achieving the research’s objectives, a variety of analytical techniques, both primary and secondary data can be applied. Primary data can be the best choice to measure the influence of e-customs as well as the existence of business activities. Nevertheless, questionnaires and interview surveys may not be objective or reliable because of the subjective opinions of stakeholders compared with secondary data (Gulati, 2005). Hence, there is an integration of secondary and primary data in this research. To gain an understanding of the current situation of e-customs in Vietnam and find out the determinants which have a strong influence on business, especially in export and import aspects, analytical review and synthesis can be a major method. Secondary data from the reports, articles and statistics of the Vietnam General Department of Customs and information collected from stakeholder groups regarding Vietnam e-customs can be used in order to produce a comprehensive and clear description to analyse. For the purpose of addressing the second research objective, the project will be conducted using ~~mostly~~ quantitative methods and primary data.

Two kinds of data, including secondary and primary, can be used in this research to satisfy the research objectives. The primary data can be the effective decision with the aim of demonstrating and evaluating the elements related to e-customs influencing firm performance as well as measuring business activities. Either the Vietnamese e-customs context in comparison with global leader cases or determinants discovery can be perceived through analytical review and synthesis approaches. Secondary data stems from the reports, statistics and analyses of the government, administrative agencies,

Vietnam General Department of Customs and other international organisations (World Bank, OECD, World Customs Organisation) as well as articles from ScienceDirect, Emerald, World Customs Journal and other databases to produce a comprehensive and clear description to analyse. For the purpose of addressing the second research objective, the projects will be mostly conducted using quantitative methods and primary data. Face-to-face interviews with customs administrators, experts in customs and business managers can be carried out to explore more new key factors of e-customs. Furthermore, the evaluation and assessment of customs officials and enterprise administrators regarding the benefits and barriers of the e-customs system as well as its effect on the organisational operations based on a questionnaire survey can also be collected. The questions will take into account the participants' relative advantages and disadvantages, complexity, incompatibility, observability, finances and human resources, legislation and cultural factor of e-customs. Note that Uriell and Dudley (2009) found that there are few differences between web-based and paper-based survey responses, demonstrating that sensitive data can be collected via web-based surveys or paper-based surveys without significantly influencing the reliability (honesty) of the survey responses. Recently, another study found the same outcome, i.e. that there are no significant differences between web-based surveys and paper-based surveys (Wang, Cheng & Cheng, 2013). In this study, both paper-based and web-based survey were selected to collect data because participants in survey can get convenient and flexible. Nevertheless, questionnaire surveys and interviews may not be objective or reliable because of the subjective opinions of stakeholders compared with the secondary data (Gulati, 2005). Hence, there is an integration of secondary and primary data in this research.

4.4 RESEARCH FRAMEWORK AND SAMPLING DESIGN

4.4.1 Framework of research

A framework of research for development and validation of items and constructs in disciplines of marketing and logistics was provided in the studies of Churchill (1979), Dunn, Seaker and Waller (1994) and Spector (1992). Grant (2003) and Shaw (2013) also developed this methodology in their thesis. The methodology uses three phases,

which is similar to the two stages of Churchill's (1979) process for scales, and construct development can be adopted in this research; this is identified in 8 steps, as in the following:

Figure 4.1 Churchill's steps for measurement development (Churchill, 1979)

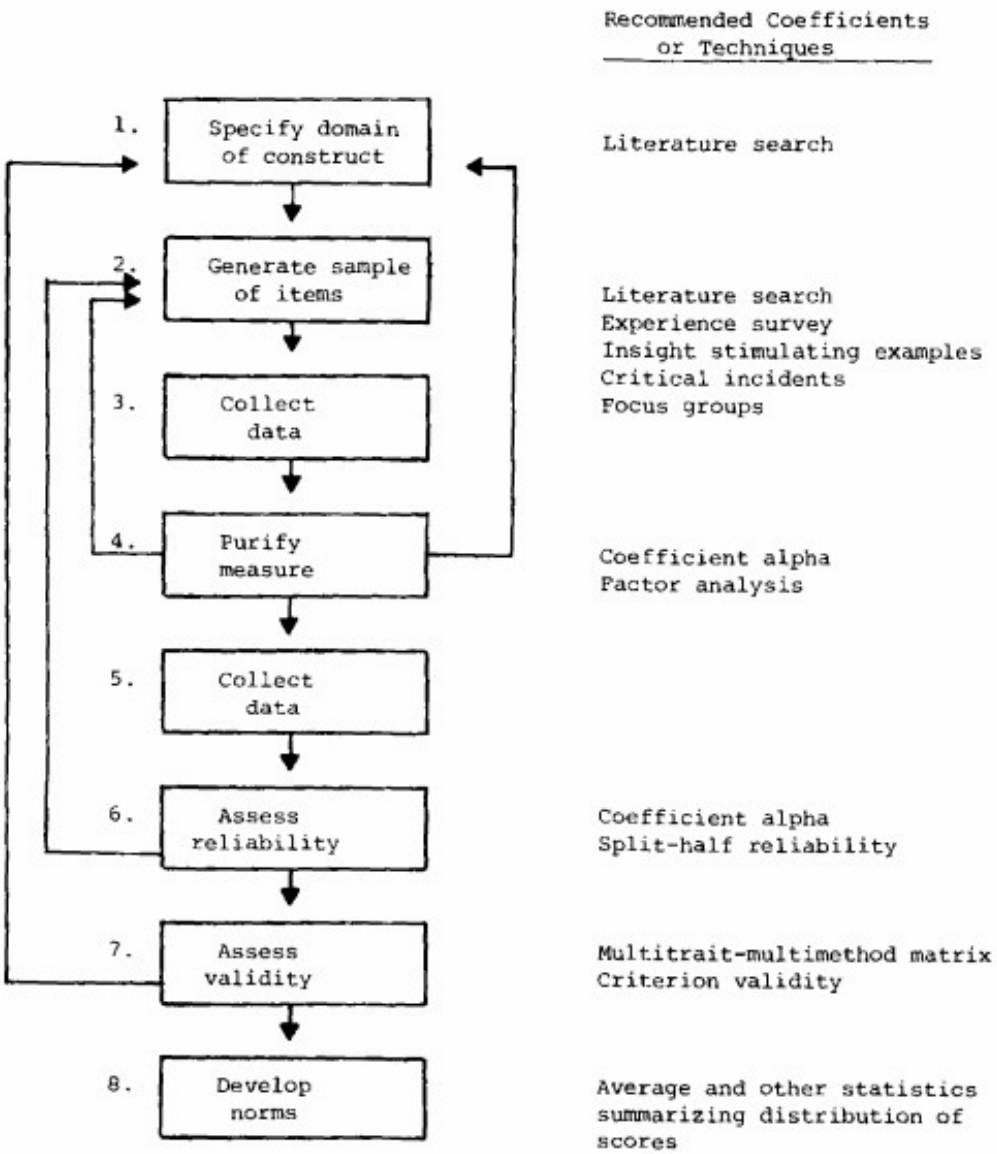
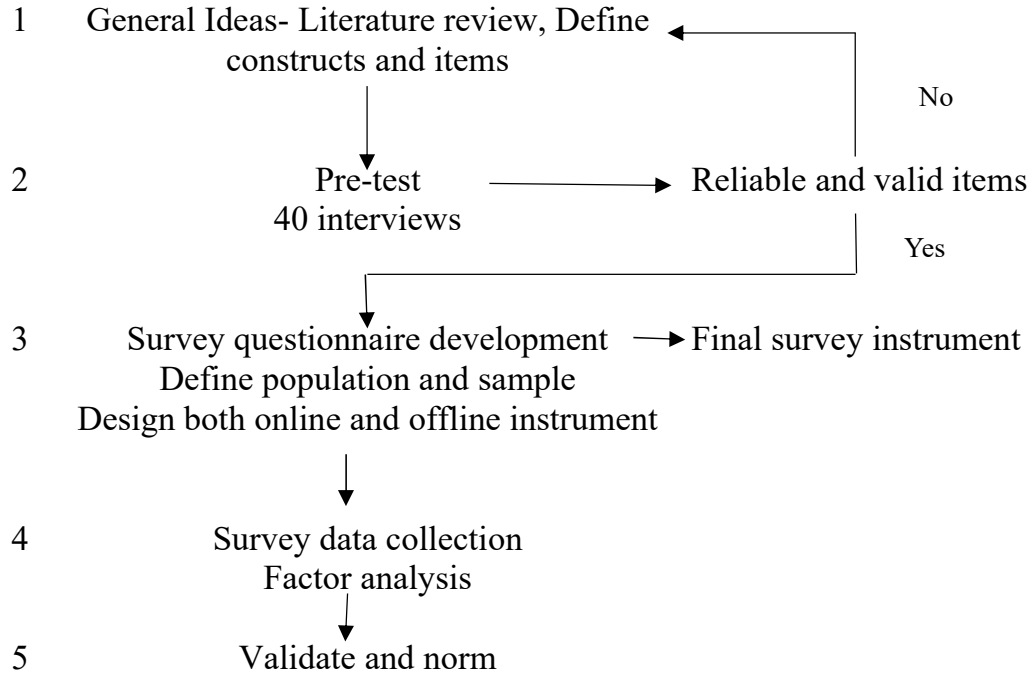


Figure 4.2 Research step approach for New Item and Scales Development (adapted from Churchill, 1979; Dunn et al., 1994)



The first step involves generating the ideas, specifying the research domain and identifying key items and constructs from the literature review. The domain of this thesis includes customs (traditional and electronic) and business performance. Working definitions for each part of the domain were provided in previous chapters. Most importantly, items related to the construct must be generated. The result of the literature review defined the 11 dominant items for investigation. In the second stage, key items and constructs were purified and tested in 40 interviews with 20 administrators and 20 businesses. The third step was conducted when the items were considered reliable and valid. In this stage, online and offline questionnaires were sent to customs staff at the customs department and branches as well as representatives of logistics business and international trade firms at ports and airports. After that, the collected data were analysed to find significant factors and develop norms in the fourth and fifth steps.

4.4.2 Sampling design

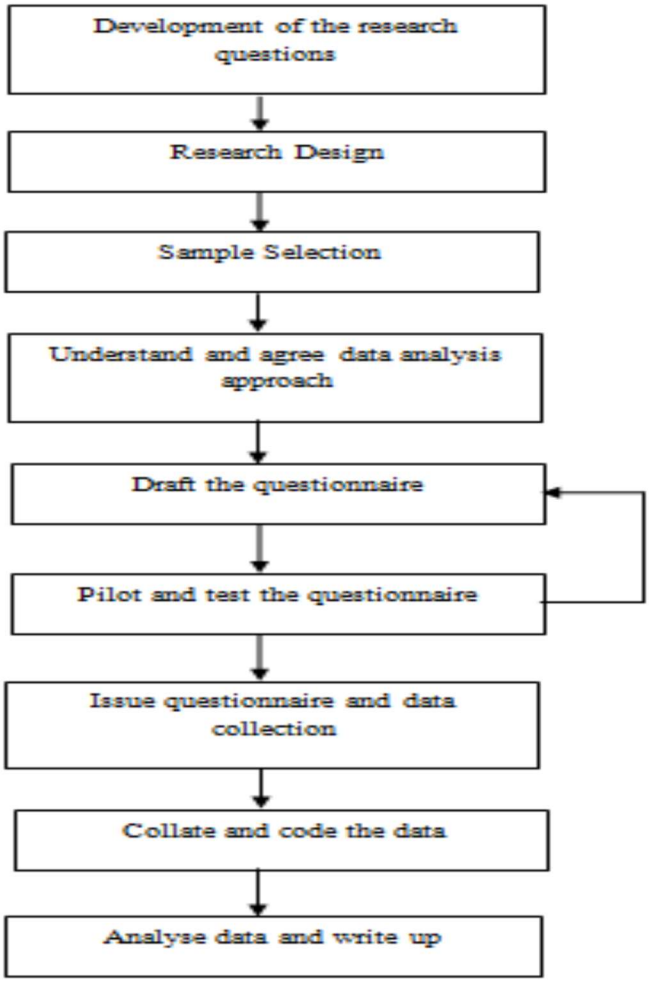
The research was conducted with a pilot survey and the main survey. The pilot survey was implemented with 10 questionnaires for business and 10 questionnaires for customs

administrators in order to double-check the understandability, the clarity of the questions in the survey as well as the accuracy of the variables. According to Easterby-Smith et al. (2003) and Kotzab (2005), information and data “from or about a specific set of people or a population” are gathered in such an efficient way by survey research, that is also the primary objective of survey. Saunders et al. (2007) indicates survey is usually used in association with the deduction in discipline of logistics research as a traditional methodology tool.

Oppenheim (1992) stated that “too often, a survey is carried out on the basis of insufficient design and planning or on the basis of no design at all. ‘Fact-gathering’ can be an exciting and tempting activity to which a questionnaire opens a quick and seemingly easy avenue; the weaknesses in the design are frequently not recognised until the results have to be interpreted.”. A framework for questionnaire design is established with the following steps which support the survey to achieve a robust plan in order to mitigate the risk.

Figure 4.9 A Framework for Questionnaire Design

(Adapted from Collis and Hussey, 2003:178; Robson, 2002:229)



According to Mentzer and Kahn (1995), Craighead et al. (2007), Sachan and Datta (2007), the method of data collection for studies related to logistics that is used frequently and popularly is the survey. Based on the statistical outcomes, surveys appear in 54.3% of logistics studies. Additionally, simulations and interviews are the following preferred techniques. Consequently, the positivist paradigm and quantitative research are demonstrated as the most popular and preferred methods in logistics research based on a number of studies that used surveys. Online surveys in the last few years have increased dramatically to become the most frequent method in marketing, with 59% of research using it (Hair et al., 2010). Grant et al. (2005) claim that online surveys offer

outstanding advantages in comparison with other traditional survey methods, including email and telephone surveys.

Bryman and Bell (2007) identify that when the researcher defines the study's population, he/she finds it impossible to examine the entirety of that population due to his/her limitations in resources and time. Therefore, a sample is chosen and represents the entire population. Devising a sample strategy should be carried out as soon as possible in the research design process. A census that approaches the target sampling frame is adopted in this study as the sampling strategy. For example, administrators and staff of Vietnam Customs as well as the SMEs involved in export and import procedures are selected as the sample.

Pilot and test the questionnaire

According to Oppenheim (1992) *"Questionnaires do not emerge fully fledged; they have to be created or adapted. Fashioned and developed to maturity after many abortive test flights. In fact, every aspect of a survey has to be tried out beforehand to make sure that it works as intended."*

The two-stage method approach of Churchill (1979) argues that a pilot survey in which a sample of respondents is carefully selected becomes popular in order to develop better measurement. Therefore, this thesis applies the two-stage method of Churchill (1979) with a pilot survey in initial step. Instead of conducting a full pilot survey, a test of questionnaire on a group of ten customs officials and ten business representatives was implemented with the aims of examining typos, content assessment and validation, the time taken to finish the questionnaires and feedback to improve survey. After the pilot survey, typos and some sentences in Vietnamese were amended to clarity meaning of questionnaire. Then, the main survey was ready to issue.

This study investigated factors influencing e-customs and the relationship between the e-customs application and SME performance. Consequently, survey research, including the statistical analysis of the collected data, can be conducted. According to Neuman (2006), survey research begins by selecting a topic and deciding the type of survey, then

addressing the research questions, researching the literature, designing the instrument, collecting and analysing the data, interpreting the data and, finally, presenting a description of the findings. An important step in this process is collecting numerical data.

The broad description of the term population is "a set of units that sample is meant to represent" (Vaus, 2007: 69). However, as stated by Malhotra (2010), a census is unrealistic if the population is large. In this regard, Hair (2007) argues that locating all the elements of the population is difficult and can be unpractical; thus, an appropriate precisely selected sample can provide sufficient information. The process of sampling design involves five general steps (Cooper et al., 2006, Hair, 2007, Malhotra, 2010, Zikmund, 2003). These steps are summarised in Table 4.7. Next, they are discussed in more detail.

Sampling size

To determine the appropriate sample sizes in this study, I used official information regarding customs labour force and export-import enterprises and took account of three criteria nominated by Israel (2009): the level of precision, the level of confidence or risk, and the degree of variability in the attributes being measured. Israel (2009) suggested an equation to calculate the necessary sample size for each combination of levels of precision, confidence, and variability:

$$n = \frac{N}{1 + N\,(e)^2}$$

where n is the sample size, N is the population size, and e is the level of precision.

In the Vietnamese context at present, there are approximate 73,000 firms participating in e-customs (Vietnam Customs, 2017); applying the formula of sample size, the result is nearly 400 enterprises (with N=73,000 and e= 0.05 with 95% confidence). The researcher planned to investigate around 700 firms regarding international trade at random to obtain the target a minimum of 400 responses. Moreover, 1,000 questionnaire forms could be delivered to customs staff to gather their perspectives of the e-customs enablers and inhibitors. In addition, SPSS can be applied in order to handle the data.

4.5 DATA ANALYSIS TECHNIQUES

4.5.1 Descriptive statistics

This research uses a range of descriptive statistics with details following:

First of all, the descriptive statistics is applied to examine the quality of data. In initial step, data screening is conducted before analysing data. This step helps data collected ensure the accuracy and handle with missing data issues (Levy, 2006). In addition to the response rate to the survey, non-response bias might affect the researcher's ability to generalise the findings of the current research to the population under investigation (Armstrong and Overton, 1977). As it is difficult to obtain data from non-responders, late responders were used as a substitute for non-responders (Armstrong and Overton, 1977, Gefen et al., 2011).

Moreover, the common method variance was tested using Harman's one-factor test. Common method variance is "*variance that is attributable to measurement method rather than the constructs the measures represent*" (Podsakoff et al., 2003: 879). Campbell and Fiske (1959) emphasise that common method variance is a source of measurement error and might threaten the validity of explanations and conclusions regarding the relationships between the research variables. Harman's one-factor test is a strategy to test for common method variance using exploratory factor analysis (EFA) of all the variables in the study "*where the un-rotatved factor solution is examined to determine the number of factors that are necessary to account for variance in the variables*" (Podsakoff et al., 2003: 889). Podsakoff et al. (2003) stated that the basic assumption of this test is that common method variance exists when (a) a single factor occurs and accounts for all extracted variance or (b) the majority of the covariance among the measures is attributed to one factor.

Next, the data and information in this research are interpreted and summarised by utilising techniques of descriptive statistical analysis. In addition, variances for every single variable which are described with the descriptive statistics become more easily understand. A number of descriptive statistics, for example, the mode, mean, range, standard deviation, variance and the graphic (diagrams and charts) are employed to

illustrate data.

4.5.2 Confirmatory factor analysis (CFA)

According to Tabachnick (1996), Hair (2006), and Pallant (2011), factor analysis may be used to reduce a large set of items to a smaller number of dimensions or components. This technique is commonly used when analysing data from a questionnaire to see the relationship between the items in the questionnaire and the underlying dimensions. Thus, Factor analysis may be used to find underlying latent factors.

Hair (2006) stated that factor analysis techniques include both exploratory and confirmatory perspectives. Many researchers consider that only the exploratory perspective is useful in searching for structure among a set of variables or as a data reduction method. However, in some situations, the researcher has preconceived thoughts on the actual structure of the data, based on theoretical reasoning or prior research. In these instances, the researcher may take a confirmatory approach -- that is, may assess the degree to which the data meet the expected structure. In this study, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. EFA for exploring how many factors are needed to best represent the data, and CFA for testing how well measured variables are represented by a smaller number of constructs of the data, based on theoretical reasoning or prior research. In these instances, the researcher may take a confirmatory approach -- that is, may assess the degree to which the data meet the expected structure. In this study, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. EFA for exploring how many factors are needed to best represent the data, and CFA for testing how well measured variables are represented by a smaller number of constructs.

Harrington (2009) discusses that the measures which are adopted and developed are examined appropriation with the investigated population in the research by CFA application. Moreover, it was used to examine the significance of the theoretical measurement model, whether or not the sample data confirm the model and its validity (Schumacker and Lomax, 2010). According to Bollen and Long (1993), the development and evaluation of CFA typically involves five different steps, which are

discussed below, in SEM.

4.5.3 Structural equation modelling (SEM)

4.5.3.1 Overview of SEM

A structural theory based on some phenomenon is analysed with a confirmatory approach, for instance, testing hypothesis in SEM statistical methodology (Byrne, 2010). Bentler (1998) also describes SEM with 'causal' relations from which observations on multiple variables are generated. Furthermore, two significant aspects of procedures are conveyed through the term of structural equation modelling. Firstly, a range of structural equations such as regression is used to represent the causal processes that are being studied. Secondly, the pictorial model can be applied in SEM to describe the structural relations. Hence, conceptualisation of theory under study enablers to understand clearly. The model postulates the plausibility of relations among variables in case of adequate goodness-of-fit. In the contrast, the model rejects the tenability of relations in case the goodness-of-fit cannot be satisfied.

SEM was used since it is considered important to determine the extent to which the theoretical models are supported by sample data. Tabachnick and Fidell (2007) define SEM as a "*collection of statistical techniques that allow a set of relationships between one or more independent variables DVs, either continuous or discrete, and one or more dependent variables DVs, either continuous or discrete, to be examined. Both 1Vs and DVs can be either factors or measured variables. Structural equation modelling is also referred to as causal modelling, causal analysis, simultaneous equation modelling, analysis of covariance structures, path analysis, or confirmatory factor analysis*" (p.676).

SEM is mainly used to "*explain the relationships among multiple variables and examines the structure of interrelationships expressed in a series of equations…… depict all of the relationships among constructs involved in the analysis*" (Hair et al., 2010: 608). Rigdon (1998) defines SEM as a "*method for representing, estimating, and*

testing a theoretical framework of (mostly) linear relations between variables, where those variables may be either observable or directly unobservable, and may only be measured imperfectly (p.251).

SEM appears in various names such as covariance structure analysis and latent variable analysis. Sometimes, the specialised software using to analyse SEM, for example, LISREL and AMOS is called as other names of SEM. Hair, Anderson, Tatham and Black (1995) and Diamantopoulos (1994) explored seven steps in SEM process as following:

(i) The theoretical model is conceptualised and developed;
(ii) A path diagram is constructed;
(iii) The SEM in terms of measurement and structural models is specified; correlation of constructs and indicators are identified and problems of research design related to sample size and model estimation method are considered;
(iv) If unique estimates are not generated, identification of SEM will be assessed;
(v) Goodness-of-fit overall of model and structural parts need to be evaluated;
(vi) In case of theoretical justification, the model modification and improvement can be interpreted;
(vii) The model is cross-validated with other data sets.

4.5.3.2 SEM analysis

Model specification

In this step, the relationships and parameters in a model are diagrammed, determined and specified certainly. As noted by Harrington (2009), previous research and theory are crucial for specifying CFA and SEM. Regarding this study, all the latent variables and parameters, as will be discussed later in Chapter Five, were developed after conducting an extensive review of the prior research on e-customs and business performance. Additionally, as discussed earlier in Chapter Three, all the hypothesised

relationships were developed based on well-established theories. All variables were assigned the role of either exogenous or endogenous variables.

Model identification

Estimates for each parameter including correlation and factor loadings are found out with purpose of model identification in this step. Meyers et al, (2006) define that the model has to estimate the diversity between the quantity of variables and a number of parameters when identifying model. Generally, a model is identified and solved when the degrees of freedom (*df*) have to satisfy the threshold value of above zero. The *df* is the result of subtraction between the number of freely unknown parameters and the number of non-redundant (known) elements. Based on this equation, if the result is more unknown elements (-*df*), the model is called an "*under-identified model"* and cannot be estimated because of the infinite number of parameter estimates. If the result is equal to the unknown elements ($df = 0$), the model then is called a "*just-identified model"*. A just-identified model, as explained by Hair et al. (2010), must show perfect fit to be accepted. However, an *over-identified model* emerges when $df > 0$, which means that the number of known elements is higher than the number of unknown parameters. In case the parameters are estimated with more than one way due to overload information in the matrix *S,* a over-identified model appears (Schumacker and Lomax, 2010).

Model estimation

CFA and SEM aim to acquire estimates including factor loadings, variances, covariances, and errors for every parameter and path in the hypothetical model. There are several methods that can be used for model estimation. Maximum likelihood (ML) was used as an estimation method for the model parameters. Brown (2006) states that ML "*aims to find the parameter values that make the observed data most likely (or conversely) maximize the likelihood of the parameters given the data*" (p.73). Breckler (1990), after reviewing SEM research over 15 years, reported that ML is commonly used with data collected by using a Likert scale. According to Harrington (2009), ML is considered the most commonly employed method for two distinctive reasons. Firstly, the standard error for each parameter that is used for measuring p-value can be provided

via ML. Secondly, a lot of goodness-of-fit indices can be calculated through ML's fitting function (Harrington, 2009: 29).

In particular, ML is chosen to apply in this study for three reasons. First of all, Iacobucci (2010) and Hair et al. (2010) indicate ML as the most popular estimation method that is used with SEM. Secondly, Bagozzi (2010) and Iacobucci (2010) report that observations with slight non-normality (little skew and peak) are estimated more effectively based on ML. Furthermore, Lei and Lomax (2005), in their simulation research, have found that the ML estimation method outperforms the general least square (GLS) estimation method in the case of small to moderate deviation from normality. Finally, ML is assessed to be more responsive to misspecification of model than the ordinary least squares (OLS) estimation method (Fan et al., 1999).

Model assessment

After the parameter estimates are gained, the solution achieving from the estimation method is evaluated in the following step. According to Schumacker and Lomax (2010), the support of observed sample data for the theoretical model is assessed in the model evaluation step. Three levels of solution assessment, for instance, evaluating the overall model, the measurement model and the structural model can be obtained in the process of evaluation. Hair et al. (2010) clarify the relations between the observed variables and the latent variables are specified in the measurement model. In order to evaluate the measurement model, the factor loadings of each observed variables on the latent variable are examined by using CFA. Based on CFA analysis, unidimensionality, convergent validity, and discriminant validity of constructs are assessed (specific in Chapter Six and Seven, Section 6.5 and 7.4 respectively). In other words, hypotheses or the paths between the latent variables can be estimated in the structural model. According to Shah and Goldstein (2006), the structural path coefficients are statistically significant. Therefore, Shah and Goldstein (2006) report that testing hypotheses relates to examination of the sign, magnitude and statistical significance of the structural path coefficients in the similar way with measurement model fit.

Regarding the overall model fit, a number of goodness-of-fit (GOF) indices were

selected to evaluate the overall model fit. These indices will be discussed in detail.

Chi-square (χ^2) is considered a fundamental GOF to measure the difference between two matrices: the observed and the estimated (Hair et al., 2010: 665). A non-significant χ^2 indicates that the two matrices are similar. In other words, a significant χ^2 indicates that the two metrics are different, which points to a problem with the model fit. However, using χ^2 statistics for model assessment might be misleading in at least two ways (Byrne, 2010, Schumacker and Lomax, 2010, Hair et al., 2010): 1) A Type II error, or rejecting the model, is more likely to occur with large sample sizes (> 200); furthermore, with large sample sizes any slight difference between the observed model and the estimated model may be found to be significant. On the other hand, Hooper et al. (2008) reported that χ^2 with a small sample size might lack power and, thus, may not discriminate between good models and poor models. 2) It has been found that the χ^2 fit statistic is extremely sensitive to violations of the normality assumption (Jöreskog and Sörbom, 1986). Consequently, according to Byrne (2010), "*findings of well-fitting hypothesised models, where the χ^2 value approximates the degrees of freedom, have proven to be unrealistic in most SEM empirical research*" (p.76). Hair et al. (2010) discussed that models tend to be complex and use sample sizes that can make the χ^2 test useless as a model fit index. Irrespective of the problem of using χ^2 as a GOF, MacCallum and Browne (1993) suggested that researchers should report the χ^2 value regardless of whether it is significant or not. However, a way to address the problem of χ^2 is to use the χ^2/df ratio (normed chi-square) to minimise the influence of the sample size. An accepted and recommended ratio for this statistic is as low as 3.0 (Bentler and Bonett, 1980, Segars and Grover, 1993).

Regardless of the limitations of the Chi-square statistic, many alternative GOF indices have been developed to evaluate model fit. In general, the literature indicates that those GOFs can be grouped into three categories: absolute fit statistics, relative fit statistics, and parsimonious fit statistics.

Absolute Fit Measures revolve around "*how well the correlation/covariance of the hypothesised model fits the correlation/covariance of the actual or observed data*" (Meyers et al., 2006: 558). The goodness-of-fit index (GFI), one of the absolute fit

indices, describes comparison between the proposed model and "the case of no model at al". According to Schumacker and Lomax (2010: 86), GFI is calculated based on "the ratio of the sum of the squared difference between the observed and estimated matrices to the observed variances". Hu and Bentler (1995) identify that a model obtains a good fit if the value of GFI closes to 1 and an acceptable model can be achieved when this value is above 0.90. On the other hand, GFI has been recently explored its unpopularity in a lot of studies of Gefen et al. (2011), Hair et al. (2010), Hooper et al. (2008), Hu and Bentler (1998), Shah and Goldstein (2006) and Sharma et al. (2005) because the problems related to its responsiveness to sample size and model misspecification appear. In their study, which aimed to use "*simulations to investigate the effect of sample size, number of indicators, factor loadings, and factor correlations on the frequencies of the acceptance/rejection of models (true and misspecified) when selected goodness-of-fit indices were compared with the prespecified cutoff values*", Sharma et al. (2005) strongly recommend that GFI should not be used because of its sensitivity to sample size and its poor sensitivity to detecting misspecified models (p.935). Shah and Goldstein (2006), in their comprehensive study to the review application of SEM in operation management research, argue against using GFI and state that "*use of an index is not recommended*" (p.160). In IS studies it has also been recommended not to use GFI because of its bias and sensitivity to sample size (Gefen et al., 2011). However, in an attempt to adjust the GFI to take into account the number of parameters estimated, the adjusted GFI (AGFI) was developed by Tanaka and Huba (1989). Unlike GFI, AGFI with values >0.80 indicate a good model fit (Segars and Grover, 1993, Straub et al., 2004, Chau, 1997).

RMSEA (the root mean square error of approximation) is another absolute fit index that has recently been recognised as one of the most informative and widely used indices in covariance structure modelling (Byrne, 2010, Hair et al., 2010). RMSEA "*estimates the lack of fit in a model compared to a perfect (saturated) model*" (Tabachnick and Fidell, 2007: 717). Unlike χ^2, RMSEA has been deemed as a widely accepted GOF indicator because of its ability to avoid rejecting models with large sample sizes and/or a large number of indicators (Hair et al., 2010). According to Hair et al. (2010), with CFI > 0.90, observed variables (M) ≥ 30, and sample size (N) > 250, a cutoff value of 0.07 is

acceptable as a good fit indicator. Hu and Bentler (1999) suggested that RMSEA ≤ 0.06 is an indicator of a good fit. Moreover, Jöreskog (1993) and MacCallum and Browne (1993) suggested that values ≤ 0.08 are an indicator of good and acceptable model fit.

Iacobucci (2010), based on the results of several simulation studies, concluded that RMSEA does not perform well and tends to over-reject true models for small sample sizes (N < 250) and a relatively large number of variables (p.96). Nevertheless, she recommends the Standardised Root Main Square Residual (SRMR) index as an alternative absolute fit measure. SRMR evaluates "*the size of the residuals between the actual covariance and the proposed model covariance*" (Meyers et al., 2006: 559). SRMR's values range between 0 to 1; however, values less than 0.08 indicate a satisfactory model fit (Hooper et al., 2008, Hu and Bentler, 1995, Hu and Bentler, 1998, Hu and Bentler, 1999, Iacobucci, 2010).

Incremental fit measures, for example, incremental or comparative fit measures, in contrary to the absolute fit measures, is measured by comparison between "the estimated model fits and the baseline or null model" (Hair et al., 2010: 668). Consequently, a single model with multi-item constructs is validated its fit more effectively with these measures. The comparative fit index (CFI), one of the most popular indices, indicates a well-fitting model if its value obtains 0.90 or more (Bentler, 1992, Hair et al., 2010). Furthermore, Hooper et al. (2008) justify another incremental fit measure named the normed-fit index (NFI) which evaluates the model by comparison between its χ^2 value to the null model's χ^2. Like CFI, NFI has a range of 0-1, and values > 0.90 are usually accepted as an indicator of model fit (Meyers et al., 2006).

The Tucker-Lewis index (TLI) and the relative noncentrality index (RNI) are different from NFI in that they are not normed and TLI takes into account the complexity of the model (Hair et al., 2010), while RNI takes into account the degree of freedom (Byrne, 2010). TLI was developed mainly "*to quantify the degree to which a particular exploratory factor model is an improvement over a zero factor model when assessed by maximum likelihood*" (Hu and Bentler, 1995; Cited in Hoyle, 1995: 84). Sharma et al. (2005: 942) found that TLI and RNI are the best indicators and the most recommended for model evaluation, especially when the factor loadings are large (> 0.5). Among other

fit indices, Bollen (2011: 376) asserts that TLI is one of the fit indices that performs well and is highly recommended to be reported. TLI and RNI's values range between 0 and 1, and values greater than 0.90 usually indicate good model fit (Bentler and Bonett, 1980, Sharma et al., 2005).

Parsimony Fit Indices, the parsimony fit indices, or adjusted fit measures, were developed with the aim of finding out the best fit model in relation to its complexity among a variety of "competing models" (Hair et al., 2010). Consequently, although these indices are not useful for validating a single model, they are more useful in comparing the fit of two or more models. The PNFI (the parsimony normal fit index) adjusts the incremental fit index NFI by multiplying its value by the parsimony ratio (PR) (Hair et al., 2010: 669). PNFI's values can be used to compare different models, taking into account the degree of model complexity. Similar to PNFI is the parsimony comparative fit index (PCFI). PNFI and PCFI both have a 0-1 range; however, their values are much lower than what is accepted on the basis of normed indices. According to Meyers et al. (2006: 559) and Mulaik et al. (1989: 439), values greater than 0.50 indicate a good fit.

IBM's AMOS provides 25 different GOF indicators, however, making decisions about which to report has been a matter of disagreement among scholars, who strongly argue that researchers do not need to report all GOF indices (e.g. Byrne, 2010, Hair et al., 2010, Hu and Bentler, 1999, Tabachnick and Fidell, 2007). For example, Hair et al. (2010: 672) recommend reporting, besides χ^2 with the associated *df*, at least one incremental index, one absolute index, and one parsimony index when comparing models of varying complexity. More specifically, they state that χ^2 with the associated degree of freedom, CFI or TLI, and the RMSEA are informative enough to evaluate model fit. They add that when a researcher aims to compare models of varying complexity, he/she may also wish to use PNFI. Meyers et al. (2006: 562) agree with Hair and his colleague that a researcher should report at least three fit tests: one absolute, one incremental and one parsimonious, to reflect diverse criteria. In this respect, Tabachnick and Fidell (2007: 720) state that CFI and RMSEA are the most frequently informative reported fit indices, especially RMSEA, which is helpful if a researcher

aims to perform power calculations. Iacobucci (2010: 90) and MacKenzie et al. (2011: 313) argue that reporting RMSEA, SRMR, and CFI is indicative enough for a well-fitting model. Following these recommendations, this study used GOF indices to reflect the three categories of absolute, incremental and parsimonious. Table 4.4 summarises the recommended cut-off values and the supporting references.

Table 4.4 The threshold values for SEM fit measures

Goodness-of-fit		Guidelines	References
χ^2		Above 0.05	Bagozzi (2010); Boyle et al. (1995); Hu and Bentler (1999)
$\chi^{2/}$/df		Good if less than 2 Acceptable if from 2 to 5	Bentler (1990); Byrne (1989)
Absolute fit measures	**RMSEA**	Good if 0.05 or less than Acceptable if from 0.05 to 0.08 Poor if from 0.08 to 0.1 Bad if above 0.1	Hair et al. (2010); MacCallum et al. (1996)
	SRMR	0.08 or less (with CFI above .92)	Hair et al. (2010); Hooper et al. (2008); MacCallum et al.(2009); Hu and Bentler (1995)
	AGFI	Above 0.80	Chau (1997); Hair et al. (2010); Segars and Grover (1993); Straub et al. (2004)
	GFI	Great if above 0.95 Traditional if above 0.90 Permissible if above 0.8	Joreskog (1969); Bogozzl (1981); Brown and Cudeck (1993)
Incremental fit measures	**CFI**	Above 0.90	Bentler (1992); Hu and Bentler (1999); Hair et al. (2010); Iacobucci (2010)
	TLI	Above 0.90	Bentler and Bonett (1980); Hu and Bentler (1995); Hu and Bentler (1998); Sharma et al. (2005)
	NFI	Above 0.90	Hair et al. (2010); Byrne (2010)

Parsimony fit measures	**PNFI**	Above 0.50	Hair et al. (2010); Chow and Chan (2008); Meyers et al. (2006); Mulaik et al. (1989)
	PCFI	Above 0.50	Hair et al. (2010); Chow and Chan (2008); Meyers et al. (2006); Mulaik et al. (1989)

Model modification and improvement Finally, if the model fit statistics are unsatisfactory, a model re-specification will be required to obtain a better fitting of the hypothesised model to the observed sample variance-covariance matrix (Kline, 2011). Regarding the measurement model, factor loadings, squared multiple correlations SMC, modification indices MI, and regression residuals can be used to modify and validate the model by deleting and/or freely estimating the problematic indicator(s). The model improvement stage involves reviewing the SEM's outputs and applying the following recommended criteria:

1) The factor loading (in AMOS factor loading labelled (Standardized Regression Weights)) for every indicator should be significant and greater than 0.5 (ideally 0.7) (Bagozzi, 2011, Hair et al., 2010, Chin, 1998, Hulland, 1999). However, loadings above +1 or less than -1 are considered out of the feasible range and an indicator of a problem with the research data (Hair et al., 2010).

2) Squared multiple correlations (SMC or the communality = (indicator's factor loading)^2) which represent indicator reliability should be greater than 0.5. This means that the majority of variance in an indicator is due to the latent variable (Bollen, 1998, MacKenzie et al., 2011).

3) Standardized residual covariances (the raw residuals divided by the standard errors of the residuals) should be below |2.58| (Brown, 2006, Byrne, 2010, Jöreskog and Sörbom, 1986, Tabachnick and Fidell, 2007). Values greater than |2.58| indicate "*that a particular relationship is not well accounted for by the model*" (Schumacker and Lomax, 2010: 173) and should be eliminated.

4) Modification indices (MI; relationships that are not estimated in the model), which show significant covariance between same construct measurements' errors

accompanied by significant regression weight, should be used to covary those errors only in case significant fit improvement is anticipated. Thus, all errors' MI – covariances that have a significant value with expected parameter change accompanied by high MI – regression weights are candidates to be freed or deleted (Byrne, 2010, Hair et al., 2010, Kenny et al., 1998). As suggested by (Hair et al., 2010: 713), unless theoretically justified, deletion is a recommended strategy as long as no more than 20% of the measured indicators.

However, to avoid an over-fitted model, indictors were considered problematic and candidates to be deleted only if they significantly violated one or more of these assumptions. In this regard, MacCallum et al. (1992) cautioned, "*when an initial model fits well, it is probably unwise to modify it to achieve even better fit because modifications may simply be fitting small idiosyncratic characteristics of the sample*".

For the structural model, one or more coefficients may be added or deleted to fit and validate a misspecified structural model. MI regression weights and parameter changes statistics can be used to re-specify the structural model (Byrne, 2010). However, as noted by Hair et al. (2010) and Meyers et al. (2006), deleting or adding a coefficient needs to be theoretically justified.

4.6 CHAPTER SUMMARY

This chapter discussed in detail the research design (research philosophy, research approach, research strategy, time horizon, sampling procedures, data collection methods and employed statistical techniques). Standpoints of research design were presented to understand the assumptions that underlie the methodology. Additionally, this chapter pointed out the choice of methodology for this research as well as highlighted the following procedures from which the next phase of the research process is introduced. The causal hypotheses relationships were usually explored with the positivistic philosophy as the appropriate paradigm. Therefore, this research applied ~~mixed~~ quantitative method ~~with a quantitative approach as the primary methodology~~ to collect and analyse data. The next chapter discusses the research instrument development and validation.

CHAPTER 5: INTERVIEW ANALYSIS

5.1 INTRODUCTION

After the literature review, the research framework in this thesis adapted from Churchill (1979) and Dunn et al. (1994) proposed a pilot study to confirm and develop measures. Furthermore, the research gap identified the debate and a different perspective about facilitators and barriers affecting e-customs. Cannon (2004) also suggests interviews as the qualitative justification to examine whether the proposed model in this research is prepared for the following step with a survey or not. Therefore, the qualitative interviews with both customs administrators and business representatives were conducted with the purpose of pre-testing the factors and impacts/relations proposed in the conceptual model. These interviews also support the researcher in finding out more omitted elements/recommendations or considering removing unnecessary/unsuitable factors if needed. And the information collected in these interviews can be used to explain the relationships among the constructs in further detail.

This chapter discusses the results of the interviews with customs administrators and businesses to test the question in the main survey as well as collect perspectives on both sides related to conducting e-customs. The structure of this chapter contains three main sections. Particularly, in section 5.2, the data collection method refers to the research method, techniques, sample, content and the way to carry out interviews. Furthermore, section 5.3 illustrates the results of the interviews with customs administrators and businesses. Finally, section 5.4 discusses and criticizes the theories and rationale to explain and argue the results of the interviews. A summary of the main perspectives of this chapter is presented in section 5.5

5.2 DATA COLLECTION METHOD

5.2.1 Sample and survey contact

According to King and Horrocks (2010), participants recruited in the interviews represent a variety of positions in relation to the research topic and they are expected to throw light on meaningful differences in experience. Hence, the interviews were

conducted with 20 customs administrators as the policymakers of e-customs and 20 representatives of businesses who are users of this system. In order to approach the customs administrators and recruit participants, the researcher received assistance from 'insiders' who work as a Deputy Director of Human Resource of GDVC and an inspection officer with rich experience in GDVC. These insiders provided support by passing the study's information letters and email to potential participants in advance and forwarding queries to the researcher (King and Horrocks, 2010). Furthermore, they also provided the names and contacts of potential interviewees in light of the research's selection criteria as well as set up some interview meetings for the author with other customs managers.

The customs managers who joined interviews included ten administrators of the General Department of Vietnam Customs (GDVC) with two Deputy Director Generals and eight managers of functional departments as well as ten directors of local customs departments. The General Director Board of GDVC has 4 members, 14 functional departments and 35 local customs departments. Consequently, the two Deputy Director Generals who participated in the interviews have direct responsibility for customs reform and modernisation. The eight managers of the functional department of GDVC are Directors or Deputy Directors of the Department of Human Resource, IT and Statistics, Customs Revolution Board, Risk Management, Anti-Smuggling Investigation, Export-Import Tax, Legislation, Supervision and Management, which have a significant influence on e-customs procedures implementation. Ten other interviews were with the customs departments of critical cities and provinces with the biggest ports and airports as well as a considerable amount of import and export goods, such as Hanoi, Ho Chi Minh City, Hai Phong, Binh Duong and Dong Nai. Eleven of the twenty interviews took place in a direct way and the others were phone interviews due to distance and time limitations. Because of the limitation of dialogue time with customs administrators, each interview lasted around 15 minutes. According to Opdenakker, 2006; Kazmer and Xie, 2008), in comparison with online and face-to-face interviews, telephone interviews are the second choice for reasons of resources of time and expense.

Approximately 80,000 enterprises have participated in e-customs in various industries

(GDVC, 2017), for example, agriculture, commerce, service and so on. Three participants come from associations of SMEs, and seventeen firms with the most activities related to import and export in the airports and ports in the principal cities of Hanoi, Ho Chi Minh City, Hai Phong, Binh Duong and Dong Nai were selected randomly to participate in the interviews. Five enterprises are located in Hanoi, four are Ho Chi Minh City, three firms are settled in Hai Phong, the same number of companies stay in Binh Duong and two others are from Dong Nai. The industry of the businesses that joined in the interviews is mostly logistics services. The interviews took from 15 to 25 minutes and were held face-to-face with firms and business associations located in Hanoi and Ho Chi Minh City, while phone interviews were used with enterprises in Hai Phong, Binh Duong and Dong Nai. All interviews were conducted with the note-taking technique and no recordings were made as per the participants' requirements.

17 SMEs who participated in the interview include 7 logistics companies, 5 manufacturing firms, 3 processing companies and 2 commercial enterprises. The interviewees from logistics firms accounted for 35% of total participants in the interviews while the remaining 65% come from SMEs association and enterprises in other industries. Hence, it is said that the interviewees were not confined with mainly logistics firms. Furthermore, the interviewees were from diverse locations and years of experience implementing customs procedures. Additionally, this research applied both interviews and questionnaire survey with pilot survey to minimise the effect of sample or response bias.

Figure 5.10 Vietnam Customs Structure (GDVC, 2017)

5.2.2 Content of interview

All customs administrators and some representatives of businesses received a personal cover letter in advance, as shown in Appendix 1, via the abovementioned insiders' assistance in order to book appointments with the participants. Other enterprises with meetings at the airports and ports where they were conducting e-customs procedures were also introduced to all the information of the cover letter before starting the interviews. The letter presents the information on the researcher, the reliability of this research, the objectives of the interview as well as the value of their response. All the participants signed the consent form before conducting the interviews to ensure the accuracy of the information they provided as well as their voluntary participation. Although the cover letter stated that the participants' names would remain incognito, the interviewees allowed the author to present their names in this study. The purpose of these interviews was to capture the perspectives of participants when they approach and carry out e-customs, which is the basis for checking the questionnaire as well as seeking some new ideas about the situation of a developing economy like Vietnam. Open questions were used in the unstructured interviews with the aim of asking interviewees about some specific situations relating to e-customs that are relevant to them and in the researcher's interest (Opdenakker, 2006). The non-standardised interviews could help the researcher explore and determine what is happening as well as understand the context of e-customs in Vietnam and have the flexibility to have more relevant in-depth questions (Alan Bryman & Emma Bell, 2015; King & Horrocks, 2010). Alan and Emma (2015) also discussed that the interviewee could present their viewpoints in this kind of interview.

Both customs administrators and businesses were asked about the advantages and difficulties of the current e-customs system to obtain a synthesis review from both sides, namely service supplier and customer, which helps the study achieve the first objective regarding the review of e-customs in Vietnam as well as identify and confirm the enablers and obstacles influencing e-customs implementation (RQ1). The reason for these questions is to examine the variables dividing the two categories of the facilitators and inhibitors which affect e-customs. If respondents did not mention these elements,

the interviewer could use in-depth questions to gain more details.

The enterprises as the users and customers of e-customs were also asked about their years of experience of doing customs procedures in the first question, which could reflect the reform and changes of e-customs on the timeline. In addition, the interviewees, as the firm representatives, were required to answer on the influence of e-customs on their business performance in the two aspects of finances and strategy (RQ2). The demands of implementing e-customs in the long term were also identified by these firms in continuous question.

Based on the different angles of policymakers and conductors, either customs managers or businesses presented their suggestions to improve the e-customs system (RQ3). The final question referred to the awareness of the Japanese government's role as a third party to support and encourage the e-customs system in Vietnam. It was proposed for all participants to discover one of the different factors between Vietnam as a developing country and developed economies based on the e-customs development history in Vietnam.

5.3 RESULT OF INTERVIEWS

Some interviews with customs administrators were noted down based on the interviewees' requirements, while others as well as the interviews with businesses were recorded. King and Horocks (2010) noted that recording and note-taking are two methods used to collect data in interviews, however, note-taking is essential when interviewees refuse to allow audio-recording. Transcriptions were prepared after conducting the interviews. Langdridge (2004) argued that transcribing, as the first step in the analysis, can help the researcher become closely familiar with the data. The partial transcription can be applied in this research in analysis progress. King and Horrocks (2010) emphasized that recording everything verbatim could not be necessary in the case of evaluation studies. The main areas and the key information were identified through listening to the tapes, and those sections were transcribed in full while summarising the rest.

5.3.1 Results of interviews with customs administrators

Q1: In your opinion, what are the enablers of e-customs as well as the benefits that businesses can obtain when implementing e-customs?

The first question with customs administrators refers to the enablers and benefits of e-customs in the Vietnamese context. Most of the responses relate to the relative advantages of e-customs, including time-savings, cost-savings, reduction of the burden of administrative documents, deduction of data re-entry and fewer errors, risk management, convenience (24/7) and advance clearance. According to Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, and Baida (2006), Raus, (2009), Choi (2011), Urciuoli, Hintsa and Ahokas (2013), there are a number of benefits of e-customs. Firstly, 100% of the interviewees mentioned saving travelling time from firms to customs departments, data processing, inspecting and clearance. CA_11 emphasised that *'clearance time of import goods decreased 6 hours and clearance time of export deducted 3 hours in 2017 in comparison with 2016'*.

Secondly, cost-savings was also presented as one of the enablers of e-customs by 100% of the participants. They identified that firms could save costs in terms of paperwork, faxes, phone calls, travel, storage, administration as well as opportunity costs when goods got faster clearance, which enhances a business's competitive advantages in the trade and market. CA_06 said that the *'working process has been changed from traditional method with paperwork to electronic way through online and Internet, which influences the administrative management of organisations'*.

Thirdly, 100% of responses outlined a decrease in the burden of administrative documents. Specifically, 10 interviewees, i.e. 50%, who are administrators in GDVC, completely agreed that *'using e-documents and e-records through automated system VNACCS/VCISS could reduce barriers of administrative'* while the other 10 respondents (the remaining 50%), who are Directors or Deputy Directors of local customs departments, thought that although e-customs supported the restriction of administrative documents, it actually increased them. For example, CA_18 described that *'the number of supplementary documents to instruct how to conduct e-customs for*

local customs departments, customs staff and business increase due to change of regulations for new system'.

Fourthly, 12 in 20 interviewees (corresponding to 60%), like CA_16, recognised issues related to *'reducing the number of data entry errors based on storage system online'* while the remaining 40% did not mention this point. Fifthly, 100% of respondents supported that sharing information and gathering various data among partners through big data storage and electrical management systems could deduct risk management. The sixth motivator involves the convenience of the e-customs system because dossiers can be submitted online and firms can receive e-receipts 24/7. Furthermore, Mr Duc Thanh Le (2017), Deputy Director of IT and Customs Statistics Department of GDVC, also explained that enterprises can get clearance and pay tax online with an e-payment system connected to 12 commercial banks in Vietnam. Finally, 15 interviewees among the 20 respondents argued that businesses can obtain customs clearance in advance before goods arrive at the airports or ports.

Consequently, most facilitators appeared in the response of interviewees. However, some factors were not mentioned, such as trialability, observability and culture. Regarding trialability, the trial phase in Vietnam, conducted from 2005 to 2009, is now obsolete. The revolution of technology is advancing new customs systems. Therefore, the previous system applied in the trial phase was not used for a long time, and most procedures have been updated. Observability and cultural factors may have been insignificant, so these elements are tested in quantitative analysis. In order to comprehensively check the components influencing e-customs implementation in the proposed model, the interviewer asked some specific questions related to three factors. Some of these added questions were structured choices, with agree/disagree, due to the limitation of the interview time. The details are as follows:

Additional question 1: Do you think the trial phase of e-customs from 2005 to 2013 has a positive or negative impact on e-customs implementation at the moment?

All respondents confirmed the contribution and positive influence of the trial phase as the milestone that built up the foundation for the development of e-customs in the

present. CA_02 identified that *'no trial phase, no current e-customs'*.

Additional question 2: Have you directly observed GDVC, customs department, customs officials, and businesses implementing e-customs?

If yes, answer additional question 3.

Additional question 3: Based on your direct observation, internal documents, the media and word of mouth, could you achieve clear knowledge of the advantages and disadvantages of e-customs?

All interviewees directly observed the e-customs implementation by GDVC, customs departments, customs officials and businesses. They also agreed that both direct and indirect observation help them define the pros and cons of e-customs.

Added question 4: Do you agree with the statement below? (Agree/Disagree/Other)

4.1 Specific instructions for e-customs implementation are necessary.

100% of customs administrators responded with agree.

4.2 The function of customs agents and support teams should be enhanced.

Five respondents agreed, while 3 respondents disagreed. Others agreed with half of the statement, whereby they supported the internal assistant teams in carrying out e-customs procedures while they showed their uncertainty about the role and the disadvantages of outsourcing customs agents and external support teams due to information security problems and quality of customs agents.

4.3 Problem-solving ability of customs departments that can satisfy businesses.

Seven customs administrators agreed while others showed other opinions. They discussed that most of the problems related to e-customs procedures were solved well. However, they were not sure that the problem-solving ability of customs departments could provide total satisfaction for businesses.

4.4 Strict supervision of customs departments is necessary when implementing e-

customs.

100% of interviewees agreed.

4.5 Businesses find it easy to communicate and interact with customs departments.

100% of interviewees agreed.

4.6 Customs departments listen to the feedback of businesses and make policy decisions based on these reviews.

100% of interviewees agreed that feedback from businesses was listened to by customs departments, and the enterprises' opinions were considered as one of the bases for making policy decisions.

4.7 Customs departments are willing to share commodity information (origin, number, code) with other stakeholders, such as other ministries, distributors and warehouses.

All customs administrators showed their willingness to share information on goods with other ministries in a specialised management chain to support clearance; meanwhile, sharing information with others should be done carefully and needs the acceptance of their superior agencies due to information confidentiality.

4.8 Customs departments are ready to cooperate with partners (brokers, distributors, warehouses, airports and ports)

100% of interviewees agreed.

4.9 Customs departments and businesses should have a good relationship.

100% of interviewees agreed.

4.10 Customs departments concentrate on training staff.

100% of interviewees agreed.

4.11 Financial achievement (i.e., revenue from taxes and other fees) is the priority target of customs departments.

100% of interviewees agreed.

4.12 You personally support continuing and furthering the use of e-customs.

100% of interviewees agreed.

Q2: In your opinion, what are the inhibitors of e-customs in Vietnam?

The second question involved obstacles that businesses have to face when using e-customs. Twenty interviewees mentioned eight factors, including complexity of e-customs software; supplementary instruction documents; cooperation between businesses, customs, warehouses, enterprise associations and other partners; IT infrastructure; confidentiality; interoperability of technology and international standards among nations; and a lack of human resources and legislation. Specifically, 17/20 interviewees thought that the VNACCS/VCISS system is currently easy to use, however, the e-customs software was complicated in the beginning. Thus, customs staff and businesses have difficulties in adapting to the new management system. Mr Duc Thanh Le (2017), Director of IT and Customs Statistics Department, stated that the customs officers and enterprises got used to applying the previous system and had even only recently been trained to use it. Consequently, it took a while for them to become familiar with the new system. Switching e-customs and e-government systems not only costs a lot but also changes several procedures, instructions, paperwork and legislation. In addition, 18/20 participants presented that supplementary documents regarding instructing e-customs, especially introducing and guiding NSW and ASW, are necessary for customs officials to solve issues when businesses implement e-customs procedures. Almost all customs managers assessed that a lack of instruction on NSW and ASW creates difficulties for departments of GDVC and local customs departments to carry out and launch these projects. Based on the annual report of GDVC (2017), cooperation among ministries to set up and deploy NSW is important; however, the other ministries just have completed their foundation as the strategies have no specific guide for staff and businesses as well as GDVC. Furthermore, 15/20 respondents mentioned poor collaboration between businesses, warehouses, customs departments and other partners. The reasons are poor electronic data sources, weak collaboration among partners and

the ethics of business regarding information transparency. In previous times, the data storage of administrative agencies in the form of paperwork created difficulties in transferring online information. Furthermore, most firms, with the aim of not paying or minimizing taxes, do not let their information go public. Moreover, 16/20 interviewees identified that while the technological environment could satisfy the demand of using VNACCS/VCIS, there is inadequate IT infrastructure to build up and conduct NSW and ASW. At present, NSW has been built with GDVC responsibility as the core member through a website. There is no official system to deal with and analyse data in NSW. Confidentiality is the following barrier that was mentioned by 8/20 respondents. All information is stored online, which can pose risks in relation to the leak data of businesses and customs if the security of the e-customs system is not confidential. Moreover, e-customs could be delayed for a while, which can have an impact on the clearance flow of import and export goods. In some cases, the analysis system of e-customs could make mistakes if hackers change the design and structure of the system. Additionally, 14/20 participants considered the interoperability of technology and international standards to be a disadvantage that could be addressed to improve the VNACCS/VCIS system as well as approach NSW and ASW. Reasons stem from the inherent differences between the systems in terms of the syntactic structures, the embedded semantics, and the embedded logic of interchange agreements, business rules and work practices by employees (Roger, 2003; IBM, 2008, Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, & Baida, 2006; Choi, 2011; Urciuoli, Hintsa, & Ahokas, 2013). Organisations often have existing technological solutions and it is unrealistic to expect that they will adopt one integrated system. In such a diverse and distributed environment, it is impossible to achieve interoperability without establishing a degree of shared understanding through the use of commonly accepted standards (Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, & Baida, 2006; Urciuoli, Hintsa, & Ahokas, 2013). Besides, a lack of customs staff with professional skills and rich experience was determined as one of the obstacles to e-customs implementation by 16/20 respondents. Innovation and the development of the e-customs system require customs officials to keep improving their skills and qualifications in order to update and apply new methods. Hence, the labour demand and

requirements related to the quality of employees has increased steadily. Finally, 100% of participants stated that the legislation on e-customs at the moment needs to be amended and improved because a number of regulations are overlapping and incompatible. There are no documents instructing on the NSW system (Duc Thanh Le, 2017; Nhu Quynh Le, 2017; Minh Hai Ngo, 2017).

Q3: Based on your experience, could you give some recommendations to enhance the effectiveness and efficiency of the e-customs system in the future?

The third question refers to some suggestions for customs administrators to improve the e-customs system in the future. Based on the responses of 20 customs administrators, there are 5 categories of suggestions. The first one refers to improving the law and regulations system. 100% of participants suppose that the legal documents related to e-customs, NSW and ASW should be amended and updated. Mr Duong Thai Nguyen (2017), Deputy Director of GDVC, and Ngoc Phan Ho (2017), Deputy Director of Risk Management Department of GDVC, emphasised the necessity of promulgating updated administrative documents on time because decisions and instructions are usually slow after troubles arise. Some specific instructions for new e-customs projects, such as the automated management system in ports, should be supplemented. Moreover, the criteria and indicators of goods inspection should be set up and finished. In addition, legislation on e-customs should be propagated nationwide, which could apply to individuals, customs staff and businesses (Duong Thai Nguyen, 2017; Ngoc Anh Vu, 2017; Long Bien Kim 2017). Secondly, solutions regarding the process, procedures, database and system are nominated. As per Mr Duong Thai Nguyen's perspective (2017), administrative procedures should be reformed to be as simple as possible. The risk management system should be enhanced to adopt IT and new technology, for example, e-manifest, e-payment and e-license (Ngoc Phan Ho, 2017). Moreover, most opinions of customs managers in GDVC suggest focusing on developing NSW and ASW as well as e-public service 24/7 (Manh Tuong Luu, 2017; Minh Hai Ngo, 2017; Duong Thai Nguyen, 2017 and Ngoc Anh Vu, 2017). Mr Phuoc Viet Dung Nguyen (2017), Director of Binh Duong Customs Department, advised applying modern monitoring tools such as container scanning machines, surveillance cameras and automated customs

management in seaports, also known as VASSCM. Mr Ngoc Anh Vu (2017), Deputy Director General of GDVC suggested boosting the inspection and supervision of all levels of customs in the process of carrying out customs procedures. Furthermore, enterprise data should be collected, gathered, selected and analysed to support risk management and clearance decision. 100% of respondents approved deploying and expanding NSW and ASW. Collaboration and sharing information among customs, businesses and other partners was suggested by almost all interviewees. For example, Mr Ngoc Anh Vu (2017) discussed increasing the cooperation with the police market management, enterprise association and so on to collect firms' data to achieve accurate and quick clearance decisions. Moreover, government agencies should set up regular training sessions for businesses to promote new policies and procedures as well as listen to feedback from customers. Phuoc Viet Dung Nguyen (2017), Quoc Dinh Tran and Thi Bich Huong Phung (2017) recommended organising a dialogue between customs and enterprises to obtain an assessment and deal with difficulties that businesses encounter. Additionally, Mr Duong Thai Nguyen (2017) also described some achievements of the alliance between Vietnam Customs and leaders, such as the USA and New Zealand, to improve the e-customs system as well as transfer new technology. Based on cooperation with developed economies, Vietnam Customs could gain more experience and learn lessons in legislation, technology and human resources. The fourth category suggestion involves the skills and ethics of customs staff. Ms Thu Huong Pham (2017), Deputy Director of Human Resource Department of GDVC, emphasised conducting internal inspections with the aim of reducing corruption in customs. Furthermore, in plan 2018, leaders of customs departments could be rotated and deployed to consolidate their management skills and restrict their abuse of power. Moreover, it is important to set up training and workshops for customs officials to improve their profession and skills as well as their attitude and their awareness of customs modernisation, NSW and ASW (Duc Thanh Le, 2017; Long Bien Kim, 2017; Khanh Quang Nguyen, 2017 and Phuoc Viet Dung Nguyen, 2017). Another solution to develop the quality of customs staff is enhancing international cooperation with developed economies such as Australia, New Zealand and the USA (Thu Huong Pham, 2017). The final solution that customs administrators suggested focuses on developing a technological environment and IT

infrastructure. Some specific recommendations indicate the investment of the government and private sector via public-private partnership (PPP) on modernising the automated system. Customs managers propose technology transfer based on collaboration between Vietnam Customs and other leader countries.

Q4: What do you think is the role of the Japanese government as a third party supporting and transferring e-customs technology to Vietnam Customs?

100% of respondents were aware of the position of the Japanese government in investing, transferring technology and assisting Vietnam Customs to modernise and carry out e-customs. The VNACCS/VCIS systems is a solid foundation for developing customs systems in the future, including NSW and ASW. Vietnam has a history of support from the Japanese government across the areas of healthcare, infrastructure, education, and now, public administrative reform. This lattermost assistance began in the form of sharing experience on developing electronic security reports, annual state budget plans, a real estate register system, and a job register system (Thuy-Dung, 2011). The most significant assistance Japan has provided in this domain is the transfer of its own current e-customs systems to the Vietnam General Department of Customs. This new e-customs application is due to commence in 2014.

5.3.2 Results of the interviews with representatives of business

Q1: When did your business participate in or conduct e-customs?

The first question aims to collect information on firms' experience in conducting e-customs, which could have an impact on a business's assessment of the e-customs system. Three representatives of business associations and seventeen delegates of firms joined these interviews. Seven firms gained experience from doing e-customs over 1 to 5 years, while 10 other enterprises had carried out e-customs for five years. In conjunction with the description of the characteristics of the businesses joining the interviews above (section 5.2.1), an overview of the enterprises that participated in the qualitative interviews is illustrated in Table 5.1

Table 5.1 Overview of business joining interviews

Location	Number of enterprises with 1–5-year experience	Number of enterprises with over 5- year experience	Interview method
Hanoi	4	1	Face-to-face
Hai Phong	2	1	Phone
Ho Chi Minh City	1	3	Face-to-face
Binh Duong	0	3	Phone
Dong Nai	0	2	Phone
Total	7	10	Phone

Q2: In your opinion, what are the enablers of e-customs as well as the benefits that businesses can obtain when implementing e-customs?

Drivers were identified by 20 respondents, including time-savings, cost-savings, reduction of administrative document burden, deduction of data re-entry and fewer errors, convenience (24/7) and advance clearance. 100% of respondents support time-savings as the first facilitator of e-customs. Although they were sure that the time for travelling and data processing and clearance could be saved and reduced, 60% of firms confirmed that the time needed for post-clearance inspection procedures is still longer than the notifications that enterprises are informed of. In addition, all interviewees agreed on cost-savings regarding the costs of administrative management, faxes, phone calls, travelling to customs departments, storage and opportunity costs for goods to be approved for import or export in a short time. However, 25% of firms mentioned that they have to pay unofficial fees for customs staff to push the clearance process faster. According to the report of VCCI and Vietnam Customs (2016), 31% of enterprises agreed that they pay 'lobby fees' to avoid risks of delayed clearance and discriminatory customs officials. Many cases of customs officers receiving bribes have been denounced; for example, a customs staff in Cat Lai port of Ho Chi Minh City Customs Department took bribes with a value of approximately VND 1 billion, equivalent to over USD 40,000, in April 2018 (Vnexpress, 2018). Meanwhile, customs officials in Dinh

Vu port of Hai Phong Customs Department received lobby fees from enterprises in May 2018 (Vietnamnet, 2018). Furthermore, 14 participants (70%) accepted that burden of administrative documents has been restricted while 6 other firms gave the opposite view because they faced problems related to clearance and they had to submit complicated supplementary documents. 100% of respondents agreed that there is a decrease of time needed for data re-entry and fewer mistakes because all the information of firms has been stored and they can update it through the data system of VNACCS instead of re-declaring many times before applying for e-customs. Therefore, the number of mistakes when inputting information can be reduced. Besides, all interviewees support the convenience of the e-customs system wherein the companies can submit dossiers online 24/7, receive e-receipts and clearance results, as well as do e-payment for fees and taxes. Most procedures and steps are carried out online and 24/7 if the dossiers and goods are classified as green-line. Twelve respondents, with most having over 5 years of experience, mentioned that they can get clearance decisions before the goods arrive at the port or airport. Hence, their goods can be imported or exported conveniently and easily.

Obviously, all items offering a relative advantage were mentioned in the answers of the respondents. Similarly, the three elements of trialability, observability and culture did not appear in the responses of the interviewees in comparison to the results of the interviews with customs administrators above. Therefore, the added questions were applied again, as follows:

Additional question 1: Do you think that the trial phase of e-customs from 2005 to 2013 is having a positive or negative impact on e-customs implementation?

Just five enterprises in Hanoi, Hai Phong and Ho Chi Minh City had a view on the trial phase, while the others had no idea. All of them had over 5 years of experience in e-customs procedures, so they implemented import and export paperwork from 2013, after the trial phase was conducted. Furthermore, one firm came from Hai Phong and three enterprises were from Ho Chi Minh City, where the trial phase was carried out in the initial stage.

Additional question 2: Have you directly observed other businesses implementing e-customs?

If yes, answer additional question 3.

Additional question 3: Based on your direct observation, internal documents, the media and word of mouth, could you achieve clear knowledge of the advantages and disadvantages of e-customs?

All respondents answered 'yes' to the second in-depth question and all of them confirmed their awareness of the benefits and difficulties related to e-customs based on the direct observation via the e-customs implementation of other enterprises and indirect observation through reports, media and words of mouth in the additional question 3.

Additional question 4: Do you agree with the statement below? (Agree/Disagree/Other)

4.1 The specific instructions for e-customs implementation are necessary.

100% of interviewees responded with agree.

4.2 The function of customs agents and support teams should be enhanced.

Seven respondents agreed with this statement while others said they were 'not sure' because they were worried about the disadvantages of customs agents and support teams regarding revealed information, costs and quality service.

4.3 The problem-solving ability of customs departments can satisfy businesses.

Five of the responses responded 'agree' while thirteen other interviewees gave contrary opinions and two respondents were not sure.

4.4 Strict supervision of customs departments is necessary when implementing e-customs.

Six participants agreed with this statement while nine of the respondents disagreed and others illustrated their uncertainty.

4.5 Businesses find it easy to communicate and interact with customs departments.

100% of interviewees agreed.

4.6 Customs departments listen to the feedback of business and make policy decisions based on these reviews.

Three interviewees supported the statement above, eight respondents disagreed and others had doubts.

4.7 Businesses are willing to share commodity information (origin, number, code) with other stakeholders such as brokers, distributors and warehouses.

Twelve responses show agreement while others were doubtful about information security problems when sharing information with stakeholders

4.8 Customs departments are ready to cooperate with partners (brokers, distributors, warehouses, airports and ports).

100% of interviewees agreed.

4.9 Customs departments and businesses should have a good relationship.

100% of interviewees agreed.

4.10 Businesses concentrate on training staff.

100% of interviewees agreed.

4.11 Financial achievement (i.e., revenue, profit, growth) is the priority target of customs departments.

100% of interviewees agreed.

4.12 You personally support continuing and furthering the use of e-customs.

100% of interviewees agreed.

Q3: In your opinion, what are the inhibitors of e-customs in Vietnam?

The third question presents the barriers of e-customs in Vietnam when businesses conduct customs procedures. The responses of the interviewees are allocated into categories of the insufficiency of the coordination between business, customs departments and other functional agencies, the deficiency of customs staff's skills, and profession, legislation and solving problems. Firstly, 60% of the interviewees supposed that a weak connection between business and customs departments leads to the late updating of regulations and administrative documents. According to Mr Huy Giam Dao (2017), General Secretary of the Vietnam Private Economic Forum, there were a lot of problems after enterprises submitted dossiers; for instance, a number of companies were required to work with functional organisations such as the Department of Plan Quarantine or Animal Quarantine, to select certificates regarding the import and export of goods as well as submit the supplementary documents to customs departments. Some businesses described that customs departments did not ally with other administrative agencies to inspect the goods. The report of Vietnam Customs and VCCI (2016), based on a survey with 3,500 enterprises, stated the difficulties in carrying out e-customs procedures. In the stage of checking dossiers, 25% of respondents identified that customs departments and other administrative offices could not coordinate, 28% agreed that customs departments required supplementary documents that did not conform with regulations, 29% supported changing laws and regulations, 16% approved that customs officials did not instruct specifically and enthusiastically, and 15% determined that procedures and processes were not public. Thus, the fragile collaboration between firms, customs departments and other organisations is one of the crucial issues when conducting e-customs.

Secondly, 14 of 20 participants pointed out the inadequacy of customs staff with good and professional skills, experience and the attitude to deal with the problems. In particular, the ethics and attitude of customs officials are significant issues. Based on the opinions of nine businesses joining these interviews in 2017, customs staff have received 'lobby fees' from businesses, which influences transparency. Firms become worried that customs officials could use some reasons, such as overload dossiers and goods, to create disadvantages for enterprises, for example, asking for supplementary documents to be submitted. Therefore, firms have provided gifts or paid unofficial fees

for customs employees to prevent risks. According to a survey of Vietnam Customs and VCCI (2016), the regulatory compliance of customs staff is just 37% on average, while the professional qualification of customs officials is around and under 50%. In addition, customs employees do not update procedures and regulations, which causes delays in goods clearance as well as increases the costs for business (Vnexpress, 2018). Furthermore, Ms Thu Trang Phung, representative of Khai Minh Global Co., Ltd, demonstrated that the position of customs officials has changed a lot, which influences the way their deal with work and problems and businesses should adapt.

Thirdly, 100% of interviewees mentioned legislation as a significant obstacle to e-customs implementation. Although Vietnam Customs attempts to reform administrative procedures simply and conveniently, changing regulations many times makes the legislation system asynchronous, disunified and complicated. Based on the majority of respondents, businesses are usually in a passive position when the customs regulations change and they encounter difficulties in updating procedures immediately. That is the reason why firms could face issues related to the need to supplement more documents as well as delayed clearance when doing e-customs clearance procedures. Furthermore, customs staff at local departments are also confused about solving the problems of business when new trouble arises, e.g., regarding import and export taxes, and they need to wait for confirmation and answers from superior customs authorities.

Fourthly, the lack of ability of customs staff to solve problems at local departments creates a barrier for businesses to implement e-customs. According to Hoai Nam Nguyen (2017), Deputy General Secretary of the Vietnam Association of Seafood Exporters and Producers, customs departments in local provinces cannot deal with the problems of firms, so businesses have to travel and contact General Customs to obtain the solutions to their cases. Moreover, the solutions of customs departments are not specific, but rather they state the general regulations or the administrative offices require the businesses to supplement more documents and certificates that are not in essential lists. Additionally, late responses or time waiting for customs department answers increase the opportunity costs and storage expenses of enterprises.

In addition, there are some inhibitors that businesses mentioned, such as confidentiality,

interoperability of technology and international standards. Three representatives of business associations agreed on the need to ensure the confidentiality of firms' information when data are saved and transferred via the Internet and electronic systems. Although the online way is convenient, it threatens information security if hackers and scammers attempt to obtain information or viruses attack the database. Besides, five participants, including three representatives of firm associations and two companies, identified the shortage of international standards when businesses expect to expand export markets internationally. Therefore, building and completing NSW and ASW is necessary.

Q4: What do you think is the influence of e-customs on your firm's performance? For example, are financial performance and strategic performance related to customers and their employees and administrative materials?

The first perspective interviewees mentioned was the shortened time for import and export, which was supported by 100% of respondents. After some specific questions regarding the profit and growth of firms, 12/20 interviewees stated that their profit could improve positively and 15/20 respondents agreed that business growth increases. Moreover, 100% of participants went paperless when conducting e-customs because they just submitted dossiers online and all information could be stored and sent through the VNACCS/VCIS and NSW systems. Additionally, 13/20 interviewees, including three representatives of business associations and 10 firms with 5-year experience in doing e-customs, stated that customs satisfaction could increase based on e-customs adoption because goods could be delivered faster with quick clearance and with the easy steps for submitting dossiers. In contrast, seven enterprises with 1-5 years' experience could not identify a change in customs satisfaction. Furthermore, regarding the specific question referring to the loyalty to customers, eight respondents agreed that they had a good relationship with customers and that the number of loyal customers had gone up since they began applying e-customs. Besides, 17/20 participants stated that the complaints of their customers had decreased because of the benefits provided by e-customs. Regarding employee satisfaction, 50% of interviewees thought that their staff felt more comfortable and had greater convenience when carrying out customs

procedures because of the use of ICT to deal with issues related to import and export. Finally, 15/20 participants (accounting for 70%) assessed that the overall performance of their firms was improved due to e-customs and 100% intended to use e-customs in the long term.

Q5: Based on your experience, could you give some recommendations to enhance the effectiveness and efficiency of the e-customs system in the future?

The perspectives of 20 interviewees focused on the two crucial solutions of law and regulations as well as the customs process, procedures, and system. 100% of interviewees wanted Vietnam Customs to keep simplifying the administrative procedures and regulations and wanted to be able to complete customs legislation systematically, such as in HS code and tax policies. Firms also wished to remove tariff barriers to facilitate international trade for businesses. According to the opinion of Mr Huy Giam Dao (2017), General Secretary of the Private Economic Forum of Vietnam, Vietnam Customs should ensure fair treatment between internal firms and FDI companies because FDI enterprises now have priority policies when they do e-customs procedures. Mr Hoai Nam Nguyen (2017), Deputy General Secretary of the Vietnam Association of Seafood Exporters and Producers, discussed that the Director of the Customs Reform Team should be a leader who receives the problems of firms regarding customs procedures to reduce the time in dealing with their complaints. Furthermore, automated solutions to classify goods in advance should be focused on because this helps businesses shorten the clearance time. Vietnam Customs could promote electronic connections and updated IT adaption in procedures for the liquidation of declarations in port and e-bills of landing. Especially the clearance time for seafood and vegetables in airports should be reduced from 2 hours to 60 or 90 minutes (Huy Giam Dao, 2017). Based on Vietnam Customs and VCCI (2016), enterprises presented some aspects that Vietnam Customs should pay attention to, such as reforming customs paperwork and procedures simply and conveniently (83%), improving the quality of information supply immediately and on time (59%), enhancing the relationship between businesses and customs departments (56%), developing IT applications (50%), increasing transparency (46%), improving customs staff's professional skills (37%) and upgrading

facilities (35%).

Q6: What do you think the role of the Japanese government is as the third party supporting and transferring e-customs technology for Vietnam Customs?

16/20 interviewees had no perspective of the Japanese government's role as a third party assisting Vietnam Customs to develop e-customs. After being provided with this information, these companies expressed their trust in VNACCS/VCIS because this system was transferred from and invested in by Japan – a leading nation. Two participants who are members of business associations were aware of this and clearly and highly appreciated the responsibility of the Japanese government in helping to set up and improve e-customs in Vietnam. Meanwhile, two interviewees knew about the partnership between Japan and Vietnam in deploying customs modernisation via the media. The participants who have an awareness of the responsibility of the Japanese government in enhancing e-customs in Vietnam stated that the Japanese government's assistance in transferring the technology named Nippon Automated Customs Clearance (NACCS) for Vietnam Customs as well as providing non-refundable aid supported Vietnam in building up and modernising its customs system. Furthermore, Japan also helped Vietnam Customs train employees to adapt to the new system and sent experts and working teams to Vietnam to cooperate and co-work with Vietnam Customs. Based on the report of JICA (2013), Japan and Vietnam have had a historical partnership for a long time and a commitment between Japan Customs and Vietnam Customs was established in order to develop the project of the modernisation and internationalisation of customs administration from 2004 to 2010, while the e-customs and NSW projects ran from 2011 to 2015. Moreover, this report also identifies Japan's support of developing the legal system and strengthening the fiscal and administrative capacity for Vietnam (JICA, 2013).

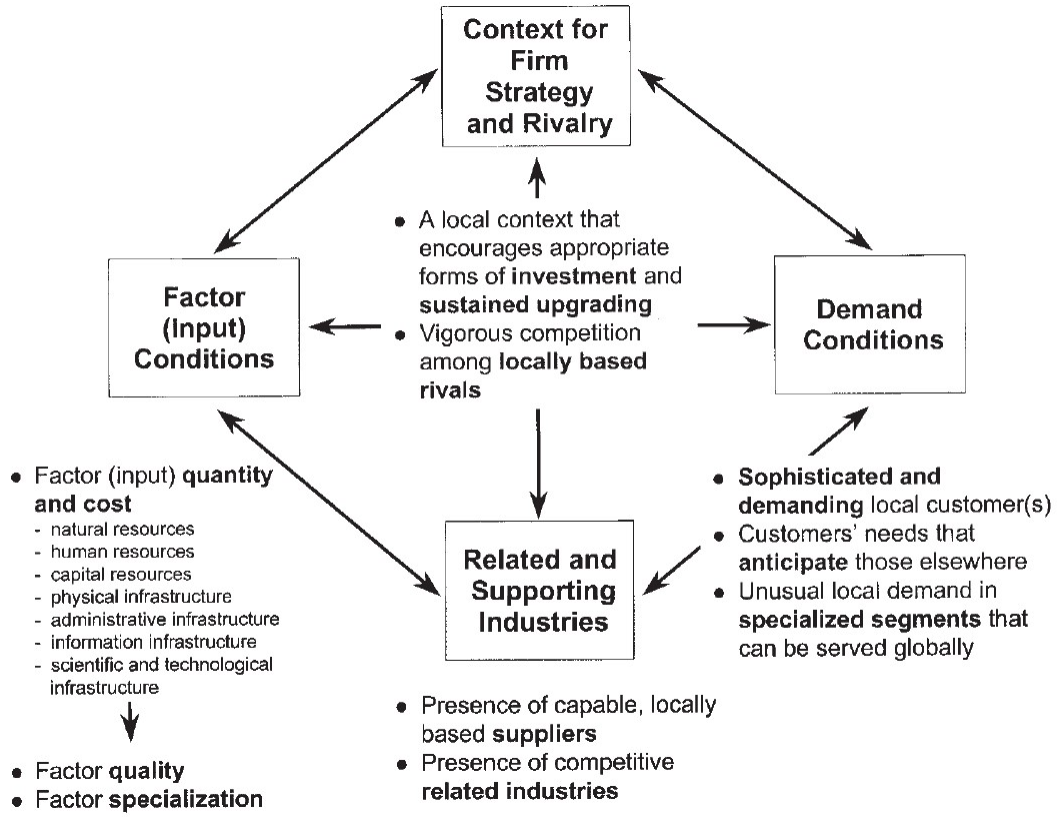
The reasons for the different perceptions between the two interviewee groups of customs administrators and businesses could come from the distinctive responsibilities and perspectives related to the relative advantages they perceive as well as their different targets. Vietnam Customs as policymakers take charge of facilitating companies journey through legislation and agreements, while enterprises, who have the

role of users, pay attention to the relative advantages that they can obtain from decisions of the government, such as policies, laws, regulations, business environment and public services.

~~***Cluster theory reveals the reasons for Japan's investment***~~

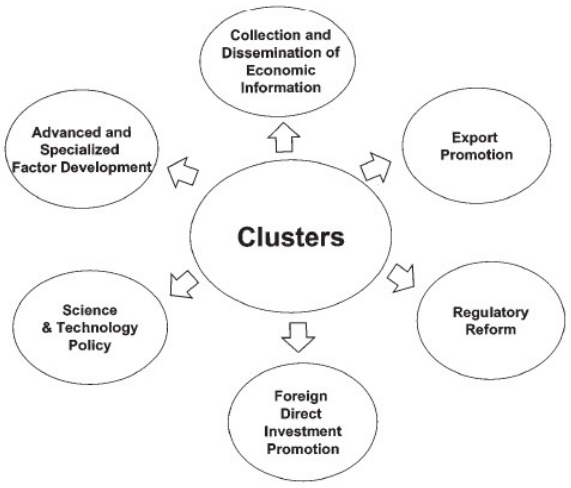
~~The cluster concept was built up based on economic concentrations on the regional level. Marshall (1890) illustrated these concentrations as 'industrial districts', with the primary factor regarding geographic proximity. Michael Porter's viewpoint (2003) explained that "clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate". Cluster theory using the diamond model of Michael Porter, referring to the definition of competitive advantages regionally, is popular with policymakers (Swords, 2013). The competitive advantages provided by clusters are mentioned in three aspects, namely improving the current productivity of the constituent enterprises or industries, enhancing the capacity of cluster participants for innovation and productivity growth, and encouraging new business formation that assists innovation and expands the cluster (Porter, 2000).~~

~~Figure 5.2 Porter's competitive diamond (Porter, 2000)~~



~~Porter's theory and model (2000) also identified the role of the government in cluster upgrading, and some policy areas were recommended, such as policies in science and technology, education and training, export and foreign investment promotion, and various others. Understanding cluster theory could support policymakers to set up a cluster mapping and development strategy (Swords, 2013).~~

~~Figure 5.3 Cluster and Economic Policy (Porter, 2000)~~



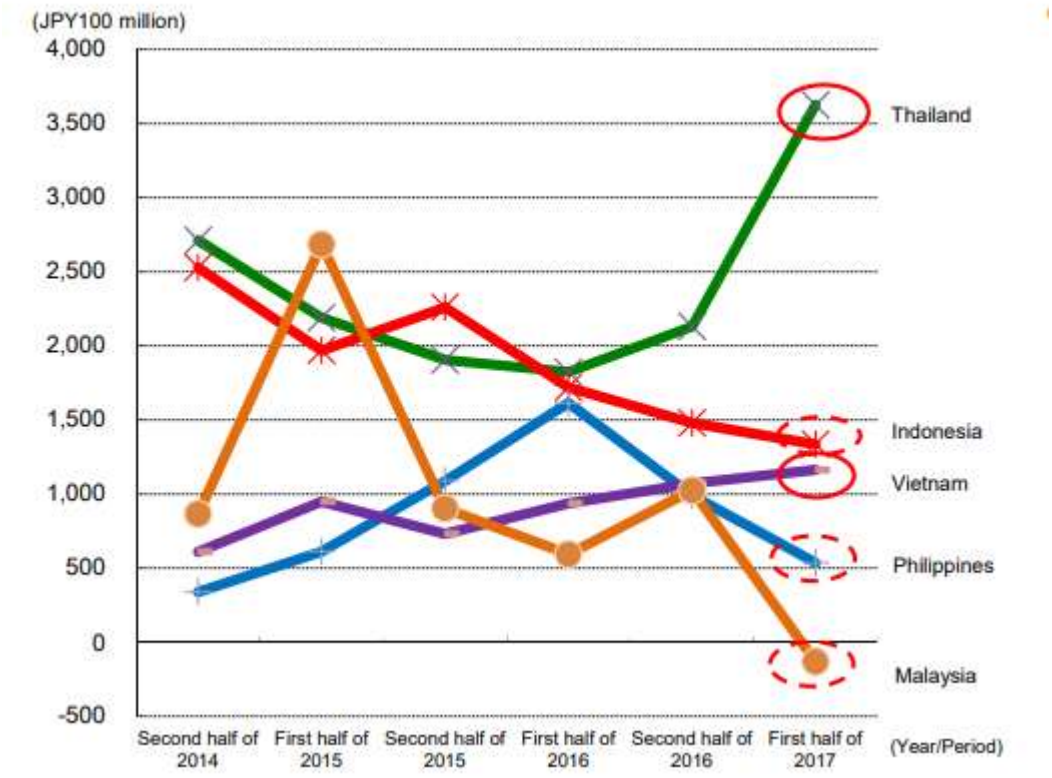
Case in Vietnam

Vietnam is an emerging country with significant GDP growth of 6 to 7% per year since 2000. Vietnamese imports and exports, in particular, have been increasing significantly, reaching approximately USD 426 billion in 2017 with a 21% growth (GDVC, 2017). In addition, investment and trade policies are opening up and integrating internationally to enhance national competitive advantages. According to Hollweg et al. (2017), Vietnam is assessed as a potential destination and a manufacturing powerhouse in Asia. In particular, the automotive, electronics, agriculture, textile and apparel industries have developed with substantial performance. The export-orientated strategies of Vietnam provide benefits for the national economy, such as job opportunities and creation, economic development and decreased poverty. PwC (2017) suggests that Vietnam could make the greatest move up the rankings of the global economies, from 32nd place in 2016 to 20th place by 2050, with an average annual GDP growth rate of 5.1%. Moreover, with its participation in the WTO in 2007 and the Trans-Pacific Partnership (TPP) in 2016, Vietnam could come into the spotlight as an export hub and market.

Consequently, with competitive advantages such as deep integration, open and promoted policies, low-cost labour, considerable growth and geographic location facilitating trade, Vietnam has become a potential market for Japan's Foreign Direct

Investment (FDI). According to Miuho (2017), Japan's FDI trends toward Asia focus on China and the ASEAN-5 (Thailand, Malaysia, Indonesia, the Philippines and Vietnam). This report also described the growth of Japan's FDI in Thailand and Vietnam while the investment flows declined in Indonesia, Malaysia and the Philippines.

Figure 5.4 Japan's FDI toward ASEAN-5 (Miuho, 2017)



Japan's FDI in Vietnam remained strong in the electrical equipment sector of the manufacturing industry (Figure 5.4). Investment increased not only in the production of electronic parts with small motors, as traditional support, but also in new industries such as semi-conductors related to components and wiring equipment to satisfy domestic demand. Furthermore, a number of new factories producing medical equipment have been built, causing an increase in investment in the chemical and medical sectors. In addition, the FDI for transportation equipment, general machinery and precision equipment sectors is stable. Therefore, Japanese business leaders, such as Canon and Panasonic in electric equipment, Nissei, Santomas, and Yasufuku in electric components and accessories, and Honda, Nissan and Toyota in auto manufacture, have

established industrial clusters in the three busiest cities in the North of Vietnam, namely Hanoi, Hai Phong and Bac Ninh, forming a triangle of development (Department of Industrial Zone Management, 2015). The Vietnamese Ministry of Investment and Planning (2015) also confirmed that some of the industrial clusters are covered by 100% of Japanese companies.

Table 5.2 Japan's FDI toward Vietnam (By industry)

(Unit: JPY100 million)

Industry/Year	Second half of 2014	First half of 2015	Second half of 2015	First half of 2016	Second half of 2016	First half of 2017
Manufacturing	474	819	644	506	629	724
Food products	55	58	20	-62	36	22
Fiber	3	3	10	15	33	15
Wood and pulp	14	11	7	19	40	19
Chemicals and medical	71	45	83	37	157	125
Oil	11	238	182	3	0	0
Rubber and leather	-4	38	8	2	-30	-32
Glass, soil, and stone	30	-16	-2	36	23	39
Iron, non-ferrous metals, metals	30	45	75	69	20	32
General machinery	87	68	40	42	41	140
Electrical equipment	36	146	40	133	146	135
Transportation equipment	70	87	116	120	121	108
Precision equipment	16	43	29	75	32	114
Non-manufacturing	136	130	87	430	441	439
Agriculture and forestry	2	0	3	3	0	0
Fisheries	0	0	0	0	0	0
Mining	0	-6	0	0	0	0
Construction	-40	-31	18	11	13	27
Transportation	0	16	5	17	24	32
Communications	0	10	0	7	5	0
Wholesale and retail	-22	-75	-57	166	7	58
Finance and insurance	107	104	71	121	345	163
Real estate	51	57	13	28	4	88
Services	37	47	6	37	34	51
Total	610	949	731	936	1,070	1,163

Note: Investment of JPY 10 billion and above are shown in the cells shades in grey

Source: Bank of Japan, Balance of payments

On the other hand, Japan is the fourth biggest partner of Vietnam (behind China, the USA and Korea) and the third biggest market for imports (after China and Korea) and exports (after the USA and China) (Vietnam Export, 2018). Based on GDVC's statistics (2018), four categories of goods were primarily imported from Japan in the first four months of 2018. Firstly, machines and equipment were imported from Japan amounting

to USD 1.41 billion, accounting for 24.9% of the import turnover, an increase of 0.9% compared with the same time last year. Secondly, computers, electrical products and electric accessories were imported into Vietnam with a value of USD 1.16 billion corresponding with 20.6% that develops 29.3%. Steel and iron were ranked the third importing position and auto components and equipment followed these. Additionally, computers and devices; machines and equipment; mobile phones and electronic accessories; steel; and chemicals have been listed in the top ten export goods. Moreover, thousands of categories imported from Japan could achieve tax incentives based on the Vietnam- Japan Economic Partnership Agreement (VJEPA) and ASEAN-Japan Comprehensive Economic Partnership Agreement (AJCEP). In particular, a 0% tax rate has been applied for machines, equipment, electric components, steel and products from steel (Finance Magazine, 2018).

In conclusion, Japanese investors set up their own companies, branches and factories in Vietnam as out-sourcing manufacturers as well as warehouses and distributors of Japanese businesses in an area that is convenient for international trade. Setting up the industrial clusters in Vietnam could support Japanese enterprises in utilizing the local competitive benefits as well as expanding their market. Hence, demand regarding facilitating trade for Japanese FDI business in Vietnam should be satisfied. The assistance of Japan Customs with the aim of modernising and reforming the Vietnam Customs system could enable this need to be addressed.

5.4 CHAPTER SUMMARY

The author conducted 40 interviews with 20 customs administrators and 20 business representatives (managers or persons in charge of import and export). In particular, two general leaders of Vietnam Customs, eight managers in functional departments of GDVC and ten directors of local customs departments in cities and provinces participated in this research. Furthermore, eight businesses and two representatives of enterprise associations also responded to these interviews. Both sides answered the questions related to the motivators and obstacles of e-customs implementation in Vietnam and their perspectives of the Japanese government's support. Both customs administrators and firms agreed on the enablers of e-customs, referring to relative

advantage factors including time-savings, cost-saving, the burden of administrative documents, data re-entry and errors, risk management, convenience and advance clearance. However, three elements suggested in the literature review did not appear in these interviews, namely trialability, observability and culture. The inhibitors of e-customs conduction discussed in the interviews match the proposed model in theory, including complexity; incompatibility (IT skills and equipment, interoperability of technology, international standards and confidentiality); difficulties in financial and human resource issues; and legislation deficiencies. Moreover, the participants mentioned two other factors as the barriers, such as cooperation among stakeholders and the problem-solving ability of customs. The different opinions were also illustrated in the responses, for instance, disparate perspectives from two aspects (policymakers as customs and customers or users as firms) or different views within internal. Regarding the influence of e-customs on business performance, almost all enterprises focused on the financial outcomes while strategic achievements were described when the interviewer posed specific questions. Finally, the participation of the Japanese government as a third party, assistant, investor and supporter of Vietnam Customs was explained based on cluster theory.

As the result of the qualitative interviews, the factors and relationship between constructs described in the proposed model are confirmed and ready for the next step of survey examination. In particular, although the interviewees among the customs administrators and businesses did not mention the three enablers of trialability, observability and culture, as discussed in the literature review and the proposed model, they were aware of the impact of these factors on e-customs implementation in Vietnam, as shown when the interviewer posed four more in-depth questions (additional questions 1, 2, 3 and 4) to comprehensively investigate the significance of the factors. Hence, trialability, observability and culture were retained and examined in the survey outlined in Chapter 6 and Chapter 7. Regarding the obstacles of e-customs implementation, two factors were added due to the enterprises' responses, namely 'cooperation among stakeholders' and 'problem-solving ability of customs'. These have some similarities with the two items (statements 4.8 and 4.3 respectively) of culture in additional question 4, referring to the fact that the '*Problem solving ability of customs*

departments can satisfy business' and that '*Customs departments are ready cooperate with partners (brokers, distributors, warehouse, airport and port)'*. Therefore, these two opinions are not separated as independent factors and are investigated as two items of the culture construct. Finally, the support of the Japanese government for Vietnam Customs provides a picture of e-customs development in Vietnam; hence, this research intends to explore the influence of a third party on e-customs implementation. Although all customs administrators fully perceived the contribution of Japan as the third party to e-customs deployment in Vietnam, most businesses were unaware of the role of the Japanese government. Based on the advice of customs administrators in GDVC and the representatives of business associations as the experts on e-customs in interviews on the impact of a third party, careful considerations were made about including this issue in this research. This is because only the minority of users know about the support of the Japanese government in building up the e-customs system in Vietnam, while the targets in the survey are businesses and customs officials as the end-users of the e-customs system and procedures. Thus, the reliability of this factor is not guaranteed. Consequently, the researcher followed the suggestion of experts to remove factors related to the impact of the third party's role on e-customs implementation in Vietnam. In conclusion, the conceptual model proposed in Chapter 3 (Section 3.6) is unchanged and the researcher can test this model in the following chapters.

CHAPTER 6

QUANTITATIVE ANALYSIS FROM THE BUSINESS PERSPECTIVE

6.1 INTRODUCTION

Chapter Six illustrated the results of the main questionnaire survey, which was conducted from January to March 2018. This chapter discusses the pilot and the main surveys that were conducted in steps 3 and 5 of the data collection process. The data collected through a questionnaire were handled by AMOS to test the reliability and validity of the variables. CFA and SEM were performed to analyse quantitative research of these stages. In this chapter, the study framework as well as the general confirmatory factor analysis and structural equation modelling are discussed. Then, the data collection method is illustrated with more details regarding the sample, the survey contact and the content of the questionnaire. Next, factor analysis with EFA was carried out. The following step of data analysis was to validate the measurement model by using CFA. The practice of SEM to assess the relationships (paths) between constructs and to validate the research model is introduced. Finally, the alternative model is presented.

6.2 SURVEY FOR BUSINESS

6.2.1 Sample of survey for business

The target population of the study includes all export and import businesses in six large provincial customs departments. Based on the report of GDVC (2017), around 70,000 businesses apply e-customs.

As Neuman (2006b) pointed out, the appropriate sample size depends on (1) the degree of accuracy required, and (2) the number of different variables to be examined simultaneously in the data analysis. In consideration of the first requirement, as noted in Chapter 3, the minimum sample size should be based on two input factors, namely population (N) and the confidence level (p-value), as shown in the following formula:

$$n = \frac{N}{1 + N\,(e)^2}$$

With N = 70,000 and e = 0.05 (95% confidence), the minimum appropriate sample size (n) is calculated as 397. For the second requirement, Neuman (2006b) suggested a rule of thumb that there should be at least 50 cases for each subgroup to be analysed simultaneously. In our analysis, the maximum number of subgroups considered at a time is three. Thus, the sample size should be at least 150 cases, but it should be larger if (as expected) the distribution across the subgroups is not even. In short, we would like to achieve a sample size of 397, or (if possible) larger. However, we were able to collect responses from no more than 439 legal respondents, and 58 of them did not provide answers (or provided invalid answers) to some of the questions.

The questionnaire survey was conducted from January to March 2018. ~~Over 500~~ Businesses in areas that were under the supervision of five provincial, inter-provincial and municipal departments of customs – those of Hai Phong, Ha Noi, Dong Nai, Binh Duong, and Ho Chi Minh City – were selected, because most goods are imported or exported through ports located in these departments' areas of responsibility.

It was expected that if business personnel were to be independently approached without any (formal or informal) indications of support from the customs authorities for the survey and associated study, the response rate would be very low indeed. Therefore, a full explanation of the purposes and proposed methods of the survey, including the text of the questionnaire, was provided to the GDVC authorities. As a result, the author was given cooperation at the province (customs departments) and district (customs branches) levels in distributing and collecting the questionnaire forms.

A broadly stratified sampling approach was adopted, whereby sets of questionnaire forms were distributed to the various customs departments selected. In turn, each department's set of allocated forms was further sub-divided for distribution to district-level customs branches. The author asked for the list of enterprises whom the customs branches were responsible for management. As the result, the author had a list of over 6,000 firms and their contacts in five cities in total.

There were two ways that the author was used to conduct the survey. In the first channel (direct approach), at the customs branch level, the researcher approached people from business who came customs authorities to do import and export procedures. In the beginning, some basic information of company (name, adress and contact) was asked and noted by the author in order to eliminate the cases from the same company when sending-out questionnaires to a lot business at the same time. After that, the questionnaires were distrubuted directly. While they were waiting for their turn, they could complete the survey from 15 to 20 minutes and gave the author back before they left customs branches. At the end of the day, the researcher summarise information of companies that were collected on that day and ticked/ noted the valid responses into the list that customs branches provided with the aim of avoiding dupication companies in the next steps.

On the following days, the author repeated this activities to collect more questionnaires. Before distributing questionnaires, the researcher asked name and information of companies first and double check with the ticked/ noted list so as not to be duplicated with previously surveyed companies. With enterprises who did not participate in the survey or carried-out before but invalid response, the questionnaires were distributed and collected on day. Fortunately, each SME had one or two specialists or employees who have responsibility for customs process. Hence, if they had answered the questionnaires already, they would confirm and the author was not confused. Especially, in Binh Duong and Dong Nai, the researcher had opportunity to join investigation scheme of customs departments and customs branches in concentrated industrial park. In this occasion, the author had chance to meet and distribute questionnaires to different enterprises as well as save their information to contact and receive their responses in 3 to 5 days later.

The second channel to conduct survey is indirect way. By following the list of enterprises from customs with company's name, adress and contact, the author chose the companies did not implement the survey and called in advanced, after that, sent hard-copy questionnaires via post or soft-copy with the link of web-based survey through email depending on the choice of firms. With the hard-copy, the author prepared

the stamps and envelopes with printed return address and number for enterprises to send their responses back. The researcher liaised with the representatives of companies to ensure that they received questionnaires or email. In case of web-based survey sending via email, the business just sent email to confirm after they completed the survey. If firms used paper-based survey through post, the author would contact again after 5 days they received the questionnaire and push them to return their responses.

Having the list of companies implementing customs procedures with customs authorities' support, asking basic information of enterprises (name, address and contact) before distributing questionnaires to avoiding duplication, summarizing/ ticking and noting the firms' imformation in the end of the day, participating the investigation scheme of local customs departments helped the author invite companies into the survey as well as manage to get representative number of responses from different firms and avoid sample bias.

Almost responses were collected by the direct method which accounted for 80% of survey's result while 20% of result came from indirect approach. In particular, the author followed up visits, emails and phone calls to increase response rate of above 60 percent. A total of 630 forms were distributed, of which 439 were returned – an overall response rate of 69.7% – of which 381 were fully usable responses (usable response rate = 87%).

This study aims to find out a consistent model of the factors influencing e-customs implementation and firm performance based on perspectives from two stakeholders (customs officials and business) while the control variables are different between the stakeholders. Consequently, the control variables are not analysed here. Lack of analysing the impact of control variables in the proposed model is considered as one of the limitation of this study.

6.2.2 Sample chracteristics

Table 6.1 describes the characteristics of the sample, for example, the customs department location where the businesses implement e-customs procedures, ownership,

industry in which the businesses operate, capital size of enterprises and years of experience of customs implementation.

Table 6.1 Description of sample

	Number	Proportion
Customs department location		
Hanoi	67	17.6
Hai Phong	53	13.9
Ho Chi Minh City	113	29.7
Binh Duong	78	20.5
Dong Nai	70	18.3
Ownership		
Private	224	58.8
FDI	150	39.4
State-owned	7	1.8
Industry of business		
Agriculture, forestry and fishery	87	22.8
Industry and construction	123	32.3
Trade and service	171	44.9
Capital size		
Below VND 10 billion	183	48
VND 10-20 billion	137	36
VND 20-50 billion	40	10.5
VND 50-100 billion	21	5.5
Experience- year of e-customs implementation		
Below 1 year	46	12
1-5 years	187	49.1
Above 5 years	148	38.8
Total	**381**	**100**

Customs department location: There are five cities where respondents carried out import and export procedures. Ho Chi Minh City, with the largest ports and contributing over 50% of the GDP of Vietnam, had the most valid responses with 113 and 29.7%, respectively. Binh Duong and Dong Nai were following with 78 and 70 valid questionnaires, representing 20.5 and 18.3% of the sample, respectively. Then, 67 businesses, accounting for 17.6% of the 381 respondents, were collected in Hanoi. Finally, 53 respondents (accounting for 13.9 %) were collected in Hai Phong.

Ownership: The 381 enterprises with valid questionnaires participating in this survey were divided into three types of ownership. The majority of firms (224 enterprises,

accounting for 58.8%) were private while the numbers of FDI and stated-owned business were 150 and 7 companies, respectively, representing 39.4 and 1.8% of the sample, respectively.

Industry of business: The three categories of industry in which businesses operated in were (i) agriculture, forestry and fishery; (ii) industry and construction; and (iii) trade and service. Most businesses in this survey were in trade and service, with 171 enterprises making up 44.9% of the 381 samples. 123 firms, representing 32.3%, operated in the second group (industry and construction). The category of agriculture, forestry and fishery had 87 respondents, accounting for 22.8%.

Capital size: The businesses in this survey were categorised into four groups related to capital size. 183 enterprises (48%) responded that their capital was below VND 10 billion. The group with a capital size of VND 10 billion to 20 billion had 137 firms, accounting for 36% of businesses. Moreover, 40 business participants, representing 10.5% of the sample, were in the third group, from VND 20 billion to 50 billion. The final group (from VND 50 billion to 100 billion) just had a minority, with 21 companies (5.5%). No business with capital above VND 100 billion participated because this study focused on companies with a small or medium size.

Years of experience in e-customs implementation: Respondents were sorted into three groups of below 1 year, from 1 year to 5 years, and above 5 years. Most of the enterprises (187 firms, representing 49.1%) joining this study had 1 to 5 years of experience with e-customs adoption. Next, 148 companies, accounting for 38.8% of the sample, confirmed that they had over 5 years of experience in implementing import and export procedures. There were 46 businesses, accounting for 12% of respondents, with e-customs experience below 1 year.

6.2.3 Survey instrument

Both the questionnaires for the customs officials (analysed in the next chapter) and for businesses (this chapter) were designed based on conjuction between the theory of DOI by Rogers (2003), the institutional theory, Hofstede's cultural dimesions and the preliminary information which was gathered from documents relative to the

implementation of e-customs in Vietnam (see Chapter 2). These have been applied in the e-government domain by, among others, Raus et al. (2009), Conrad (2009), Gerpott (2011), and Hameed et al. (2012). Based on the literature review on e-government and e-customs , the content of the instrument was also established and developed.

A copy of the questionnaire instrument (in both English and Vietnamese) is contained in Appendix. The first part asks the respondents to provide information about the basic characteristics of the business, including customs department location, ownership, the industry of the business, capital size and years of experience in e-customs implementation. The second part, a series of statements about the enablers and inhibitors influencing e-customs and about the impact of e-customs on business performance, used a 5-point Likert scale allowing each respondent to express the extent to which they agreed with each individual statement. For convenience, below we shall refer to (the substance of) each such statement as a questionnaire "item". The items used in this survey were first derived from similar items from previous studies in the literature and from our own preliminary research; they were then revised after being piloted and consulted on with a small number of businesses and scholars.

Table 6.2 presents a summary list of the main questionnaire items. For example, Item 1, with the mnemonic "Time savings", is associated with the statement "E-customs can reduce the time required for travelling, data processing, and customs clearance", and the relevant rating ranges from 1 for "Strongly Disagree" through 3 for "Neither Agree Nor Disagree" to 5 for "Strongly Agree".

Table 6.2 Items in questionnaire survey

No	Survey items	Description	Sources
Relative advantages			
1	Time savings	E-customs can reduce the time for travelling, data processing, and customs clearance.	Granqvist, M., Hintsa, J., & Männistö, T (2011); Choi (2011); Raus, (2009, 2010)
2	Cost savings	E-documents and online submission instead of paper documents result in cost reduction and reduced travel costs.	Raus (2009, 2010), Granqvist, Hintsa, & Männistö (2011), Urciuoli, Hinsta and Ahokas (2013); Granqvist, M., Hintsa, J., & Männistö, T (2011);
3	Fewer data errors	The application of e-customs technologies reduces the number of data entry errors.	Raus (2010); Granqvist, Hintsa, & Männistö (2011).
4	Reduction in the burden of administrative documents	Adoption of e-documents and e-records helps e-customs decrease the pressure of administrative documents.	Dam (2013); to Henningsson & Andersen (2009)
5	Convenience with 24/7 system	It is convenient to submit the customs dossier and to receive receipts and clearance outcomes because of 24/7 availability.	Aoyama (2008); Amin (2010)
6	Risk management	E-customs enhances risk management and anti-smuggling.	Gordhan (2009) and Biljan (2012); Choi (2011)
7	Advance clearance	Businesses can submit customs dossiers and get e-customs clearance in advance (before goods arrive at port).	Dam (2013)
Trialability			
8	Perspectives of the trial period 2005-2013	Businesses have an awareness of the trial phase from 2005 to 2013.	Raus (2010), Dam (2013)
9	Previous experience of businesses	Businesses that are about to implement e-customs can readily learn from the experiences of previous businesses.	
Observability			
10	Direct observation/knowledge regarding the e-customs application of other business	Business personnel have directly observed other businesses applying e-customs.	Raus (2010); Byrne & Golder (2002)
11	Indirect knowledge of the advantages and difficulties	Through internal documents, the media and word of mouth, business personnel have gained clear	

		knowledge of the advantages and difficulties of e-customs.	
Incompatibility			
12	Inadequate skills and technological equipment	IT skills and equipment in the business are inadequate for e-customs application.	Shalehi (2010); Salehi, Alipour & Yahyavi (2010); Mustonen-Ollila & Lyytinen (2003)
13	Weakness in syncing compatibility with other countries	Vietnam e-customs have difficulties in syncing compatibility with systems of other countries.	
14	Weakness in confidentiality	Internal information and data of the business and e-customs system can be leaked.	
15	Weakness in international standard compatibility	E-customs system of Vietnam is poorly compatible with international standards.	
16	Difficulties in software upgrading or transformation	E-customs software is difficult to upgrade and transform.	
Culture			
Uncertain avoidance			
17	Specific instructions to apply e-customs	Specific instructions on applying e-customs are necessary.	Warkentin et al. (2002); Hujran et al. (2011)
18	Promote the function of customs agencies and support team	Responsibility of customs agents and support teams is given attention.	
19	Problem-solving ability	Problem-solving ability of e-customs departments can satisfy businesses.	
• **Power distance**			
20	Strict supervision of customs departments	Strict supervision of customs departments is necessary when applying e-customs.	Warkentin et al. (2002); Hujran et al. (2011)
21	Interactive ability between customs and business	Businesses find it easy to communicate and interact with customs departments.	
22	Policy decisions based on business feedback	Customs departments listen to the feedback of businesses and make policy decisions based on these reviews.	
• **Collectivism/ Individual**			
23	Sharing information	Businesses are willing to share commodity information (the origin, number, code) for customs departments, brokers, distributors and warehouses.	Hujran et al. (2011)
24	Alliance among partners	Businesses are ready to cooperate with partners (brokers, distributors, warehouses, airports and ports).	
25	Relationship between business and customs	Customs departments and businesses should have a good relationship.	
• **Masculine/ Feminine**			
26	Focus on HR training	Businesses concentrate on training staff/	Hujran et al. (2011)

27	Financial achievement	Financial achievement is the priority target of a firm.	
• **Long-term/ Short-term orientation**			
28	More investment in customs in the future	You personally support continuing and furthering the use of e-customs.	Hujran et al. (2011)
Complexity			
29	Data loss online	Customs dossiers are often incomplete due to data losses during transmission over the Internet.	Goossenaerts, Dreverman, Smits & Exel, (2006); Raus (2009, 2010)
30	Complicated and difficult to use e-customs software	The e-customs software is complicated, inadequate, and difficult to use.	
Difficulties in financial and human resource			
31	Adequate financial effort	Businesses have adequate financial resources to install and join e-customs.	Urciuoli, Hintsa, & Ahokas (2013)
32	Financial support	Businesses can receive financial support from commercial banks or financial organisations for the e-customs participation plan.	
33	Adequate human resource	Quantity and quality of employees of firms can satisfy to apply e-customs	
Legislation deficiencies			
34	Unification of legislation	Regulations and administrative legal documents are duplicated and unified.	Holzner (2009), Raus (2010)
35	Compliance ability of business	Businesses comply with e-customs regulations seriously.	
36	Compliance ability of customs staff	Customs officials comply with e-customs regulations seriously.	
37	Difficulties in approaching customs laws or regulations	Businesses have difficulties in approaching customs laws or regulations.	
38	Difficulties in changing/updating/transforming of customs legislation	Businesses have difficulties in changing/updating/transforming customs legislation.	
E-customs implementation			
39	Current obstacles of e-customs can be improved	Difficulties of e-customs are manageable.	Raus (2010), Dam (2013)
40	E-customs system improves year by year	E-customs system has been developed and upgraded to satisfy the demands of users every year.	
41	Benefits of e-customs for business	After considering all of the above, you would see e-customs as being more advantageous for your business.	
Business performance			
• **Financial performance**			
42	Increase in revenue	Revenue of a firm increases when applying e-customs.	Glick et al. (2005)
43	Increase in profit	Profit of firm increases when applying e-customs.	

44	Increase in growth (market share, asset, income, net profit,…)	Growth of market share, asset, income and net profit of firm increases when applying e-customs/	Wall et al. (2004); Cho & Pucik (2005)
• **Strategic performance**			
45	Paperless	Firms go paperless when applying e-customs.	Agle et al. (1999); Johnson and Greening (1999); Digalwar and Sangwant (2007), Barney and Clark (2007); Abbott (2003); Burke et al. (2005); Simmons (2008); Tuzovic and Bruhn, (2005); Harter, Schmidt, and Hayes (2002)
46	Social activities	Firms pay more attention to social activities when applying e-customs.	
47	Increase in the number of loyal customers	Customer satisfaction.	
48	Decrease in customer complaints		
49	Benefits for employees	Employee satisfaction	
50	E-customs facilitates employees' tasks		
51	Firm performance overall	In general, business performance is improved	

6.3 RELIABILITY AND VALIDITY

6.3.1 Overview of reliability and validity

The issue of whether information systems researchers validate their quantitative instruments rigorously has recently been raised. An absence of solid instrumental validation might put the scientific basis of research at risk (Straub et al., 2004). According to Delone and McLean (1992), rigour is problematic in Management Information Research, especially with regard to measurement. Straub (1989) proposes that a validated instrument in MIS is a critical issue in at least two main aspects. First, instrumentation brings rigour to MIS technology. Second, it can promote cooperative research among researchers by allowing other researchers to use pretested instruments across heterogeneous settings and time. Moreover, "with validated instruments, researchers can measure the same research constructs in the same way, granting improved measurement of independent and dependent variables and, in the long run, helping to relieve the confounding that plagues many streams of MIS literature" (Straub, 1989). Finally, validity helps in achieving more clarity in the formation and interpretation of research questions.

Developing an acceptable measurement instrument requires achieving an adequate level of construct validity. Construct validity refers to the degree of "the measure, based on a suitable operational definition of the construct, appropriately reflects the concept of

interest" (Lewis et al., 2005). The American Psychology Association (1985) stated that measures have to demonstrate some qualities to be accepted. These qualities are content validity, criterion validity, internal consistency and construct validity. Regarding construct validity, the following table illustrates the different measurement properties of assessing this type of validity.

Table 6.3 Measurement properties of assessing construct validity

Measurement properties	Definition and computing
Content validity (face validity)	The appropriateness of the items on the instrument for measuring the construct. Generally, content validity can be achieved by achieving the definition domain (conceptual definition and model specification) and by using an expert panel to review and evaluate the adopted measurement.
Factorial validity	The degree to which a factor analysis solution reflects the theoretical dimensions of a construct. This measurement property is determined by comparing the items from factor analysis
Reliability	This consistency or stability of a measure across different samples. Reliability is evaluated by computing the internal consistency for each of the empirically derived components of the construct.
Convergent validity	The degree to which different and repeated attempts to measure the same concept are in agreement. It can be evaluated by inspecting the factor loadings for every construct, composite reliability and average variance extracted. According to Bagozzi et al., (1994), convergent validity is proved by calculating the correlation among construct components.
Discriminant validity	The degree to which the measures of theoretically different concepts are distinct. It can be inspected by comparing the estimated correlations between the research's constructs and the squire root for the average variance extracted for a construct.
Nomological validity	The ability of a construct to predict measures of other constructs in a network of constructs. This aspect of validity is evaluated examining the relationships among the different constructs

Source: Developed based on Lewis et al. (2005); Moore and Benbasat (1991) and Straub (1989)

Thus, to ensure content validity, besides the extensive literature review to correctly define the conceptual domain for every construct and adopting appropriate measures that reflect every aspect of each construct, pre-test interviews and a pilot survey were conducted to locate and correct any weaknesses in the questionnaire. Malhotra and Grover (1998) emphasise that content validity is achieved first when the researcher develops the research items. They argue that verifying that all main facet of the conceptual definition is manifested is an important measure of content validity and instrument construction. Furthermore, Chin et al. (2008), Cronbach (1971), Lewis et al. (2005), Straub et al. (2004) and Straub (1989) report that further content validity can be confirmed by using experts in the field and representatives of the sample units to validate the research items and make sure that they reflect the conceptual definitions and the domain of the study.

Besides, Lawshe (1975) suggests that content validity can be assessed by examining the level of agreement between the evaluation panels as they categories measurement items.

For the construct validity (factorial, convergent and discriminant), structural equation modelling utilising partial least square (PLS) was used to validate the construct and test the initial model using a pilot study. As mention above, construct validity is the extent to which an operationalization correctly measures the concepts that it purports to measure (Straub, 1989). The focus of construct validity is on whether the selected items move together in such a way that they can be considered as a conceptual whole and whether a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the constructs being measures (Boudreau et al., 2001). According to Carmines and Zeller (1979), construct validity involves three distinct steps. First, the theoretical relationship between the constructs themselves must be specified through a literature review. Second, the empirical relationship between the measures of the constructs must be examined. Finally, the empirical evidence must be interpreted in terms of how it clarifies the construct validity of the particular measure".

The internal consistency or reliability, which refers to the stability and consistency of the adopted measures, was assessed by the "alpha coefficient" (Cronbach, 1971). The alpha coefficient is the first evaluation of the quality of the research's instrument and is considered as one of the best estimates of internal consistency (Churchill and Iacobucci, 2005). Chau (1997) argued that Cronbach's alpha outperforms other estimation methods because it is easy to calculate and less restrictive. A high Cronbach's alpha means that the items efficiently capture the construct, while a low alpha means that the items do not satisfactorily capture the construct.

Internal validity relates mainly to the issues of causality and is "concerned with the question of whether a conclusion that incorporates a causal relationship between two or more variables is sound" (Bryman and Bell, 2007). Internal validity raises the question of whether the observed effects could have been caused by or correlated with a set of un-hypothesised and/or unmeasured variables (Straub, 1989; Straub et al., 2004). Sekaran and Bougie (2010) differently define internal validity as the researcher's confidence in the cause-and-effect relationships. The confidence depends on the data that the survey yields to allow the researcher to draw an accurate conclusion about the cause-and-effect relationship. However, this study followed several recommendations to maximise the internal validity. These recommendations include using well-established theories, adopting pre-validated instruments and measures, and evaluating the appropriateness of the instrument (pre-testing) (Boudreau et al., 2001; MacKenzie et al., 2011; Moore and Benbasat, 1991; Straub et al., 2004; Straub, 1989).

Although well-established theories and prior empirical research were used to establish the research hypotheses, any statement and/or conclusion about the causal relationships were based on a theoretical foundation rather than the empirical evidence of study. The research model drew on well-established theories (see Chapter Three), aiming to focus more on the implementation of electronic customs and its influence on business performance.

The value of quantitative research is measured by how well threats to internal validity have been managed and by the validity of instruments as measures of the phenomenon under investigation. This study follows the deductive approach that requires, as

discussed earlier in Chapter Three, understanding the phenomenon under investigation, and based on this understanding, a theoretical definition can be developed through the literature review. The theoretical definition is then used as the main guide in developing the items that properly measure the construct under investigation (Schwab, 2004).

The use of valid and reliable instruments minimised the internal validity threat for this study. The instruments that were used in this research stem from a pool of valid and reliable measuring tools previously tested in research. However, a small part of the questionnaire was carefully developed on the basis of literature review and interviews. According to Malhotra (2010), web-based surveys offer the advantage of avoiding any human intervention that may cause data errors while entering responses into a database. That is the reason the web-based survey was used in addition to the traditional paper method.

6.3.2 Reliability of preliminary data

Cronbach's alpha was used to gauge the internal consistency of the measurement scale items. According to Tabachnick and Fidell (2007), Hair (2010), and Pallant (2011), if Cronbach's alpha is below 0.6, it is invalid and implies that there is a problem with the internal consistency of the questionnaire items. An alpha score from 0.6 to nearly 0.7 is marginal, from 0.7 to nearly 0.8 is fair, and from 0.8 to 0.9 is high (very good).

According to Pallant (2011) and Tabachnick and Field (2007), these values show the correlation between each item and the total score. If the corrected item-total correlation is below 0.3, this means that this item measures a characteristic other than the overall characteristics of the group of items. Another issue is the consideration of the alpha score if each item is deleted. If deleting an item results in an increase in the alpha score, then the item should be removed (Pallant, 2011). Nunnally (1978) discussed that if the observed variable has a value of total correlation more than or equal to 0.3, this reliability can be satisfied. The observed variable has a total correlation <0.3 and the value of Cronbach's alpha of this deleted variable is much more than the Cronbach's alpha in general, this observed variable will be deleted to improve reliability measurement.

As shown in Table 6.4, 51 observed variables were divided into 11 categories, including relative advantages, trialability, observability, incompatibility, culture, complexity, difficulties in financial and human resources, legislation deficiences, e-customs implementation, financial performance and strategic performance. The valid sample was 381. A Likert scale from 1 to 5 was applied with a minimum of 1 and a maximum of 5. Based on descriptive statistics, the standard deviation of some observed variables is much more than 1, as per the following: RA4 (1.462), RA6 (1.343), RA7 (1.428), Trial1 (1.453), Trial2(1.369), Observe1 (1.350), Observe2 (1.405), Compat2 (1.413), Compat4 (1.387), CUL3 (1.419), CUL4 (1.405), CUL5 (1.008), CUL6 (1.029), CUL7 (1.478), CUL8 (1.412), CUL9 (1.031), CUL10 (1.460), CUL11 (1.025), and CUL12 (1.053).

Table 6.4 Initial and Revised Reliability Test Cronbach's Alpha

Variables	Mean	SD	Initial Test		Second Test	
			Corrected item-total correlation	Alpha if item is deleted	Corrected item-total correlation	Alpha if item is deleted
Relative advantages. Cronbach's alpha = 0.438					**Cronbach's alpha = 0.912**	
RA1	3.98	0.778	0.463	0.309	0.791	0.889
RA2	3.94	0.767	0.467	0.31	0.83	0.875
RA3	3.94	0.776	0.457	0.312	0.803	0.885
RA4	3.01	1.462	0.06	0.5	-	-
RA5	4	0.771	0.446	0.317	0.775	0.895
RA6	3.21	1.343	0.018	0.511	-	-
RA7	3.15	1.428	0.014	0.523	-	-
Trialability. Cronbach's alpha = 0.043						
TRIAL1	2.93	1.453	0.022	.[a]	-	-
TRIAL2	3.03	1.369	0.022	.[a]	-	-
Observability. Cronbach's alpha = 0.081						
OBSERVE1	2.86	1.35	0.042		-	-
OBSERVE2	2.97	1.405	0.042		-	-
Incompatibility. Cronbach's alpha = 0.506					**Cronbach's alpha = 0.890**	

INCOMPAT1	3.65	0.977	0.462	0.345	0.772	0.86
INCOMPAT2	3.12	1.413	0.071	0.616	-	-
INCOMPAT3	3.81	0.823	0.545	0.329	0.819	0.822
INCOMPAT4	2.97	1.387	0.102	0.59	-	-
INCOMPAT5	3.76	0.912	0.48	0.346	0.775	0.851
Legislation deficiencies. Cronbach's alpha = 0.917						
LEGAL1	2.54	0.927	0.727	0.911		
LEGAL2	2.51	0.931	0.832	0.89		
LEGAL3	2.46	0.91	0.814	0.894		
LEGAL4	2.28	0.831	0.837	0.891		
LEGAL5	2.63	0.953	0.74	0.909		
Culture. Cronbach's alpha = 0.699					**Cronbach's alpha = 0.913**	
CUL1	2.68	0.967	0.561	0.654	0.702	0.904
CUL2	3.26	0.958	0.594	0.651	0.712	0.902
CUL3	3.07	1.419	0.1	0.72	-	-
CUL4	3.33	1.405	0.092	0.721	-	-
CUL5	2.55	1.008	0.647	0.641	0.714	0.902
CUL6	2.7	1.029	0.557	0.652	0.702	0.904
CUL7	3.1	1.478	0.078	0.726	-	-
CUL8	3.02	1.412	0.049	0.728	-	-
CUL9	2.79	1.031	0.636	0.642	0.766	0.897
CUL10	3.04	1.46	0.088	0.724	-	-
CUL11	2.81	1.025	0.623	0.644	0.774	0.896
CUL12	2.77	1.053	0.658	0.638	0.776	0.896
Complexity. Cronbach's alpha = 0.862						
COMPLEX1	3.76	0.853	0.759	.		
COMPLEX2	3.7	0.911	0.759	.		
Dfficulties in Financial and Human Resource. Cronbach's alpha = 0.911						
FINHR1	2.19	0.805	0.826	0.868		
FINHR2	2.19	0.826	0.825	0.869		
FINHR3	2.27	0.819	0.813	0.879		
E-customs implementation. Cronbach's alpha = 0.826						

E_CUS_IMPL1	2.75	0.824	0.628	0.812		
E_CUS_IMPL2	2.87	0.878	0.746	0.694		
E_CUS_IMPL3	2.74	0.873	0.678	0.765		
Financial Performance. Cronbach's alpha = 0.750						
FINPF1	3.96	0.691	0.595	0.648		
FINPF2	3.82	0.725	0.632	0.602		
FINPF3	3.92	0.706	0.511	0.742		
Strategic Performance. Cronbach's alpha = 0.917						
STRPF1	3.94	0.689	0.726	0.906		
STRPF2	3.94	0.658	0.699	0.909		
STRPF3	3.9	0.677	0.703	0.908		
STRPF4	3.92	0.706	0.776	0.901		
STRPF5	3.89	0.718	0.782	0.9		
STRPF6	3.92	0.693	0.772	0.901		
STRPF7	3.9	0.699	0.747	0.904		

Firstly, 7 observed variables of Relative Advantages were conducted Cronbach's alpha. However, the Cronbach's alpha value was very low, with 0.438 <0.6. Furthermore, RA4, RA6 and RA7 had a correlation < 0.3 and the Cronbach's alpha if the item is deleted is much more than the general Cronbach's alpha, respectively 0.5; 0.511 and 0.523 > 0.438. According to the theory of Cronbach's alpha, the observed variables RA4, RA6 and RA7 are deleted. The test was carried out again and the results satisfy the criteria with a Cronbach's alpha of 0.912, and all total correlation values of RA1, RA2, RA3 and RA5 are much more than 0.3. Three observed variables can be satisfied.

Cronbach's alpha of trialability (Trial1 and Trial2) has a value of 0.043 < 0.6 and their total correlation is less than 0.3. Consequently, Trial1 and Trial2 cannot be accepted. Similar to trialability, the two observed variables of observability, namely Observe1 and Observe2, were denied because they could not satisfy the criteria of Cronbach's alpha test with a value of Cronbach's alpha of 0.081 <0.6 and the total correlation of observed variables was less than 0.3.

Five observed variables of incompatibility, namely INCOMPAT1, INCOMPAT2,

INCOMPAT3, INCOMPAT4 and INCOMPAT5, were put into SPSS. The Cronbach's alpha result received a value of 0.506 <0.6. Furthermore, the correlation of INCOMPAT2, INCOMPAT4 (0.071 and 0.102 <0.3) and Cronbach's alpha if they are deleted are 0.616 and 0.590 respectively, with > Cronbach's alpha of 0.506. Thus, the researcher deleted two observed variables and re-tested reliability with incompatibility. Then, the result was achieved with a Cronbach's alpha of 0.890 and no variable had a correlation of less than 0.3.

Five observed variables of legislation received a reliability value with 0.917 > 0.6 and all correlation values were more than 0.3, as in the following.

Firstly, twelve observed variables of culture obtained Cronbach's alphas with 0.699 > 0.6. However, the correlations of CUL3, CUL4, CUL7, CUL8 and CUL10 were respectively 0.100; 0.092; 0.078; 0.049; 0.088 <0.3 and Cronbach's alpha if items were deleted obtained 0.720; 0.721; 0.726; 0.728 > 0.699. Hence, these five observed variables were deleted. After deleting the five variables, the remaining obtained 0.913 as the Cronbach's alpha and all correlations > 0.3. Consequently, CUL1, CUL2, CUL5, CUL6, CUL9, CUL11 and CULL12 can satisfy reliability measurement.

COMPLEX1 and COMPLEX2 had 0.862 as the Cronbach's alpha and all correlations were 0759 >0.3. Based on the reliability test, these two observed variables could be accepted

The observed variables of financial and human resources (FINHR) gave the results of reliability statistics with a Cronbach's alpha of 0.911 and all correlations ≥ 0.3. Thus, these three variables could satisfy the requirements of the reliability test.

The three observed variables of e-customs implementation (E_CUS_IMPL) were carried out with Cronbach's alpha. The results presented a value of Cronbach's alpha of 0.826> 0.6 and all total correlations could satisfy the criteria much more than 0.3.

Three observed variables were used to measure the financial performance (FINPF) of businesses. The value of Cronbach's alpha was 0.750 > 0.6 and the correlations of these variables were more than 0.3. Consequently, the reliability of financial performance met

the demand of the Cronbach's alpha test.

Seven variables were investigated regarding the reliability of the strategic performance (STRPF) of firms with a Cronbach's alpha of 0.917 > 0.6 and all correlations were much more than 0.3. As the result, these seven observed variables could meet the requirements of the reliability test.

The results, as presented in Table 6.4, show that there is no score of Cronbach's alpha below 0.6. Specifically, the group of items reflecting the *Relative Advantages* construct had an alpha score of 0.813, which is high. The lowest score, for the level of internal consistency among the items reflecting the *Observability* attribute, had an alpha score of 0.687, which is considered marginal. The other three groups of items, reflecting the *Complexity, Incompatibility,* and *Trialability* attributes, had alpha scores in the range of 0.7 to 0.8, which is considered as a fair internal consistency.

Table 6.4 shows that there is only one item in the group of items that reflect the *Non-complexity* attribute of e-customs, the overall complexity item, which has the value of corrected item-total correlation of 0.295, which is very near 0.3; the remaining have values from 0.332 to 0.695. However, Pallant (2011) suggested that if the alpha score is not below 0.7, and if the alpha score decreases when the item is deleted, then it is not necessary to remove this item.

From Table 6.4, it can be seen that there are three items that fit this classification: Overall complexity (from 0.704 to 0.713), compatible legacy software (from 0.788 to 0.811), and experience of pilot businesses (from 0.705 to 0.732). However, the differences in these cases are rather small. As a result, these items were not deleted. Therefore, it can be concluded that the levels of internal consistency among the five groups of items were different but they were valid for confirmatory factor analysis.

In conclusion, after Cronbach's alpha test, 14 of the 51 observed variables tested for reliability using Cronbach's alpha were eliminated. Therefore, 37 observed variables could satisfy the requirements.

Comparing the initial assumptions and outcomes of the measurement model, the initial

nine hypotheses were reduced to six. In particular, the two factors of trialability (TRIAL) and observability (OBSERVE) were removed in the reliability test as they did not satisfy the requirements of Cronbach's alpha. Moreover, complexity (COMPLEX) and Incompatibility (INCOMPAT) were merged as a result of the pattern matrix, and the construct of INCOMPAT was established.

Table 6.5 Initial hypothesis and hypothesis after reliability

Initial hypothesis	Hypothesis after reliability
H1: Relative advantages positively affect e-customs implementation H2: Trialability positively affects e-customs implementation H3: Observability positively affects e-customs implementation H4: National culture positively affects e-customs implementation H5: Complexity negatively affects e-customs implementation H6: Incompatibility negatively affects e-customs implementation H7: Difficulties in finance and human resources negatively affect e-customs implementation H8: Legislation deficiencies negatively affects e-customs implementation H9: E-customs positively affects business performance	H1: Relative advantages positively affect e-customs implementation H2: National culture positively affects e-customs implementation H3: Incompatibility negatively affects e-customs implementation H4: Difficulties in Finance and human resources negatively affect e-customs implementation H5: Legislation deficiencies negatively affects e-customs implementation H6: E-customs positively affects business performance

6.4 FACTOR ANALYSIS

After the extent of the internal consitency of the items in each of the seven groups was verified, the corresponding latent varible is extracted by confirmatory factor analysis which is implemented on each group of items. The scores of the Keiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is shown in Table 6.6 below. This value is greater than 0.60 and the Bartlett's Test of Sphericity achieves significant value with p = 0.00. Thus, both KMO and Barlett's test are satisfied the threshold, which means all five-factor analyses are appropriate (Pallant, 2011; Tabachnick & Fidell, 2007).In addition, the items were loaded quite strongly.

The 37 items representing the seven attributes of e-customs and business performance were subjected to factor analysis using SPSS version 24. Before that, the suitability of the data for factor analysis was considered. Firstly, it was seen that each of the 37 items

correlated ($\rho \geq 0.3$) with at least one other item, indicating reasonable factorability. Secondly, the table below shows that the Kaiser-Meyer-Olkin value was 0.920, surpassing the recommended value of 0.6, and that the Bartlett's Test of Sphericity (Hair et al., 2010; Tabachnick & Fidell, 2007) reached statistical significance ($\chi 2$ (381) = 10320.48, $p < 0.01$). Finally, the communalities were all greater than 0.3 (see Table 6.6), providing additional evidence that each item shared some common variance with other items. Therefore, all 37 items were acceptable for factor analysis.

Table 6.6 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.920
Bartlett's Test of Sphericity	Approx. Chi-Square	10320.485
	df	666
	Sig.	.000

From Table 6.7, principal components analysis revealed the presence of eleven components with eigenvalues approaching and exceeding 1.0, explaining 25.865%, 12.705%, 7.004%, 6.389%, 4.998%, 2.947% and 2.780% of the variance, respectively. To sum up, the seven-component solution explained a total of 66.688% of the variance.

Table 6.7 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.379	30.753	30.753	11.050	29.865	29.865	8.241
2	5.046	13.638	44.391	4.701	12.705	42.570	5.981
3	2.919	7.890	52.281	2.592	7.004	49.574	5.175
4	2.668	7.210	59.491	2.364	6.389	55.964	6.600
5	2.123	5.738	65.229	1.849	4.998	60.962	6.547
6	1.421	3.842	69.070	1.090	2.947	63.908	6.133
7	1.291	3.489	72.560	1.028	2.780	66.688	5.119
8	.769	2.078	74.638				
9	.647	1.749	76.387				
10	.550	1.487	77.874				
11	.536	1.448	79.322				
12	.519	1.402	80.724				
13	.496	1.341	82.065				
14	.455	1.229	83.295				

15	.432	1.169	84.463				
16	.418	1.129	85.593				
17	.417	1.126	86.718				
18	.374	1.011	87.730				
19	.356	.962	88.691				
20	.347	.938	89.629				
21	.332	.897	90.526				
22	.310	.837	91.363				
23	.296	.799	92.163				
24	.287	.776	92.939				
25	.281	.760	93.698				
26	.253	.683	94.381				
27	.247	.668	95.050				
28	.227	.613	95.662				
29	.217	.586	96.248				
30	.203	.548	96.796				
31	.198	.534	97.330				
32	.191	.516	97.846				
33	.184	.497	98.343				
34	.165	.446	98.789				
35	.157	.424	99.213				
36	.148	.399	99.612				
37	.143	.388	100.000				

Extraction Method: Principal Axis Factoring.

The Pattern Matrix (Table 6.8) of the first-factor analysis on the 37 items showed that all 37 factors have a factor loading greater than 0.6. Thus, all 37 items are valid to form seven factors (latent variables), including (1) Relative Advantages, (2) Culture, (3) Incompatibility based on both Incompatibility and Complexity, (4) Legislation deficiencies, (5) Difficulties in Financial and Human Resource, (6) E-customs Implementation, and (7) Business Performance, created by a combination between Financial Performance and Strategic Performance.

Table 6.8 Pattern Matrix

	Factor						
	Relative Advantages	Culture	Incompatibility _Complexity	Legislation	Financial & Human Resource	E-customs Implementation	Business Performance
RA2	.851						
RA5	.840						
RA1	.839						
RA3	.829						
CUL11		.828					
CUL9		.821					
CUL12		.816					
CUL5		.757					
CUL2		.745					

CUL1		.719					
CUL6		.701					
COMPLEX2			.904				
INCOMPAT3			.887				
COMPLEX1			.854				
INCOMPAT5			.851				
INCOMPAT1			.807				
LEGAL2				.916			
LEGAL4				.887			
LEGAL3				.833			
LEGAL5				.770			
LEGAL1				.687			
FINHR1					.911		
FINHR2					.849		
FINHR3					.813		
E_CUS_IMPL2						.900	
E_CUS_IMPL3						.706	
E_CUS_IMPL1						.697	
STRPF5							.854
STRPF6							.834
STRPF4							.824
STRPF1							.786
STRPF7							.781
STRPF3							.769
STRPF2							.753
FINPF3							.696
FINPF2							.682
FINPF1							.600

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.[a]

In particular, seven latent variables were extracted as proposed. The first variable, *Relative advantages*, is revealed through four items: Time savings, Costs savings, Fewer data errors, and Convenience (24/7 system). The second factor, *Culture*, is discovered through seven items, namely financial orientation achievement, the relationship between business and customs, long-term orientation, interactive ability between business and customs, promotion of function of customs agencies and support team, specific instructions to apply e-customs and policy decisions based on business feedback. The third variable, *Incompatibility*, is exposed based on five items, including non-complicated and easy to use e-customs software, no loss of data due to online use, confidentiality, adequate skills and technological equipment, and ease of software update and transformation. The fourth variable, *Legislation deficiencies*, is explored through five items consisting of the unification of legislation, compliance ability of business, compliance ability of customs staff, difficulties in approaching customs laws

and regulations, and difficulties due to changing/updating/transforming of customs legislation. The fifth variable, Difficulties in *Financial and Human Resources*, is detected via three items: adequate financial effort, financial support from external, and adequate human resources. The sixth variable, *E-customs Implementation*, contains three items that are further improvement of current obstacles of e-customs, improvement of e-customs system year by year and the benefits of e-customs for business. The final variable, *Business Performance*, is investigated through eight items: increase in revenue, increase in profit, increase in growth, paperless, social activities, increase in the number of loyal customers, decrease in customers' complaints, benefits for employees, facilitating employees' tasks and firm performance overall.

6.5 CONFIRMATORY FACTOR ANALYSIS (CFA)

6.5.1 The first-order CFA model

CFA alone is limited in its ability to examine the nature of the relationships between constructs beyond simple correlations. A measurement theory then is often a means to an end for examining the relationships between constructs, not an end in itself. The result from the CFA model indicates the validation of a set of construct indicators that enable us to study the relationships among seven important constructs.

Assessing Measurement Model Validity

Measurement model fit can be evaluated in two ways: "*first, by assessing constructs' reliability and convergent and discriminant validity, and second, by examining the individual path (parameter) estimates*" (Shah and Goldstein, 2006: 168).

Regarding assessing the constructs' validity and reliability, as discussed in Chapter Five, the convergent validity of the constructs can be assessed by examining the average variance extracted (AVE), which attempts to measure the amount of variance of a latent variable component captured from its indicators relative to the amount due to measurement error. All AVE values, as shown in Table 6.5, are greater than the generally recognised 0.50 cut-off (Chin and Dibbern, 2010, Urbach and Ahlemann, 2010), which

indicates that the majority of the variance is accounted for by the construct. In other words, every latent variable is able to explain more than half of the variance of its indicators. These results demonstrate acceptable and sufficient convergent validity at the construct level.

At the indicator level, the convergent validity of an individual indicator can be examined from the measurement model by determining whether the relationship between that indicator and its hypothesised construct is large and statistically significant (MacKenzie et al., 2011). The significance of the estimate (unstandardised regression weight) of a relationship between an indicator and the hypothesised construct can be tested with a z-test or t-test of the estimate's critical ratio. According to Bollen (1989), the degree of validity of each indicator can be assessed by examining the unique proportion of variance in the indicator accounted for by the construct. In this regard, MacKenzie et al. (2011: 314) report, "in the typical case where each indicator is hypothesised to load on only one construct, this will be equal to the square of the indicator's completely standardised loading". As recommended by Fornell and Larcker (1981), a value > 0.50 demonstrates an adequate level of validity. On the other hand, discriminant validity can be examined using the cross-loadings. Cross-loadings are obtained by correlating the component scores of the constructs with the other items (Chin, 1998). Hulland (1999: 199) states that achieving acceptable discriminant validity using cross-loadings happens when the shared variance between the theoretical construct and its indicator exceeds the variance explained and is shared with the other latent variables in the model.

The reliability of each indicator can be assessed by examining the communalities, or what is called the squared multiple correlation (SMC), of the indicator (Bollen 1989). For every indicator, a value > 0.50 is desired because it suggests that the majority of the variance in the indicator is due to the latent construct.

Table 6.9 The criteria of reliability and validity of measurement model

Reliability and validity type	Criteria and cut-off values	Source
Indicator reliability	Indicator loadings: standardised loadings ≥ 0.70 (in exploratory studies, loadings of 0.40 are acceptable)	(Chin, 1998); (Hair et al 2011); (Hulland, 1999)

Internal consistency reliability	Composite reliability (CR) ≥ 0.70 (in exploratory and early-stage research 0.60 is considered acceptable)		(Bagozzi and Yi, 1988); (Hair et al., 2010); (Gefen et al., 2000)
Convergent validity	Average variance extracted (AVE) ≥ 0.5		(Bagozzi and Yi, 1988); (Hair et al., 2011)
Discriminant validity	Fornell-Larker criterion	The square root of the AVE for each latent variable should be higher than its correlations with the other latent variables.	(Fornell and Larcker, 1981); (Götz et al., 2010)
	Cross loadings	Each indicator should show the highest loading for its designed construct than for any other construct.	(Chin, 1998); (Götz et al. 2010); (Hulland, 1999)

Source: Hair et al. (2012)

Based on the results of data processing with AMOS, the p-values of all variables are less than 0.0001, which is much smaller than the threshold. Table 6.10 below illustrates the R^2, the standardised loading, composite reliability, AVE and p-value for all 37 variables and seven posited constructs.

Table 6.10 displays the standardised loadings (standardised regression weights using AMOS terminology). When we refer to loading estimates, we refer to the standardised values unless otherwise noted. The lowest loading obtained was 0.678, linking Finance Performance (FINPF) to item FINPF1, which still exceeds the 0.5 standard. The AVE estimates and construct reliabilities are also shown in table 5.8. The AVE estimates range from 58.4% for Firm Performance to 77.4% for Financial and Human Resources (FINHR). All exceed the 50% rule of thumb. The construct reliabilities range from 0.830 for E-customs implementation (E_CUS_IMPL) to 0.936 for Incompatibility (INCOMPAT). Once again, these exceeded 0.7, suggesting adequate reliability. Taken together, the evidence supports the convergent validity of the measurement model. The AVE estimates all exceeded 0.5 and the reliability estimates all exceeded 0.7. All of them exceeded the recommended threshold, thus exhibiting unidimensionality, reliability and convergent validity.

Table 6.10 Indicators of CFA outcomes

Variables	R^2 (>0.25)	Loading ≥ 0.70	Composite Reliability (CR ≥ 0.70)	Average Variance Extracted (AVE ≥ 0.5)	P-value (<0.05)
E_CUS_IMPL1	.494	0.703	0.830	0.622	Less than 0.0001
E_CUS_IMPL3	.612	0.782			
E_CUS_IMPL2	.761	0.872			
FINHR3	.758	0.871	0.911	0.774	
FINHR2	.786	0.887			
FINHR1	.776	0.881			
RA5	.658	0.811	0.912	0.721	
RA3	.732	0.855			
RA1	.698	0.835			
RA2	.800	0.894			
INCOMPAT1	.691	0.831	0.936	0.746	
COMPLEX 2	.787	0.887			
INCOMPAT5	.751	0.866			
COMPLEX 1	.728	0.853			
INCOMPAT3	.773	0.879			
LEGAL1	.585	0.765	0.920	0.698	
LEGAL4	.787	0.887			
LEGAL3	.738	0.859			
LEGAL2	.771	0.878			
LEGAL5	.606	0.779			
CUL6	.559	0.748	0.914	0.602	
CUL1	.555	0.745			
CUL2	.569	0.754			
CUL5	.570	0.755			
CUL9	.642	0.801			
CUL11	.655	0.809			
CUL12	.662	0.814			
FINPF1	.460	0.678	0.931	0.585	
FINPF3	.599	0.774			
STRPF7	.627	0.792			
STRPF5	.679	0.824			
STRPF6	.644	0.802			
FINPF2	.504	0.710			
STRPF3	.534	0.731			
STRPF4	.673	0.820			
STRPF2	.538	0.734			
STRAPF1	.593	.770			

According to Fornell and Larcker (1981) and Götz et al. (2010), discriminant validity is examined by a comparison between the square root of the AVE for each latent variable and its correlations with the other latent variables. The square root of the AVE for each construct should be greater than its correlation with the other constructs. The diagonal

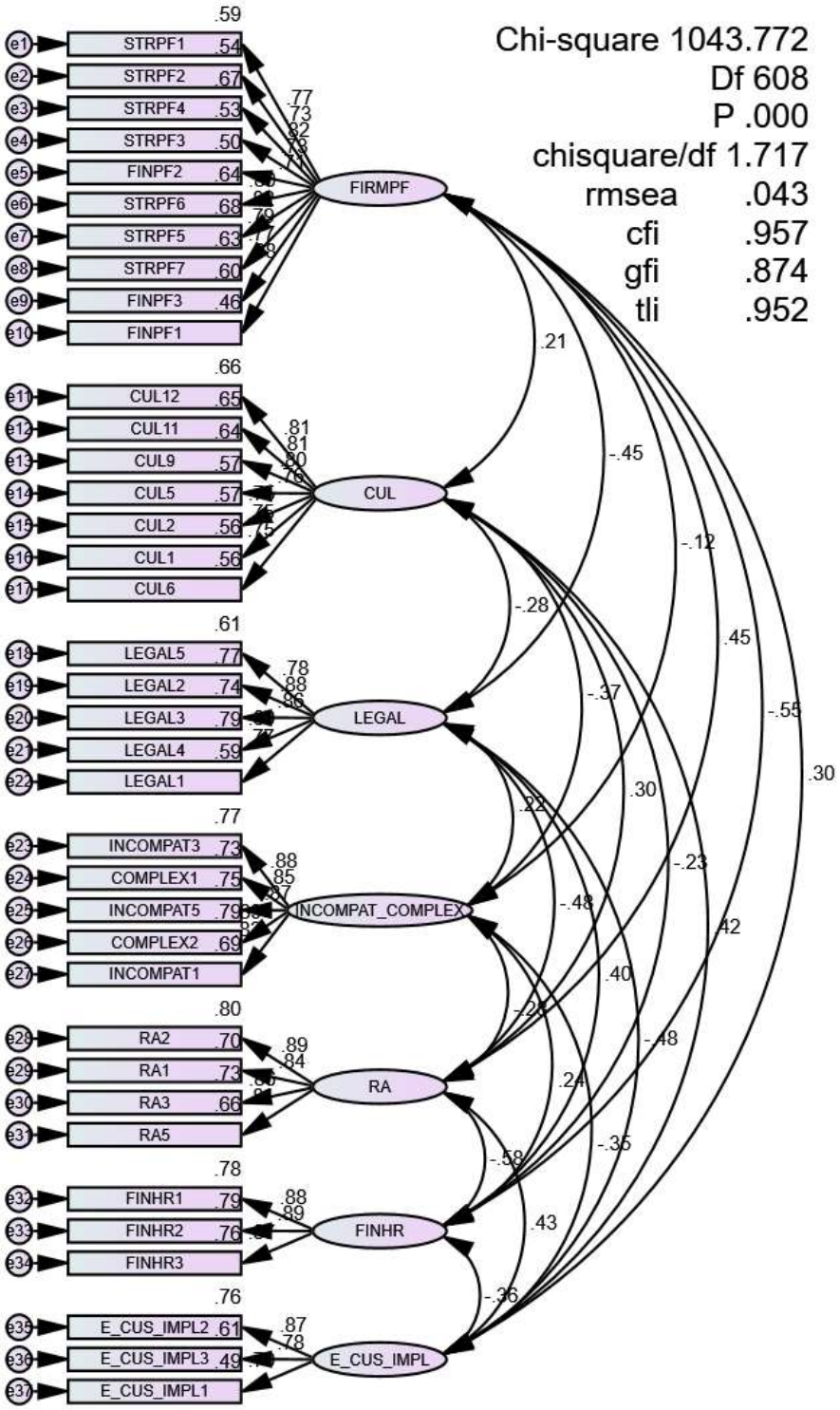
cells in Table 6.11 present the square root of the AVE for each construct. The table shows that every square root of AVE for each construct is larger than its correlations with the other constructs. This indicates that every construct (latent variable) shares more variance with its hypothetical indicators than with any other indicators.

Table 6.11 Construct Correlation (Standardised)

Factor	CR	AVE	FIRMPF	CUL	INCOMPAT_COMPLEX	LEGAL	RA	FINHR	E_CUS_IMPL
FIRMPF	. 931	.585	**.765**	.					
CUL	.914	.602	.214	**.776**					
INCOMPAT_COMPLEX	.936	.746	-.118	-.368	**.864**				
LEGAL	.920	.698	-.451	-.283	.225	**.835**			
RA	.912	.721	.454	.298	-.279	-.477	**.849**	.	
FINHR	.911	.774	.-546	-.227	.242	.399	-.579	**.800**	
E_CUS_IMPL	.830	.622	.296	.419	-.350	-.482	.431	-.362	**0.789**

The assessment of nomological validity is based on the approach outlined for EFA. The correlation matrix provides a useful start in this effort to the extent that the constructs are expected to relate to one another. Previous innovation and e-government studies mentioned in the literature review suggest that Relative Advantages (RA) and Culture (CUL) have a positive influence on e-customs implementation (E_CUS_IMPL). In contrast, Incompatibility and Complexity (INCOMPAT_COMPLEX), Legislation deficiencies (LEGAL), Difficulties in Financial and Human Resouces (FINHR) have a negative impact on E_CUS_IMPL. Furthermore, e-customs also positively affects firm performance (FIRMPF). The correlations between the factor scores for each construct are shown in table 6.11. The results support the prediction that some constructs are positively related to one another, while some of them have a negative influence. Moreover, all the results are significant with $p < 0.05$.

Figure 6.1 CFA first-order model



Overall fit of confirmatory factory analysis (CFA)

Although a number of indices are described in CFA outputs, all possible fit indices will not be presented in this study. The key goodness-of-fit values will be focused on to illustrate, for example, the χ^2 statistics, the CFI, and the RMSEA.

Table 6.12 CFA Goodness-of-fit Statistics

Chi-square (χ2)		**Guidelines**
	Chi-square = 1043.772	
	Degrees of freedom = 608	
	p-value ~ 0	
Absolute Fit Measures		
	Goodness-of-fit (GFI)= 0.874	> 0.95 great; > 0.9 traditional; > 0.8 sometimes permissible (Joreskog, 1969; Bogozzl, 1981; Brown and Cudeck, 1993)
	Root mean square error of approximation (RMSEA)= 0.043	< 0.07 (Hair et al. 2010)
	90 percent confidence interval for RMSEA= (0.039; 0.048)	
	Root mean square residual (RMR)= 0.026	
	Normed chi-square= 1.717	<2: good; from 2 to 5 acceptable (Hair et al. 2010)
Incremental Fit Indices		
	Normed fit index (NFI)= 0.902	
	Comparative fit index (CFI)= 0.957	>0.90 (Hair et al. 2010)
	Relative fit index (RFI)= 0.893	
Parsimony Fit Indices		
	Adjusted goodness-of-fit index (AGFI)= 0.855	
	Parsimony normed fit index (PNFI)= 0.824	

The selected fit indices from CFA output are described in Table 6.12. The overall model χ^2 achieves 1043.772 associated with 608 degrees of freedom. Using a rate of 0.05, the p-value obtains significance with a small result, less than 0.0001. Consequently, the χ^2 goodness of fit statistic can meet the threshold and desmonstrate the fit between the observed covariance matrix and the estimated covariance matrix within the sampling variance. In addition, an absolute fit index with a representative as RMSEA gains value of 0.0043 which is below the cutoff value of 0.07. This value is quite low for a model with 37 measured variables and a sample size of 381. When the 90% confidence interval

is applied for RMSEA, the true value of RMSEA expresses between 0.039 and 0.049. Therefore, the outcome shows the low upper bound of RMSEA in this case and the results of RMSEA support additionally for the model fit. Furthermore, the normed χ^2 as the the following absolute fit statistics shows value of 1.717 which is calculated by division between the the chi-square value and the degrees of freedom (1043.772/606= 1.717). According to Hair et al. (2010), the value of the normed χ^2 smaller than 2.0 presents a very good fitted model and this value from 2.0 to 5.0 is acceptable. As the result, a very good fit for the CFA model is suggested by value of the normed χ^2.

The CFI, one of the incremental fit indices, is most widely used. In this CFA model, the value of CFI gets 0.957 for a model of this complexity and large-scale sample size. This value is greater that 0.90 as the CFI guideline. Moreover, the suggested threshold values are also exceeded by the other incremental fit indices as well. Although there is no comparison between this model an other ones, the value of the parsimony index (0.855) with AGFI as a representatitve reflects a good model fit. In summary, the CFA outcomes demonstrate the reasonably good fit of this measurement model. Hence, the further examination of the model results enbalers to proceed suitably in the following step.

6.5.2 The second-order CFA model

Cultural dimensions of Hofstede refer Vietnam culture with five components including uncertain avoidance, high power distance, collectivism, masculine and short-term orientation. However, with the purpose of integrating and developing with international trade and technology, culture in Vietnam has some changes, especially in public service. In particular, in the beginning of new technology adoption, uncertain acceptance is performed to receive the changes and uncertain avoidance is shown when applying and implementing the new technology and process. This research is investigated e-customs in implementation stage, so element of uncertain avoidance (UA) is considered. Furthermore, the distance between government authorities and organisations/ business/ citizens is narrow in public service in order to get feedback and opinions from users. Besides, e-customs is supposed as the foundation for digitalisation in public service for long-term strategy in Vietnam. Hence, low power distance (PD) and long-term orientation are analysed in this study. Based on previous business performance studies

presented in the literature review, firm performance is divided into financial performance and strategic performance. In order match to nomological validity, the second-order factor for Culture (CUL) and Firm Performance (FIRMPF) are explored.

Table 6.13 Results of convergent validity for Culture and Firm Performance Construct

Factor	Construct	R^2 (>0.25)	Loading ≥ 0.70	Composite Reliability (CR ≥ 0.70)	Average Variance Extracted (AVE ≥ 0.5)	P-value (<0.05)
UA	**CUL**	**0,947**	0.973	0.899	0.650	**P < 0.001**
PD	**CUL**	1.072	1.035			
COLLECTIVISM	**CUL**	0.405	0.637			
MASCULINE	**CUL**	0.407	0.638			
LONG_TERM	**CUL**	0.422	0.650			
FINPF	**FINPF**	1.287	1.134	1.030	1.061	
STRPF	**FINPF**	0.837	0.915			

Analysing similarly, the second-order CFA model can satisfy the construct validity. The standardised factor loadings exceed the threshold of 0.7, composite reliability has a value of 0.899 and 1.030 that are above the threshold 0.7, AVE has a value of 1.061 for FIRMPF and 0.650 for CUL, which are both over 0.5. Furthermore, the p-value is less than 0.05 and thus gains significance. Taken together, this measurement model can satisfy convergent, unidimensionality and reliability validity. In addition, the overall fit of this model is also assessed in table 6.14.

Table 6.14 Comparison Goodness-of-fit indices between 2 CFA models

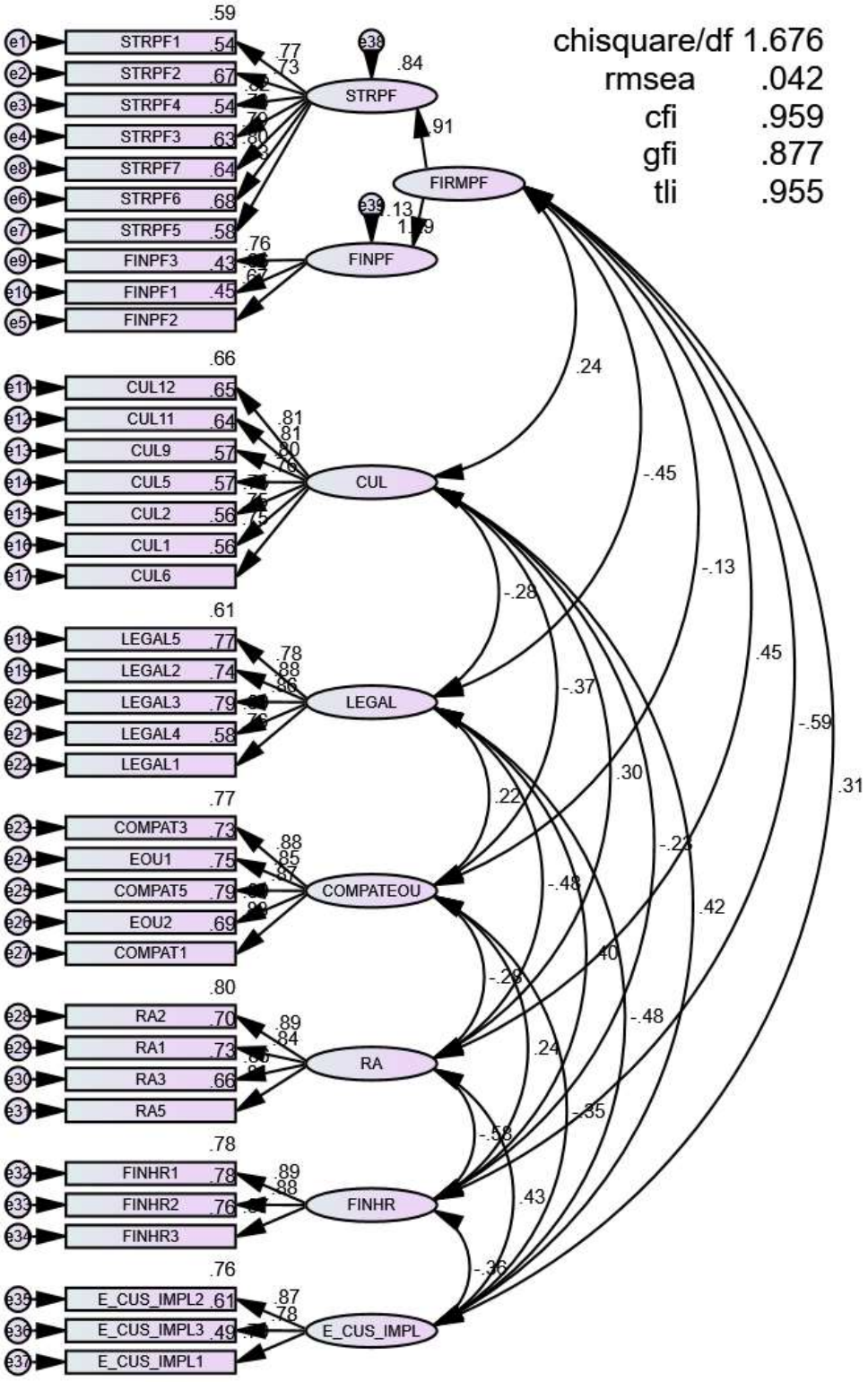
CFA 2		**CFA 1**	**Guidelines and assessment**
Chi-square ($\chi 2$)			
	Chi-square = 1012.757	1043.772	
	Degrees of freedom = 604	608	
	p-value ~ 0	~ 0	
Absolute Fit Measures			
	Goodness-of-fit (GFI)= 0.878	0.874	> 0.95 great; > 0.9 traditional; > 0.8 sometimes permissible (Joreskog, 1969; Bogozzl, 1981; Brown and Cudeck, 1993) Improved

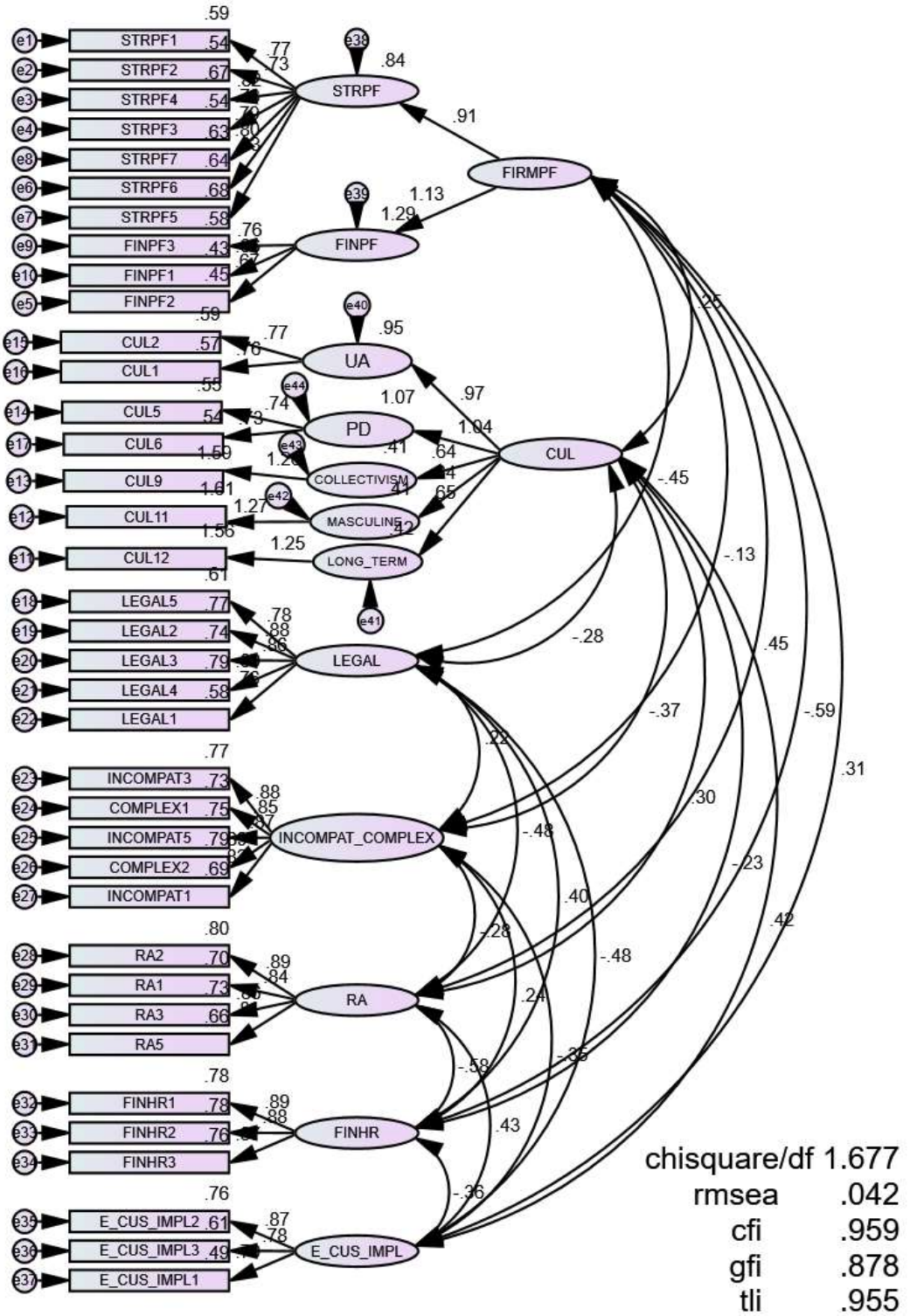
	Root mean square error of approximation (RMSEA)= 0.042	0.043	< 0.07 (Hair et al. 2010) Improved
	90 percent confidence interval for RMSEA= (0.038; 0.047)	(0.039; 0.048)	
	Root mean square residual (RMR)= 0.026	0.026	
	Normed chi-square= 1.677	1.717	<2: good; from 2 to 5 acceptable (Hair et al. 2010) Improved
Incremental Fit Indices			
	Normed fit index (NFI)= 0.905	0.902	
	Comparative fit index (CFI)= 0.959	0.957	>0.90 (Hair et al. 2010) Improved
	TFI = 0.955	0.952	>0.90 (Hair et al. 2010) Improved
	Relative fit index (RFI)= 0.896	0.893	
Parsimony Fit Indices			
	Adjusted goodness-of-fit index (AGFI)= 0.857	0.855	
	Parsimony normed fit index (PNFI)= 0.821	0.824	

The selected fit indices from CFA output are described in Table 6.14. The overall model χ^2 achieves 1012.757 associated with 604 degrees of freedom. Using a rate of 0.05, the p-value obtains significance with a small result, less than 0.0001. Consequently, the χ^2 goodness of fit statistic can meet the threshold and desmonstrate the fit between the observed covariance matrix and the estimated covariance matrix within the sampling variance. In addition, an absolute fit index with a representative as RMSEA gains value of 0.0042 which is below the cutoff value of 0.07. This value is quite low for a model with 37 measured variables and a sample size of 381. When the 90% confidence interval is applied for RMSEA, the true value of RMSEA expresses between 0.038 and 0.047. Therefore, the outcome shows the low upper bound of RMSEA in this case and the results of RMSEA support additionally for the model fit. Furthermore, the normed χ^2 as the the following absolute fit statistics shows value of 1.677 which is calculated by division between the the chi-square value and the degrees of freedom (1012.757 /604=1.677). According to Hair et al. (2010), the value of the normed χ^2 smaller than 2.0 presents a very good fitted model and this value from 2.0 to 5.0 is acceptable. As the result, a very good fit for the CFA model is suggested by value of the normed χ^2.

The CFI, one of the incremental fit indices, is most widely used. In this CFA model, the value of CFI gets 0.959 for a model of this complexity and large-scale sample size. This value is greater that 0.90 as the CFI guideline. Moreover, the suggested threshold values are also exceeded by the other incremental fit indices as well. Although there is no comparison between this model an other ones, the value of the parsimony index (0.858) with AGFI as a representatitve reflects a good model fit. In comparison with the first-order CFA model, the improvement of chi-square (χ^2), absolute fit measures and incremental fit indices indicate that the second-order CFA model is better and better-of-fit than the first-order CFA model. Therefore, the CFA of model 2 supplies all the evidence of good fit and construct validity to investigate the path diagram and structural model in the following part.

Figure 6.2 CFA second-order





6.6 STRUCTURAL EQUATION MODEL ANALYSIS

As discussed by Schumacker and Lomax (2010) and Shah and Goldstein (2006), having

established and confirmed the reliability and validity of the measurement model, the next stage of analysis is to test the causal relationships between the research constructs (structural model). As presented in Chapter Five, SEM is a technique used to analyse multiple and interrelated relationships among the constructs for model building (Tabachnick and Fidell, 2007). Thus, this analysis aims to investigate the causal relationships between the different independent and mediating factors with the dependent variables (used for knowledge acquisition and used for knowledge provision).

A structure theory is a conceptual representation of the structural relationships between the constructs. It can be expressed in terms of a structural model that represents the theory with a set of structural equations and is usually depicted with a visual diagram. The structural relationship between any two constructs is represented empirically by the structural parameter estimate, also known as a path estimate. Structural models are referred to by several terms, including a theoretical model and a causal model. A causal model infers that the relationships meet the conditions necessary for causation.

Even though SEM has the advantage of simultaneously estimating the measurement model and the structural model, the six-stage overall process is consistent with a two-step SEM process. In the first step, the fit and construct validity of the proposed measurement model was tested. Once a satisfactory measurement model is obtained, the second step is used to test the structural model. Thus, two key tests, one measurement and one structural, assess the fit and validity. The measurement model fit provides a basis for assessing the validity of the structural theory. The one-step model provides only one key test of fit and validity. It does not separate the measurement model assessment from the structural model assessment. Therefore, separate testing of the measurement model via a two-step approach is essential because valid structural theory tests cannot be conducted with bad measures. A valid measurement model is essential because with poor measures we would not know what the constructs truly mean. Consequently, if a measurement model cannot be validated, researchers should first refine their measures and collect new data. If the revised measurement model can be validated, then the full structural model can be processed.

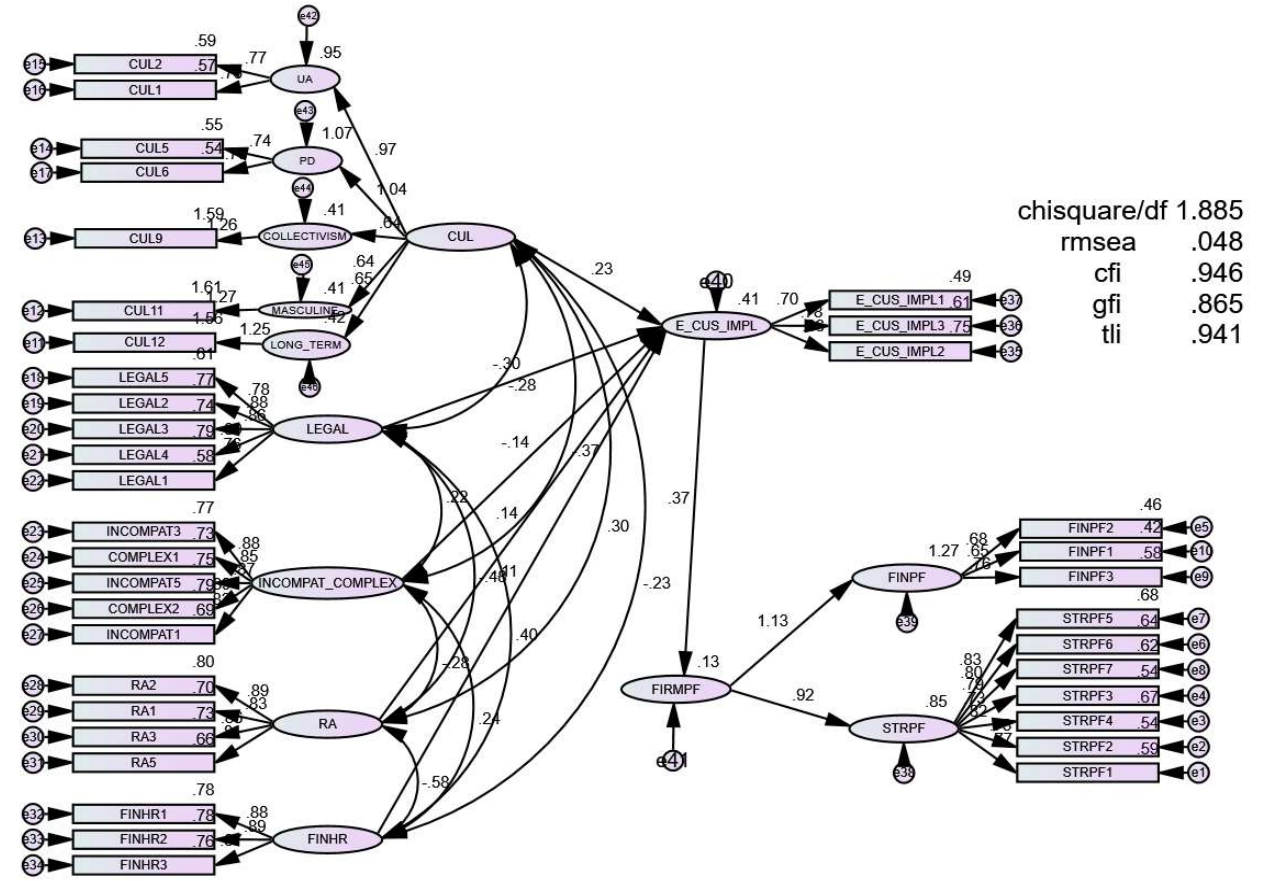
In transforming from CFA to a structural model, the primary objective is to specify the structural model relationships as replacements for the correlational relationships found in the CFA model. This process, however, also involves a series of other changes, some just in terms of notation and others of more substantive issues.

The structure model is shown in the path diagram in Figure 6.3 below. For simplicity, the measured indicator variables and their corresponding paths and errors have been left off the diagram.

Figure 6.3 Standardised Path Estimates for Structural Model

Hypothesis	Parameter	Supported?
H1: RA + → E_CUS_IMPL	$P_{E\_CUS\_IMPL,RA}$	Yes
H2: CUL + → E_CUS_IMPL	$P_{E\_CUS\_IMPL,CUL}$	Yes
H3: COMPAT - → E_CUS_IMPL	$P_{E\_CUS\_IMPL,COMPAT}$	Yes
H4: FINHR - → E_CUS_IMPL	$P_{E\_CUS\_IMPL,FINHR}$	No
H5: LEGAL - → E_CUS_IMPL	$P_{E\_CUS\_IMPL,LEGAL}$	Yes

H6: E_CUS_IMPL + → FIRMPF P_{FIRMPF,E_CUS_IMPL} Yes



The structural model shown in the path diagram above can now be estimated and assessed. To do so, the emphasis will first be on SEM model fit and then whether the structural relationships are consistent with the theoretical expectations. The information in Table 6.15 shows the overall fit statistics from the tested SEM model. The χ^2 is 1147.739 with 609 degrees of freedom ($\rho < 0.05$) and the normed chi-square is 1.885. The model CFI is 0.946 with an RMSEA of 0.048 and a 90% confidence interval of 0.044 to 0.053. Almost all the measures are within a range that would be associated with a good fit. However, GFI achieves 0.865, i.e. below 0.9. Based on the complexity and

sample size, the result of GFI can be acceptable (Hair et al., 2010). Furthermore, the overall model fit also changed very little from the CFA model to the SEM model. The only substantive difference is a chi-square increase of 134.98 and a difference of five degrees of freedom.

Table 6.15 Comparison of Goodness-of-fit measures between Structural and CFA models

GOF Index	Structural Model	CFA Model
$\chi 2$ (chi-square)	1147.739	1012.757
Degrees of freedom	609	604
Probability	0.00	0.00
GFI	0.865	0.878
RMSEA	0.048	0.042
Confidence interval of RMSEA	(0.044; 0.053)	(0.038; 0.047)
RMR	0.057	0.026
Normed chi-square	1.885	1.677
NFI	0.893	0.905
CFI	0.946	0.959
TLI	0.941	0.955
RFI	0.883	0.896
AGFI	0.844	0.857
PNFI	0.816	0.821

The loadings estimates are slightly changed from the CFA results. Sixteen of thirty-seven estimated standardised loadings change and the maximum change with E_CUS_IMPL2 is 0.008, i.e. < 0.01 (Table 6.16). Thus, if parameter stability had not already been tested in the CFA stage, there is now evidence of stability among the measured indicator variables. In technical terms, this indicates that no problem is evident due to interpretational confounding and this further supports the measurement model's validity. As we would expect with so little change in loadings, the construct reliabilities are identical as well. The construct reliabilities have also partly changed for the constructs of Culture and E-customs Implementation.

Table 6.16 Comparison of Standardised Regression Weights, Factor Loadings and Construct Reliabilities for SEM and CFA Model

Indicator	Construct	Standardised Regression Weights and Factor Loading (>0.5)			Construct Reliabilities (>0.7)	
		SEM	CFA Model	Change	SEM	CFA
E_CUS_IMPL	CUL	.228				
E_CUS_IMPL	LEGAL	-.299				
E_CUS_IMPL	INCOMPAT_COMPLEX	-.137				
E_CUS_IMPL	RA	.142				
E_CUS_IMPL	FINHR	-.110				
FIRMPF	E_CUS_IMPL	.366				
STRPF	FIRMPF	.920				
FINPF	FIRMPF	1.127				
UA	CUL	.974				
PD	CUL	1.035				
COLLECTIVISM	CUL	.637				
MASCULINE	CUL	.638				
LONG_TERM	CUL	.649				
CUL1	UA	.755	.756	0.001	0.733	0.733
CUL2	UA	.766	.765			
CUL5	PD	.739	.739		0.732	0.732
CUL6	PD	.732	.732			
CUL9	COLLECTIVISM	1.260	1.260		1.588	1.588
CUL11	MASCULINE	1.269	1.269		1.269	1.269
CUL12	LONG_TERM	1.251	1.251		1.565	1.565
LEGAL5	LEGAL	.779	.779		0.920	0.920
LEGAL2	LEGAL	.878	.878			
LEGAL3	LEGAL	.859	.859			
LEGAL4	LEGAL	.888	.887	0.001		
LEGAL1	LEGAL	.764	.765	0.001		
INCOMPAT3	INCOMPAT_COMPLEX	.879	.879		0.936	0.936
INCOMPLEX1	INCOMPAT_COMPLEX	.853	.853			
INCOMPAT5	INCOMPAT_COMPLEX	.866	.866			
INCOMPLEX2	INCOMPAT_COMPLEX	.887	.887			
INCOMPAT1	INCOMPAT_COMPLEX	.831	.831			
RA2	RA	.893	.894	0.001	0.912	0.912
RA1	RA	.835	.835			
RA3	RA	.856	.856			
RA5	RA	.812	.811	0.001		
FINHR1	FINHR	.882	.885	0.003	0.911	0.911
FINHR2	FINHR	.886	.884	0.002		

Indicator	Construct	Standardised Regression Weights and Factor Loading (>0.5)			Construct Reliabilities (>0.7)	
		SEM	CFA Model	Change	SEM	CFA
FINHR3	FINHR	.871	.869	0.002		
E_CUS_IMPL2	E_CUS_IMPL	.864	.872	0.008	0.826	0.830
E_CUS_IMPL3	E_CUS_IMPL	.779	.782	0.003		
E_CUS_IMPL1	E_CUS_IMPL	.699	.703	0.004		
STRPF2	STRPF	.734	.734		0.917	0.917
STRPF1	STRPF	.770	.770			
STRPF4	STRPF	.820	.820			
STRPF3	STRPF	.732	.732			
STRPF5	STRPF	.826	.825	0.001		
STRPF7	STRPF	.790	.791	0.001		
STRPF6	STRPF	.803	.803			
FINPF1	FINPF	.650	.656	0.006	0.739	0.739
FINPF3	FINPF	.761	.761			
FINPF2	FINPF	.677	.672	0.004		

Furthermore, table 6.17 shows the estimated unstandardised and standardised structural path estimates. All but one structural path estimate are significant and in the expected direction. The exception is the estimate between FINHR and E_CUS_IMPL because the p-value of 0.074 is > 0.05. Therefore, although the estimate is in the hypothesized direction, it is not supported. Overall, however, five of the six estimates are consistent with the hypotheses; these results support the theoretical model with a caveat for a path that is not supported.

Table 6.17 Structural Parameter Estimates for SEM

Structural Relationship	Unstandardised Parameter Estimate	Standard Error	p-value	Standardised Parameter Estimate
H1:RA → E_CUS_IMPL	0.16	0.073	0.032	0.14
H2: CUL → E_CUS_IMPL	0.20	0.049	***	0.23
H3:INCOMPAT_COMPLEX → E_CUS_IMPL	-0.14	0.055	0.009	-0.14
H4: FINHR → E_CUS_IMPL	-0.12	0.066	0.079	-0.11
H5: LEGAL → E_CUS_IMPL	-0.31	0.060	***	-0.3
H6: E_CUS_IMPL → FIRMPF	0.24	0.041	***	0.37

***p-value < 0.001

Six hypotheses pertaining to structural relationships were presented above and are supported and not supported as follows:

H1: Relative Advantages (RA) positively indicates E-customs Implementation (E_CUS_IMPL)

This hypothesis is supported with a standardised positive coefficient of 0.14.

H2: National Culture (CUL) positively indicates E-customs Implementation

This hypothesis is supported with a standardised positive coefficient of 0.23

H3: Incompatibility and complexity (INCOMPAT_COMPLEX) has a negative influence on E-customs Implementation

This hypothesis is supported with a standardised negative coefficient of -0.14

H4: Difficulties in finances and human resources (FINHR) has a negative influence on E-customs Implementation

This hypothesis is not supported as the p-value cannot satisfy the criteria below 0.05 although this factor has a standardised negative coefficient of -0.11.

H5: Legislation deficiencies (LEGAL) has a negative influence on E-customs Implementation.

This hypothesis is supported with a standardised negative coefficient of -0.3

H6: E-customs implementation has a positive influence on firm performance (FIRMPF)

This hypothesis is supported with a standardised positive coefficient of 0.37

Regarding improving the model, the standardised residuals and modification indices are usually applied to revise the model (Hair et al., 2010). However, the outcomes of SEM, which is examined based on the business perspective, show that the patterns of standardised residuals, as well as modification indices, are not large, for example, the value of the standardised residual is less than |1|. Therefore, model revision is not necessary in this case and the original model is unchanged, although the direct path

FINHR → E_CUS_IMPL is not supported while the other hypotheses are all significant.

6.7 CHAPTER SUMMARY

This chapter presented the results of confirmatory factor analysis (CFA), structural equation modelling (SEM) and multi-group analysis. CFA was used to evaluate and validate the research instrument. The results indicated that the employed measures were appropriate for the population investigated and all theoretical measurement models showed satisfactory and acceptable reliability, discriminant validity and convergent validity. In addition, SEM validated the proposed research models. The next chapter will interpret and discuss the findings of CFA and SEM in more detail.

CHAPTER 7

QUANTITATIVE ANALYSIS FROM THE CUSTOMS OFFICIAL PERSPECTIVE

7.1 INTRODUCTION

Chapter seven interprets the outcomes of the main study, which was conducted from January to March 2018 with customs officials. The data collected from the questionnaires were handled by AMOS to test the reliability and validity of the variables. CFA and SEM were performed to analyse the quantitative research of these stages. In this chapter, the study framework, as well as the general confirmatory factor analysis and structural equation modelling, is discussed. Then, the data collection method is illustrated in more detail regarding the sample, the survey contact and the content of the questionnaire. Next, the factor analysis with EFA is described. The following step of data analysis validates the measurement model using CFA. The practice of using SEM to assess the relationships (paths) between the constructs and to validate the research model is introduced. Finally, the alternative model is presented.

7.2 SURVEY FOR CUSTOMS OFFICIALS

7.2.1 Sample of survey for customs officials

This research can apply several analytical techniques. Firstly, the analytical review and synthesis, which illustrate analyzing, conciliating, summarizing and presenting data and information systematically, have been adopted with the aim of reviewing the literature. Secondly, a questionnaire survey study was conducted with 702 customs officials to examine the proposed model using confirmatory factor analysis (CFA) and structural equation modelling (SEM). The primary objective of multivariate analysis in this thesis was to attempt to explain and predict the influence of the factors on e-customs implementation in Vietnam as well as the relationship between e-customs and business performance. In comparison with other techniques, SEM has more advantages. That is

the reason why SEM was selected for this study, using AMOS version 24 to analyze the data.

The author received support of 'insiders' who have been working in Human Resource and Inspection Department of GDVC in order deploy questionnaire survey for customs officials in GDVC as well as local departments in five cities. Particularly, the insiders assisted the researcher to get permission agreement to implement the survey with customs officials in GDVC and local customs departments as the government authorities. Moreover, both of them have rich experience and close relationship with other customs managers and head of local customs. Hence, the insiders helped the author connect with customs administrators in advanced and the author got convenient to approach and book appointments with customs managers for survey. Actually, the survey for business and customs officials were carried-out at the same time while the researcher came to GDVC and local customs department directly in order to save time and cost. After having appointments with local customs departments, the researcher scheduled to visit customs authorities in five cities directly with paper-based questionnaires prepared in advanced. With the previous introduction and insiders' relationship, head of local departments and customs branches facilitated enthusiastically for the author to meet and invite customs officials to participate in the survey. Based on this support, the customs staffs were willing to answer the questionnaires of this survey. Because the questionnaires were distributed to various participants with diverse age, working experience, responsible positions (officials, leaders, mid-managers and high managers) and customs department locations. As the result, with enough large scale, the sample can be managed to get the representative number of responses from different group of age, working experience and education to avoid sample bias.

The questionnaire survey was carried out from January to March 2018, whereby 1034 customs officials in the five cities of Hanoi, Hai Phong, Ho Chi Minh City, Binh Duong and Dong Nai were under the supervision of this survey. These customs departments manage a number of imported and exported goods. 1034 questionnaires were distributed to customs officials; of which 767 were returned and 702 valid responses were collected to use in analysis, for a 68 % response rate.

7.2.2 Sample characteristics

The attributes of the sample are presented in table 7.1 comprising the characteristics of gender, age, working experience and education. In particular, 463 respondents, accounting for 66 % of the 702 participants, were male while the remaining 239 (34%) were female.

Table 7.1 Description of the sample

	Number	Proportion
Gender		
Male	463	66
Female	239	34
Age		
Under 30	121	17.2
From 30 to 40	283	40.3
From 40 to 50	215	30.6
Over 50	83	11.8
Working experience		
Below 5 years	237	33.8
From 5 to 10 years	278	39.6
Over 10 years	187	26.6
Education		
College/ Bachelor	605	86.2
Master	91	13
Doctor and above	6	9
Total	**702**	**100**

Four age groups were explored in this survey, including under 30, from 30 to 40, from 40 to 50 and over 50. Specifically, 121 officials were under 30, representing 17.2% of the sample. Most customs officials were aged 30 to 40, which accounted for 40.3%, with 283 respondents. The 40 to 50-year-old group followed, with 215 officials accounting for 30.6%. Finally, the smallest group of over 50-year-olds had 83 respondents, corresponding with 11.8%.

Regarding work experience, 237 customs officials, equivalent to 33.8% of the 702 respondents, had less than 5 years of experience. The participants with 5 to 10 years of

experience were in the majority, with 278 customs officials representing 39.6% of the sample. Furthermore, the number of officials with over 10 years of experience was 187, comprising 26.6%.

About the education of the respondents, most of them had college or bachelor degrees, with 605 such officials accounting for 86.2% of the sample. 91 customs staff (13%) possessed master degrees and a small number of 6 respondents (9%) achieved doctoral degrees or higher qualifications.

7.2.3 Survey instrument

The questionnaires for customs officials were designed based on the theory of DOI by Rogers (2003) associated with the institutional theory and Hofstede's cultural dimesions. Studies related to e-government by Raus et al. (2009), Conrad (2009), Gerpott (2011), and Hameed et al. (2012) as well as preliminary information obtained in a implementation of e-customs in Vietnam provided the questionnaire's measurement items for customs officials.

Table 7.2 Items and their explanation

No	Survey items	Description	Sources
Relative advantages			
1	Time savings	E-customs can reduce the time for travelling, data processing, and customs clearance.	Granqvist, M., Hintsa, J., & Männistö, T (2011); Choi (2011); Raus, (2009, 2010)
2	Cost savings	E-documents and online submission instead of paper documents result in cost reduction and reduced travel costs.	Raus (2009, 2010), Granqvist, Hintsa, & Männistö (2011), Urciuoli, Hinsta and Ahokas (2013); Granqvist, M., Hintsa, J., & Männistö, T (2011);
3	Fewer data errors	The application of e-customs technologies reduces the number of data entry errors.	Raus (2010); Granqvist, Hintsa, & Männistö (2011).
4	Reduction in the burden of administrative documents	Adoption of e-documents and e-records helps e-customs decrease the pressure of administrative documents.	Dam (2013); to Henningsson & Andersen (2009)

5	Convenience with 24/7 system	It is convenient to submit the customs dossier and to receive receipts and clearance outcomes because of 24/7 availability.	Aoyama (2008); Amin (2010)
6	Risk management	E-customs enhances risk management and anti-smuggling.	Gordhan (2009) and Biljan (2012); Choi (2011)
7	Advance clearance	Businesses can submit customs dossiers and get e-customs clearance in advance (before goods arrive at port).	Dam (2013)
Tralability			
8	Perspectives of the trial period 2005-2013	Customs officials have an awareness of the trial phase from 2005 to 2013.	Raus (2010), Dam (2013)
9	Previous experience of customs department	Customs officials that are about to implement e-customs can readily learn from the experiences of previous customs department.	
Observability			
10	Direct observation/ knowledge regarding the e-customs application of other customs officials	Customs officials personnel have directly observed other customs officials applying e-customs	Raus (2010); Byrne & Golder (2002)
11	Indirect knowledge of the advantages and difficulties	Through internal documents, the media and words of mouth, customs officials personnel have gained clear knowledge of the advantages and difficulties of e-customs.	
Incompatibility			
12	Inadequate skills and technological equipment	IT skills and equipment in the customs departments are inadequate for e-customs application	Shalehi (2010); Salehi, Alipour & Yahyavi (2010); Mustonen-Ollila & Lyytinen (2003)
13	Weakness in syncing compatibility with other countries	Vietnam e-customs get dificulties in syncing compatibility with systems of other countries	
14	Weakness in confidentiality	Internal information and data of business and e-customs system can be leaked	
15	Weakness in international standard compatibility	E-customs system of Vietnam is poorly compatible with international standards.	
16	Difficulties in software upgrading or transformation	E-customs software is difficult in upgrade and tranform	

Culture			
• **Uncertain avoidance (UA)**			
17	Specific instructions to apply e-customs	Specific instructions on applying e-customs are necessary.	Warkentin et al. (2002); Hujran et al. (2011)
18	Promote the function of customs agencies and support team	Responsibility of customs agents and support teams is given attention.	
19	Problem-solving ability	Problem-solving ability of e-customs departments can satisfy businesses.	
• **Power distance (PD)**			
20	Strict supervision of customs departments	Strict supervision of customs departments is necessary when applying e-customs.	Warkentin et al. (2002); Hujran et al. (2011)
21	Interactive ability between customs and business	Businesses find it easy to communicate and interact with customs departments.	
22	Policy decisions based on business feedback	Customs departments listen to the feedback of businesses and make policy decisions based on these reviews.	
• **Collectivism**			
23	Sharing information	Customs departments are willing to share commodity information (the origin, number, code) for customs departments, brokers, distributors and warehouses.	Hujran et al. (2011)
24	Alliance among partners	Customs departments are ready to cooperate with partners (brokers, distributors, warehouses, airports and ports).	
25	Relationship between business and customs	Customs departments and businesses should have a good relationship.	
• **Masculine**			
26	Focus on HR training	Customs departments on training staff	Hujran et al. (2011)
27	Financial achievement	Financial achievement is the priority target of customs departments	
• **Long-term**			
28	More investment in customs in the future	You personally support continuing and furthering the use of e-customs.	Hujran et al. (2011)
Complexity			
29	Data loss online	Customs dossiers are often incomplete due to data losses during transmission over the Internet.	Goossenaerts, Dreverman, Smits & Exel, (2006); Raus (2009, 2010)
30	Complicated and difficult to use e-customs software	The e-customs software is complicated, inadequate, and difficult to use.	
Difficulties in financial and human resource			
31	Investment for e-customs	Investment for deploying e-	Urciuoli, Hintsa, &

	deployment	customs system at customs departments is costly	Ahokas (2013)
32	Demand of training	Officials face many difficulties with e-customs in the beginning, so demand for training is high.	
33	Quality of human resource	Customs officials have adequate IT skills, experience and knowledge to deploy e-customs.	
Legislation deficiencies			
34	Unification of legislation	Regulations and administrative legal documents are duplicated and unified.	Holzner (2009), Raus (2010)
35	Compliance ability of business	Businesses comply with e-customs regulations seriously.	
36	Compliance ability of customs staff	Customs officials comply with e-customs regulations seriously.	
37	Difficulties in approaching customs laws or regulations	Customs have difficulties in approaching customs laws or regulations.	
38	Difficulties in changing/updating/transforming of customs legislation	Customs officials have difficulties in changing/updating/transforming customs legislation.	
E-customs implementation			
39	Current obstacles of e-customs can be improved	Difficulties of e-customs are manageable.	Raus (2010), Dam (2013) appiled to e-customs adoption
40	E-customs system improves year by year	E-customs system has been developed and upgraded to satisfy the demands of users every year.	
41	Benefits of e-customs for business	After considering all of the above, you would see e-customs as being more advantageous for your organisation.	
Business performance			
• **Financial performance**			
42	Increase in revenue	Revenue of a firm increases when applying e-customs.	Glick et al. (2005)
43	Increase in profit	Profit of firm increases when applying e-customs.	
44	Increase in growth (market share, asset, income, net profit,…)	Growth of market share, asset, income and net profit of firm increases when applying e-customs	Wall et al. (2004); Cho & Pucik (2005)
• **Strategic performance**			
45	Paperless	Firms go paperless when applying e-customs.	Agle et al. (1999); Johnson and Greening (1999);
46	Social activities	Firms pay more attention to social	

		activities when applying e-customs.	Digalwar and Sangwant (2007), Barney and Clark (2007); Abbott (2003); Burke et al. (2005); Simmons (2008); Tuzovic and Bruhn, (2005); Harter, Schmidt, and Hayes (2002)
47	Increase in the number of loyal customers	Customer satisfaction.	
48	Decrease in customer complaints		
49	Benefits for employees	Employee satisfaction	
50	E-customs facilitates employees' tasks		
51	Firm performance overall	In general, business performance is improved	

7.3 RELIABILITY OF PRELIMINARY DATA

Cronbach's alpha reliability coefficients were calculated for all latent variables using SPSS 24. All calculated coefficients were greater than the cut-off value of 0.70 (Tabachnick and Fidell, 2007; Hair, 2010 and Pallant, 2011).

The 51 observed variables were divided into 11 categories, including relative advantages, trialability, observability, incompatibility, culture, complexity, difficulties in financial and human resources, legislation deficiencies, e-customs implementation, financial performance and strategic performance. The valid sample was 702. A Likert scale from 1 to 5 was applied, with a minimum of 1 and a maximum of 5.

Table 7.3 Initial and Revised Reliability Test Cronbach's Alpha

Variables	Mean	SD	Initial Test		Second Test	
			Corrected item-total correlation	Alpha if item is deleted	Corrected item-total correlation	Alpha if item is deleted
Relative advantages. Cronbach's alpha = 0.947						
RA1			0.818	0.939		
RA2			0.820	0.939		
RA3			0.794	0.941		
RA4			0.778	0.943		
RA5			0.860	0.936		
RA6			0.826	0.939		
RA7			0.861	0.936		
Trialability. Cronbach's alpha = 0.018						
TRIAL1			0.009	.[a]	-	-
TRIAL2			0.009	.[a]	-	-

Observability. Cronbach's alpha = 0.828						
OBSERVE1			0.730	.[a]	-	-
OBSERVE2			0.730	.[a]	-	-
Incompatibility. Cronbach's alpha = 0.935						
INCOMPAT1			0.798	0.926		
INCOMPAT2			0.844	0.917		
INCOMPAT3			0.827	0.920		
INCOMPAT4			0.812	0.922		
INCOMPAT5			0.861	0.913		
Legislation. Cronbach's alpha = 0.944						
LEGAL1			.811	.937		
LEGAL2			.828	.934		
LEGAL3			.835	.933		
LEGAL4			.880	.924		
LEGAL5			.879	.925		
Culture. Cronbach's alpha = 0.819 12 items					**Cronbach's alpha = 0.931 9 items**	
CUL1			0.663	.792	.705	.926
CUL2			0.678	.791	.721	.925
CUL3			0.040	.851	-	-
CUL4			0.685	.789	.739	.924
CUL5			0.693	.788	.721	.925
CUL6			0.729	.785	.781	.921
CUL7			0.732	.785	.765	.922
CUL8			0.021	.853	-	-
CUL9			0.015	.852	-	-
CUL10			0.726	.785	.770	.922
CUL11			0.707	.787	.744	.923
CUL12			0.693	.788	.756	.922
Complexity. Cronbach's alpha = 0.798						
COMPLEX1			0.644	.[a]		
COMPLEX 2			0.644	.[a]		

Financial and Human Resource. Cronbach's alpha = 0.876						
FINHR1			.727	.856		
FINHR2			.766	.822		
FINHR3			.793	.797		
E-customs implementation. Cronbach's alpha = 0.821						
E_CUS_IMPL1			.617	.810		
E_CUS_IMPL2			.740	.687		
E_CUS_IMPL3			.675	.755		
Financial Performance. Cronbach's alpha = 0.351					**Cronbach's alpha = 0.818 2 items**	
FINPF1			.357	.062	0.692	.[a]
FINPF2			.358	.043	0.692	.[a]
FINPF3			.035	.818	-	-
Strategic Performance. Cronbach's alpha = 0.466 7 items					**Cronbach's alpha = 0.902 4 items**	
STRPF1			.514	.342	0.762	0.880
STRPF2			.028	.553	-	-
STRPF3			.097	.507	-	-
STRPF4			.528	.333	.805	.865
STRPF5			.493	.344	.815	.861
STRPF6			.035	.542	-	-
STRPF7			.443	.363	.741	.888

However, there were some constructs and variables of constructs that could not satisfy the criteria of Cronbach's alpha. Regarding the construct of Culture (CUL), the item-total statistics table reveals that CUL3, CUL8 and CUL9 have a "corrected item-total correlation" of less than 0.3. These three items showed corrected item-total correlations of 0.040, 0.021 and 0.015, respectively. According to Field (2010), a value of less than 0.3 means the item "does not correlate very well with the scale overall items with low correlations may have to be dropped". MacKenzie et al. (2011) strongly recommend deleting problematic items "provided that the essential aspects of the construct domain

are captured by the remaining items". After deleting these three problematic items (CUL3, CUL8 and CUL9), the construct of CUL showed a reliability coefficient of 0.931.

Furthermore, the construct of Trialability also was erased because the Cronbach's alpha is below the cut-off value of 0.7 and all the variables have a "corrected item total correlation" of less than 0.3. In a similar way, the FINPF3, STRPF2, STRPF3 and STRPF6 of Financial Performance (FINPF) and Strategic Performance (STRPF) constructs were removed to ensure an appropriate value of Cronbach's alpha reliability coefficients.

In conclusion, after the Cronbach's alpha test, 9 of the 51 observed variables tested for reliability with Cronbach's alpha were eliminated. Therefore, 42 observed variables could satisfy the requirements.

7.4 CONFIRMATORY FACTOR ANALYSIS (CFA)

7.4.1 The first order CFA model

Assessing Measurement Model Validity

Table 7.4 displays the indicator reliability through standardized loadings (standardized regression weights using AMOS terminology), internal consistency reliability via CR and convergent validity via AVE. The lowest loading obtained a 0.684 linking Complexity (COMPLEX) to item COMPLEX1 and 0.695 linking E-customs Implementation (E_CUS_IMPL) to item E_CUS_IMPL1, which are below 0.7 but still exceed the 0.5 standard for exploratory analysis. The AVE estimates ranged from 60.1% for Culture (CUL) to 78% for Observability (OBSERVE). All exceed the 50% rule of thumb. Construct reliabilities ranged from 0.822 for Complexity (COMPLEX) to 0.944 for Legislation (LEGAL). Once again, these exceeded 0.7, suggesting adequate reliability. Taken together, the evidence supports the convergent validity of the measurement model. The AVE estimates all exceeded 0.5 and the reliability estimates all exceed 0.7. All of them exceeded the recommended threshold, thus exhibiting

unidimensional, reliability and convergent validity.

According to Fornell and Larcker (1981) and Götz et al. (2010), discriminant validity is examined by a comparison between the square root of the AVE for each latent variable and its correlations with the other latent variables. Table 7.4 shows that the discriminant validity of the model satisfies the criteria.

Table 7.4 Indicators of CFA outcomes

Variables	R^2	Loading ≥ 0.70	Composite Reliability (CR ≥ 0.70)	Average Variance Extracted (AVE ≥ 0.5)
CUL1	0.540	0.735	0.931	0.601
CUL2	0.566	0.752		
CUL4	0.595	0.771		
CUL5	0.570	0.755		
CUL6	0.658	0.811		
CUL7	0.629	0.793		
CUL10	0.638	0.799		
CUL11	0.591	0.769		
CUL12	0.624	0.790		
RA1	0.723	0.850	0.947	0.721
RA2	0.723	0.850		
RA3	0.675	0.821		
RA4	0.640	0.800		
RA5	0.787	0.887		
RA6	0.715	0.845		
RA7	0.786	0.886		
COMPLEX1	0.468	0.684	0.822	0.704
COMPLEX 2	0.941	0.970		
INCOMPAT1	0.695	0.834	0.936	0.747
INCOMPAT2	0.765	0.875		
INCOMPAT3	0.749	0.866		
INCOMPAT4	0.718	0.848		
INCOMPAT5	0.803	0.896		
OBSERVE1	0.505	0.711	0.873	0.780
OBSERVE2	1.055	1.027		
LEGAL1	0.705	0.840	0.944	0.772
LEGAL2	0.742	0.861		
LEGAL3	0.760	0.872		
LEGAL4	0.828	0.910		
LEGAL5	0.825	0.908		

FINHR1	0.632	0.795	0.878	0.706
FINHR2	0.697	0.835		
FINHR3	0.788	0.888		
E_CUS_IMPL1	0.483	0.695	0.826	0.615
E_CUS_IMPL2	0.741	0.861		
E_CUS_IMPL3	0.620	0.788		
FINPF1	0.499	0.707	0.912	0.636
FINPF2	0.545	0.739		
STRPF1	0.671	0.819		
STRPF4	0.746	0.864		
STRPF5	0.738	0.859		
STRPF7	0.615	0.784		

Furthermore, the discriminant validity was evaluated by using MSA (the maximum shared squared variance) and ASV (average shared squared variance). Typically, MSV and ASV should show values less than AVE to establish discriminant validity (Ghorban, 2012). The results show, as seen in the following table, that all MSV and ASV values are less than the AVE value for each construct. All AVE estimates from table 7.4 are greater than corresponding inter-construct squared correlation estimates in table 7.5 below. Therefore, this test indicates that there are no problems with discriminant validity for this CFA model.

Table 7.5 Construct Correlation (Standardised)

Construct	CUL	RA	COMPAT	COMPLEX	OBSERVE	LEGAL	FINHR	E_CUS_IMPL	FIRMPF
CUL	1.00	0.293	0.357	-0.054	0.072	-0.210	-0.257	0.423	0.238
RA	0.293	1.00	0.260	0.040	0.046	-0.478	-0.477	0.422	0.477
INCOMPAT	0.357	0.260	1.00	0.047	0.091	-0.255	-0.204	0.345	0.143
COMPLEX	-0.054	0.040	0.047	1.00	-0.128	-0.038	0.006	-0.027	0.091
OBSERVE	0.072	0.046	0.091	-0.128	1.00	-0.137	-0.073	0.149	0.028
LEGAL	-0.210	-0.478	-0.255	-0.038	-0.137	1.00	0.362	-0.374	-0.546
FINHR	-0.257	-0.477	-0.204	0.006	-0.073	0.362	1.00	-0.472	-0.443
E_CUS_IMPL	0.423	0.422	0.345	-0.027	0.149	-0.374	-0.472	1.00	0.339
FIRMPF	0.238	0.477	0.143	0.091	0.028	-0.546	-0.443	0.339	1.00
$\sqrt{AVE}$	0.775	0.849	0.864	0.839	0.883	0.879	0.840	0.784	0.798

Overall fit of confirmatory factory analysis (CFA)

Although a number of indices are described in CFA outputs, all possible fit indices will not be presented in this study. The key goodness-of-fit values will be focused on to illustrate, for example, the χ^2 statistics, the CFI, and the RMSEA.

Table 7.6 CFA Goodness-of-fit Statistics

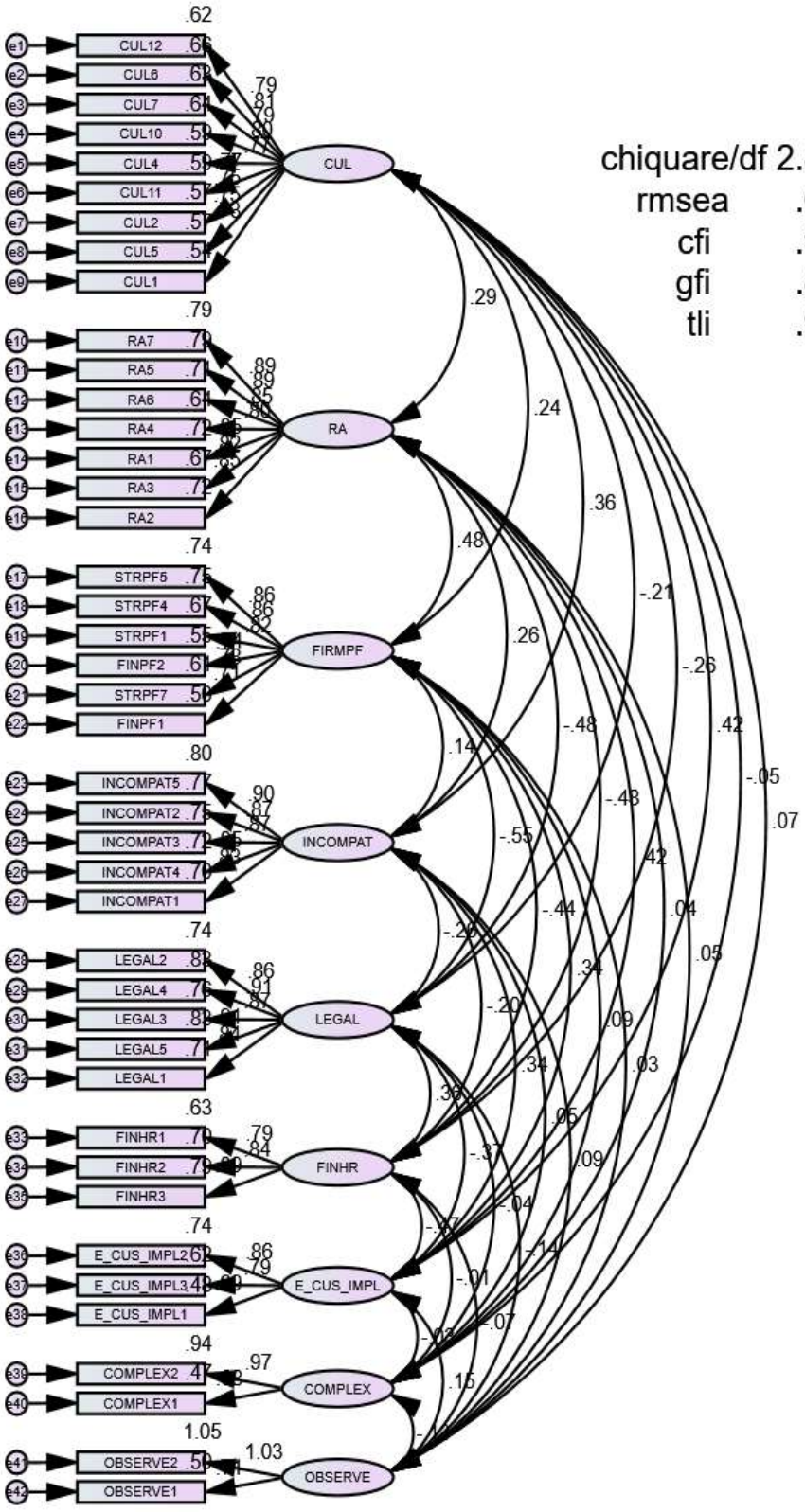
Chi-square (χ2)		**Guidelines**
	Chi-square = 2236.443	
	Degrees of freedom = 783	
	p-value ~ 0	
Absolute Fit Measures		
	Goodness-of-fit (GFI)= 0.876	> 0.95 great; > 0.9 traditional; > 0.8 sometimes permissible (Joreskog, 1969; Bogozzl, 1981; Brown and Cudeck, 1993)
	Root mean square error of approximation (RMSEA)= 0.051	< 0.07 (Hair et al. 2010)
	90 percent confidence interval for RMSEA= (0.049; 0.054)	
	Root mean square residual (RMR)= 0.027	
	Normed chi-square= 2.856	<2: good; from 2 to 5 acceptable (Hair et al. 2010)
Incremental Fit Indices		
	Normed fit index (NFI)= 0.903	
	Comparative fit index (CFI)= 0.935	>0.90 (Hair et al. 2010)
	Relative fit index (RFI)= 0.893	
Parsimony Fit Indices		
	Adjusted goodness-of-fit index (AGFI)= 0.857	
	Parsimony normed fit index (PNFI)= 0.821	

The selected fit indices from CFA output are described in Table 7.6. The overall model χ^2 achieves 2236.443 associated with 783 degrees of freedom. Using a rate of 0.05, the p-value obtains significance with a small result, less than 0.0001. Consequently, the χ^2 goodness of fit statistic can meet the threshold and desmonstrate the fit between the observed covariance matrix and the estimated covariance matrix within the sampling variance. In addition, an absolute fit index with a representative as RMSEA gains value of 0.0051 which is below the cutoff value of 0.07. This value is quite low for a model with 42 measured variables and a sample size of 702. When the 90% confidence interval

is applied for RMSEA, the true value of RMSEA expresses between 0.049 and 0.054. Therefore, the outcome shows the low upper bound of RMSEA in this case and the results of RMSEA support additionally for the model fit. Furthermore, the normed χ^2 as the the following absolute fit statistics shows value of 2.856 which is calculated by division between the the chi-square value and the degrees of freedom (2236.443 /783=2.856). According to Hair et al. (2010), the value of the normed χ^2 smaller than 2.0 presents a very good fitted model and this value from 2.0 to 5.0 is acceptable. As the result, an acceptable fit for the CFA model is suggested by value of the normed χ^2.

The CFI, one of the incremental fit indices, is most widely used. In this CFA model, the value of CFI gets 0.935 for a model of this complexity and large-scale sample size. This value is greater that 0.90 as the CFI guideline. Moreover, the suggested threshold values are also exceeded by the other incremental fit indices as well. Although there is no comparison between this model an other ones, the value of the parsimony index (0.857) with AGFI as a representatitve reflects a good model fit. In summary, the CFA outcomes demonstrate the reasonably good fit of this measurement model. Hence, the further examination of the model results enbalers to proceed suitably in the following step.

Figure 7.1 CFA result


chiquare/df 2.856
rmsea .051
cfi .935
gfi .876
tli .928
CUL
RA
FIRMPF
INCOMPAT
LEGAL
FINHR
E_CUS_IMPL
COMPLEX
OBSERVE
CUL12
CUL6
CUL7
CUL10
CUL4
CUL11
CUL2
CUL5
CUL1
RA7
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RA6
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STRPF5
STRPF4
STRPF1
FINPF2
STRPF7
FINPF1
INCOMPAT5
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INCOMPAT3
INCOMPAT4
INCOMPAT1
LEGAL2
LEGAL4
LEGAL3
LEGAL5
LEGAL1
FINHR1
FINHR2
FINHR3
E_CUS_IMPL2
E_CUS_IMPL3
E_CUS_IMPL1
COMPLEX2
COMPLEX1
OBSERVE2
OBSERVE1

7.4.2 The second-order CFA model

According to the literature review related to firm performance, business performance can have two categories, namely financial and strategic performance. Consequently, the second-order factor for Firm Performance (FIRMPF) is discovered.

Assessing Measurement Model Validity

Table 7.7 displays indicator reliability through standardized loadings (standardized regression weights using AMOS terminology), internal consistency reliability via CR and convergent validity via AVE. Other constructs are stable and have the same value as the first-order CFA model above, while the construct of Culture (CUL) and Firm Performance (FIRMPF) have factor loadings, composite reliability and AVE and its correlation with the others has changed. The lowest loading value obtained was 0.750 for item CUL1, which exceeds the 0.7 standard. The AVE estimates range at lease at 57.6% for Uncertain Avoidance (UA). All exceed the 50% rule of thumb. The construct reliabilities exceed 0.7, suggesting adequate reliability. Taken together, the evidence supports the convergent validity of the measurement model. The AVE estimates all exceed 0.5 and the reliability estimates all exceed 0.7. All of them exceed the recommended threshold, exhibiting unidimensional, reliability and convergent validity.

According to Fornell and Larcker (1981) and Götz et al. (2010), discriminant validity is examined by a comparison between the square root of the AVE for each latent variable and its correlations with the other latent variables. Table 7.8 shows that the discriminant validity of the model satisfies the criteria.

Table 7.7 Indicators of the second-order CFA

Variables	R^2	Loading ≥ 0.50	Composite Reliability (CR ≥ 0.70)	Average Variance Extracted (AVE ≥ 0.5)
FINPF				
FINPF1	0.659	0.812	0.818	0.693
FINPF2	0.726	0.852		
STRPF				

STRPF1	0.667	0.816	0.903	0.700
STRPF4	0.760	0.872		
STRPF5	0.756	0.869		
STRPF7	0.617	0.786		
UA				
CUL1	0.562	0.750	0.731	0.576
CUL2	0.590	0.768		
PD				
CUL4	0.590	0.768	0.819	0.804
CUL5	0.569	0.754		
CUL6	0.646	0.804		
COLLECTIVISM				
CUL7	1.575	1.255	1.575	1.575
MASCULINE				
CUL10	0.624	0.790	0.752	0.762
CUL11	0.580	0.762		
LONG_TERM				
CUL12	1.570	1.253	1.570	1.570

Table 7.8 Construct Correlation (Standardised) with construct of Firm Performance

Construct	FIRMPF
CUL	0.240
RA	0.485
COMPAT	0.147
COMPLEX	0.093
OBSERVE	0.026
LEGAL	-0.552
FINHR	-0.448
E_CUS_IMPL	0.344
FIRMPF	1.00
$\sqrt{AVE}$	0.835

Overall fit of confirmatory factor analysis (CFA)

Although a number of indices are described in CFA outputs, all possible fit indices will not be presented in this study. The key goodness-of-fit values will be focused on to illustrate, for example, the χ^2 statistics, the CFI, and the RMSEA.

Table 7.9 CFA Goodness-of-fit Statistics

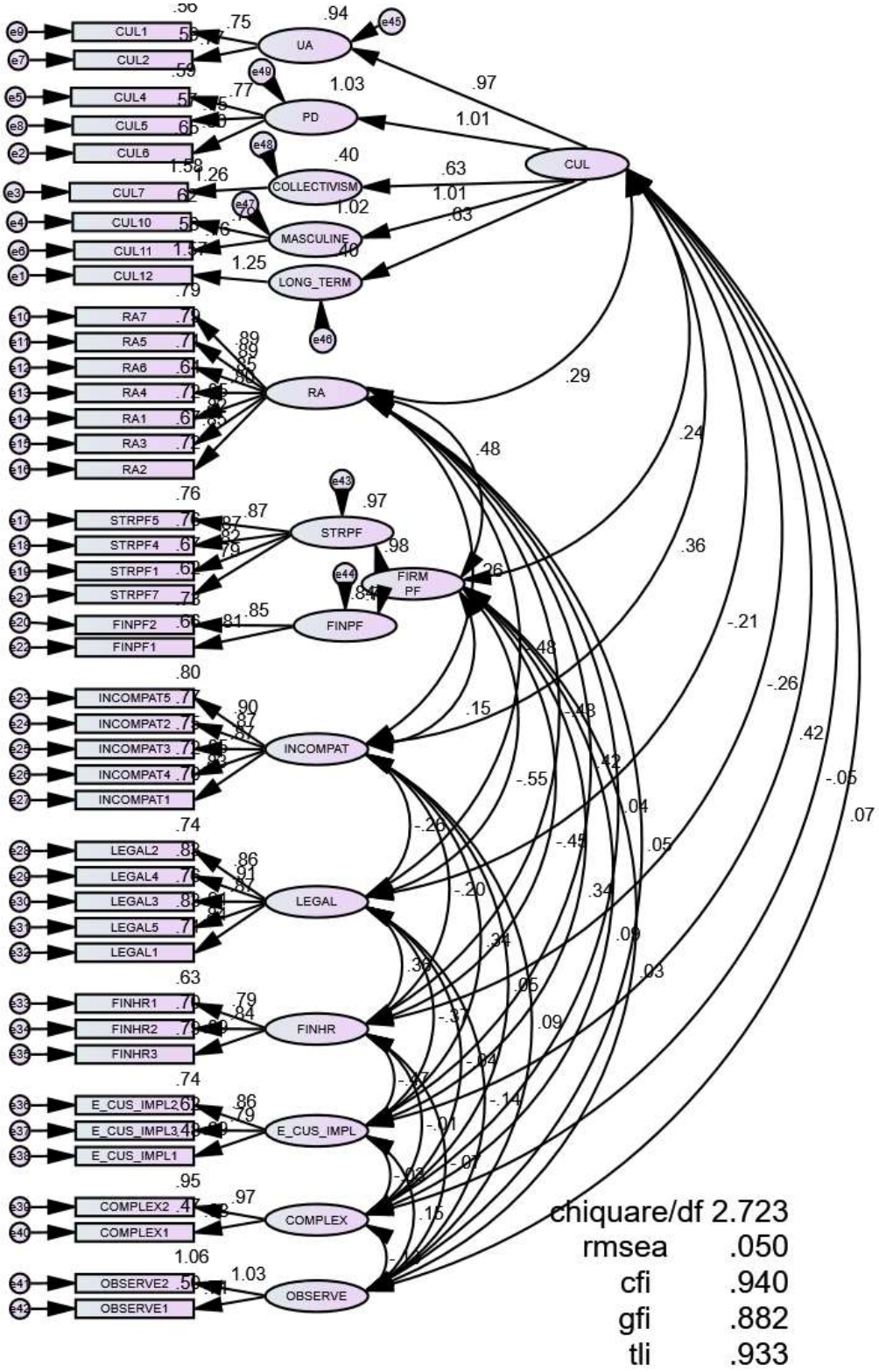
The first-order CFA model		The second-order factor CFA model
Chi-square (χ2)		
	Chi-square = 2236.443	2118.860
	Degrees of freedom = 783	778
	p-value ~ 0	0.00
Absolute Fit Measures		
	Goodness-of-fit (GFI)= 0.876	0.882
	Root mean square error of approximation (RMSEA)= 0.051	0.050
	90 percent confidence interval for RMSEA= (0.049; 0.054)	(0.047; 0.052)
	Root mean square residual (RMR)= 0.027	0.027
	Normed chi-square= 2.856	2.723
Incremental Fit Indices		
	Normed fit index (NFI)= 0.903	0.908
	Comparative fit index (CFI)= 0.935	0.940
	Relative fit index (RFI)= 0.893	0.898
Parsimony Fit Indices		
	Adjusted goodness-of-fit index (AGFI)= 0.857	0.863
	Parsimony normed fit index (PNFI)= 0.821	0.821

The selected fit indices from CFA output are described in Table 7.9. The overall model χ^2 achieves 2118.860 associated with 778 degrees of freedom. Using a rate of 0.05, the p-value obtains significance with a small result, less than 0.0001. Consequently, the χ^2 goodness of fit statistic can meet the threshold and desmonstrate the fit between the observed covariance matrix and the estimated covariance matrix within the sampling variance. In addition, an absolute fit index with a representative as RMSEA gains value

of 0.0050 which is below the cutoff value of 0.07. This value is quite low for a model with 42 measured variables and a sample size of 702. When the 90% confidence interval is applied for RMSEA, the true value of RMSEA expresses between 0.047 and 0.052. Therefore, the outcome shows the low upper bound of RMSEA in this case and the results of RMSEA support additionally for the model fit. Furthermore, the normed χ^2 as the the following absolute fit statistics shows value of 2.723 which is calculated by division between the the chi-square value and the degrees of freedom (2118.860 /778=2.723). According to Hair et al. (2010), the value of the normed χ^2 smaller than 2.0 presents a very good fitted model and this value from 2.0 to 5.0 is acceptable. As the result, an acceptable fit for the CFA model is suggested by value of the normed χ^2.

The CFI, one of the incremental fit indices, is most widely used. In this CFA model, the value of CFI gets 0.940 for a model of this complexity and large-scale sample size. This value is greater that 0.90 as the CFI guideline. Moreover, the suggested threshold values are also exceeded by the other incremental fit indices as well. Although there is no comparison between this model an other ones, the value of the parsimony index (0.863) with AGFI as a representatitve reflects a good model fit. In summary, the CFA outcomes demonstrate the reasonably good fit of this measurement model. Hence, the further examination of the model results enbalers to proceed suitably in the following step. In comparison with the first-order CFA model, almost all goodness-of-fit indexes and criteria are improved, such as normed χ^2, GFI, NFI, CFI, RFI and GFI. Therefore, the second-order factor CFA model can have a better model fit than the first-order CFA model.

Figure 7.2 CFA output with second-order factor



7.5 STRUCTURAL MODEL ANALYSIS

The relationships in the structural model can replace the correlations in the CFA model when transforming from CFA to a structural model. Hence, there are some changes, which may be a notation or more substantive issues.

The results from the CFA model indicate the validation of a set of construct indicators that enable us to study the relationship among nine important constructs. Following a comparison between the initial assumptions and the outcomes of the measurement model, the nine initial hypotheses are reduced to eight due to the removal of the Trialability construct in the Cronbach's alpha step.

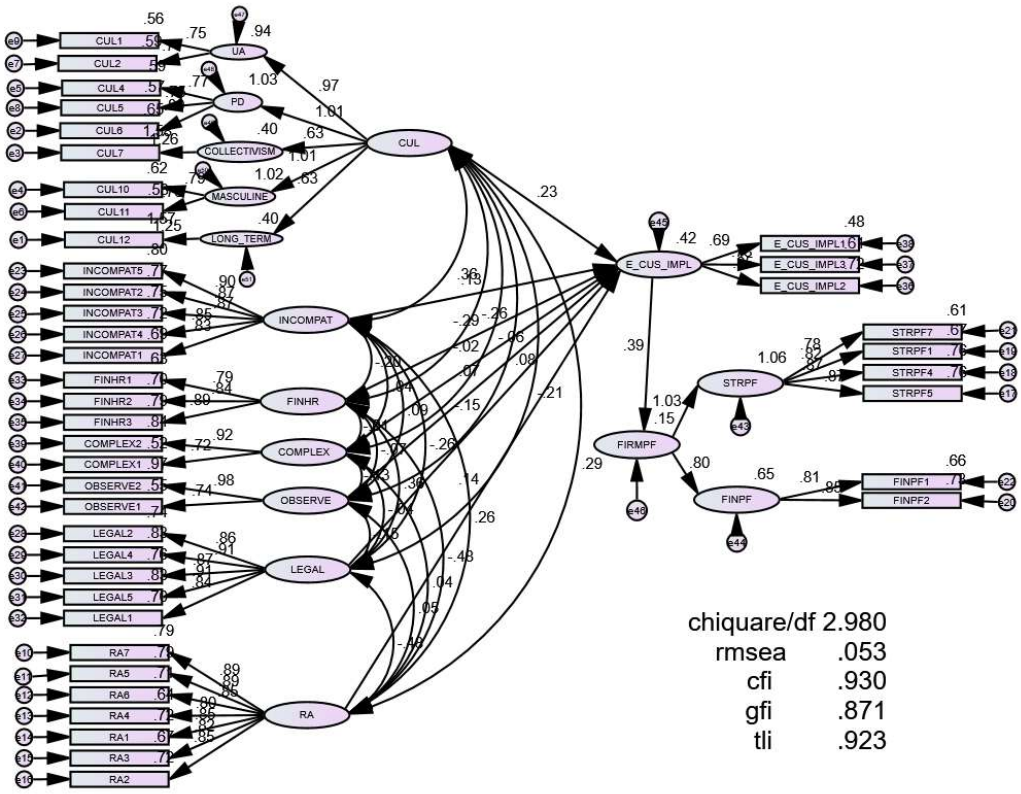
Table 7.10 Initial hypotheses and hypotheses after CFA

Initial hypothesis	Hypothesis after CFA model
H1: Relative advantages positively affect e-customs implementation	H1: Relative advantages positively affect e-customs implementation
H2: Trialability positively affects e-customs implementation	H2: Observability positively affects e-customs implementation
H3: Observability positively affects e-customs implementation	H3: National culture positively affects e-customs implementation
H4: National culture positively affects e-customs implementation	H4: Complexity negatively affects e-customs implementation
H5: Complexity negatively affects e-customs implementation	H5: Incompatibility negatively affects e-customs implementation
H6: Incompatibility negatively affects e-customs implementation	H6: Difficulties in finance and human resources negatively affect e-customs implementation
H7: Difficulties in finance and human resources negatively affect e-customs implementation	H7: Legislation deficiencies negatively affects e-customs implementation
H8: Legislation deficiencies negatively affects e-customs implementation	H8: E-customs positively affects business performance
H9: E-customs positively affects business performance	

The structure model is shown in the path diagram in Figure 7.3 below. For simplicity, the measured indicator variables and their corresponding paths and errors have been left

off the diagram.

Figure 7.3 Visual Diagram of the structural model



Hypothesis	Parameter
H1: RA + → E_CUS_IMPL	$P_{E\_CUS\_IMPL,RA}$
H2: OBSERVE+ → E_CUS_IMPL	$P_{E\_CUS\_IMPL,OBSERVE}$
H3: CUL + → E_CUS_IMPL	$P_{E\_CUS\_IMPL,CUL}$
H4: COMPLEX- → E_CUS_IMPL	$P_{E\_CUS\_IMPL,COMPLEX}$
H5: INCOMPAT-→ E_CUS_IMPL	$P_{E\_CUS\_IMPL,INCOMPAT}$
H6: FINHR - → E_CUS_IMPL	$P_{E\_CUS\_IMPL,FINHR}$
H7: LEGAL - → E_CUS_IMPL	$P_{E\_CUS\_IMPL,LEGAL}$
H8: E_CUS_IMPL + → FIRMPF	P_{FIRMPF,E_CUS_IMPL}

The structural model shown in the path diagram above can now be estimated and assessed. To do so, the emphasis will first be on SEM model fit and then on whether the structural relationships are consistent with theoretical expectations. The information in Table 7.11 shows the overall fit statistics from the testing of the SEM model. The χ^2 is

2339.484 with 785 degrees of freedom ($\rho < 0.05$) and the normed chi-square is 2.980. The model CFI is 0.930 with an RMSEA of 0.053 and a 90% confidence interval of 0.051 to 0.056. Almost all measures are within a range that would be associated with a good fit. However, GFI achieves 0.871, which is below 0.9. Based on the complexity and sample size, the result of GFI can be accepted (Hair et al., 2010). Furthermore, the overall model fit also changes very little from the CFA model to the SEM model. The only substantive difference is a chi-square increase of 220.624 and a difference of seven degrees of freedom.

Table 7.11 Comparison of Goodness-of-fit measures between Structural and CFA models

GOF Index	Structural Model	CFA Model
$\chi 2$ (chi-square)	2339.484	2118.860
Degrees of freedom	785	778
Probability	0.00	0.00
GFI	0.871	0.882
RMSEA	0.053	0.050
Confidence interval of RMSEA	(0.051; 0.056)	(0.047; 0.052)
RMR	0.052	0.027
Normed chi-square	2.980	2.723
NFI	0.899	0.908
CFI	0.930	0.940
TLI	0.923	0.933
RFI	0.889	0.898
AGFI	0.852	0.863
PNFI	0.819	0.821

The loadings estimates are slightly changed from the CFA results. Nineteen of the 42 estimated standardised loadings change. In particular, the maximum changes with the constructs of Complexity (COMPLEX) and Observability (OBSERVE) are from 0.031

to 0.050, while the others change less than or equal to 0.010 (Table 7.12). Thus, if parameter stability had not already been tested in the CFA stage, there is now evidence of stability among the measured indicator variables. In technical terms, this indicates that no problem is evident due to interpretational confounding, further supporting the measurement model's validity. As we would expect with so little change in loadings, the construct reliabilities are identical as well. The construct reliabilities also have partly changed with the constructs of Complexity, Observability and E-customs Implementation.

Table 7.12 Comparison of Standardised Factor Loadings and Construct Reliabilities for SEM and CFA Model

Indicator	Construct	Standardised Factor Loading (>0.5)			Construct Reliabilities (>0.7)	
		SEM	CFA Model	Change	SEM	CFA
E_CUS_IMPL	RA	0.139				
E_CUS_IMPL	OBSERVE	0.073				
E_CUS_IMPL	CUL	0.235				
E_CUS_IMPL	COMPLEX	-0.020				
E_CUS_IMPL	COMPAT	0.128				
E_CUS_IMPL	FINHR	-0.285				
E_CUS_IMPL	LEGAL	-0.147				
FIRMPF	E_CUS_IMPL	0.392				
STRPF	FIRMPF	1.031				
FINPF	FIRMPF	0.804				
CUL1	UA	0.750	0.750		0.768	0.731
CUL2		0.768	0.768			
CUL4	PD	0.768	0.768		0.819	0.819
CUL5		0.754	0.754			
CUL6		0.804	0.804			
CUL7	COLLECTIVISM	1.255	1.255		1.575	1.575
CUL10	MASCULINE	0.790	0.790		0.752	0.752
CUL11		0.762	0.762			
CUL12	LONG_TERM	1.253	1.253		1.570	1.570
RA1	RA	0.850	0.850		0.947	0.947
RA2		0.849	0.850	0.001		
RA3		0.821	0.821			
RA4		0.800	0.800			
RA5		0.887	0.887			

Indicator	Construct	Standardised Factor Loading (>0.5)			Construct Reliabilities (>0.7)	
		SEM	CFA Model	Change	SEM	CFA
RA6		0.845	0.845			
RA7		0.887	0.886			
COMPLEX1	COMPLEX	0.722	0.684	0.038	0.810	0.822
COMPLEX2		0.920	0.970	0.050		
INCOMPAT1	INCOMPAT	0.834	0.834		0.936	0.936
INCOMPAT2		0.875	0.875			
INCOMPAT3		0.866	0.866			
INCOMPAT4		0.848	0.848			
INCOMPAT5		0.896	0.896			
OBSERVE1	OBSERVE	0.742	0.711	0.031	0.861	0.873
OBSERVE2		0.984	1.027	0.043		
LEGAL1	LEGAL	0.837	0.840	0.003	0.944	0.944
LEGAL2		0.860	0.861	0.001		
LEGAL3		0.872	0.872			
LEGAL4		0.911	0.910	0.001		
LEGAL5		0.910	0.908	0.002		
FINHR1	FINHR	0.795	0.795		0.878	0.878
FINHR2		0.836	0.835	0.001		
FINHR3		0.887	0.888	0.001		
E_CUS_IMPL1	E_CUS_IMPL	0.692	0.695	0.003	0.820	0.826
E_CUS_IMPL2		0.851	0.861	0.010		
E_CUS_IMPL3		0.782	0.788	0.006		
FINPF1	FINPF	0.811	0.812	0.001	0.818	0.818
FINPF2		0.853	0.852	0.001		
STRPF1	STRPF	0.816	0.816		0.903	0.903
STRPF4		0.872	0.872			
STRPF5		0.871	0.869	0.002		
STRPF7		0.784	0.786	0.002		

Furthermore, table 7.13 shows the estimated unstandardised and standardised structural path estimates. As the result, one structural path estimate is insignificant and one structural path estimate is significant but in the unexpected direction, while others are significant and in the expected direction. The exception is the estimate between COMPLEX and E_CUS_IMPL because the p-value is 0.595, i.e. > 0.05. Therefore, although the estimate is in the hypothesized direction, it is not supported. In addition, the estimate between COMPAT and E_CUS_IMPL is significant with a p-value <0.05, but these have a positive relationship, in contrast with the initial hypothesis. In

summary, seven of the eight estimates are consistent with the hypotheses; these results support the theoretical model, with a caveat for the path that is not supported.

Table 7.13 Structural Parameter Estimates for SEM

Structural Relationship	Unstandardised Parameter Estimate	Standard Error	p-value	Standardised Parameter Estimate
H1:RA → E_CUS_IMPL	0.151	0.048	0.002	0.140
H2: OBERVE → E_CUS_IMPL	0.052	0.026	0.046	0.073
H3: CUL → E_CUS_IMPL	0.215	0.037	***	0.235
H4: COMPLEX → E_CUS_IMPL	-0.017	0.032	0.595	-0.020
H5: INCOMPAT → E_CUS_IMPL	0.116	0.035	***	0.128
H6: FINHR → E_CUS_IMPL	-0.291	0.045	***	-0.285
H7: LEGAL → E_CUS_IMPL	-0.154	0.043	***	-0.147
H8: E_CUS_IMPL → FIRMPF	0.352	0.037	***	0.392

***p-value < 0.001

Eight hypotheses pertaining to structural relationships were presented above and are supported and not supported as follows:

H1: Relative Advantages (RA) positively affects E-customs Implementation (E_CUS_IMPL).

This hypothesis is supported with a standardised positive coefficient of 0.14.

H2: Observability positively affects e-customs implementation.

This hypothesis is supported with a standardised positive coefficient of 0.073.

H3: National Culture (CUL) positively affects E-customs Implementation.

This hypothesis is supported with a standardised positive coefficient of 0.235.

H4: Complexity (COMPLEX) has a negative influence on E-customs Implementation.

This hypothesis is not supported as the p-value cannot satisfy the criterion of below 0.05, although this factor has a standardised negative coefficient of -0.020.

H5: Incompatibility (INCOMPAT) has a negative influence on E-customs Implementation.

This hypothesis is supported with a standardised positive coefficient of 0.13.

H4: Difficulties in finances and human resources (FINHR) has a negative influence on E-customs Implementation.

This hypothesis is supported with a standardised negative coefficient of -0.285.

H5: Legislation deficiencies (LEGAL) has a negative influence on E-customs Implementation.

This hypothesis is supported with a standardised negative coefficient of -0.15.

H6: E-customs implementation has a positive influence on firm performance (FIRMPF).

This hypothesis is supported with a standardised positive coefficient of 0.392.

7.6 ALTERNATIVE MODEL ANALYSIS

7.6.1 Alternative model

The underlying theoretical foundations for the model has been presented and discussed in detail in Chapters Two and Three. Can the model be respecified to improve the fit and meaning underlying the constructs? A number of research scholars have recommended that alternative models should be developed and compared to the original hypothesised model(s) (Anderson and Gerbing, 1988, Edwards and Bagozzi, 2000, Bollen and Long, 1993). An alternative model depicts "the relationships between the construct and measures as spurious, due to the influence of one or more common causes" (Edwards and Bagozzi, 2000: 165). In the SEM theorised model, the proposed model should be compared with the alternative model using the nested modelling test, thereby assessing the need for different paths (Anderson and Gerbing, 1988). Respecification of the indicators in the measurement model is used to increase the goodness-of-fit in the structural model when the indicators "have not worked out as planned" (Anderson and Gerbing, 1998). Anderson and Gerbing (1998) noted there are four ways to respecify indicators, however, only two ways are preferred as they preserve the potential of having a unidimensional measurement. The other two ways, relating the indicator to multiple constructs and using correlated error measurements, do not, and would thus obfuscate the meaning of the estimated underlying constructs. As discussed earlier in Chapter Four, modification indices and specification search can be used to revise and develop alternative (nested) models through altering one or more structural relationships, for example by adding or deleting paths. However, as stated by Hair et al. (2010) and Shah and Goldstein (2006), structural modifications and the addition of new paths "must have strong theoretical as well as empirical support" (Hair et al., 2010: 747).

In conclusion, seven of these eight relationships were supported with significant path estimates. According to Hair et al. (2010), patterns of large standardised residuals and/or large modification indices indicate changes in the structural model that may lead to model improvement with an alternative model. In a comparison between CFA and SEM,

the χ^2 difference of 220.624 and a difference of seven degrees of freedom suggest that the model fit may be improved using modification indices (MI) and the standardised residuals (Hair, 2018).

Table 7.14 shows the standardised residuals greater than |3|. In looking for patterns of residuals for a variable or set of variables, two patterns are obvious, including RA and LEGAL. Each item of the RA and LEGAl constructs has a positive and negative significance standardised residual with all six items in the FIRMPF construct. In particular, the residuals between LEGAL and FIRMPF achieve values from |5| to over |9|, while the residuals between RA and FIRMPF obtain values from over |3| to |5|. This indicates that a substantial relationship may have been omitted between RA and FIRMPF or LEGAL and FIRMPF.

Moreover, the examination of the two modification indices for the direct paths of RA → FIRMPF and LEGAL → FIRMPF shows that both have the highest value of 69.261 with RA and 103.438 with LEGAL. This strongly supports the addition of the RA → FIRMPF and LEGAL → FIRMPF relationships. Besides, it is supported theoretically, which is explained in more detail in the following part of the discussion (section 7.6.2).

This also corresponds to the pattern of residuals described above in relation to the relationships between the indicators of RA construct and FIRMPF, LEGAL and FIRMPF. Furthermore, the theoretical foundation also supports this relationship, which is discussed in the following section.

Table 7.14 Standardised Residual and Modification Indices for Structural Relationship in SEM

Standardised Residual (all residuals greater than |3|)												
	Largest Positive Standardised Residuals							Largest Negative Standardised Residuals				
	RA1	RA2	RA3	RA4	RA5	RA6	RA7	LEGAL 1	LEGAL 2	LEGAL3	LEGAL4	LEGAL 5
FINPF1	4.084	4.665	4.856	4.006	4.086	3.795	4.393	-9.35	-6.927	-7.163	-7.099	-6.711
FINPF2	4.494	5.837	4.778	3.79	3.549	3.931	4.095	-8.502	-7.047	-6.551	-6.175	-6.064
STRPF1	5.557	6.462	6.127	5.257	5.011	4.94	4.678	-7.463	-6.87	-6.669	-5.75	-6.161
STRPF4	5.221	7.224	6.451	5.286	5.582	5.662	5.264	-8.935	-8.377	-8.39	-7.575	-7.375

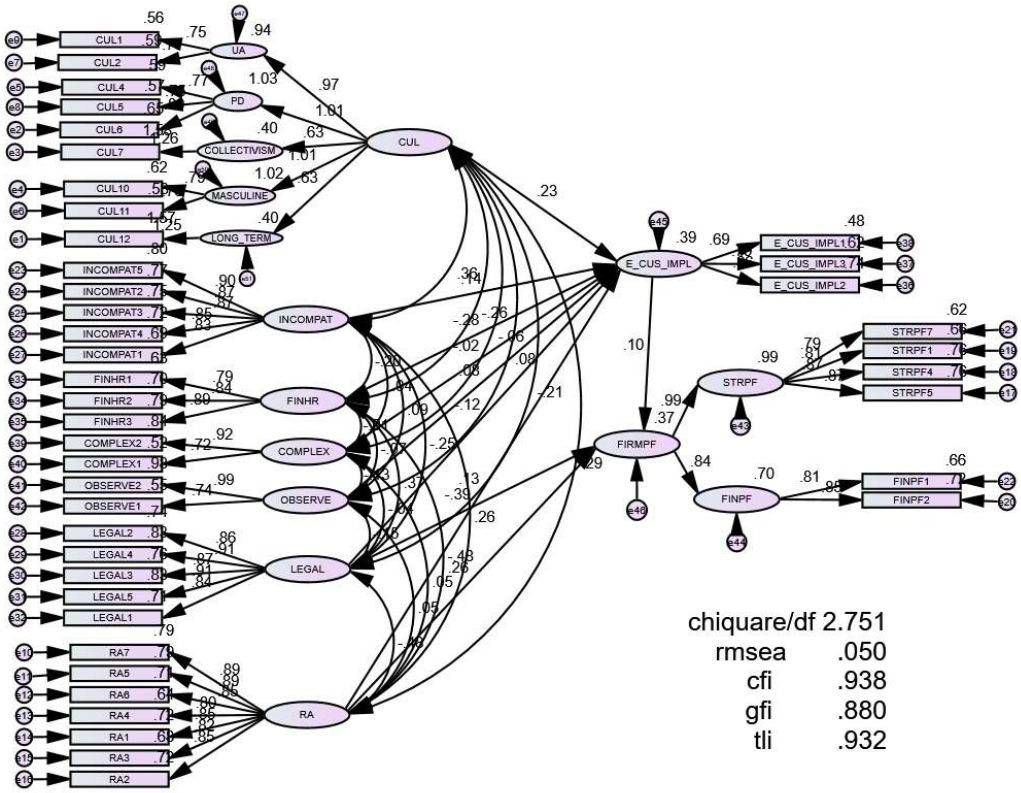
STRPF5	5.814	7.23	6.154	5.904	5.926	5.749	5.409	-8.069	-7.292	-7.546	-6.93	-6.719
STRPF7	5.852	7.193	5.955	4.732	5.589	5.45	5.321	-7.287	-9.109	-7.54	-6.503	-7.473
Modification Indices for Structural Relationship												
RA → FIRMPF					69.261							
LEGAL → FIRMPF					103.438							

Consequently, an alternative model can be proposed with relationships among the constructs of RA and FIRMPF and LEGAL and FIRMPF, as in Table 7.15. The model fit of the alternative model has a χ^2 of 2158.960 and degrees of freedom of 786. Thus, the normed chi-square reduces from 2.975 in the original model to 2.747 in the alternative model. Other model fit indices can be improved. In particular, GFI increases from 0.871 in the original model to 0.879 in the alternative model. Besides, NFI, CFI, TLI not only exceed 0.9 but also get better in comparison with the original model. Based on the GOF measures, the alternative model is a better fit than the original structural model, which is significant with a p-value < 0.01.

Table 7.15 Comparison of Goodness-of-fit measures between original and alternative model

GOF Index	Original model	Alternative model
χ2 (chi-square)	2339.484	2154.304
Degrees of freedom	785	783
Probability	0.00	0.00
GFI	0.871	0.880
RMSEA	0.053	0.050
Confidence interval of RMSEA	(0.051; 0.056)	(0.047; 0.053)
RMR	0.052	0.029
Normed chi-square	2.980	2.751
NFI	0.899	0.907
CFI	0.930	0.938
TLI	0.924	0.932
RFI	0.889	0.897
AGFI	0.852	0.861
PNFI	0.819	0.825

Figure 7.5 The alternative model



Several of the path estimates from the original model have changed slightly, as would be expected, as shown in Table 7.16. Most notably, the E_CUS_IMPL and FIRMPF relationship with a parameter of 0.10 remains significant but is substantially smaller than before, because in SEM1, FIRMPF is also dramatically affected by RA and LEGAL with regression weights of 0.260 and -0.389, respectively. The squared multiple correlation (R^2) for FIRMPF also improves from 15.4% to 37.4% with the addition of this relationship. These findings suggest that the structural model has a good model fit. The results showed reasonably good overall model fit and the hypothesized relationships were generally supported.

Table 7.16 Comparison of Structural Relationships between Original Model and Alternative Model

Structural Relationship	Original Model		Alternative Model (Add RA → FIRMPF; LEGAL → FIRMPF)	
	Standardised Parameter Estimate	p-value	Standardised Parameter Estimate	p-value
H1:RA → E_CUS_IMPL	0.140	0.002	0.126	0.006
H2: OBERVE → E_CUS_IMPL	0.073	0.046	0.077	0.040
H3: CUL → E_CUS_IMPL	0.235	***	0.235	***
H4: COMPLEX → E_CUS_IMPL	-0.020	0.595	-0.025	0.518
H5: INCOMPAT → E_CUS_IMPL	0.128	***	0.135	***
H6: FINHR → E_CUS_IMPL	-0.285	***	-0.279	***
H7: LEGAL → E_CUS_IMPL	-0.147	***	-0.119	0.005
H8: E_CUS_IMPL → FIRMPF	0.392	***	0.097	0.018
RA → FIRMPR	-	-	0.260	***
LEGAL → FIRMPF	-	-	-0.389	***

7.6.2 Alternative model analysis

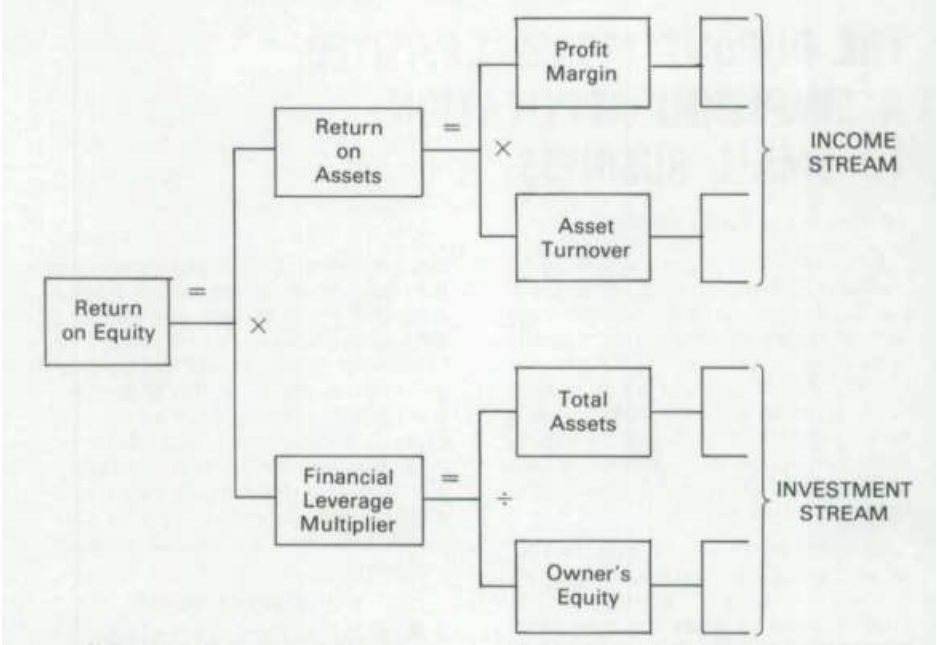
Additional path 1: Relative Advantage positively affects Firm Performance (RA → FIRMPF)

The additional relationship is supported by customs officials with a standardised positive coefficient of 0.26, which proves that the relative advantages of the e-customs system significantly influence firm performance because this factor is related directly to cost-savings and convenience for businesses (Lambert and Stock, 1993).

According to Voorhis (1981), the goal of firms is to increase the financial returns from the operation of a business. With the resource limitation of SMEs, any way to tackle this problem should be simple and quick. Consequently, the DuPont financial analysis model was proposed to provide a solution for businesses, especially small-sized firms (Davis, 1950). 'Income stream' and 'investment stream' are illustrated as two key

directions of financial analysis in this model, while return on equity (ROE) is identified as the major indicator of finances and receives the attention of the small business owner. Figure 7.6 describes the components of the DuPont Model.

Figure 7.6 The DuPont Model



Source: Voorhis (1981)

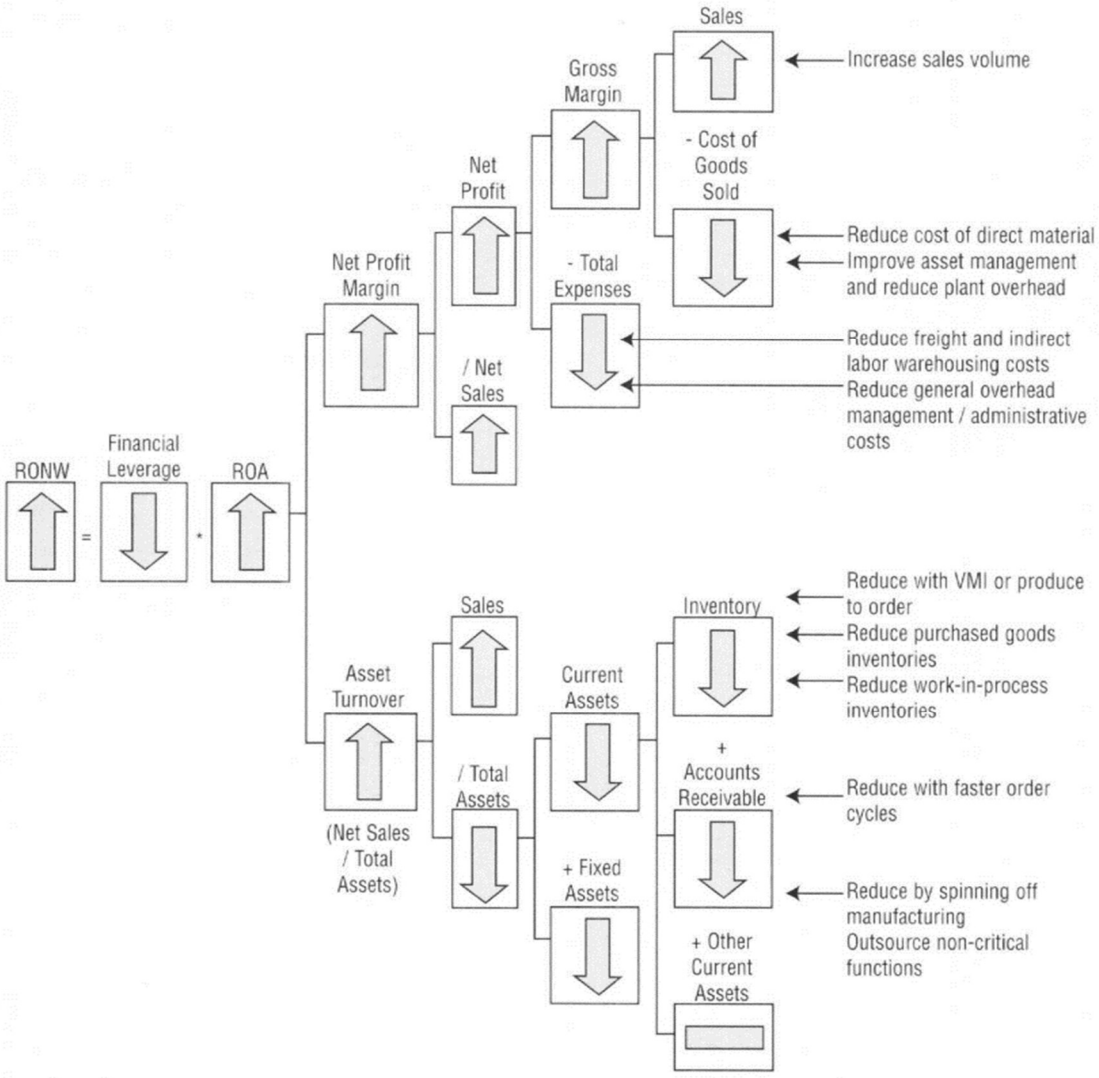
Lambert and Stock (1993) adapted the DuPont Model to develop the strategic profit model was introduced and show how RONW is a function of three factors that can be controlled by management, namely (i) net profit, (ii) asset turnover and (iii) financial leverage. Stapleton et al. (2002) applied this model in logistics and specified how logistics contributed to RONW through the model presented below.

There are a number of studies discussing the benefits of e-customs, such as the reduction of the burden of administrative documentation and the requirements for data re-entry as well as fewer data errors, time savings, cost reductions, usefulness in risk management and advance clearance (Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, & Baida, 2006; Raus, 2009; Choi, 2011; Urciuoli, Hintsa, & Ahokas, 2013). These advantages of e-customs contribute to decreasing the general overhead management or

administrative costs and reduce inventory costs as well as freight and indirect labour warehousing costs. Consequently, based on the Strategic profit model, cost deduction creates an increase in the return on the net worth of firms as one of the financial indicators of business performance.

Figure 7.7 Logistics Contribution to Return on Net Worth

(Stapleton et al., 2002 based on study of Lambert and Stock, 1993).



Additional path 2: Legislation positively affects Firm Performance (LEGAL → FIRMPF)

This additional relationship is supported by customs officials with a standardised negative coefficient of -0.4. Institutional theory mentioned that the legislation factor influences individuals, enterprises and stakeholders. Procedure, regulation and policy programs were assessed as instruments of government authorities. The various studies discussed the impact of legislation, regulation and rule of law on business performance, for example, researches of Daniels and Trebilcock (2004), Licht et al. (2007), Frye and Zhuravskaya (2000), Roxas, Chadee and Erwee (2012). Most outcomes of the studies perceived regulation as a burden from the perspective of the business owner (Carter et al., 2009; Department for Business, Innovation and Skills, 2012; Mason et al., 2006; National Audit Office, 2012; Open University Business School, 2012), while a few studies interpreted that regulation facilitates the market opportunities and firm performance. For instance, another study by Gomez (2016) reported the opposite findings related to the relationship between rule of law and firm performance in 22 developed countries in Europe as a developed environment. Based on the outlook of the business lobby groups, politicians, academics and the media, regulation was defined as 'red tape' or a burden on business performance, especially for small firms (Kitching, Hart and Wilson, 2015). According to Fletcher (2001) and the Federation of Small Businesses (2011), small businesses with resource limitations suffer disproportionately from administrative constraints. Raus (2010) and Holzner et al. (2009) clarified that legislation constraints have been argued as having a negative impact on the innovation process in general and the customs system in particular. In terms of the innovation aspect, Chadee and Roxas (2012) also agreed on the negative influence of regulatory quality, rule of law and corruption as the institutional environment on firm performance, specifically in the case of Russia. In addition, the annual reports of GDVC (2016, 2017) also describe the restriction and weakness of legislation related to e-customs and NSW when there are a number of overlapping regulations, which makes customs staff and businesses confused when they are conducting import and export procedures.

7.7 CHAPTER SUMMARY

This chapter presented the results of confirmatory factor analysis (CFA) and structural equation modelling (SEM). CFA was used to evaluate and validate the research

instrument. The results indicated that the employed measures were appropriate for the population investigated and all theoretical measurement models showed satisfactory and acceptable reliability, discriminant validity and convergent validity. In addition, SEM validated the proposed research model. Finally, an alternative model was developed and the findings of both models were discussed. The next chapter will interpret and discuss the findings of the CFA and SEM in more detail.

CHAPTER 8 DISCUSSION OF THE RESEARCH FINDINGS

8.1 INTRODUCTION

The outcomes of the research hypotheses will be discussed in this chapter. The research findings are evaluated with the previous literature in terms of e-customs and digital transformation studies. In addition, the outcomes of this research are also analysed in conjunction with the three main objectives of the research. Firstly, this study explored the enabler and inhibitor factors that influence e-customs implementation in Vietnam. Secondly, it investigated the interaction effects between e-customs and SMEs' performance in the case of Vietnam. In the final section, the policy implications are presented.

8.2 WHAT ARE ENABLERS AND INHIBITORS THAT INFLUENCE E-CUSTOMS FOR SMES IN VIETNAM? (RESEARCH QUESTION 1)

According to the statistical testing results, the drivers and barriers influencing e-customs implementation were explored based on business and customs officials' perspectives. Furthermore, the impact of e-customs implementation on the business performance of SMEs in Vietnam was clarified. Particularly, Relatives advantages, Observability and Culture are confirmed as the drivers, while Complexity, Incompatibility, Difficulties in finances and human Resources, and Legislation deficiencies are found to be barriers. Furthermore, the additional factors (excepting five attributes from DOI theory) including Culture, Difficulties in Finances and Human Resources and Legislation deficiencies, demonstrated significance or partial significance. Additionally, the exploration of culture discovered some differences in comparison with the prior literature in terms of innovation, while the other elements are consistent with previous studies. The findings pointed out that the impact of factors could explain 41% and 42% of e-customs implementation, and business performance can be explained by 13% and 15% of e-customs implementation based on a survey conducted with businesses and customs officials, respectively. The outcomes also show that the proposed model is significant as it fits within all the thresholds.

8.2.1 Drivers of e-customs implementation

Relative advantages positively affect e-customs implementation (H1)

This hypothesis is supported with the same standardised positive coefficient of 0.14 for both business and customs officials' perspectives and p-values of 0.032 and 0.002 for the surveys implemented with business and customs staff, respectively. The results mean that the more benefits e-customs provides, the more effective e-customs implementation is. In this context, the seven reliable items used for the construct of Relative Advantage are 'time savings' (RA1), 'cost savings' (RA2), 'fewer data errors' (RA3), 'reduction in the burden of administrative documents' (RA4), 'convenience with 24/7 system' (RA5), 'risk management' (RA6) and 'advance clearance' (RA7). All regression weights of the seven observed variables are above 0.8, while the cut-off value is above 0.7. Hence, business and customs officials are aware and strongly agree with these benefits of e-customs. This finding is consistent with a number of studies. The research of Dmitrieva and Rudakova et al. (2021) identified that the advantages that stakeholders received when applying e-customs encouraged e-customs diffusion and implementation in Russia. Relative advantages is evaluated as one of the most important factors in this research. In particular, customs officials agree with all the benefits of the e-customs system whereby businesses accept and have a high assessment with the four relative advantages of e-customs. The decision to adopt ICT relates to the usefulness and relative advantages that users perceive, which is referred to in relevant theories, including the theory of diffusion of innovation (DOI) (Rogers, 2003), the technology acceptance model (TAM) and the theory of reasoned action (TRA) (Ajzen & Fishbein,1975; Davis, 1989). This study supports the evidence in previous studies discussing the benefits of e-customs (Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, & Baida, 2006; Raus, 2009; Choi, 2011; Urciuoli, Hintsa, & Ahokas, 2013) as follows:

Time savings (RA1): In particular, business and customs officials clearly perceived that time for travelling, data processing and customs clearance can be reduced with e-customs adoption based on the statistical loading of the RA1 result of 0.835 and 0.850. Based on an OECD study, if the time that are goods held at the border is reduced by 10%, the imports will increase by around 6% (Wilson, 2009). Consistent with previous

research, King (1990), Hellberg (1991), Raus (2009, 2010), Granqvist et al. (2011), Choi (2011), and UNPAN (2012) emphasized that e-customs can reduce the time for accessing data, and inspecting and clearing goods, which supports businesses to implement customs procedures more quickly compared with traditional customs. Further, government agencies can develop communication and coordination among themselves by using e-customs. Exchanging information, such as examination results, approval of clearance, quarantine verifications and recommendation documents, could be conveniently supported by using an EDI system, which helps businesses as well as individuals who do customs declaration save time and costs because they do not have to visit several state agencies. The rank of the Logistics Performance Index (LPI) of Vietnam increased from 64th in 2016 to 39th among 160 countries in the world in 2018 (World Bank, 2019). The LPI of Vietnam is the third highest in ASEAN, just after Singapore (7th) and Thailand (32nd). In particular, the indicators of customs and time-savings of Vietnam's LPI increased from 2.75 and 3.5 in 2016 to 3.27 and 3.67 in 2018, respectively. Therefore, there is a significant efficiency improvement of customs transformation, such as the simplification of procedures and increased speed of clearance via the development of Vietnam's LPI. In 2017, it took 132 and 105 hours to conduct series of import and export procedures, respectively, which is a decrease of 6 hours and 3 hours in comparison with 2016, due to the adoption of the VNACCS/VCIS system (GDVC, 2017). In 2018, the export procedures can be processed on the same day and it takes around 3 days for imported products (GDVC, 2018). In addition, applying Vietnam Automated System for Seaport Customs Management (VASSCM) since 11th December 2017 has led to a 50% reduction in the time taken to process and deliver goods in seaports, airports and local customs departments. It takes just 1 or 2 minutes to take goods from customs warehouses, while businesses previously had to spend at least 7 to 10 minutes in addition to the 10 to 15 minutes for travelling among functional departments previously (customs.gov.vn, 2017). Especially, the time for clearance was reduced to 10 minutes in Noi Bai International Airport in 2020 (Vietnam Financial Magazine, 2020).

However, some firms are classified in yellow or red lines in the clearance process, which means that it takes a longer time to do clearance because their goods have to be formally

inspected or physically controlled (GDVC, 2015). Reasons could come from both sides, i.e. businesses and customs departments. Enterprises could smuggle or engage in trade fraud with the aim of tax evasion. For example, the Lang Son customs department found that 34 of 93 companies had imported goods that were not declared at the Tan Thanh border gate, with the value of VND 1.15 trillion, which is equivalent to US$ 50.7 million (Vietnam news, 2017). Moreover, the historical information of firms stored in the customs system may be inadequate and such companies are then allocated to the yellow or red line for the first and second times. Additionally, a lack of professional ethics of customs staff leads to corruption. Customs employees using their power and responsibilities could attempt to make opportunities for face-to-face meetings with enterprises and receive bribes from these firms. After that, customs officials will help the businesses to move their goods from the yellow or red line to the green one (GDVC, 2017). That is the reason why 35% of firms in interviews conducted by the author and 31% of enterprises in the survey of GDVC and VCCI (2016) mentioned unofficial fees paid to customs staff.

Cost reductions (RA2): Business and customs officials agreed that e-documents and online submission could save multiple costs. It was observed that the variable RA2 had a loading of 0.893 and 0.850 as the result of the survey with enterprises and customs staff, respectively. The study of Pourakbar and Zuidwijk (2018) showed that inspection is a time-consuming process that is costly for both customs and the supply chain. According to the report of Bakshi and Gans (2010), the supply chain can be disrupted and costs to corresponding 0.5% of the value of a container per day can be incurred due to unanticipated container delays. Furthermore, Urciuoli et al. (2013), Raus (2009), and Granqvist, Hintsa, and Männistö (2011) argued that cost-savings is one of the drivers of e-customs through the modernisation of customs system by computerisation. The administrative costs regarding paperwork, faxes and phone calls of enterprises and public organisations can be reduced because of the adoption of ICTs in customs (King, 1990; Raus, 2009, 2010; Granqvist, Hintsa & Männistö, 2011; Choi, 2011; Overbeek et al., 2011; UNPAN, 2012). ADB (2009) and Rause et al. (2011) defined that sharing data on these networks can streamline procedures and the logistics flow. As the result, the stakeholders can save time and costs and increase productivity. ADB (2009) described

that data savings in terms of online/network storage could help stakeholders automate access into import declaration with a personnel-freeing effect. Therefore, the costs of paperwork, communication trade and the logistics document process, as well as time, could be decreased. In particular, the VNACCS/VCIS and VASSCM systems also eliminate manual processing using paper documents; for instance, the collation of information between customs departments and port firms can be carried out using computerisation based on data storage instead of paper-based methods (GDVC, 2017). The modern solution could help enterprises and customs engage in accurate and transparent management as well as save costs (customs.gov.vn, 2017). In addition, the fast clearance could assist enterprises to save costs in goods storage at customs warehouses as well as reduce opportunity costs.

Reduced requirement for data re-entry and fewer data errors (RA3) was supported by firms and customs officials' perspectives with coefficients of 0.856 and 0.821, respectively. The information and data in public administration results are shared and exchanged in the electronic system, which reduces the necessity for data re-entry as well as the number of data errors made. Moreover, technical processing can save time and costs. Raus (2010) and Granqvist, Hintsa, and Männistö (2011) found that storing the information of firms as well as their trade history and consignments in the e-customs system could reduce the necessity for data re-entry and errors. Based on the instruction of GDVC (2014), businesses can save their own data on the system, allowing them to fill in the customs declarations automatically. Moreover, customs officials also double-check enterprises and consignments' information via VNACCS/VCIS to improve analysis accuracy and minimize mistakes.

Reduced burden of administrative documents (RA4): The pressure of administrative documents could be decreased through the adoption of e-documents and e-records in the e-customs system by customs officials (0.80), while this item did not satisfy reliability in the survey with businesses. By adopting e-documents and e-records, e-customs is likely to decrease the pressure of administrative documents. Henningsson and Andersen (2009) illustrated that the burden of paperwork could be reduced by 25% through the use of ICT applications. The perspectives of customs administrators are

separated into two groups based on hierarchy management as well as the responsibility of administrators. According to Richard et al. (2010), the hierarchical levels of managers reflect three categories of managers, namely top managers, middle managers and supervisory managers. The senior managers of GDVC as the policymakers and top managers identified the benefits of changes to the customs law and regulations. In contrast, the administrators of local customs departments, as the policy implementers and middle managers, perceived the gaps between theories and practice when they directly carried out e-customs. At the beginning of customs modernisation, several regulation documents had to be amended and supplemented with other papers, which confused both administrators and customs staff in local customs departments and caused difficulties (Dong Nai Customs Department, 2017). Fink (2001) argued that there is a difference between a policymaker and a policy implementer. Based on the experience, ideological inclinations or educational background of policymakers, they change regulations day-by-day to espouse broad philosophies, while the policy implementers have a different orientation from the policy initiators.

According to the business aspect, there are two categories of anxiety concerning administrative papers. Most businesses support the advantage of e-customs, referring to the reduction of bureaucratic documents, while the minority of firms, who had faced problems in the clearance process, such as needing to submit more supplementary papers to clarify and explain their goods, had the opposite perspective.

Convenience with the 24/7 system (RA5) contributes to the profits of the e-customs system with loading values of 0.812 and 0.887 as the results after conducting the survey with firms and customs employees, respectively. Businesses can submit files and all related documents online. Dan and Carlotte (2019) emphasized the dramatic effects of the improvement of the e-customs process with immediate release and 24/7 automated customs processing on trade and the economy. They also pay tax via the Internet. It is convenient to submit a customs dossier and to receive a receipt and clearance outcome because of 24/7 availability. According to King (1990), one of the successful e-customs projects of a leader country is the TradeNet service of Singapore, which has shown that the special features of the e-customs system can save time, lower costs and add

convenience for both businesses and authority bodies. In the case of Vietnam, both sides, i.e. businesses and customs administrators, approved the convenience of the VNACCS/VCIS and NSW system wherein firms could submit dossiers and information online 24 hours per day, 7 days per week. After that, the enterprises can receive the electronic bills and results of the clearance of their goods as well as pay taxes and fees online via various commercial and international banks.

Risk management (RA6): Customs officials in this survey perceived usefulness in terms of risk management (RA6) with a loading of 0.845. Based on WCO (2012) and Aoyama (2008), the e-customs system requires information exchange among customs, business and stakeholders such as other ministries, government agencies, warehouses and distributions. To address issues of smuggling and commercial fraud, stakeholders should enhance their relationships and coordination effectively. This is especially in the case of immediate release and clearance and the sharing of data among ports, borders, entry points, authorities and enterprises. However, there is weak information exchange and sharing between businesses, customs and other government agencies due to the hierarchal bureaucracy of the administrative structure and the intention to commit tax fraud of firms (GDVC, 2017).

Biljan and Trajkov (2012) argue that risk management in the customs sector concerns indicating which individuals, goods and means of transport have to be investigated. The modernisation of the customs system can support authorities to succeed in faster clearance while minimising the risks of non-compliance or illicit trade. Further, exchanging electronic data allows the pre-arrival or pre-departure data used in automatic systems to verify different shipments with a high-risk potential and show where more inspections can be conducted.

According to Gordhan (2007) and Biljan (2012), risk management in customs refers to the indication and investigation of individuals, goods and means of transport at various levels. Government agencies and businesses can achieve quick clearance and minimize the risks of non-compliance or illicit trade to acceptable standards by modernising the customs system and database. Additionally, an automatic system in e-customs could analyse the pre-arrival or pre-departure data as well as verify the various consignments

with a high-risk performance; subsequently, more inspection could be conducted (Holloway, 2009; UNPAN, 2012). According to Choi (2011), UNPAN (2012) and GDVC (2015), data are regularly collected by risk management software, and this information also has been used for analysis to make decisions on selecting new subjects for inspection. Risk management seems to be the responsibility and concern of customs departments rather than businesses. Therefore, no businesses mentioned this regarding the usefulness of e-customs.

The practice of intrusive inspection in the customs process has been set up as a limitation, as was described in the revised Kyoto Convention and WTO trade facilitation negotiations (Laporte, 2011). To answer these regulations, e-customs could be an effective solution to maintain the balance of customs management (Biljan & Trajkov, 2012). Goods inspection could be conducted in a simple, standardised and consistent way to enhance the administration of international supply chains through e-customs adoption. Furthermore, the requirements of security and compliance in the monitoring and control stages could be satisfied through the e-customs system. As a result, both intrusive observation and risks in security and non-compliance could be reduced through the support of e-customs.

According to Gillbert et al. (2004), the adoption and usage of e-government platforms can be encumbered by the need for confidentiality. Baida et al. (2007), Gillbert et al. (2004), Liao and Cheung (2001) emphasized that confidentiality means that data has to be kept confidential and not used to achieve a competitive advantage. When customs administration cannot prove how efficiently and securely the data is treated, it could be difficult to convince traders to use e-customs (Urciuoli et al., 2013). Thus, both customs managers and businesses worry about confidential risks when all the data are stored and transferred via the Internet and electronic system.

Advance clearance (RA7): Businesses can submit customs dossiers and obtain e-customs clearance in advance (before goods arrive at the port). According to WCO and UNCTAD (2011), the demand of traders regarding early release has been clarified in the WCO Guidelines for Immediate Release of Consignments. Based on the instruction of these guidelines, there are four categories of immediate release, namely

correspondence and documents without commercial value, low-value consignments with no duty or taxes, low-value dutiable consignments and high-value consignments. With low-value consignments, the value limitation is set up differently depending on the various countries' regulations and merchandise categories. If necessary, information has been submitted to customs in advance, high-value consignments could be granted facilitated clearance. In the case of guarantying duties and tax payment, businesses could be allowed immediate release and subsequent clearance.

Based on VNACCS/VCIS instruction, the electronic lodgement of data could support expediting the decisions on customs clearance and release (GDVC, 2014). Required documents and information could be submitted to VNACCS/VCIS ahead of the goods arriving in the country. VNACCS/VCIS can automatically receive declarations and dossiers. After that, the data processing system checks the stored information and automatically screens the risk management profiles of businesses to sort them into three lines (green, yellow or red). With the green line, consignments could be released immediately before the goods arrive at the airports or ports to shorten the import-export time for enterprises (GDVC, 2014). Mr Van Can Nguyen, President of GDVC, stated that 65% of importing consignments are in the green line, 30% are in the yellow line with a dossier check, and 5% are in the red line with a physical inspection. In particular, 99.6% of consignments in the green line could get fast clearance of under 1 minute while others in the yellow line spend less than 2 hours before being released (Vietnam Financial Magazine, 2018). Consequently, the risk management system could be facilitated using the advanced electronic processing of information. In addition, advance clearance also reduces delays at border crossings and entry points as well as shortens release times. Furthermore, traders could save storage and insurance costs.

Recoding to business perspectives, three points of relative advantages were removed for businesses, including a reduction in burden (RA4), enhanced risk management (RA6) and advance clearance (RA7). In addition, according to the interviews with the representatives of business, they still encounter difficulties in administrative documents which lead to the delay of clearance and extension of customs clearance times.

Trialability positively affects e-customs implementation (H2)

This hypothesis is not supported by the perspectives of both firms and customs staff in the Cronbach's alpha reliability step. Trialability is defined as "the degree to which an innovation may be experienced with on a limited basis" (Rogers, 2003, p.258). The trial period was conducted from 2005 to 2009 in 2 cities, namely Ho Chi Minh City and Hai Phong, yet in the qualitative interviews and questionnaire survey in previous chapters, the respondents were from SMEs and customs staffs with less than 10 years of experience with e-customs procedures. Hence, the respondents had only a slight perspective about the trial period of e-customs. This result is also consistent with purpose of this research examining implementation, development and evolution phases of e-customs which is corresponding to the fourth step (implementation) in innovation-decision process model of Rogers (2003). Based on the results of the interviews, the policymakers with a rich experience of around 10 years or more working in customs headquarters and departments were aware of trialability.

Observability positively affects e-customs implementation (H3)

Businesses do not support this hypothesis, while customs officials have the opposite perspective related to observability with a standardised coefficient of 0.1. Consequently, customs officials seem to be easier and more convenient to observe process and procedures of e-customs implementation and share with their relatives and colleagues than enterprises. This finding is also consistent with the scholars of Gerpott (2011) and Lee (2004) regarding observability of government officers in the context of e-government.

National culture positively affects e-customs implementation (H4)

This hypothesis is supported with a standardised positive coefficient of 0.23 from both business and customs officials' perspectives. The findings confirmed the significance of culture and its influence on e-customs implementation in Vietnam. Moreover, culture was explored as a new factor that had not appeared in the prior literature related to the relationship between culture and e-customs. The research results strongly supported H4, which proposed that national culture (CUL) positively affects e-customs

implementation with the strongest positive influence. The results support the positive relationship between national culture dimensions and e-customs implementation in Vietnam, and culture is a significant factor of e-customs implementation, supporting Al-Hujran et al. (2011) and Hofstede (2011), as shown in the following. Five dimensions of culture as the sub-hypotheses including uncertainty avoidance (UA), power distance (PD), collectivism (COLLECTIVISM), masculine (MASCULINE) and long-term orientation (LONG_TERM) were analysed and supported in this study. While uncertain avoidance and power distance are two strongest components that contribute Culture construct based on the business perspective, customs officials agree three dimensions including uncertain avoidance, power distance and masculine have the most contribution for Culture. Furthermore, there are some differences compared with the previous research related to culture and innovation or e-government. Firstly, other studies indicate that uncertain acceptance, low power distance and individualism encourage innovation and e-government. In other words, this paper declares that uncertainty avoidance and collectivism in Vietnam also have a positive impact on e-customs. Secondly, Vietnam is known as a high-power distance country, however, with the aim of integration and international trade improvement, this perspective is changing in Vietnam from high to low power distance between policymakers and businesses. Thirdly, this research also agrees with the literature that masculine and long-term orientation societies will show more innovation in e-government. In Vietnam, the short-term orientated society (Hofstede, 2011) is becoming an old theme as this emerging country is switching to a long-term orientation. In terms of the five dimensions, uncertainty avoidance, power distance and masculinity show significant influence.

In particular, there are some elements of culture which were deleted. Based on the business viewpoint, problem-solving ability (CUL3), strict supervision of customs department (CUL4), sharing information (CUL7), an alliance among partners (CUL8) and focus on HR training (CUL10) were rejected in this study. According to customs officials' viewpoint, CUL3, CUL8 and CUL 9, relating to the relationship between business and customs, were removed. Solving problems was raised by businesses much more than customs administrators because it directly influences the benefits of firms' trade activities. The limitations of legislation and a multi-hierarchy management

structure, as well as weak collaboration among government agencies, are key reasons for this obstacle (GDVC and VCCI, 2017; VN Media, 2018). Vietnam Customs has an attribute with multiple levels of management, including the General Department of Customs and Customs Departments in local and customs branches. Therefore, if customs staff in local branches cannot handle the issues of business, they have to report to higher managers, which causes delayed consignments at borders. Moreover, the public services that e-customs provides not only improve infrastructure and maintain quality but also concentrate on customer service to enhance customer satisfaction. Furthermore, some cases require businesses to provide more supplementary paperwork. NSW and ASW are still new projects for the Vietnamese government in general and Vietnam Customs in particular. According to GDVC (2016), although the agenda of NSW regarding customs procedures was set up in 2008, NSW was officially launched in 2014 with initial steps. Hence, the specific instruction documents of NSW and ASW are deficient and should be supplemented to complete national targets by 2020, which was reflected through the responses of customs administrators. According to the report of GDVC (2017), the number of enterprises participating in NSW in 2017 was limited to 334. Accordingly, the business interviewees did not discuss this regarding the limitation of sharing information (CUL7) and alliance among partners (CUL8) due to confidentiality. According to Gillbert et al. (2004), the adoption and usage of e-government platforms could be encumbered by confidentiality. Baida et al. (2007), Gillbert et al. (2004), Liao and Cheung (2001) introduce that data has to be kept confidential and cannot be used to alter competitive advantage. When customs administration cannot prove how efficiently and securely the data is being treated, it could be difficult to convince traders to use e-customs (Urciuoli et al., 2013). Thus, both customs managers and businesses worry about confidentiality risks when all data are stored and transferred via the Internet and electronic system.

8.2.2 Inhibitors

The obstacles of implementation of e-customs could hinder and lead to the failure of the project (Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, and Baida, 2006; Raus, 2009; Choi, 2011).

Complexity negatively affects e-customs implementation (H5)

The hypothesis H5 is supported as the p-value is below 0.05, with a standardised negative coefficient of -0.14 in combination with Incompatibility (INCOMPAT), when surveying businesses, while customs officials do not support this hypothesis, although the coefficient achieves -0.02. Hence, customs officials define the complexity related to technological constraints as having little impact on e-customs implementation in comparison with the business point of view. Technological obstacles, such as inadequate infrastructure, IT skills, confidentiality, and difficulties in using and upgrading software, have been discussed in the literature as primary barriers in developing countries like Vietnam (Goossenaerts et al., 2009; Dmitrieva & Rudakova et al., 2021). In contrast, our study based on business view point suggests that both incompatibility (INCOMPAT) and complexity (COMPLEX) of technology are not challenges for e-customs in Vietnam. In particular, the incompatibility of a customs system is disagreed in the current circumstance, which means that compatibility of Vietnam customs system becomes a driver of e-customs efficiency. The Vietnamese government has identified the ICT sector as a primary one contributing to national growth. To achieve a sustainable economy and international integration, all ministries and local governments were instructed to promote IT adoption and development through Resolution No.26/NQ-CP promulgated by the Prime Minister in April 2015 (Nguyen and Trang, 2017).

Complexity, one of the attributes of innovation in DOI theory, refers to “the degree to which an innovation is perceived as difficult to understand and use” (Rogers, 2003). Goossenaerts, et al. (2006) and Rogers (2003) discussed that a simple idea is easy to be adopted in comparison with a complicated idea that requires complex skills and knowledge. The government officials, individuals and firms encounter difficulties in e-government adoption, which refers to the definition of complexity. According to Helbig (2009), complexity has an influence on models of e-government theories and the demand for e-government services. Other studies by Alsheha (2007), Arduini (2010), Betrah (2007) and Lee (2009) also explain that complexity can limit the effectiveness of current e-government adoption and not satisfy the social demand related to information technologies.

Consequently, the majority of customs administrators mentioned the complexity of VNACCS/VCIS and a new management system as obstacles in conducting e-customs in the beginning. On the opposite side, no businesses clarified this issue, which could highlight the flexibility and ability of enterprises in adopting new technology and innovation much more than government agencies (Gerorski and Machin, 1992; Soni et al., 1993; Freel, 2000; Westerberg and Wincent, 2008; Qian and Li, 2003; Verhees and Meulenberg, 2004). Scholars such as Acs and Yeung (1999), Qian and Li (2003), Verhees and Meulenberg (2004), and Timmons (1998) point out that SMEs have more flexibility to achieve an efficient integration of technological inventions than larger firms. Therefore, SMEs have active innovative ability. A survey by GDVC and VCCI (2016) identified some obstacles that businesses need to get used to when applying the VNACCS/VCIS system in the initial stages. Based on the annual report of GDVC (2017), customs staff and businesses have some difficulties in adapting to the new automated management system. Therefore, the complexity of the system could be one of the inhibitors of e-customs implementation.

Incompatibility negatively affects e-customs implementation (H6)

This hypothesis is supported by both business and customs officials; however, firms' views clarify that incompatibility (INCOMPAT) combined with complexity (COMPLEX) has an impact on e-customs implementation with a standardised negative coefficient of -0.14, while this factor influences e-customs based on customs staff's perspective with a standardised positive coefficient of 0.13. Consequently, there is a difference in viewpoint between the two sides. In particular, businesses suppose incompatibility as one of the barriers related to technology in conducting e-customs, while customs officials argue that customs system is compatible. One of the requirements of customs procedures is the possibility to ensure compatibility with different countries, which also becomes a challenge for customs systems in terms of the interoperability between various systems. The main reason is that there are inherent differences between the systems, such as the syntactic structures, the embedded semantics and the embedded logic of interchange agreements, business rules, and work practices by employees (Roger, 2003; IBM, 2008, Yao-Hua Tan, Stefan Klein, Boriana

Rukanova, Allen Higgins, & Baida, 2006; Choi, 2011; Urciuoli, Hintsa, & Ahokas, 2013). It is difficult and unrealistic for nations to change to one integrated system because the governments of countries have already invested in and constructed their own monolithic networks. Cross-border trade causes this issue to become more serious. Consequently, the diverse and distributed environments assert perspectives of international standards in order to gain interoperability (Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, & Baida, 2006; Urciuoli, Hintsa, & Ahokas, 2013). These standards should be achieved through consistent compatibility on local and national levels as well as the global level. For example, trading parties who are both EU members may use EU standards. However, if they are not EU trading partners, some general standards should be added. To determine this issue, the different countries should unify and adjust their own regulations to avoid conflicts of criteria as well as facilitate harmonisation.

Regarding the customs officials' viewpoint, this hypothesis is supported with a positive loading value of 0.13. In comparison with content of questionnaire survey, this means that compatibility becomes one of the facilitators for e-customs implementation based on the opinions of customs staff. In the ICT aspect of e-customs, there are several achievements, for example, deploying outsourcing management system and automated system for seaport customs management; improving automated clearance and release system VNACCS/VCIS 24/7; enhancing the security system; developing e-tax and duty 24/7 with 12 banks' participation and promoting the online public service system (GDVC, 2017). The government departments, trading firms and transportation service providers desire to enhance the efficiency of supply chain operations, and they have to apply ICT solutions in supplying public services mandatorily (UNCTAD, 2006). In particular, IT innovation in the Industry 4.0 technological era with blockchain and big data require non-stop improvement of the e-customs system, such as expanding NSW and ASW. Unfortunately, the current NSW in Vietnam cannot satisfy the demands of users according to the annual report of GDVC (2017). Besides, the continuous development of various systems requires users to have professional ICT skills to update and be proficient in their applications. If the ICT conditions are responded to, ICT skills and equipment will become one of the motivators promoting e-customs.

Difficulties in finance and human resources negatively affect e-customs implementation (H7)

This hypothesis is not supported by businesses as the p-value is over 0.05, while customs officials agree with this opinion with a standardised negative coefficient of -0.3. Three observed variables were used to measure the construct of finances and human resources, including 'Investment for e-customs deployment' (FINHR1), 'demand of training' (FINHR2) and 'quality of human resource' (FINHR3). The findings indicated that costly investment for e-customs system deployment, high demand for training, and a lack of high-quality customs officials have a negative impact on e-customs implementation. A lack of human resources in terms of quantity and quality, such as a deficit in IT knowledge and skills, or the fear of losing jobs can become considerable barriers for e-customs. In the study of Shalehi (2010), the author criticized that customs staff and clients in Iran are used to practising on existing ICT equipment and software, which leads to the ineffective operation of e-customs. According to Raus (2009), while IT innovation provides benefits in terms of more convenient and accessible services for citizens and businesses, it may become obsolete for governmental activities. In some cases, customs officials are afraid of losing their jobs or are reluctant to change familiar habits due to their not owning the right skill-set to cope with the new technological environment, which generates a critical barrier to the implementation of e-customs. Based on the annual report of the General Department of Vietnam Customs in 2020, the shortage of customs staff with professional skills and rich experience is an obstacle to e-customs implementation. According to the Navigos Group, the largest career website in Vietnam, 71% of employers agree that the biggest obstacle is a lack of IT skills (Agility, 2021).

With SMEs, the investment in technology for e-customs is not a big problem, while the investment for e-customs systems of the government is a huge amount. Based on the instruction of customs departments and the use of the Internet, computers and VNACCS/VCIS software, firms can easily carry out e-customs procedures online. Moreover, SMEs can change technology and adapt to a new environment flexibly and quickly (Acs and Yeung 1999, Qian and Li 2003, Verhees and Meulenberg 2004,

Timmons 1998). Those are the reasons why finances and human resources are not the barriers with enterprises to implement e-customs.

The Vietnam Automated Cargo and Port Consolidated System and the Vietnam Customs Information System (VNACCS/VCIS), funded by the Japanese government, will help facilitate trade and investment activities in Vietnam, according to the General Director of the General Department of Vietnam Customs Nguyen Ngoc Tuc. The project will also help Vietnam implement a one-stop customs system that links Vietnam with other ASEAN countries in addition to improving customs management efficiency, Mr Tuc added. In late March 2012, Japan signed an agreement to grant JPY2.66 billion ($33 million) to Vietnam to help the latter build an electronic customs clearance procedure (e-customs) system and implement a one-stop customs system. Under the agreement, Japan will train Vietnamese personnel to deploy the VNACCS/VCIS within three years and transfer the relevant technology to Vietnam. Japan would also send experts to help Vietnam establish a long-term strategy on information technology and information technology applications. These experts will review the legal framework and make necessary adjustments to increase the capacity of Vietnam's customs officers. Vietnam started applying electronic customs (e-customs) procedures at all customs offices across the country on January 1, 2013, after a seven-year pilot. Statistics from the General Department of Vietnam Customs show that 41,592 businesses nationwide used e-customs in 2012 (www.vov.vn Feb 21, www.baohaiquan.vn Feb 14). Moreover, the government had to invest synchronously and comprehensively not only in the e-customs system but also in other industries, such as IT infrastructure, legislation and human resources. Furthermore, switching e-customs and e-government systems not only costs a lot in terms of hardware and software development, but also in changes of procedures, instructions, paperwork and legislation. Additionally, GDVC also allocates a financial budget for regular training for customs officials and enterprises to instruct them how to use the e-customs system (GDVC,2020).

Legislation deficiencies negatively affects e-customs implementation (H8)

This hypothesis is supported by both businesses and customs officials with a standardised negative coefficient of -0.31 and -0.12, respectively. Businesses assess

legislation deficiencies as a primary obstacle when they conduct e-customs procedures. This finding is consistent with the studies of Raus (2010), Holzner and Peci (2011) and Dmitrieva and Rudakova et al. (2021), in which legislative constraints have been argued as having a negative impact on the innovation process in general and the customs system in particular. Zheng and Dong et al. (2019) also intimated that the customs procedure was not streamlined at many dry ports in China because of paperwork. In addition, annual reports of the GDVC (2016, 2017) also describe the restrictions and weaknesses of legislation related to e-customs and NSW when there are several overlapping regulations, which confuses customs staff and businesses when conducting import and export procedures. Regarding regulation compliance, the survey of GDVC and VCCI (2016) showed that 37% of firms evaluated by customs officials complied with the regulations, laws and responsibilities. 83% of businesses participating in this survey suggested that administrative procedures and regulations should be simplified.

Furthermore, legislation and regulations are not strict or specific enough to enhance the compliance of customs officials and businesses. For example, although many laws call for access to corruption, the lack of legislation outlining specific responsibilities has led to very uneven implementation of transparency provisions. Laws also fail to address the need for a monitoring and enforcement system for transparency. There are 30 laws, rules, and regulations calling for access to information, but these are often not implemented seriously. Even with the rather progressive clauses on openness and transparency in the Anticorruption Law, citizens are only entitled to request information on the operations and activities of the organisations in which they work or of the People's Committee of the commune in which they reside. Their ability to request information on the operations and activities of People's Committee Offices at the district level and above is not guaranteed. Improving access to information requires the better implementation of existing laws, but without widespread legislative changes, such improvements are unlikely (WorldBank, 2013). Accordingly, both customs administrators and firms confirm legislation as the most significant inhibitor of e-customs implementation in Vietnam in particular and in emerging markets in general (Babbar et al., 2008; Prasad and Tata, 2010).

NSW and ASW are still new projects for the Vietnamese government in general and Vietnam Customs in particular. According to GDVC (2016), although the agenda of NSW regarding customs procedures was set up in 2008, NSW was officially launched in 2014 with initial steps. Hence, the specific instruction documents of NSW and ASW are deficient and should be supplemented to complete national targets by 2020, which was reflected in the responses from the customs administrators. The report of GDVC (2017) stated that the number of enterprises participating in NSW in 2017 was limited to 334. Accordingly, the business interviewees did not discuss this.

8.3 WHAT IS THE IMPACT OF E-CUSTOMS ON BUSINESS PERFORMANCE IN VIETNAM? (RESEARCH QUESTION 2)

E-customs positively affects business performance (H9)

H9 is supported with the same standardised positive coefficient of 0.4 from the perspective of both the businesses and customs staff. Hence, the more effectively e-customs is achieved, the more the business performance is enhanced. The results from the survey with enterprises showed that 13% of SME performance in Vietnam can be explained by the direct impact of e-customs implementation, while this outcome in the survey with customs officials is 15%. In addition, e-customs implementation positively affects both sides of firm performance, including financial and strategic performance, with the following indicators: profit, growth rate, paperless operations, customer satisfaction and employee satisfaction. The number of customs departments implementing e-customs increased from 2 in September 2009 to 13 in 2010, to 21 in 2012, to 34/34 customs departments and 171/171 customs branches since 2015. Over this same period, the proportion of customs declaration forms that were submitted electronically rose from over 6 million customs declaration forms in 2015 to nearly 11 million in 2017. In terms of turnover value, the proportion of exports and imports being declared electronically rather than through traditional customs increased sharply after 2009, reaching a value of USD 25.1 billion in 2017 – a 21% increase from 2016 (GDVC, 2017). GDVC (2017, 2019) reported that the number of customs declaration forms submitted electronically increased from over 6 million in 2015 up to nearly 11 million in 2017 and 12.42 million in 2019. With the electronic declaration, the value of exports

and imports rose from USD 25.1 billion in 2017 to USD 500 billion in 2019. WTO (2019) expressed that Vietnam ranked third in ASEAN, after Singapore and Thailand, in terms of the total value of imports and exports. Furthermore, the LPI of Vietnam achieved the 3rd position in ASEAN and the 39th among 160 countries in 2018 (World Bank, 2019). Hence, the transformation and development of customs services have made a great contribution to Vietnam's logistics performance, for instance, speed, simplicity of computation, and time reduction in customs procedures and clearance.

According to traditional perspectives, financial outcomes such as profit and growth are indicators to assess business performance (Johnson, 1983; Dess and Robinson, 1984; Capon et al., 1990; Parnell and Wright, 1993; Covin et al., 1994; Dawes, 1999; Wall et al., 2004). Douglas M.Lambert (2000) identified that the reduction of total expenses, including costs of lot quantity, transportation, inventory carry, warehouses, information system, general and administration, could increase net profit through a strategic profit model. Consequently, almost all business respondents stated in these interviews that saving costs when carrying out e-customs could boost their profit and growth of revenue and assets.

However, a number of studies of Johnson and Kaplan (1987), Lynch and Cross (1991), Eccles (1991), Neely *et al*. (1994) and Ghalayini and Noble (1996) reveal series of disadvantages of business performance measured with financial indicators. Hence, the new approach of firm performance with strategic indicators including satisfaction of employees and customers as well as social responsibilities is developed by Kaplan and Norton (1992, 1996), Eccles (1991), Ittner and Larcker (1998, 2003) and Neely (1999). Consistent with previous research, this thesis strongly supports for application of both financial and non-financial performance to assess business performance. Therefore, questions regarding paperless operations, customer satisfaction, the loyalty of customers and employee satisfaction were discussed to assess the impact of e-customs on business performance.

The transformation from the traditional way (face-to-face communication and paper submission) to online leads businesses to use less paper in administrative management as well as customs procedures. Paperless could be one form of the environmental

performance of enterprises (Chakravarthy, 1986; Waddock and Graves, 1997). Connolly et al. (1980), Hitt (1988), Zammuto (1984) defined that "the measurement of firm performance through assessing stakeholders' satisfaction with the foundation of the stakeholder theory". Two stakeholder groups are considered, namely customer and employee, and their satisfaction can become indicators of firm performance. According to Fornell, Johnson, Anderson, Cha, and Bryant (1996), both the quality and quantity of goods or services are targets of customers. Barney and Clark (2007) also emphasised that if customers' demands are satisfied, they can enhance their willingness to pay for goods and services. Advantages that e-customs provides, such as time-savings, cost-savings, and the reduction of administrative documents, could satisfy both customers and employees when the clearance time is shortened and the facilitation of international trade is improved significantly (Parasuraman et al., 1994; Fornell, Johnson, Anderson, Cha, & Bryant, 1996). However, there are several factors influencing the loyalty of customers (Dodd, 2002), for example, price, the quality of goods and services (Parasuraman et al., 1988 and 1994; Lim et al., 2006; Kim et al. 2004), the performance and categories of products or services, location of stores, customer service, the value of the brand name, quick response to complaints, promotional activities, switching costs, and so on (Santouridis and Trivellas, 2010; Hao et al.2009; Toyese, 2014; Jones et al., 2000). Furthermore, the sample size of interviews is limited to within 20 results, which cannot represent the majority of businesses. Thus, supporters who agree with enhancing customer loyalty through e-customs implementation are a few. Nevertheless, overall firm performance when adopting e-customs is developed based on reforming administration and applying ICT (GDVC and VCCI, 2017). Accordingly, the long-term usage of enterprises is confirmed.

8.4 WHAT SUGGUESTIONS CAN BE PROVIDED TO ENHANCE E-CUSTOMS IMPLEMENTATION? (RESEARCH QUESTION 3)

This section aims to answer the third research question "What should be done to enhance the usefulness of Vietnamese e-customs and to limit its deficiencies to move forward towards the National Single Window and the ASEAN Single Window?".

Based on the discussion in the previous sections, some suggestions can be made. Regarding the customs officials perspective, there are some concerning issues, including 'Direct observation/knowledge regarding the e-customs application of other businesses' (OBSERVE1), 'Sharing information' (CUL7), 'Focus on HR training' (CUL10), 'Financial achievement' (CUL11), 'More investment in customs in the future' (CUL12), 'Complicated and difficult to use e-customs software' (COMPLEX2), 'Difficulties in approaching customs law or regulation' (LEGAL4), 'Difficulties in changing/updating/transforming customs legislation' (LEGAL5), 'Difficulties in software upgrade or transformation' (INCOMPAT5), and 'Adequate human resource (FINHR3). Additionally, the business perspective also mentions problems of 'Policy decisions based on business feedback' (CUL6), 'Specific instructions to apply e-customs' (CUL1), 'Promote the function of customs agencies and support teams' (CUL2), 'Interactive ability between customs and business' (CUL5), 'Financial support' (FINHR2), 'Adequate financial effort' (FINHR1), 'Complicated and difficult to use e-customs software' (COMPLEX2), 'Difficulties in approaching customs law or regulation' (LEGAL4) and 'Weakness in confidentiality' (INCOMPAT3). In summary, the problems of e-customs implementation not only relate to inhibitors including legislation deficiencies, incompatibility, complexity, difficulties in finances and human resources, but also involve some factors of culture corresponding to the solution categories. Hence, this study recommends three main solution categories, namely (i) legislation and administration solutions, (ii) technological solutions, and (iii) human and culture solutions.

Because the limitation of questionnaire,

8.4.1 Legislation and administration solutions

There are some recommendations for legislation and administrative paperwork according to the feedback from the enterprises. Particularly, regulations and administrative legal documents should be checked in order to find-out the duplication and unification that should be deleted and updated following the current circumstances. Furthermore, detailed legal documents and instructions should be completed, especially supporting documents for Customs Law, Import and Export Tax Law and Tax

Management Law. The Vietnam General Department of Customs also determined a detailed plan to improve the legal system and assigned this responsibility primarily to the Legal Department and Customs Management Supervision Department from 2019 to 2021 (GDVC, 2019). Furthermore, according to the international agreements and commitment terms of the WTO signed in 2007 as well as the EVFTA signed in 2019, tariffs have to proceed with the reduction roadmap and regulations should enhance and facilitate international trade. Therefore, changes to the tax and regulations of import and export products can be significant.

With the aim of enhancing abilities of approaching customs laws and regulations, especially in case of changing, updating and transforming customs legislation, communication activities should be boosted through multiple communication channels. Based on the report of customs assessment (GDVC,2020), information is provided via online channels that are preferred to the traditional way, for example, portal of GDVC, website of the local customs departments and national trade portal. Improving abilities of approaching information also supports compliance of both business and customs officials. Moreover, the detailed customs instructions and regulations facilitate for business to following and obey. In addition, customs officials get enhanced ethical and professional training that not only improve attitude but also strengthen individual ability. Besides, mechanism of personal monitoring and evaluation is built-up and applied for all customs officials that will be discussed more specifically in the following section.

Additionally, GDVC is set-up a strategic road-map forward to 2030 to digitalising customs as following (GDVC, 2020):

Firstly, e-customs procedures should be standardised internationally to ensure a stable environment for businesses as well as guarantee the compliance ability of both firms and customs staff. Sometimes, there are differences in e-customs procedure instructions among customs departments in various cities and provinces (GDVC, 2018).

Secondly, NSW and ASW should be deployed and operated smoothly. Particularly organising and implementing administrative procedures with NSW and ASW as well as

the inspection of import and export goods should be the focus. Additionally, the Vietnam General Department should issue a decree to connect and share information between government agencies and stakeholders via NSW. According to GDVC (2020), NSW and ASW have been promoted with the participation of 13 ministries and departments, 188 administrative procedures have been put on the NSW, 2.9 million files have been processed, and 36,000 firms have joined NSW.

Thirdly, the structure of customs departments can be simplified to improve the efficiency of activities and solve problems for business more quickly. According to the annual report of GDVC (2019), 12 customs departments were cut in the process of restructuring. Next, upgrading online public service to level 4 is an urgent task. Administrative documentation at level 4 is the highest degree applied to all processes and steps on the Internet to facilitate the user in accessing and implementing paperwork anytime and anywhere. In 2019, 163/193 customs documents were conducted at level 4, while 21 documents were at level 3 and 9 documents were levels 1 and 2 (GDVC, 2019). Hence, the number of customs declarations processed and handled in 2019 reached 13.24/13.33 million e-customs documents, accounting for 99.34%; the amount of taxes and fees via digital methods was 96.8% (GDVC, 2019). Finally, the effectiveness of inspection, supervision and control of exported and imported goods should be enhanced. GDVC also set up the scheme for innovating the inspection models for exported and imported goods.

8.4.2 Technological solutions

Moreover, some solutions related to ICTs can be discussed. (i) First of all, GDVC should have a comprehensive program to improve and innovate the e-customs system. According to GDVC (2019), the Steering Committee for setting up the customs IT system was officially established with Decision 155/Decision- GDVC with 12 members as senior leaders of Vietnam Customs. (ii) Several e-customs systems in Vietnam have been deployed and applied, such as Ecustoms5, the system of processing and export production goods, the Vietnam Automated System for Seaport Customs Management (VASSCM), E-manifest and so on (GDVC, 2019). However, these systems have to keep improving, updating and innovating especially in the Industry 4.0 technical era with

trends of blockchains, big data and artificial intelligence (AI). Besides, some subsystems should be created and transformed into digital systems, for example, applications or software to manage goods and in relation to business to classify and analyse goods at ports/airports and monitor samples. Hence, data collection also should be given attention for analysis and risk management. (iii) A centralised document management system called EdocCustoms was launched and implemented in 2019 (GDVC, 2019). This data system applied big data and data analytics aims of collect, analyse information of business in customs, import and export. A centralised data management system can provide information that integrates into other systems or subsystems of customs to satisfy multi-dimensional information with the aims of managing, monitoring and evaluating enterprises' operations when conducting customs procedures.

(iv) In order to enhance transparency and risk management, a system of internal inspection, complaints and denunciation to prevent corruption should be proposed. Information used for professional operations and to combat commercial fraud, smuggling and tax evasion can be collected and received quickly through this system. As the result, customs management can be promoted and become more transparent and efficient, which contributes to corruption reduction, time and costs savings for businesses when implementing e-customs procedures, as well as increasing the revenue of the state budget.

(v) An integrated module to support operational customs officials can be suggested. With the goal of building a customs force at a professional and specialised level, customs staff should be equipped with modern technology as an effective assistant to enhance the productivity and efficiency of customs procedures and improve their management skills and their ability to handle operations capacity. This module can assist customs staff based on each job position and responsibility to access linked information for different purposes and directions. It also integrates operation interfaces for customs officials to handle duties in the right process.

(vi) A system of experts represents the stored knowledge of skilled customs officials and professional information analysts. This expert system is capable of adapting and

implementing learning evaluation on professional instructions based on practice to keep improving the efficiency of the knowledge warehouse using machine learning and AI.

(vii) Furthermore, ICT infrastructure should be improved with a 5G system to increase the speed of accessing the Internet to save time for both customs offices and businesses. GDVC should also focus on developing physical and organisational structures and facilities to ensure that there is the appropriate infrastructure for upgrading the system.

(viii) In addition, the 24/7 e-tax system should be expanded through cooperation with more commercial banks to facilitate businesses. According to GDVC (2019), 41 banks participated in receiving imported and exported tax in general, and 28 banks joined the e-tax 24/7 system. In the same report of GDVC (2019), the rate of payment via the e-tax system of the coordinating banks and the State Treasury always reaches over 90% of the total state budget revenue of the customs sector. Consequently, the tax payment procedures keep simplifying, which saves time and costs for business as well as opens up more payment channels for taxpayers. Individuals and firms can pay taxes proactively using the internet at any time and anywhere via any device. The tax payment does not depend on the working hours or working locations of the collecting agencies, such as commercial banks, customs departments or State Treasury. Regarding the state agencies, human resources are saved and effective management is also ensured due to safety and simplification via the e-tax 24/7 system. The debt deduction of tax is processed accurately after the enterprise has paid tax, which minimises the adjustment of payment vouchers with information errors. As per the results, the satisfaction of business and international investors can be increased. In terms of commercial banks, their cooperation with GDVC in e-tax payment helps to develop and improve the quality of payment services for customers, attract more potential customers as well as restrict the need to check payment vouchers with wrong information.

(ix) In addition, Vietnam Customs also identified a change management method based on each transaction to the individual firm (GDVC, 2019). A mobile application to support the customs procedures implementation anytime, anywhere and on any devices can hereby be proposed. To achieve this, a set of general standards for building mobile applications and system architecture must be unified. This application also has to

communicate and integrate with other systems and its security should also be the main focus. This mobile application can allow businesses, individuals and other organisations to follow up the activities and every change of state agencies as well as monitor the results of the handling of the paperwork of stakeholders promptly. Therefore, public services can be searched transparently and easily, which can satisfy the demands of businesses, organisations and individuals, thereby enhancing the relationships and reactions between policymakers with a representative of GDVC and businesses.

8.4.3 Human and culture solution

The third solution category mentions human resources and culture. Firstly, the quality of customs staff should be reviewed and checked regularly to motivate human resources to keep improving their professional skills. That is why GDVC usually organizes periodic qualification tests for customs staff. Over 2,100 customs staff joined in the competency assessment examination from 25 November 2019 to 8 January 2020 (GDVC, 2020). In 2018, GDVC established and implemented a system for assessing the capacity of civil servants who are not in a leadership position in the six main professional fields, namely management supervision, import and export tax, post-clearance inspection, risk management, anti-smuggling investigation and handling of violations. The software application applied to assess staff qualification to ensure stability, transparency and accuracy was deployed in 2018 (GDVC, 2019). This application was also carried out with 3,000 customs officials (GDVC, 2019).

Secondly, training human resources to enhance compliance and attitude of customs staff should also be a priority. On average, GDVC annually organizes 150 training classes with the participation of around 17,000 customs officials (GDVC, 2019). Several local customs departments have actively implemented good and suitable ways to improve their professional condition, for instance, by constructing software for testing staff qualifications (Dong Nai, Hai Phong, Quang Tri…), self-developing relevant documents and organizing professional training for executive officials. Furthermore, open training classes related to the e-customs system and procedures for business and customs brokers should be expanded.

Finally, there should be a focus on increasing the relationship and collaboration with businesses and stakeholders to listen to their feedback and review, update the problems they encounter, and share and update information for enterprises. Based on WCO (2012) and Aoyama (2008), the e-customs system requests information exchange among customs, business and stakeholders, such as other ministries, government agencies, warehouses and distributors. To address the issues of smuggling and commercial fraud, stakeholders should enhance the relationship and coordination effectively. Especially in the case of immediate release and clearance, sharing data among ports, borders, entry points, authorities and enterprises are crucial. However, there is weak information exchange and share between businesses, customs and other government agencies due to the hierarchical bureaucracy of the administrative structure and the tax fraud of firms (GDVC, 2017).

On 15 January 2020, GDVC launched Decision 85/Decision-GDVC regarding the plan for promoting the relationship between customs departments, businesses and stakeholders (GDVC, 2020). This activity can spread to the business community, facilitating enterprises to actively participate in cooperation with customs authorities. Moreover, firms can identify their responsibility in contributing to policy consultations, law enforcement supervision and collaboration to improve efficient customs management. In addition, the regular communication between enterprises and customs offices supports businesses in accessing, grasping and understanding legal regulations as well as limiting problems that arise and improving legal compliance capacity. In particular, customs departments in cities and provinces should focus on deploying the following activities, such as propagandizing about the dialogue between customs and firms, supporting businesses to deal with issues related to e-customs procedures, consulting with enterprises and stakeholders, monitoring law enforcement, and cooperating with the business community.

8.5 CHAPTER SUMMARY

This chapter interpreted and discussed the different results of the proposed research models in order to determine the factors that motivate and restrict e-customs implementation in Vietnam as well as the impact of e-customs on firm performance.

The proposed module based on DOI was tested and almost all factors are validated and significant. The discussed findings showed that enablers, including relative advantages and national culture, have a positive influence on e-customs implementation; in contrast, inhibitors, such as complexity and legislation deficiencies, have a negative impact on e-customs for both customs officials and businesses. There are some differences between the two perspectives. Particularly, the trialability factor is not supported by both customs staff and businesses, while observability is not supported by business, while customs officials have a contrasting viewpoint on its positive effect on e-customs. Incompatibility has a negative influence on e-customs implementation based on the perspective of firms, while this factor has a positive impact on the opinion of customs staff. Financial and human resources are assessed as a significant negative factor in e-customs implementation based on the viewpoint of customs officials, while the business side disagrees with this perspective. Furthermore, both the customs workforce and enterprises stated that e-customs and relative advantages have a positive influence on business performance, while legislation is considered as a primary negative factor influencing firm efficiency by customs officials. In addition, according to the qualitative and quantitative analyses in previous chapters, three main recommendation categories, namely including legislation and administration, technology, human and culture, are also suggested.

CHAPTER 9 CONCLUSION AND LIMITATIONS

9.1 INTRODUCTION

This chapter is based on the foregoing discussions to present the contributions to research and the implications for practice. It hereby also presents theoretical and methodological contributions for researchers related to international trade and e-customs in emerging countries and outlines the implications for policymakers and businesses related to e-customs. Finally, the research limitations and future avenues for research are discussed in detail.

9.2 OVERVIEW OF THE RESEARCH AIMS AND CONCLUSION

This research aimed to advance empirical study in the realm of e-customs implementation and business performance. There are three primary objectives of this study: (i) exploring the enablers and inhibitors influencing e-customs implementation in Vietnam, (ii) assessing the impact of e-customs on SMEs' performance in Vietnam and (iii) providing recommendations that will assist policymakers in enhancing the efficiency and effectiveness of e-customs as well as offer support for business managers to develop further strategies. As the result, a conceptual model based on DOI theory and the literature review was proposed and examined in the context of Vietnam, in which the enablers, with the additional factor of culture, are integrated with other factors of DOI theory, including relative advantages, trialability and observability; legislation deficiencies, difficulties in finances and human resources, in combination with the factors of incompatibility and complexity in DOI, which are assessed as obstacles. To test these theoretical models, interviews and a questionnaire survey were administered to 1083 participants encompassing customs officials and business representatives from 5 cities and provinces linked to the country's principal ports and airports.

RQ1: What are enablers and inhibitors that influence e-customs for SMEs in Vietnam?

The literature review highlighted and synthesized the primary factors influencing e-customs in Vietnam. The quantitative approach was applied in this study using SEM.

The results of this study confirmed that almost all proposed factors have an impact on e-customs implementation except one, namely trialability, while the influence of e-customs in firm performance is significant. Consequently, eight hypotheses of this research are supported while one hypothesis is rejected. However, the opinions of customs officials and businesses contain some differences. In particular, both enterprises and customs staff agree that relative advantages and culture are two dominant factors positively affecting e-customs implementation, while complexity and legislation are discussed as barriers to e-customs implementation. Both sides also disagree on whether trialability influences e-customs in general in Vietnam because the trial phase from 2005 to 2009 was 10 years ago. Additionally, observability is valid with customs officials, while firms expressed a contrasting opinion. The factor of compatibility is evaluated as a negative element by businesses, while customs staff argue that this factor positively influences e-customs. Next, relationships between finance, human resources and general e-customs also showed differences from the enterprises and customs officials' perspectives. In particular, the businesses clarified that finances and human resources are not an obstacle when they carry out e-customs procedures, while this factor is a principal difficulty for customs officials in e-customs implementation. Both enterprises and customs staff agree that legislation is one of the inhibitors negatively influencing e-customs implementation in Vietnam.

In conclusion, businesses perceive the facilitators of e-customs implementation as being relative advantages and culture, while complexity, incompatibility and legislation deficiencies are mentioned as the obstacles. Particularly, exploring a facilitator (Culture) and an obstruction (Legislation) showed that these are the most significant positive and negative elements with beta values of 0.23 and -0.3, respectively. Furthermore, e-customs implementation can be explained to 41% by these factors.

In comparison with customs officials' standpoint, relative advantages, observability, culture and compatibility are categorised as enablers while difficulties in finances and human resources and legislation deficiencies are discussed as the inhibitors influencing e-customs implementation in Vietnam. In particular, culture has the most positive impact while finances and human resources demonstrate the most negative effect on e-

customs with loading values of 0.235 and -0.285, respectively. Furthermore, these factors can provide an explanation of 42% for e-customs.

RQ2: What is the impact of e-customs on business performance in Vietnam?

This study highlights the direct positive impact of e-customs implementation on business performance and the indirect effects on both financial and strategic firm performance with the indicators of profit, growth rate, paperless operations, social activities, and satisfaction of customers and employees. Therefore, this research supports the investigation of firm performance based on both financial and non-financial performance. Both firms and customs officers stated that e-customs implementation in Vietnam positively affects firm performance, with the same coefficient of 0.4 for both sides' viewpoints. In the survey with business, firm performance can be explained to 13% by the direct impact of e-customs implementation. Additionally, e-customs implementation also has an indirect influence on financial performance and strategic performance, with values of 0.412 and 0.337, respectively. Based on the findings of the survey with customs officials, the direct effect of e-customs implementation can describe 15% of SMEs' performance. Regarding indirect influence, e-customs implementation affects financial performance and strategic performance at 0.315 and 0.404, respectively.

RQ3: What suggestions can be provided to enhance e-customs implementation?

The problems of e-customs implementation not only relate to barriers including legislation, finances and human resources but also involve factors of culture corresponding to solution categories. Hence, this study recommends two primary solution categories: (i) legislation and administration and (ii) human resources and culture.

There are some recommendations for the legislation and administrative paperwork to solve the problems related to e-customs procedures and processes experienced by enterprises. Firstly detailed, legal documents and instructions should be provided, especially supporting documents for Customs Law, Import and Export Tax Law and Tax Management Law. The Vietnam General Department of Customs also developed a

detailed plan to improve the legal system and primarily assigned this responsibility to the Legal Department and Customs Management Supervision Department from 2019 to 2021 (VGDC, 2019). Furthermore, based on international agreements and the terms of the commitment of the WTO signed in 2007 as well as the EVFTA signed in 2019, tariffs have to proceed with the reduction roadmap and regulations should enhance and facilitate international trade.

Secondly, e-customs procedures should be standardised internationally to ensure a stable environment for businesses as well as guarantee the compliance ability of both firms and customs staff. Sometimes, there are differences in e-customs procedure instructions among customs departments in various cities and provinces (VGDC, 2018).

Thirdly, NSW and ASW should be deployed and operated smoothly. Particularly, organising and implementing administrative procedures with NSW and ASW as well as the inspection of import and export goods should be concentrated on. Additionally, the Vietnam General Department should issue a decree to connect and share information between government agencies and stakeholders via NSW. According to VGDC (2020), NSW and ASW have been promoted with the participation of 13 ministries and departments, 188 administrative procedures have been put on the NSW, 2.9 million files have been processed and 36,000 firms have joined NSW.

Fourthly, the structure of customs departments can be simplified to improve the efficiency of activities and solve problems for business more quickly. According to the annual report of VGDC (2019), 12 customs departments were cut in the process of restructuring. Next, upgrading the online public service to level 4 is an urgent task. Administrative documents at level 4 are the highest degree applied to all Internet processes and steps to facilitate users accessing and implementing paperwork at any time and from anywhere. In 2019, 163/193 customs documents were conducted at level 4 while 21 documents were at level 3 and 9 documents were levels 1 and 2 (VGDC, 2019). Hence, the number of customs declarations processed and handled in 2019 reached 13.24/13.33 million e-customs documents, accounting for 99.3% of taxes, while fees via digital methods occupied 96.8% (VGDC, 2019). Finally, the effectiveness of the inspection, supervision and control of exported and imported goods should be

enhanced. VGDC also set up a scheme to innovate the inspection models of exported and imported goods.

The second solution category refers to human resources and culture. Firstly, the quality of customs staff should be reviewed and checked regularly to motivate human resources to keep improving their professional skills. That is why VGDC usually organizes periodic qualification tests for customs staff. Over 2,100 customs staff joined in the competency assessment examination from 25 November 2019 to 8 January 2020 (VGDC, 2020). In 2018, VGDC established and implemented a system for assessing the capacity of civil servants who are not in a leadership position in the six main professional fields, namely management supervision, import and export tax, post-clearance inspection, risk management, anti-smuggling investigation and handling of violations with nine sets of test. The software application used to assess staff qualifications to ensure stability, transparency and accuracy was deployed in 2018 (VGDC, 2019). This application was also implemented on 3,000 customs officials (VGDC, 2019).

Secondly, training human resources to enhance the compliance and attitude of customs staff also should be in focus. On average, VGDC annually organizes 150 training classes with the participation of around 17,000 customs officials (VGDC, 2019). Several local customs departments have actively implemented good and suitable ways to improve their skills, for instance, constructing software for testing staff qualifications (Dong Nai, Hai Phong, Quang Tri…), self-developing documents, and organizing professional training for executive officials. Furthermore, open training classes related to the e-customs system and procedures for business and customs brokers should be expanded.

Finally, there should be an emphasis on increasing the relationships and collaboration with businesses and stakeholders to listen to their feedback and reviews, address the problems they encounter, and share and update information for enterprises. On 15 January 2020, VGDC launched Decision 85/Decision-VGDC regarding the plan for promoting the relationships between customs departments, businesses and stakeholders (VGDC, 2020). This activity can spread to the business community, facilitating enterprises to participate in actively cooperating with customs authorities. Moreover,

firms can identify their responsibilities in contributing to policy consultations, law enforcement supervision and collaboration to improve the efficiency of customs management. In addition, regular communication between enterprises and customs offices supports businesses in accessing, grasping and understanding legal regulations as well as limits problems that arise and improves legal compliance capacity. In particular, customs departments in cities and provinces should focus on deploying the activities such as propagandizing the dialogue between customs and firms, supporting businesses to deal with issues related to e-customs procedures, consulting with enterprises and stakeholders, monitoring law enforcement, and cooperating with the business community.

9.3 THESIS CONTRIBUTION

This study investigates the enablers and inhibitors influencing e-customs implementation and the impact of e-customs on SMEs' performance in Vietnam based on institutional theory, stakeholder theory and DOI theory. Having detailed the various gaps and limitation in the existing research (Chapter 2), this thesis reaches to purpose to fill the gaps in current knowledge. Firstly, this research helps categorise the drivers and barriers and analyse the effect of these factors on e-customs implementation that previous studies still debate. This thesis supports for conjunction of institutional theory and IT innovation with DOI theory which helps conceptualise factors in the proposed model and offer the appropriate theoretical lens for analysis. Attributions of regulatory (coercive) and culture-cognitive in the institutional theory contribute two additional factors (legislation and culture) next to five elements from DOI theory (relative advantages, trialability, observability, complexity and compatibility) in the conceptual model. Based on the result of previous study, one more factor, finance and human resource, was suggested to add-on for examination. According to the findings of this study, three additional factors are significant and have the most positive/ negative impact on e-custom. Particularly, viewpoint of business argues that group of facilitators includes relative advantages and culture while group of obstacles contains complexity, incompatibility and legislation deficiencies. Customs officials discuss with some differences in which relative advantages, observability and culture are mentioned as the

enablers while finance & human resource and legislation are described as the inhibitors. Therefore, different groups of research subjects provide dissimilar outcomes. The thesis also provides a deeper understanding about implementation of customs modernisation in Vietnam as the context of an emerging economies with a single-party political system and developing technological environment whereas most of prior scholars examine customs transformation in global leaders

Secondly, this study confirms the positive impact of e-customs on SMEs' performance that have been absent in the prior literature. The validity of relationship between e-customs and SMEs' performance also supports for the stakeholder theory. Government with representative as Customs authorities, business and citizen are mentioned as the stakeholders in customs transformation process and the interaction between government and business (G2B) is focused on this study. Donaldson and Preston (1995) defined government, administrative authorities, trade associations, communities and political groups as the principal stakeholders of business. Hence, their policies and action have dominant impact on enterprises' operation. Furthermore, stakeholders including customs administrators, customs officials, business associations and enterprises participated in the interviews and survey of this research to obtain comprehensive viewpoints. Drawing on a rigorous theoretical foundation, empirical support and contextually relevant research, this study combines streams of stakeholders' perspectives with the aim of understanding and explaining factors that influence e-customs implementation in Vietnam and its impact on SMEs' performance.

Finally, this study contributes a range of solutions to enhance efficiency of e-customs and can applied in the phenomenon Vietnam as well as other emerging economies with practice of customs agencies and SMEs. These recommendations can suggest a to-do list or a plan for policy makers and business managers. Moreover, this thesis builds-up the model that have been tested and evaluated applying in term of e-customs implementation, however, further researches related to e-government or administrative innovation also can use this model. In addition, the outcomes of the research can change perspectives related to cultural dimensions and innovation in Vietnam. In particular, Vietnam is switching to less power distance between government and business, and

rolling to long-term orientation with public service as e-customs. This research argues some contrast in comparison with other scholars, for example, uncertainty avoidance and collectivism as the cultural attributes of Vietnam also facilitate for e-customs implementation.

The findings of this study have several implications for researchers in the areas of international trade in general and e-customs specifically. The contributions of this research can be grouped into two categories: theoretical and methodological contributions.

9.3.1 Theoretical contribution

The factors comprising the enablers and inhibitors in this module affecting e-customs implementation generally in Vietnam are identified based on previous studies, the experience of leaders and ground theories (DOI and TAM). According to DOI theory (Rogers, 2003), the drivers that the proposed model mentions are relative advantages, trialability and observability, while the barriers are complexity and incompatibility. The first contribution is that this study ~~also examined~~ is evidence that supports DOI theory in e-customs as a specific area of public sector with five attributions that have been usually applied in persuasion stage and now analysed in implementation step in the innovation- decision process from both perspectives of business and customs officials, as well as comprehensive viewpoints from public policymakers, policy enforcement officials and enterprises.

As the outcomes, both firms and customs staff agree that the relative advantage factor as a driver promoting e-customs procedures, which can support the previous studies of Betrah (2007), Gerpott (2011), Hwang (1999), Lemuria (2008), Raus (2009), Sang (2009), Trkman (2009), and Van Dijk (2008) in the same area. In particular, the benefits that individuals, organisations and businesses can gain due to customs transformation from the traditional to the electronic method are similar to those based on the leaders' experiences; these include time and costs savings, fewer data errors, reduction in hassle, convenience with the 24/7 system, enhanced risk management and advance clearance (King, 1990; Hellberg, 1991; Raus, 2009, 2010; Granqvist, M., Hintsa, J., & Männistö,

T, 2011; Choi, 2011; UNPAN, 2012; Urciuoli, Hinsta and Ahokas, 2013; Dawes, 1996; Overbeek et al.,2011; Gordhan, 2009; Biljan, 2012; Holloway, 2009). The second attribute of DOI theory, observability, is partially supported by customs officials as a motivating factor. Hence, this research can support the opinions of Gerpott (2011) and Lee (2004). However, the perspectives of businesses regarding observability show difficulties when they observe, communicate and describe innovation from/to others. The third attribute, trialability, was discussed as a motivator for e-customs in the previous works of Gerpott, (2011), Lee, (2004), and Murphy (2005). However, in this study, this viewpoint was refuted by both business and customs officials because this factor can be adopted in the initial stage and not in the implementation step when the five-step innovation of Rogers (2003) is applied. The fourth element, complexity, was assessed as a barrier to conducting e-customs by Goossenaerts et al. (2006) and Rogers (2003). This standpoint is also endorsed by the results of this research in that it was found to be a significant factor, and the negative coefficient, despite its intensity, is not powerful. Some scholars determined that the fifth characteristic, incompatibility, is an inhibitor of e-customs in developing countries with a constrained technological environment (Shalehi, 2010; Salehi, Alipour & Yahyavi, 2010; Rogers, 2003; Egyedi & Loeffen, 2002; Byrne & Golder, 2002; Mustonen-Ollila & Lyytinen, 2003). Although businesses agreed with the opinion of the previous studies on the negative influence of incompatibility, its impact was relatively little as it had a small negative standardised coefficient. In contrast, technical constraints are not a principal barrier of Vietnam Customs and customs officials clarified that compatibility is a significant element with a positive standardised coefficient.

Based on previous studies, this research also suggests three additional factors. In particular, culture is one more motivating element, while finances and human resources and legislation are barriers in e-customs (Warkentin et al., 2002, Hujran et al., 2011, Urciuoli, Hintsa, & Ahokas, 2013, Holzner, 2009, Raus, 2010); this is discussed as the second theoretical contribution of this study. As the results, outcomes of this examination showed that the perspectives of culture and legislation were supported by both sides while factor of finance and human resource was just accepted partly by customs officials. Particularly, culture was evaluated as a primary factor affecting e-

customs implementation in Vietnam by both enterprises and customs staff. According to Hofstede (2011), five dimensions of culture including uncertainty avoidance, power distance, collectivism/individualism, masculine/feminine and long-term/short-term orientation were applied in this study as per the research of Al-Hujran et al. (2011) in the e-government area. However, some differences were found in this research in comparison with other scholars related to culture and innovation or e-government. Firstly, other studies indicate that uncertainty acceptance, low power distance and individualism encourage innovation and e-government. However, this study declares that uncertainty avoidance and collectivism, like in Vietnam, also have a positive impact on e-customs. Secondly, Vietnam is known as a high-power distance country, however, with the aim of integration and international trade improvement, this perspective is changing in Vietnam from a high to a low power distance between policymakers and businesses. Thirdly, this research also agrees with previous literature that masculine and long-term orientated societies will be more innovative in innovation/e-government. Vietnam, as a short-term orientation society (Hofstede, 2011), is switching to a long-term orientation. In terms of the five dimensions, uncertainty avoidance, power distance and masculinity show a significant influence. In summary, the validity and reliability of these factors are proved and the theories and perspectives of previous studies explored in the literature review are mostly supported.

The third contribution is analysing the relationship between e-customs implementation and firm performance, which has not been investigated in any published academic research, as the research gap showed. Although several studies investigated e-customs and SME performance independently, the relationship between them has not been explored and analysed by any previous scholars according to the author's search. As a result of this study, e-customs implementation in Vietnam promotes enterprises' performance in both financial and strategic efficiency, as agreed upon by businesses and customs officials. This perspective has been supported by institutional and stakeholder theory (Scott, 1987; DiMaggio and Powell, 1983; Zucker, 1987; Freeman, 1984; Fitzgerald and Storbeck, 2003). The outcomes of this research emphasize suitability when applying modern frameworks to measure business performance with comprehensive financial and non-financial aspects (Kaplan and Norton, 1992, 1996;

Eccles, 1991; Ittner and Larcker, 1998, 2003; Neely, 1999). In addition, this research explored more relationships between relative advantages and legislation affecting business performance. The additional relationship between relative advantages and firm performance can be proof of the strategic profit model of Lambert and Stock (1993).

9.3.2 Methodological contribution

This study applied both qualitative and mostly quantitative methods to take their respective advantages and overcome their disadvantages. According to Boudreau et al. (2001), MacKenzie et al. (2011) and Moore and Benbasat (1991), some rounds of pre-testing are encouraged. In particular, the qualitative interviews were carried out to confirm the factors listed in the literature review as well as explore some new points in the process. Moreover, the quantitative analysis framework of Churchill (1979) and Dunn, Seaker and Waller (1994) was used with a pilot survey and the main survey to ensure the accuracy and understandability of the questionnaire for the participants as well as validate the different variables. Furthermore, both customs officials and enterprises' representatives were inspected in this survey, offering in-depth viewpoints from both sides. Finally, SEM was analysed with AMOS software to satisfy the objectives of this research regarding explaining and predicting the influence of factors of e-customs implementation. Additionally, the correlations among constructs and factors were comprehensively examined. The construct adoption for the first time in Vietnam in the context of e-customs was one of the main challenges of this research. Consequently, the methodology in this study can overcome the weaknesses of other previous scholars.

9.4 PRACTICAL IMPLICATIONS

Regarding the practical implications for customs administrators and business managers, this study derives its significance from the factors affecting e-customs implementation in Vietnam and the relationship between e-customs and firm performance, in terms of both public policymakers and businesses. It hereby brings value for customs departments, organisations and individuals in the short and long terms.

Firstly, the identification of elements influencing e-customs in Vietnam can support

public policymakers in general and customs administrators in particular in setting up and developing suitable, timely plans and strategies to facilitate the development of international trade as well as business and organisations' operations to satisfy the demands of users. Based on the barriers and disadvantages of e-customs discussed in the previous chapter as the outcomes of this research, some policy recommendations were specified above with three categories, in particular, administration and legal, technology and human resources. Regulations and legislation can be reviewed and completed perfectly, and the simplification of the customs structure is essential. Technological solutions should focus not only on improving infrastructure but also on applying new technology and applications to the e-customs system in order to enhance its efficiency and effectiveness. Moreover, customs departments can develop the quality of their human resources to improve customs officials' attitudes, professional skills and IT techniques through training courses and regular examinations.

Secondly, the impact of e-customs implementation on firm performance and the relationship between the relative advantages and firm performance can enhance awareness of both customs staff and businesses about the importance of e-customs application. Yao-Hua Tan, Stefan Klein, Boriana Rukanova, Allen Higgins, and Baida (2006), Raus (2009), Choi (2011), Urciuoli, Urciuoli et al. (2013) discussed the benefits of e-customs for individuals, organisations and businesses in their studies. Based on that, both enterprises and customs officials can improve their compliance with e-customs procedures and technologies. Furthermore, firms can prepare and deploy strategies to match and adapt to the new changes and the dynamic environment.

Finally, the confirmation of firm performance with both financial and strategic indicators suggest that enterprises should perform comprehensive analysis and assessment. Besides the financial indicators as the traditional method, businesses should also concentrate on non-financial indicators, such as social responsibility and customer and employee satisfaction to ensure sustainable development (Yip et al., 2009; Kaplan and Norton, 2008; Barnabe, 2011; Saidi-Mehrabad et al., 2011). With the modern perspective of firm performance on both sides, organisational operations can be improved effectively through specific and extensive plans to satisfy all stakeholders

(Silvestro, 2014; Cocca and Alberti, 2010)

9.5 LIMITATIONS AND FURTHER RESEARCH

The use of a 5-point Likert scale in this study resulted in a limited range of ratings, as most respondents avoided giving the highest (5) and lowest (1) ratings, resulting in a "bunching" effect around the values of 3 (intermediate) and either 2 (lower) or 4 (higher), depending on the context. Given the reluctance of respondents in this field and in Vietnam to use the full scale, further research should use a 7-point, 9-point or 10-point scale to pick up finer variations in the level of approval or disapproval being expressed.

A second limitation is the relatively small sample size in the survey of businesses. It was initially hoped that at least 400 usable responses would be obtained from businesses as the number of firms participating in the e-customs system is over 70,000 (GDVC, 2019). Given the sensitive nature of the subject matter and the usual reticence of Vietnamese businesses and individuals with regard to non-compulsory questionnaire surveys, the above figures may be close to the maximum achievable under the circumstances. In future research, further efforts will be needed in order to augment the set of primary information available for analysing this study's research questions and related issues.

The third limitation has been the need to rely on the authorities (customs departments and branches) for assistance in distributing and collecting the questionnaire forms. Given the nature of the research, this is largely unavoidable at this stage. It is encouraging to note that there appears to be no major reluctance or inhibitions among the responding custom officials and businesses with regard to making comments critical of e-customs, including past mistakes in implementing it. This suggests that the ratings provided have not been unduly influenced by official pressure. Future research should devote substantial investigative resources to obtaining feedback via more independent methods and to comparisons of the resultant findings with those reported above.

The analytical framework of this research has been built mainly using the elements of DOI theory (Rogers, 2003) and TAM (Davies, 1989), and its main purpose has been to

investigate the perceptions of businesses regarding e-customs and their support of it. Future research could augment the framework by incorporating elements from other models and theories that may, a priori, be applicable to Vietnam's customs sector. More attention could also be paid to other stakeholder groups and to the *impact* of e-customs on the work and lives of these stakeholders.

This study persuades a consistent model for both perspectives of business and customs officials while the control variables of firms and customs staffs are different. Hence, the control variables were not mentioned and analysed, which can be one of the limitations of this study. In the further researches, the current study can be used and divided into two other studies with separated perspectives from business or customs officials. In each study, the appropriate control variables, for example, gender, age, years of experience using e-customs/ working experience, education and location, can be presented and analysed in order to check sensitivity for robustness in addition to the main analysis. Another weakness in asking customs officials to answer questions on SMEs performance is that they would not be able to provide accurate answer as they were not SMEs and did not know which SMEs they refer to when they answered the questions on performance.

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APPENDIXES

Appendix 1(a) Covering letter (English version)

THE IMPACT OF ELECTRONIC CUSTOMS ON BUSINESS PERFORMANCE OF SMES IN VIETNAM

I am a lecturer in National Economics University, Hanoi, Vietnam and researcher in University of Hull, UK. I am conducting a wide research survey analysing the impact of e-customs on business performance of SMEs in Vietnam.

I think this research may be interesting to you as a user of e-customs. Hence, I would like to invite you to participate in this study. I would be thankful if you take between 15 to 20 minutes to complete the survey document attached. If you would like to receive a copy of the Survey results of this research when they are published, please indicate this in the final section of the survey document.

Participation in this study is voluntary. All information you provide is considered strictly confidential. Your name and your organisation's name will not appear in any thesis or report resulting from this study. Only the researcher associated with this project will have access. There are no known or anticipated risks to you as a participant in this study.

Should you have any concerns about the conduct of this research project, please feel free to contact me with the details following Thanh Hang Nguyen, Business School, University of Hull, Cottingham Road, Hull, HU6 7RX; Tel No (+44) 7849877594/ (+84) 902549866; Email T.H.Nguyen@2016.hull.ac.uk

I hope that the results of our study will be of benefit to the organisations directly involved in the study, other voluntary recreation organizations not directly involved in the study, as well as to the broader research community.

I am very much look forward to hearing from you and thank you in advance for your assistance in this project.

Yours Sincerely,

Thanh Hang Nguyen

Name of Supervisor and Supervisee

Supervisor: Prof. David B Grant

Professor of Logistics, Faculty of Business, Law and Politics

University of Hull, Hull

Appendix 1(b) Covering letter (Vietnamese version)

Tôi, Nguyễn Thanh Hằng, là giảng viên trường Đại học Kinh tế quốc dân đồng thời là nghiên cứu sinh tại Đại học Hull, Anh Quốc. Hiện nay, tôi đang thực hiện đề tài nghiên cứu về những tác động của hải quan điện tử tới hiệu quả kinh doanh của các doanh nghiệp tại Việt Nam dưới sự hướng dẫn của hai giáo sư tại trường Đại học Hull.

Tôi nghĩ rằng nghiên cứu này có thể nhận được sự quan tâm của ông/ bà vì ông/ bà chính là những người trực tiếp tiến hành thực hiện hải quan điện tử. Vì vậy, tôi thực sự mong muốn mời ông/ bà tham gia thực hiện nghiên cứu này bằng cách trả lời bảng hỏi dưới đây. Tôi vô cùng biết ơn nếu ông bà dành khoảng 15 phút để đánh dấu vào các câu trả lời trong bảng hỏi.

Sự tham gia của ông bà là hoàn toàn tự nguyện. Mọi thông tin ông/ bà cung cấp cho chúng tôi hoàn toàn được bảo mật một cách nghiêm ngặt. Đồng thời, danh tính của ông/ bà cũng được đảm bảo được xử lý vô danh, không công khai hay xuất hiện trong bất cứ báo cáo kết quả hay luận án từ nghiên cứu này. Tôi xin cam đoan không có bất cứ rủi ro nào xảy ra với những người tình nguyện tham gia nghiên cứu này.

Tôi hi vọng nghiên cứu này sẽ đóng góp vào việc hiểu đúng thực trạng hải quan điện tử tại Việt Nam và gợi mở ra những chính sách tham khảo hữu ích đem lại những lợi ích cho các bên liên quan. Một lần nữa, tôi xin chân thành cảm ơn sự hỗ trợ và hợp tác của ông/ bà trong cuộc khảo sát này.

Nếu ông/ bà còn thắc mắc xin liên hệ với tôi theo thông tin dưới đây:

ThS. NCS. Nguyễn Thanh Hằng

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Trân trọng và cảm ơn!

Appendix 2(a) Consent form (English version)

THE IMPACT OF ELECTRONIC CUSTOMS ON BUSINESS PERFORMANCE OF SMES IN VIETNAM

Research Team

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By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this interview will include answering some questions relating to the research topic.
- I have had any questions about my involvement answered to my satisfaction;
- I understand the risks (if any) that may be involved;
- I understand that there will be no direct benefit to me from my participation in this interview;
- I understand that my participation in this interview is voluntary;
- I understand that if I have any additional questions, I can contact the research team;
- I understand that I am free to withdraw at any time, without comment or penalty;
- I agree to participate in the interview.

Name: ……

Signature: …….

Date: ……

Appendix 2(b) Consent form (Vietnamese version)

BẢN THỎA THUẬN THAM GIA PHỎNG VẤN

(Vietnamese Version)

ĐÁNH GIÁ TÁC ĐỘNG CỦA HẢI QUAN ĐIỆN TỬ TỚI HIỆU QUẢ KINH DOANH CỦA CÁC DOANH NGHIỆP TẠI VIỆT NAM

Nhóm nghiên cứu

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Trước khi ký tên vào bản cam kết, tôi đã đọc và hiểu những thông tin liên quan đến đề tài và đã biết rằng:

- Tôi sẽ được mời trả lời một số câu hỏi liên quan đến nghiên cứu này;
- Tôi đã được giải thích rõ những thông tin liên quan;
- Tôi hiểu các rủi ro liên quan (nếu có);
- Tôi sẽ không có lợi ích trực tiếp nào từ việc tham gia vào nghiên cứu này;
- Sự tham gia của tôi là hoàn toàn tự nguyện;
- Nếu tôi có thắc mắc gì khác, tôi có thể liên lạc với nhóm nghiên cứu;
- Tôi có thể từ chối tham gia cuộc phỏng vấn bất cứ lúc nào mà không cần phải giải thích hay bị bất cứ ảnh hưởng tiêu cực nào;
- Tôi đồng ý tham gia vào cuộc phỏng vấn.

Họ và tên: …….
Chữ ký: ……

Ngày tham gia: ..……

Appendix 3 Content of interviews with customs administrators and business

Customs administrators:

Method: Take-note

Question 1: What do you think the benefits the business obtains when implementing e-customs with VNACCS/VCIS?

- ***Saving times***

CA_11 stated *'Clearance time of import goods decreased 6 hours and clearance time of export deducted 3 hours in 2017 in comparison with 2016'.*

- ***Cost-savings***

CA_06 said *'Working process has been changed from traditional method with paperwork to electronic way through online and Internet, which influences on administrative management of organisations'.*

- ***Decrease of burden of administrative documents***

CA_05 told *'Using e-documents and e-records through automated system VNACCS/ VCISS could reduce barriers of administrative'*

CA_18 described about restriction of administrative documents *'The number of supplementary documents to instruct how to conduct e-customs for local customs departments, customs staffs and business increase due to change of regulations for new system.'*

- ***Fewer data entry errors***

CA_16 said *'The number of data entry errors can be reduced basing on storage system online'*

- ***Risk management***

CA_07 told *'sharing information and gathering various data among partners through big data storage can enhance risk management'.*

- ***Convenience***

CA_03 shared *'Dossiers could be submitted online and firms could get e-receipts after that in 24/7'*

CA_04 stated *'Enterprises could get clearance outcome and pay tax online with e-payment system which connected to 12 commercial banks in Vietnam'*

- ***Advance clearance***

CA_08 told *'Business could obtain customs clearance in advance before goods arrives at the airport or ports'.*

Question 2: What do you think the difficulties your business has to face to when applying e-customs?

- ***Complexity***

CA_01 stated two points '*e-customs software was complicated in the beginning'* and *'switching e-customs and e-government system not only costs a big amount of funding but also changes a number of procedures, instructions, paperwork and legislation'.*

CA_04 also emphasized *'customs staffs and business get difficulties in adapting with the new management system. The customs officers and enterprise got used to applying the previous system as well as they had just been trained how to use that. Consequently, it took a while for them to get familiar with a new system'*. Additionally, he added more information *'slow connection with business in storage and warehouse of port and airport'.*

- ***Lack of supplementary documents***

CA_13 told *'Almost customs managers assessed that lack of instruction of NSW and ASW make difficulties for departments of GDVC and local customs departments to carry-out and launch these project'.*

CA_02 explained more details *'cooperation among Ministries to setup and deploy NSW is important, however, the other ministries just have completed their foundation as the strategies not specific guide for staffs and business as well as GDVC'.*

- ***Poor collaboration between business, warehouse, customs departments and other partners***

CA_05 defined *'reasons are from poor electronic data sources, weak collaboration among partners and ethics of business in information transparency. In previous time, data storage of administrative agencies as paperwork make difficulties in transferring into online information'.*

CA_09 clarified *'most firms with the aim of not paying taxes or minimizing taxes do not let their information public'.*

- ***Inadequate IT infrastructure to build-up and conduct NSW and ASW***

CA_04 interpreted *'while technological environment could satisfy the demand of using VNACCS/ VCIS, there is inadequate IT infrastructure to build-up and conduct NSW and ASW. At the present, NSW has been built with GDVC responsibility as the core member through a website. There is no official system to deal-with and analyse data in NSW'.*

- ***Confidentiality***

CA_06 told '*All information is stored online, which could be risky to leak data of business and customs if the security of e-customs system does not confidential. Moreover, e-custom could be delayed for a while, which have impact on clearance flow of import and export goods. In some case, analysis system of e-customs could make some mistakes when hackers change design and structure of system'.*

- ***Interoperability of technology and international standards***

CA_14 defined *'reasons are from the inherent differences between the systems in terms of the syntactic structures, the embedded semantics, and the embedded logic of interchange agreements, business rules and work practices by employees'*

CA_18 interpreted *'Organisations often have existing technological solutions and it is unrealistic to expect that they will adopt one integrated system. In such a diverse and distributed environment, it is impossible to achieve interoperability without establishing a degree of shared understanding through the use of commonly accepted standards.*

- ***Lack of customs staffs with professional skills and rich experience***

CA_03 told *'Innovation and development of e-customs system requires customs officials to keep improving their skills and qualification in order to update and apply new methods. Hence, the labour demand and requirement related to quality of employees has increased steadily'*

- ***Legislation of e-customs***

CA_04, CA_10, CA_11 stated '*a number of regulations are overlapping and incompatible. There is no documents instructing NSW system'*

Question 3: Do you have any recommendation to enhance the efficiency of e-customs?

- ***Improve law and regulations system.***

CA_01 told *'necessity of promulgating updated administrative documents on time because Decisions and instructions are usually slow after troubles arise'.*

CA_07 said *'some specific instructions for new projects of e-customs such as automated management system in ports should be supplemented'.*

CA_02 emphasised '*criteria and indicators of goods inspection should be set- up and finished'.*

CA_06 added *'legislation of e-customs should be propagated in national wide, which could approach to individuals, customs staffs and businesses.*

- ***Improve process, procedures, database and system***

CA_01 stated *'administrative procedures should be reformed as simple as possible'*

CA_07 provided more details *'the risk management system should be enhanced to adopt IT and new technology, for example, e-manifest, e-payment and e-license'*

CA_01, CA_02, CA_09. CA_11 agreed *'focus on developing NSW and ASW as well as e-public service 24/7'*

CA_13 suggested *'apply modern monitoring tools such as container scanning machine, surveillance camera and automated customs management in seaports named VASSCM'.*

CA_02 underlined to '*boost inspection and supervision of all levels of customs in the process of carrying- out customs procedures". Additionally, he emphasised "*enterprise data should be collected, gathered, selected and analysed to support for risk management and clearance decision'

- ***Collaboration and sharing information among customs, business and other partners***

CA_02 recommended *'increasing of cooperation with police market management, enterprise association and so on to collect firms' data to archive accurate and quick clearance decision'*

CA_13 indicated '*government agencies should set-up training sessions regularly for business to propaganda new policies and procedures as well as listen to feedback from customers'*

CA_12, CA_15 supported to *'organise dialogue between customs and enterprises to obtain assessment and deal with difficulties that business encountered'*

CA_01 stated '*some achievements of alliance between Vietnam Customs and leaders such as USA and New Zealand to improve e-customs system as well as transfer new technology. Basing on cooperation with developed economies, Vietnam Customs could*

learn more experience and lessons in legislation, technology and human resources. The fourth category suggestion involves skills and ethics of customs staffs'

- ***Skills and ethics of customs staffs***

CA_03 advised *'conduction of internal inspection with the aim of reducing corruption in customs. Furthermore, in plan 2018, leaders of customs departments could be rotated and deployed to consolidate their management skills and restrict their abuse of power. enhancing international cooperation with developed economies such as Australia, New Zealand and USA'*

CA_04, CA_06, CA_08, CA_13 supported to '*set-up trainings and workshop for customs officials to improve their profession and skills as well as their attitude and their awareness of customs modernisation, NSW and ASW'*

- ***Develop technological environment and IT infrastructure***

CA_02 focused on *'investment of government and private sector via public-private partnership (PPP) on modernising automated system. Customs managers propose technology transfer basing on collaboration between Vietnam Customs and other leader countries'*

Question 4: How is the influence of the third party e.g., Japanese government who involves e-customs project in Vietnam?

CA_01 pointed-out *'the position of Japanese Government in investing, transferring technology and assisting Vietnam customs to modernise and carry-out e-customs'*

CA_02 identified *'the most significant assistance Japan has provided in this domain is the transfer of its own current e-customs systems to the Vietnam General Department of Customs. This new e-customs application is due to commence in 2014'.*

Appendix 4a List variables used in survey with business

No	Survey items	Code	Description
Relative advantages			
1	Time savings	RA1	E-customs can reduce time for travelling, data processing, and customs clearance.
2	Cost savings	RA2	E-documents and online submission instead of paper documents result in cost reductions, and reduced travel costs.
3	Fewer data errors	RA3	Application of e-customs technologies reduces the number of data entry errors
4	Reduction in burden of administrative documents	RA4	Adoption of e-documents and e-records help e-customs decrease pressure of administrative documents
5	Convenience with 24/7 system	RA5	It is convenient to submit customs dossier and to receive receipt and clearance outcome because of 24/7 availability
6	Risk management	RA6	E-customs enhance risk management and anti-smuggling
7	Advance clearance	RA7	Businesses can submit customs dossiers and get e-customs clearance in advance (before goods arrive at port).
Trialability			
8	Perspectives of trial period 2005-2013	TRIAL 1	Business have awareness of trial phase from 2005 to 2013
9	Experiences of previous business	TRIAL2	Businesses which are about to implement e-customs can readily learn from the experiences of previous businesses.
Observability			
10	Direct observation/ knowledge regarding to e-customs application of other business	OBSERVE1	Business personnel have directly observed other businesses applying e-customs
11	Indirect knowledge of advantages and difficulties	OBSERVE2	Through internal documents, the media and words of mouth, business personnel have gained clear knowledge of the advantages and difficulties of e-customs.
Incompatibility			
12	Inadequate skills and technological equipment	INCOMPAT1	IT skills and equipment in the business are inadequate for e-customs application
13	Weakness in sync compatibility with other countries	INCOMPAT2	Vietnam e-customs get dificulties in syncing compatibility with systems of other countries
14	Weakness in Confidentiality	INCOMPAT3	Internal information and data of business and e-customs system can be leak
15	Weakness in International standard compatibility	INCOMPAT4	E-customs system of Vietnam is poorly compatible with international standards.
16	Difficulties in software upgrade or transform	INCOMPAT5	E-customs software is difficult in upgrading and tranforming

Culture			
• **Uncertain avoidance**			
17	Specific instructions to apply e-customs	CUL1	The specific instructions to apply e-customs are necessary
18	Promote function of customs agencies and support team	CUL2	Responsibility of customs agents and support teams are paid attention
19	Problem solving ability	CUL3	Problem solving ability of e-customs departments can satisfy business
• **Power distance**			
20	Strict supervision of customs departments	CUL4	Strict supervision of customs departments is necessary when applying e-customs
21	Interactive ability between customs and business	CUL5	Business are easy to communicate and interact with customs departments
22	Policy decisions based on business feedback	CUL6	Customs departments listen to feedback of business and make policy decision based on these reviews.
• **Collectivism/ Individual**			
23	Sharing information	CUL7	Business are willing to share commodity information (the origin, number, code) for customs departments, brokers, distributors and warehouse.
24	Alliance among partners	CUL8	Business are ready cooperate with patners (brokers, distributors, warehouse, airport and port)
25	Relationship between business and customs	CUL9	Customs departments and business should have a good relationship
• **Masculine/ Feminine**			
26	Focus on HR training	CUL10	Business concentrate on train staffs
27	Financial achievement	CUL11	Financial achievement is the priority target of firm
• **Long-term/ Short-term orientation**			
28	More invest in customs in the future	CUL12	You personally support continuing and furthering the use of e-customs
Complexity			
29	Data loss over online	COMPLEX1	Customs dossiers are often incomplete due to losses of data during transmission over the Internet.
30	Complicated and difficult to use e-customs software	COMPLEX2	The e-customs software is complicated, inadequate, and difficult to use.
Difficulties in financial and human resource			
31	Adequate finance effort	FINHR1	Business have adequate financial resource to install and join e-customs
32	Financial support	FINHR2	Business can receive financial support from commercial banks or financial organisation for e-customs particiapation plan.
33	Adequate human resource	FINHR3	Quantity and quality of employees of firms can satisfy to apply e-customs

Legislation deficiencies			
34	Unification of legislation	LEGAL1	Regulations and administrative legal documents are duplicated and unificated
35	Compliance ability of business	LEGAL2	Business comply e-customs regulations seriously
36	Compliance ability of customs staffs	LEGAL3	Customs officials comply e-customs regulations seriously
37	Difficulties in approaching to customs law or regulation	LEGAL4	Business get difficulties in approaching to customs law or regulation
38	Difficulties in changing/ updating/ transforming of customs legislation	LEGAL5	Business get difficulties in changing/ updating/ transforming of customs legislation
E-customs implementation			
39	Current obstacles of e-customs can be improved	E_CUS_IMPL1	Difficulties of e-customs are manageable
40	E-customs system improves year by year	E_CUS_IMPL2	E-customs system has been developed and upgraded to satisfy the demands of user every year.
41	Benefits of e-customs for business	E_CUS_IMPL3	After considering all the above, you would see e-customs as being more advantageous for your business
Business performance			
• **Financial performance**			
42	Increase in revenue	FINPF1	Revenue of firm increases whey applying e-customs
43	Increase in profit	FINPF2	Profit of firm increases whey applying e-customs
44	Increase in growth (market share, asset, income, net profit,…)	FINPF3	Growth of market share, asset, income and net profit of firm increases whey applying e-customs
• **Strategic performance**			
45	Paperless	STRPF1	Firm uses paperless when applying e-customs
46	Social activities	STRPF2	Firm pays more attention on social activities when applying e-customs
47	Increase in number of loyalty customers	STRPF3	Customer satisfaction
48	Decrease in customer complanation	STRPF4	
49	Benefits for employees	STRPF5	Employee satisfaction
50	E-custom facilitates employees' tasks	STRPF6	
51	Firm performance overall	STRPF7	In general, business performance is improved

Appendix 4b List variables used in survey with customs officials

No	Survey items	Code	Description
Relative advantages			
1	Time savings	RA1	E-customs can reduce time for travelling, data processing, and customs clearance.
2	Cost savings	RA2	E-documents and online submission instead of paper documents result in cost reductions, and reduced travel costs.
3	Fewer data errors	RA3	Application of e-customs technologies reduces the number of data entry errors
4	Reduction in burden of administrative documents	RA4	Adoption of e-documents and e-records help e-customs decrease pressure of administrative documents
5	Convenience with 24/7 system	RA5	It is convenient to submit customs dossier and to receive receipt and clearance outcome because of 24/7 availability
6	Risk management	RA6	E-customs enhance risk management and anti-smuggling
7	Advance clearance	RA7	Businesses can submit customs dossiers and get e-customs clearance in advance (before goods arrive at port).
Trialability			
8	Perspectives of trial period 2005-2013	TRIAL 1	Customs officials have awareness of trial phase from 2005 to 2013
9	Experiences of previous customs departments	TRIAL2	Customs officials can readily learn from the experiences of previous customs departments
Observability			
10	Direct observation/ knowledge regarding to e-customs application of other customs officials	OBSERVE1	Customs officials personnel have directly observed other customs departments applying e-customs
11	Indirect knowledge of advantages and difficulties	OBSERVE2	Through internal documents, the media and words of mouth, customs officials personnel have gained clear knowledge of the advantages and difficulties of e-customs.

Incompatibility			
12	Inadequate skills and technological equipment	INCOMPAT1	IT skills and equipment in the customs departments are inadequate for e-customs application
13	Weakness in sync compatibility with other countries	INCOMPAT2	Vietnam e-customs get dificulties in syncing compatibility with systems of other countries
14	Weakness in Confidentiality	INCOMPAT3	Internal information and data of business and e-customs system can be leak
15	Weakness in International standard compatibility	COMPAT4	E-customs system of Vietnam is poorly compatible with international standards.
16	Difficulties in software upgrade or transform	COMPAT5	E-customs software is difficult in upgrading and tranforming
Culture			
• **Uncertain avoidance**			
17	Specific instructions to apply e-customs	CUL1	Customs officials need specific instructions to apply e-customs
18	Promote function of customs agencies and support team	CUL2	Responsibility of customs agents and support teams are paid attention
19	Problem solving ability	CUL3	Problem solving ability of e-customs departments can satisfy business
• **Power distance**			
20	Strict supervision of customs departments	CUL4	Strict supervision of customs departments is necessary when applying e-customs
21	Interactive ability between customs and business	CUL5	Business are easy to communicate and interact with customs departments
22	Policy decisions basing on business feedback	CUL6	Customs departments listen to feedback of business and make policy decision basing on these reviews.
• **Collectivism/ Individual**			
23	Sharing information	CUL7	Customs departments are willing to share commodity information (the origin, number, code) for brokers, distributors and warehouse.
24	Alliance among	CUL8	Customs departments are ready

	partners		cooperate with patners (brokers, distributors, warehouse, airport and port)
25	Relationship between business and customs	CUL9	Customs departments and business should have a good relationship
• **Masculine/ Feminine**			
26	Focus on HR training	CUL10	Customs departments concentrate on train staffs
27	Financial achievement	CUL11	Financial achievement is the priority target of customs departments
• **Long-term/ Short-term orientation**			
28	More invest in customs in the future	CUL12	You personally support continuing and furthering the use of e-customs
Complexity			
29	Data loss over online	COMPLEX1	Customs dossiers are often incomplete due to losses of data during transmission over the Internet.
30	Complicated and difficult to use e-customs software	COMPLEX2	The e-customs software is complicated, inadequate, and difficult to use.
Difficulties in financial and human resource			
31	Investment for e-customs deployment	FINHR1	Investment for depoying e-customs system at customs departments is costly
32	Demand of training	FINHR2	Officials face many difficulties with e-customs in the beginning, so demand for training is high.
33	Quality of human resource	FINHR3	Customs officials have adequate IT skills, experience and knowledge to deploy e-customs.
Legislation deficiences			
34	Unification of legislation	LEGAL1	Regulations and administrative legal documents are duplicated and unificated
35	Compliance ability of business	LEGAL2	Business comply e-customs regulations seriously
36	Compliance ability of customs staffs	LEGAL3	Customs officials comply e-customs regulations seriously
37	Difficulties in approaching to customs law or	LEGAL4	Customs officials get difficulties in approaching to customs law or regulation

	regulation		
38	Difficulties in changing/ updating/ transforming of customs legislation	LEGAL5	Customs officials get difficulties in changing/ updating/ transforming of customs legislation
E-customs implementation			
39	Current obstacles of e-customs can be improved	E_CUS_IMPL1	Difficulties of e-customs are manageable
40	E-customs system improves year by year	E_CUS_IMPL2	E-customs system has been developed and upgraded to satisfy the demands of user every year.
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• **Financial performance**			
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• **Strategic performance**			
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48	Decrease in customer complanation	STRPF4	
49	Benefits for employees	STRPF5	Employee satisfaction
50	E-custom facilitates employees' tasks	STRPF6	
51	Firm performance overall	STRPF7	In general, business performance is improved