

Voluntary insurance for rapid growth bank-led digital banking: Seeking the attention of bank management in the Vietnam financial sector

Akim M. Rahman*

Dr. Momtaz Begum University of Science and Technology (MUST) Banshgari, Bhairab, Bangladesh

Received 18 November 2023; revised 21 March 2024; accepted 6 May 2024

Abstract:

Vietnam, a country where 87% of the population is under 54 years of age, appears to be the leader in the race of financial digitalisation among Southeast Asian countries. However, the psychological risk-factor has been undermining the progression-trends of bank-led e-transactions. As a result, the current growth-trends of e-transactions are slower than expected in Vietnam. Even though Fintech claims it to be a secure-service, people mostly in rural areas feel it to be the opposite. To overcome this dilemma, having voluntary insurance (VI) as a product under Akim's model in e-banking services can be instrumental. This new and growing value of the product will keep the bank growing. It can ensure risk-free e-banking services. So, the policy proposal adoption can enhance the number of e-banking-users in Vietnam. For assessing an effective price of the VI in the e-banking service market, this study uses welfare analysis for ensuring cost-effective VI products in the operation. Thus, the VI product becomes attractive to the parties involved. Having a third party as an insurance-provider in the e-banking service-market, the welfare cost evolves from inefficient pricing and will be small. Once the VI is in place, it will spread from bankers to e-banking customers. So, its growth trend, the S-curve, will capture revenue and productivity growth against time. In the beginning, the trends will be slow. But at some point, digital banking-users will begin to demand it. This expected progression will ensure a higher number of e-transactions by attracting probable customers. Therefore, the prompt efforts of policymakers can play significant roles, which can ensure a cashless Vietnamese society soon.

Keywords: bank-led digital banking, e-banking service market, e-banking transactions, perceived risk factors, Vietnamese cashless society, voluntary insurance as a product.

Classification numbers: 2.1, 2.2, 2.3

1. Introduction

Today, people live in a business-mentality world with technology-driven lifestyles. In this globe, country wise, service providers supply services in competitive manners. Similarly, service receivers receive services in multi-faucets in efficient-fashions avoiding perceived risk-factors. In this modern world, time values are important to people, no matter what society or country they reside in. Accordingly, the factors of decisions particularly cost-effectiveness and expediency have led institutions, business entities, and individuals to use information technology facilitations in diverse ways. Hence, in the 21st century, customers participate in options of relative timesaving. Likewise, service-sectors such as banks modernise their services, which has resulted in today's e-banking services. These services are mobile-banking and bank-led e-banking in the financial sector where the Vietnamese financial sector is no exception. This banking-service-digitisation includes online withdrawals and deposits, mobile apps, digital bill payments, salary payments and receipts, etc.

While the digital journey globally was in its first stages, meeting customers' diverse needs, the State Bank of Vietnam, i.e., the Central Bank inspired domestic banks for adopting technology applications. As a result, it can facilitate new methods of supplying products and services using various tech distribution channels [1]. In this transformational journey, Fintech has been significant in contributing to countries such as Vietnam where both mobile banking and bank-led digital-banking services are in place. In Vietnam, about 87% of the population is under 54 years of age, which was the basis of the State Bank's inspirational decision for digital banking progress [2]. Also, as reported in January 2017 by the General Statistics Office of Vietnam, Vietnam had 47.3 millions internet users. This data statistic represents around 50% of the total population of Vietnam [3]. This progression also shows that the Internet users' growth rate is 9 to 12% yearly, which currently ranks 15th place globally. Therefore, Vietnam has a good establishment to build a digital banking system effectively. Therefore, it can drive to become a cashless society sooner rather than later.

*Email: akim@must.ac.bd

With this potential of digital banking development in the Vietnamese economy, the dimension of e-banking service users is endlessly increasing. For example, the users' percentage was only 7% in 2011, but it reached to 49% in 2020 [4]. As reported by the Vietnam Bankers Association [5, 6], until April of 2022, the transactions to cashless had grown by 69.7% in numbers. Here the amount had grown by 27.5% compared to that of the same period of the year 2021. Data statistics further ratifies that at present, there are 40 e-wallets in Vietnam. It further shows that the e-wallet market is in its booming stages and reached 90% of the market capacity. Two major competitors of e-wallets in the Vietnam-economy are MoMo and Moca [7].

Factor(s) undermining growth trends of e-banking transactions in Vietnam: Despite the government and bank industry's ongoing efforts for the progression of services in the e-banking market in Vietnam, the perceived risk factors, *particularly* the psychological risk factor undermines the expected growth trends of digital banking services [8-10]. This dilemma is not new globally when it comes to e-banking services.

Digital banking faces serious pitfalls, being its riskiness where psychological risk factor dominates a customer's or a probable customer's decision not to use it [7, 9-11]. In this business-driven world, customers of digital banking services compete for options for saving time. On the other hand, a bank strives to marginalise its operational expenses or costs with the goal of enhancing revenues or profits. Customers of digital banking in most cases rarely read the digital banking's terms and conditions when they sign-up for it [11]. They do not save contract copies of services, nor do they remember the number of transactions or transaction amount in his or her account. Accordingly, a customer of the e-banking service market faces perceived risk factors such as additional fees, account hacking, hidden charges, etc. All these together cause psychological repulsion to customers, where female customers are more likely to stay away compared to male customers...

Limitations of the deposit insurance system provision in banking services: The deposit insurance system, adopted in late 2005 in Vietnam, does not cover digital banking transactions. The goals of the deposit insurance system in Vietnam are threefold. They are: a) protecting bank depositors' interest and legal rights, b) bolstering and disseminating public confidence in the system of banking, and c) mediating savings by the people into the domestic system of banking in financial sector of Vietnam. Besides this, additional goals of the law albeit, not mentioned explicitly, were the essential need to boost progression of digital banking race by making a situation where everyone has a fair and equal chance of succeeding. More specifically, create a level playing field between private-sector credit institutions and state-owned banks in Vietnam and beyond [12].

With this limitation, customers, and probable customers in many countries including Vietnam face perceived risks, particularly, psychological risk. It has been undermining the potential progress of the digital banking services [1, 6, 13]. This is the reality of the Vietnamese economy even through about 66% of its population uses internet banking [1, 6]. Furthermore, on this aspect, there is no strict law or approach in practice in Vietnam to address the perceived risk factors [5].

In practice, overcoming customers' complaints, service providers sometimes protect themselves with claims of "technical or electrical problems". Under provisions, the numbers of complaints are racking up [11, 14]. These are no new in bank-led e-banking service market in Vietnam [1, 6]. Studies in literature suggest that efforts for marginalising the consequences of perceived risk factors in Vietnam, banks' responses to customers' inquiries are the things that the digital banks need to do beforehand [1]. Now it is clear that the psychological risk factor significantly undermines today's potentiality of rapid growth of digital banking in the financial sector of Vietnam [1].

The way to move forward addressing the issue: Tackling the issue of this e-banking dilemma, A.M. Rahman (2018a, b) [15, 16] first introduced in literature a new product - the VI in the e-banking service market. This proposal in literature is recognised as the Akim model. Underpinning the Akim model, the relevant policy designs can facilitate the VI product to be in today's e-banking service market. This policy approach can ensure a rapid growth trend of e-banking uses countrywide. Simultaneously, it will open doors for businesspersons who want to open new insurance companies for providing insurance services. But as of today, no country has yet introduced the VI policy in its economy. So, no bank has yet introduced the VI in digital banking services.

Accordingly, the current study takes on the mission of bringing the VI proposal to policymakers' attention in the Vietnamese economy so that the VI product under Akim's model can be introduced sooner rather than later to have a cashless Vietnamese society. It can open doors for entrepreneurs in the economy. Overall, a successful effort of authorities in the Vietnamese economy can place Vietnam as the world leader in ensuring risk-free e-banking services. Therefore, this study aims to call the attention of policymakers in Vietnam.

2. Literature review

The subject literature ratifies that the "perceived risk" impacts the decision process of using e-banking services negatively [13, 15, 16] where the Vietnam scenario is no different. As reported by the SaaS cloud banking platform Mambu in 2021, around 72% of Vietnamese banking consumers were more likely to use online and digital

banking services compared to a year and a half ago [17]. Tackling these problems in the e-banking service market, the application of the Akim model [15, 16] is expected to be beneficial to participants where government efforts for policy design can ensure a cashless society in Vietnam. Besides ensuring risk-free bank-led digital services, this new product can contribute to the economy in multiple aspects.

However, our research suggests that no bank in the financial sector of a country has yet introduced the VI to protect its e-banking service market. The Central Bank has established the filing complaint desk for receiving customers' complaints since the beginning of e-banking journey. Not questioning the numbers of complaints filed, it is permissible to say that the Central Bank now recognises the policy loophole that may result in filing complaints. The Vietnamese financial sector in this aspect is no different [8]. In this business-driven world, the government prefers to enjoy cost-effective technology use in the country. Since the beginning of the year 2007, a few key banks in Vietnam were foremost emerging to be prepared to embrace its digital service as a solution for keeping and propping its revenues [8]. However, because of limitations, uncertainties, and obstacles on security issues, the e-banking sector has been affecting certain business models in Vietnam [18].

For example, as in many other countries, the bank accounts of customers in Vietnam are insured and facilitated by the Central Bank of Vietnam. Besides, deposits of depositors in Bangladesh are insured under the provision of Bank Deposit Insurance Law (2000). However, the provisions of the referred law in Bangladesh overlook the transactions of e-banking services [19]. The similar banking provisions of Vietnam are not exceptional. In Vietnam, the provision of a deposit insurance system covers only bank accounts, and bank deposits [20, 21]. However, it does not cover today's digital transactions in the e-banking service market. It faces risk factors such as psychological risk, social and privacy risk, customer dispute risk, and time value risk as well as technological interruption, etc.

This raises the question: How can Vietnamese policymakers become inspired in crafting public policies so that the banking sector is required to adopt the VI policy in the financial sector for ensuing risk-free digital transactions in the e-banking service market? This study lays out the foundations for adopting the Akim model in policy design, ensuring riskless e-banking services in Vietnam. Thus, under the deposit insurance system provisions, banks will adopt VI policy for ensuing secured digital transactions in Vietnam.

Goals of this effort: This effort advances with four precise goals. These goals are as follows:

a) To apply the Akim model in policy design by introducing VI, guaranteeing a higher growth trend of transactions in the e-banking service market in Vietnam.

b) To simplify how the VI proposal can be instrumental in Vietnam's economy using welfare analysis.

c) To illustrate the life cycle of VI after adopting it as a digital banking service in the Vietnamese economy.

d) To utilise the S-curve technique for capturing the growth trends of productivity or revenue against time in Vietnam's economy.

3. Methodology

For conceptualising the basis of the proposed new product - the VI in Vietnam's financial sector, this study uses the Theory of Consumer Choices and Behaviours [4, 9, 10, 14, 22, 23]. With an aim to provide guidance in policy design - the VI policy in the e-banking service market, this study continues with welfare analysis for adopting the VI policy. In other words, this study conducts a welfare analysis on introducing the VI product in the digital banking service market. It raises the question: What is welfare analysis?

In order to answer the question raised, first it is rational to say that the benefits of the policy of VI implementation are not limited only to the service receivers and service providers. Thus, the prospect of the VI policy implementation will be advantageous to all parties involved, where it is expected that the higher growth trends of the economy will benefit the Vietnamese. Using the S-curve in this study will ease capturing the growth trends of digital transactions, which will ease economic growth trends in the Vietnamese economy. Also, since the VI services will not be free of cost in the digital banking service market, the preference of using a welfare analysis is helpful in evaluating the impacts of a price ceiling. So, it will be helpful to evaluate the VI policy proposal for implementing it in the Vietnamese economy for the greater benefit of society.

4. The role of voluntary insurance policies in bank-led e-banking for Vietnam's economy

The State Bank of Vietnam recently announced plans to introduce new digital banks in the country to boost competition and promote financial inclusion [18]. In the year 2021, Vietnam's economy had 539.48 million transactions. It was higher than that of the previous years. In other words, in Fig. 1A, e-transaction increased by 10.48% in the year 2021, which was mainly caused by the COVID-19 pandemic. Because of drastic consumer lifestyle changes of both locals and travelers since the COVID-19 pandemic, businesses are now under pressure to adopt digital understanding and practices. Fig. 1B shows that in the year 2022, the growth trend of e-banking transactions was 5.53%.

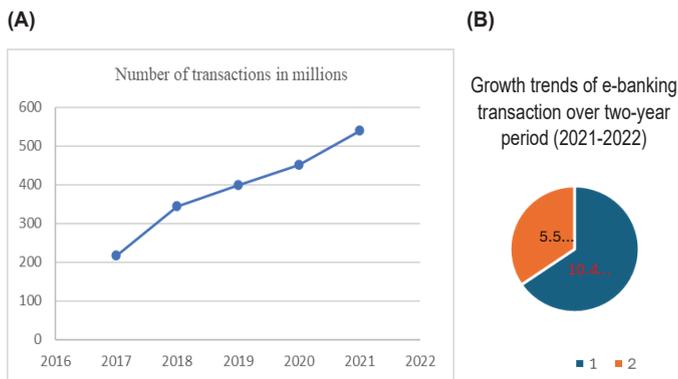


Fig. 1. (A) Trends of bank-led digital banking in Vietnam's economy (Source: Statistics Research Department, 2023); (B) Growth trends of e-transactions in % over 2021-2022 period in Vietnam. Source: Statista.com.

However, as reported this effort has been facing challenges where perceived risk factors, mostly people's psychological factors, are undermining the growth trends. People in rural areas feel it to be riskier than those in urban areas. As a promoting effort, the "Cashless Payment Day" was held in June of 2022, which was an effective way to advertise e-banking to people around Vietnam [5].

Tackling the issues that undermine e-banking progression, particularly the growth trends of digital transactions in Vietnam's financial sector, adopting the VI policies [14, 15] can be helpful. The financial sector here can introduce it as a new product in the e-banking service market, where the banks or a third party can collect premium guaranteeing tenable digital transactions in the e-banking service market.

In this e-banking service market, a customer's participation - whether buying the VI or not buying it will be voluntary underpinning the proposed provision. If and only if a customer wants the benefits of VI product, the bank will attach insurance to a customer's account. Under the policy, since banks will design the program in a way of transferring the risk from the premium payers to the premium receivers, the system will safeguard the premium payers with certainty. The premium receivers here will take measures to guarantee risk free e-banking services. This proposed policy provision can be an addendum to today's deposit insurance system in Vietnam's financial sector. In other words, it will be a supplemental provision of today's deposit insurance system laws in Vietnam's financial sector. By so doing the proposed addendum can be established with less effort.

The voluntary insurance policy: What is it? How can it work in terms of economics?

Since the perceived risk factor, particularly psychological risk performs a powerful role in setting the stage for the policy proposal, the choices of the VI can ensure customers

and a secured e-banking service in today's digital world. It is rational to assume that the customers in the e-banking service market are risk-averse in choices no matter where they reside countrywide. In general, they prefer certainty to uncertainty when it comes to the decision to use the e-banking services. Fig. 2 shows the preferences of a risk-averse banking customer in e-banking service market in Vietnam. As UNICEF reported in 2021 approximately 77.1% of the Vietnamese population is below the age of 54 [24] and accordingly they may prefer to use digital banking services.

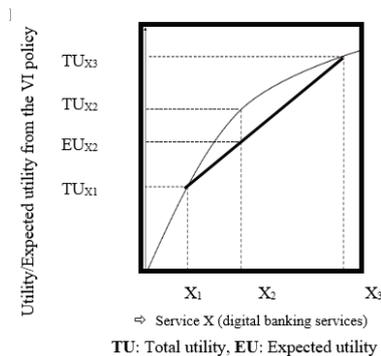


Fig. 2. Risk aversion scenario in Vietnam financial sector. Source: Statista.com.

In a world of uncertainty, in terms of economics, the actual utility that the customer receives by using e-banking services will not ever fall on the TU (X) curve. However, it will be somewhere on the chord (the bold line) in Fig. 2. The X₃ here stands for service outcome where the customer may use a certain level of services X. Here X₁ stands for a negative outcome, which indicates a customer may use less of the service X. If there is a level of uncertainty, a customer may not use X₃ units of service X. Thus, the utility that this customer receives will lie somewhere on the chord (the bold line) in Fig. 2. This chord stands as the expected utility (EU) of using service X, where it lies in the curve's concavity. The reason is that it is the average probability of whether the customer will use service X or not. As a result, a customer will not receive the TU (X₂) but the EU (X₂) of the digital banking services in Vietnam.

5. Voluntary insurance policy preferences in Vietnam's economy: Welfare analysis

In this section, we explore the benefits, which are expected to be received by the customers and by the bank(s) after adopting the VI product in e-banking service market in Vietnam.

Since both the customer and the bank itself will receive the economic benefit under the VI proposal, it is important for the bank to bring this information to customers' attention while they decide on choosing the VI or not while signing

up for e-banking services. The reason is that the amount of the premium amount will go out from e-banking customer's pocket who chooses the insurance. As a result, it will guarantee a secured digital transaction where the VI will destabilise all perceived risk factors, etc. Since the premium amount is going out from customer's pocket, the risk adverse people may not choose insurance based on own fondness. It is like certain people may not even select the traditional banking services because of the account fees that a bank charges no matter where they reside on the globe.

5.1. Theoretical basis on voluntary insurance price setting: Justification for Vietnamese economy

The model: How would the VI product work in the e-banking service market in Vietnam?

Setup and notation for analysis purposes: First, consider a scenario where customers in e-banking service market face options in decision: a) signing the contract for insurance or not. Signing the contract H here offers high coverage, which guarantees absolute risk free e-banking services; b) not signing up for insurance but signing up for e-banking services say contract L and accordingly it eases access to the e-banking services. Here the customer's preference for the H depends on the amount of cost of having the H contract i.e., $H = f(P)$ where P is the price of H contract where the probable cost resulted from perceived risk or from other factors will be covered by the insurance provider.

Simplifying further, contract L is no insurance facilitation, but it facilitates e-banking services. Here, customers are easily accessing e-banking services. And contract H charges a premium, and customers are eased using digital banking services. These are simply normalisations to relax where the VI policy is in place. In this setup a bank can manage premium just like it manages its customer's account fee(s) with the bank.

The author further assumes that the characteristics of the contracts are as given where insurance premium amount to be endogenously decided. This is because the characterisation of different insurance markets, with variation across individuals, emphasises the pricing of the contracts and not the offered coverage. This analysis is supported by the findings of a study by G.A. Akerlof (1970) [25] in literature.

Demand of insurance in the e-banking service market: Here, I assume that customers of the e-banking service market make a distinct choice whether to buy the insurance or not. Since it is taken as given that there are only two

available contracts in e-banking service market and it is related to coverages, the demand is a function of relative price (p). Also, it is assumed that banks cannot offer different prices to their customers in this market. On this aspect, banks can make prices dependent on the observed characteristics. Accordingly, it is assumed that if a customer chooses to buy insurance, the customer buys it at the lowest price available in the market. So, it is sufficient to characterise the demand for insurance as a function of the lowest premium, i.e., the price (p).

Underpinning the above elaboration, a mathematical relationship can be established as such: $D = f(p)$ where D = demand for insurance and p = premium amount or price. Since the services will be mostly digital, the premium amount will be small enough. Eventually, with proper documentation, the probable customers might be able to sign up for the VI services if they feel it to be a necessity in the future.

Supply and equilibrium in the e-banking service market: I assume that based on the VI policy, there will be $N \geq 2$ identical risks neutral insurance service providers or banks that set prices in a Nash Equilibrium. There might be both a perfect and an imperfect rivalry in the e-banking services. However, I choose here to focus on the case of the perfect competition. This is because it stands for a natural standard for welfare analysis of the efficiency cost of selection [20, 22, 25].

In multiple banks setting the same price scenario, it is assumed that individuals who decide to buy insurance at this price choose a bank randomly in preference. Here the only cost of supplying contract H to individuals is the insurable total cost (TC). The average cost (AC) curve represents the costs of the sample of individuals who choose the contract H. Symbolically, AC is TC/i where AC reduces as the (i) increases i.e., $AC \propto (1/i)$ where i is the number of customers in e-banking service market.

To describe the equilibrium, it requires having two more assumptions. Firstly, it is assumed that price \bar{p} exists where $D(\bar{p}) > 0$ and $MC(p) < p$ and in every case the condition $p > \bar{p}$ holds up. Interpreting the equation separately, I assume, it is profitable and efficient to provide insurance to those with the highest willingness to pay for it. Secondly, it is assumed that there exists \underline{p} where $MC(p) > \underline{p}$ then the $MC(p) > p$ for all the $p < \underline{p}$ [22]. In other words, the assumption is that the $MC(p)$ crosses the demand curve only once. All these assumptions guarantee the existence and uniqueness of the equilibrium where it is characterised by the lowest breakeven price $P^* = AC(P)$.

5.2. Welfare assessment of the H contract (the voluntary insurance-choice or voluntary insurance-preferences) in Vietnamese economy

For measuring the welfare of the H-contract, the consumer surplus (CS) measurement is rational choice and it is certainty equivalent to welfare measurement. The certainty equivalent to an uncertain outcome is the amount that would make an individual indifferent between obtaining the amount for sure and obtaining the uncertain outcome. Outcome with a higher certainty supplies higher utility to the individual [23]. This welfare assessment is rational and interesting in literature [22], because it can be measured monetarily. Here the total surplus (TS) in the e-banking service market is the sum of certainty equivalents for consumers and profits of the firm or bank that supplied insurance. In this analysis, the author ignores any income effects associated with price changes of the VI in the e-banking service market.

5.3. The voluntary insurance product choices of a customer in the e-banking service market: Graphical representation

Based on the above background, the graphical presentation of adverse choice and advantageous or beneficial selection choice is shown below.

This demonstration explains the efficiency aspects costs for each type of selection of the VI for guaranteeing risk-free e-banking services in Vietnam’s financial sector.

Adverse selection in the e-banking service market: The y-axis in Fig. 3 stands for cost of H-contract. The x-axis stands for quantity i.e., the share of individuals in the market with H-contract where maximum quantity is denoted by Q_{max} . Here the demand curve denotes the demand for H-contract. Also, the average cost (AC) curve and the marginal cost (MC) curve denote the average and marginal incremental costs respectively to the insurer from coverage with the H-contract compared to the L-contract.

In the e-banking service market, the important feature of adverse selection is that people who have the highest readiness to pay for insurance are those who have the highest expected costs. The downward sloping of MC curve in Fig. 3 shows that the MC is increasing because of higher prices, which results in a decrease in quantity i.e., the number of people or individuals. So, as costs for insurance fall, the marginal individuals who select the H-contract have lower expected costs than that of the infra marginal individuals, which leads to lower average costs [4, 22, 23].

Here, the spirit of confidentiality is that the bank cannot charge individuals based on its privately known MC. But instead, it is restricted to charge a uniform price that is in equilibrium, which implies average cost pricing under the VI policy.

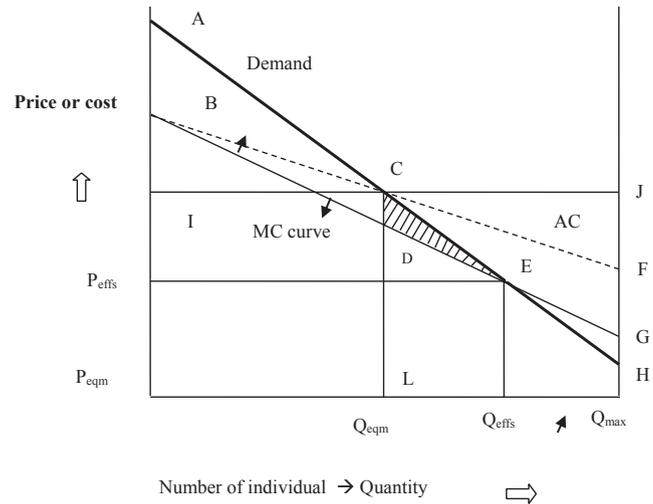


Fig. 3. Cost of adverse selection on efficiency aspect under the VI policy in Vietnam.

Since here we have $AC > MC$, the adverse selection creates under-insurance. This result is supported by the findings of the study authored by G.A. Akerlof (1970) [25]. This under-insurance scenario in the e-banking service market is shown in Fig. 3. Here the equilibrium of e-banking customers who buy the H-contract is Q_{eqm} (i.e., AC curve intersects the DD curve at point C in Fig. 3). Thus, efficient number settles at the point where $Q_{eff} > Q_{eqm}$, as shown in Fig. 3.

The area CDE (the shaded area) in Fig. 3 stands for the welfare loss, which arises because of the adverse selection in the e-banking service market in Vietnam. It indicates a loss of consumer surplus (CS) from individuals who are not insured in equilibrium. This is because their willingness to pay is less than the average cost (AC) of the insured population. However, it would be efficient for them to insure in the e-banking service market. This is because their willingness to pay exceeds the marginal cost (MC).

Elaborating this further, let's estimate and then compare the welfare under a different scenario. Suppose that the customers are mandated to sign up for the H-contract in the e-banking service-market. By doing so, it will generate welfare = area ABE - area EGH, which is shown in Fig. 3. It can now be compared to welfare at the competitive equilibrium condition, which is equivalent to area ABCD. Based on this setting, the welfare is equal to area ABE, which is an efficient allocation. It is the benefit or welfare from mandating everyone to sign up for the L-contract (normalised to zero). Here, the relative welfare ranking of these alternatives is an open empirical question. Thus, it can be studied by assessing the welfare under alternative policy interventions. It can be a part of the directions for future studies.

Advantageous selection in the e-banking service market: In literature, a theory on selection in insurance markets highlights the possibility of adverse selection, and the resultant efficiency loss from underinsurance [25]. Considering G.A. Akerlof (1970)'s theory [25], findings of several studies in literature propose that in health insurance market, insured people have higher average costs than that of uninsured individuals [26, 27]. But there exists an "advantageous selection" in the life insurance market. People with more insurance have lower average costs than those with less or no insurance at all. In literature, D.M. Cutler, et al. (2001) [26] provided evidence of the adverse choice and the advantageous selection in different insurance markets.

This theoretical framework makes it easy to define the nature and consequences of advantageous selection, which is justified by using a graphical presentation in Fig. 4. In a comparison between adverse choice and advantageous selection, it can be said that the e-banking customers who value insurance the most are those who have, on average, the lowest expected costs. It interprets the upward sloping of both the MC and the AC curves, as it is shown in Fig. 4. Market inefficiency here arises because of at least three factors. They are: a) customers vary based on incurred marginal costs; b) banks are regulated to ensure uniform pricing; and c) the equilibrium price is settled based on the average cost in this case.

However, with advantageous selection cases, the consequential market failure is one of the overinsurance (i.e., exceeds the value) rather than just underinsurance (i.e., less than true value) (i.e., $Q_{eff} < Q_{eqm}$ in Fig. 3). It was pointed out by D.D. Meza, et al. (2001) [27] in literature. It is always recognised that insurance service providers have an added incentive to reduce prices. In this scenario, the consequential welfare loss is given by the shaded area CDE, as shown in Fig. 3. Consequently, it happens because of the excess marginal cost (MC) over willingness to pay for individuals whose willingness to pay exceeds the average cost (AC) of the insured population. With this analytical framework, the welfare can also be evaluated in other situations. They are: a) mandating the H-contract where area ABE - area EGH in Fig. 3 ii) mandating the L-contract, which is normalised to zero; and b) a competitive equilibrium point where area ABE - area CDE and an efficient allocation of area ABE as shown in Fig. 3.

Summary of graphical presentation and direction for future study: Analyses evolved from Figs. 3 and 4 demonstrate that the demand curve and the cost curve are sufficient information for welfare analysis of equilibrium and non-equilibrium pricing of existing contracts in the proposed e-banking services. In this e-banking services market, the cases of different preferences and confidential information can have the same welfare implications if they have generated similar demand and cost curves.

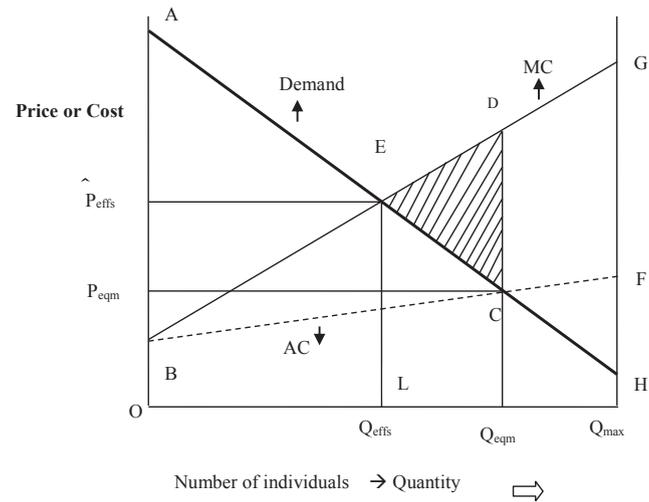


Fig. 4. Cost of advantageous selection on efficiency aspect under VI policy in Vietnam.

Estimating welfare under the framework relates to Figs. 3 and 4: Again, in the contract form in the e-banking service market, a customer will have options choosing the insurance (H) or the L-contract, which will facilitate accessing to e-banking services. In this setup, the bank itself will be an insurance provider in e-banking operation. The bank will deduct the premium amount from the customer's bank account just like banks do deduct service fees from customers' accounts. In case a customer does not have an account with the bank, but the customer chooses insurance in aim to complete a digital transaction, the customer will bear insurance cost per transaction in the e-banking services.

Under the framework, within the preferred arrangements, this welfare approximation requires data statistics that allows for estimating the demand curve $D(p)$ and the average cost curve $AC(p)$ in this study. Here the marginal cost (MC curve) can be backed out from these two curves. Thus, it does not require further estimation. For further clarity, it is noted here that:

$$MC(p) = \left[\frac{dTC(p)}{dD(p)} \right] = \left[\frac{d(AC(p) \cdot D(p))}{dD(p)} \right] = \left[\left(\frac{dD(p)}{d(p)} \right)^{-1} \right] * \left[\frac{d(AC(p) \cdot D(p))}{d(p)} \right]$$

With the above-mentioned three curves, i.e., the $D(p)$, $AC(p)$, and the $MC(p)$ in hand, welfare under various allocations can be computed as it is shown in Figs. 3 and 4 in this study.

It is well recognised that estimating any demand curve requires data statistics on prices and quantities (i.e., choices of coverages in this case) as well as the identification of price variation. This all can be used tracing out the demand curve here. In this estimation, the price variation must be exogenous to unobservable demand characteristics. For estimating the $AC(p)$ curve in this study, the data statistics on the expected costs of people with H-contract, such as

data on the next risk realisation and how it translates to insurer costs can be used. With such data statistics in hand, the same variation in prices can be used to trace out the AC (p) curve. The reason is that the expected cost here is likely to affect the demand. So, it is reasonable to say that any price variation that is exogenous to demand is also exogenous to insurable cost [22, 26]. In other words, we do not need a separate source of variation.

Thus, with price variation, no functional form assumption is needed to trace out the demand and the AC curves in this case [22, 23, 26]. For example, if the goal is to estimate the efficiency cost incurred from inefficient pricing, which arises from the selection choices, the price variation between the market equilibrium price (point C in Figs. 3 and 4) and the efficient price (point E) allow us to estimate the welfare cost of the inefficient pricing. This inefficient cost (area CDE) is associated with the selection choice without making any restrictions on the shape of the demand or AC curves. The variation of the prices that does not span these points, the area CDE can still be estimated. But it will require extrapolation.

5.4. Moral hazards that may affect the expected outcome of the voluntary insurance policy in Vietnam's financial sector

Relying on the techniques used for welfare analysis here, the moral hazard does not change the findings of our analysis here. In this study, H-contract represents full coverage. In contrast, L-contract will have no coverage but customers sign-up for using digital banking services at their own risk. So, in this setup, the probable moral hazard has no effect on the findings of this welfare analysis.

A future study connecting with moral-hazard issues can be conducted by making slight modification i.e., allowing the L-contract to include some partial coverage for ensuring a cashless Vietnamese society sooner than delaying in Vietnam.

6. The potential of voluntary insurance products and policymaker attention in shaping Vietnam's economy

6.1. Potentiality of the voluntary insurance product in Vietnamese economy

Once Vietnam policymakers and the bank-management introduce the VI product through banking provisions that authorise it in the e-banking service market, it will spread from bankers to customers in Vietnam. This life cycle of the VI product can be depicted using the S-curve.

Lifecycle of the VI product under S-curve connecting with economy of Vietnam: The S-curve in Fig. 5 charts the growth trends of revenue or productivity against time in Vietnam. In progression, as the VI product sets up itself, the growth trends in initial stages will be slow. The e-banking customers

will begin demanding it, at some point. Accordingly, the growth trends will increase rapidly as time passes. These incremental changes in stages will facilitate the continuing upward trends of growth. Near the end of its life cycle, the growth trend will slow down and may even begin to decline. In these stages, no amount of new investment in that product will yield a normal rate of return [25, 28]. However, it will set up a secured bank-led e-banking service through bankers, who introduce this new product in e-banking, which can present a cashless Vietnamese society soon.

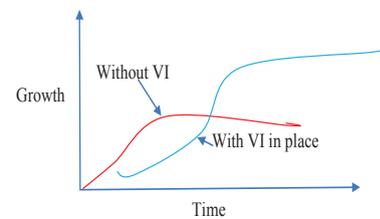


Fig. 5. Impacts of the VI product in e-banking service market in Vietnam's economy.

In this journey, the successive S-curve will come along to replace traditional banking. It will continue to drive the growth trends of digital transactions where the VI is likely to have three stages of "product life." These stages can be summed up as: 1) a starting up phase; 2) a stage of rapid increase in revenue; and 3) an ultimate declining stage. But it will never find the underlying cause of the curve. It will never produce normal returns, but it will play vital roles presenting a secure system of bank-led e-banking, which will be attracted by probable customers in Vietnam. It will position Vietnam to be a global leader in e-banking progress.

6.2. Seeking policymakers' attentions in Vietnam's economy: The goal of the current effort

This effort is for bring the issue to the attentions of policymakers and bank management in Vietnam's economy so that the proposed VI product can be in digital banking service market in Vietnam. It raises three questions. They are: Why is the VI product essential for ensuring higher growth trends of transaction of e-banking services?; Why is it important?; Why is it now?

For answering these questions, it is rational to say that transferring risk away from customers will directly help both the customers and the banks. It will attract probable customers who are on the brink of using e-banking services, but they feel it to be risky where psychological factors influence their decisions. This proposed model in practice can comfort the customers with incentives under marketing technique for increasing usages of number of digital transactions while keeping best utility of it. This incentive can be in the form of money, which can be credited to the customer's account.

Since the VI product will be a legal one, it will comfort customers in several ways such as: ensuring new values for customers, for improving society in multiple ways, and continued existence of the company in competitive market. In the process, banks, and insurance providers may offer rebates to customers based on the number of transactions in the e-banking service market, which in turn can attract more new customers. On the other hand, it can help overcome today's slowdown in growth trends of transactions in e-banking in Vietnam.

Having this VI product in place can help ensure risk free e-banking, which can guarantee elevated cashless activities in Vietnam's economy. Since the facilitations of e-banking can ensure trade in the form of currency and time value, overall, it can be helpful to its customers. Therefore, with the expectations of the benefits, customers will flock to it when they use digital transaction services. By the same token, the banking sector will be further competent, cutting down its operating costs, meeting customers' needs and then keeping up with global changes to ensure higher profits.

With these prospects in multiple facets in the e-banking service market, the financial sector of Vietnam is no exception. For sailing through today's tough competition and to sustain revenues, the Vietnamese financial sector has been more engaging than before [6]. In this journey the VI product can be instrumental in the economy in multiple aspects. Last but not least, having the VI policy in practice can place Vietnam to be recognised as world leader in the world of the e-banking service market, where policymakers or innovators will be credited for their roles.

7. Limitations and future study directions

In general, limitations of any scientific study evolve from the characteristics of techniques or methods that are used in the said study. This is because any choice(s) of techniques or method affects or influences the interpretation of the findings of the study undertaken. This scenario is no different in this study. This study is a theoretical study by nature where the Consumer Choice and Behavioural Theory and the techniques of welfare analysis are used for summarising the findings of this study.

The future study directions can be summarised as follows:

a) A comparison of welfare ranking between L-contract and H-contract is an open question, which can be answered empirically.

b) Do the customer's different preferences (either L or H) and confidential information have the same welfare implications, if they generate similar demand and cost curves?

c) Whether the amount of premium has any impact on the probability of the VI policy adoption, which can influence

the growth trends of e-banking transactions in Vietnam's financial sector?

d) Conducting an empirical study where data statistics should be on customers and probable customers' opinions on the causes of slow growth trends of digital transactions services in Vietnam.

e) Conducting a test whether the insurance premium or the cost for the VI has impacts on the possibility of the VI policy adoption in financial sector of Vietnam.

8. Conclusions

In today's world, Vietnam, a country with 87% of population under 54 years of age, has appeared to be the leader in the race of digitalisation banking services among southeast Asian countries [24]. However, like in any other country, the psychological risk factor has still been negatively impacting people's attitudes towards using bank-led digital banking services. Thus, the proposed VI product adoption can be a stimulus to the efforts of meeting today's slowdown e-banking service market in Vietnam. This approach to banking services and the increasing value is what will keep the banks growing. It can ease the economy booming in Vietnam as well as facilitate the Vietnamese by creating employment opportunities and by supporting in the form of charitable giving. The findings of welfare analysis ensure effective cost of pricing of the insurance. In the case of bank as an insurance provider, adverse selection case in insurance market, welfare cost of inefficient pricing is quantitatively small. And here any helpful selection results in the opposite. Once the VI is in place, it will spread from bankers to customers. So, its growth trend (the S-curve) will capture the growth of revenue or productivity against time. This growth will be slow at the beginning stages but at some point, digital banking-users will begin to demand it, which will ensure a high growth trends of digital transactions in Vietnam. Therefore, in this journey, the efforts of policymakers and banking management in Vietnam can contribute significant roles for the benefit of its economy, which could transition to cashless society soon.

So, the question is: Can policymakers and bank management in Vietnam play vital roles for the benefit of its modern society by ensuring an effective e-banking service market? The answer to this question is Yes. The prompt efforts of the policymakers and bank management in Vietnam can play significant roles ensuring a cashless society soon. Also, the outcome of this journey can place the nation of Vietnam to be the number one in ensuring a successful and absolutely secured e-banking service market in the world.

Finally, any future study can be carried out in multiple facets including comparative study of welfare ranking between L-contract and H-contract; whether amount of premium has any impact on the probability of VI policy

adoption; empirical study on customers and probable customers' opinions on the causes of slow growth trends of digital transactions in Vietnam's economy, etc.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

REFERENCES

- [1] P.M. Duc (2022), "Customer satisfaction in digital banking sector in Vietnam: A-meta case approach", *TELOS: Revista de Estudios Interdisciplinarian en Ciencias Sociales*, **24(3)**, pp.819-836, DOI: 10.36390/telos243.22.
- [2] A. Kapoor (2022), "Vietnam banking - towards the forefront of digitalization", *SunTec*, <https://www.suntecgroup.com/blogs/vietnam-banking-towards-the-forefront-of-digitalization>, accessed 10 August 2023.
- [3] General Statistics Office of Vietnam (2017), *Statistical Yearbook of Vietnam 2017*, Statistical Publishing House, 1000pp (in Vietnamese).
- [4] M. Rothschild, J. Stiglitz (1976), "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information", *Quarterly Journal of Economics*, **90(4)**, pp.630-649, DOI: 10.2307/1885326.
- [5] Vietnam Economic Times (2019), "New digital era for Vietnam's banks", *VietnamNet Global*, <https://vietnamnet.vn/en/new-digital-era-for-vietnams-banks-554167.html>, accessed 10 August 2023.
- [6] Vietnam Bank Association (2022), "Vietnam among world's earliest in banking digital transformation: Forum", *ANN Asia News Network*, <https://asianews.network/vietnam-among-worlds-earliest-in-banking-digital-transformation-forum/>, accessed 10 August 2023.
- [7] Temenos (2023), "Temenos digital banking forum 2023: Vietnam", <https://www.temenos.com/events/temenos-digital-banking-forum-2023-vietnam/>, accessed 10 August 2023.
- [8] O.T. Nguyen (2020), "Factors affecting the intention to use digital banking in Vietnam", *Journal of Asian Finance, Economics and Business*, **7(3)**, pp.303-310, DOI: 10.13106/jafeb.2020.vol7.no3.303.
- [9] A.M. Rahman (2021a), *COVID-19 Pandemic Crisis Country-wise: Looking Thru Consumer Choice Theory Lens*, LAP Lambert Academic Publishing, 74pp.
- [10] A.M. Rahman, S. Islam (2021b), "COVID-19 brings blessing for digital-banking in world-economy country-wise: An analysis under demand-supply model of market economics", *Journal of Business and Economic Development*, **6(2)**, pp.65-72, DOI: 10.11648/j.jbed.20210602.12.
- [11] A.M. Rahman, S. Islam (2022), "Ensuring risk-free digital-banking in US-economy: Application of Akim's model", *International Business & Economics Studies*, **4(2)**, DOI: 10.22158/ibes.v4n2p102.
- [12] Retail Banker International (2022), "Ant group-backed digital bank to offer loan service for SMEs in Singapore", <https://www.retailbankerinternational.com/news/anext-loan-service-smes-singapore/?cf-view>, accessed 10 August 2023.
- [13] M.C. Lee (2009), "Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit", *Electronic Commerce Research and Applications*, **8(3)**, pp.130-141, DOI: 10.1016/j.elerap.2008.11.006.
- [14] A.M. Rahman (2020a), "bKash vs. bank-led option: Factors influencing customer's preferences - does it warrant voluntary-insurance-policy for rapid-growth digital-banking in Bangladesh-economy?", *Journal of Banking and Financial Economics*, **1(13)**, pp.51-69.
- [15] A.M. Rahman (2018a), "Voluntary insurance for ensuring risk-free on-the-go banking services in market competition: A proposal for Bangladesh", *The Journal of Asian Finance, Economics and Business*, **5(1)**, pp.17-27, DOI: 10.13106/jafeb.2018.vol5.no1.17.
- [16] A.M. Rahman (2018b), *Voluntary Insurance in Banking Services - New Product for Ensuring Risk-Free Digital-Banking of World-economy*, Lambert Academic Publishing, 68pp.
- [17] Statista (2022), "Share of people who are aware of and interested in digital banking services in Vietnam in 2021", <https://www.statista.com/statistics/1316181/vietnam-awareness-and-interest-in-digital-banking-services/>, accessed 10 August 2023.
- [18] T.P. Nguyen, T.L.P. Dang (2018), "Digital banking in Vietnam current situation and recommendations", *International Journal of Innovation and Research in Educational Sciences*, **5(4)**, pp.418-420.
- [19] Future Digital Finance (2020), "Build a world class digital banking experience", <https://netfinance.wbresearch.com/>, accessed 10 August 2023.
- [20] T. Kuisma, T. Laukkanen, M. Hiltunen (2007), "Mapping reasons for resistance to internet banking use: A means-end approach", *International Journal of Information Management*, **27(2)**, pp.75-85, DOI: 10.1016/j.ijinfomgt.2006.08.006.
- [21] B. Li (2022), "Cross-border digital payment systems: The case of Singapore, Thailand, Malaysia, and Vietnam", *International Monetary Fund*, <https://www.imf.org/en/News/Articles/2022/11/08/sp110822-cross-border-digital-payment-systems>, accessed 10 August 2023.
- [22] A.M. Rahman (2019), "Microeconomics - basics: New way learning microeconomics in the 21st century era", *Social and Economic Research Institute*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3649850, accessed 10 August 2023.
- [23] A.M. Rahman (2020b), *Mathematics for Business and Economics*, Print Your Books Academic Publishing Company, Dhaka, Bangladesh.
- [24] UNICEF (2021), "Viet Nam SDGCW survey 2020-2021", <https://www.unicef.org/vietnam/media/8706/file/Sample%20&%20Respondents%20Characteristics.pdf>, accessed 10 August 2023.
- [25] G.A. Akerlof (1970), "The market for "lemons": Quality uncertainty and the market mechanism", *Quarterly Journal of Economics*, **84(3)**, pp.488-500, DOI: 10.2307/1879431.
- [26] D.M. Cutler, A. Finkelstein, K. McGarry (2001), "Preference of heterogeneity and insurance markets: Explaining a puzzle of insurance", *American Economic Review*, **98(2)**, pp.157-162, DOI: 10.1257/aer.98.2.157.
- [27] D.D. Meza, D.C. Webb (2001), "Advantageous selection in insurance markets", *RAND Journal of Economics*, **32(2)**, pp.249-262, DOI: 10.2307/2696408.
- [28] S. Kaplan (2017), "Innovation Lifecycles: Leveraging market, technology, and organizational S-curves to drive breakthrough growth", *InnovationPoint*, https://www.innovation-point.com/wp-content/uploads/2017/02/Innovation_Lifecycles.pdf, accessed 10 August 2023.