Impact of Trust and Risk on Internet banking adoption in Armenia

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Abstract

This study aims to investigate the Armenian customers' perception towards internet baking services and identify the main factors that can have impact on the Internet banking adoption process by Armenian customers. The proposed model integrates Trust and Risk as crucial factors that can influence customers' intention to use Internet banking and also factors from Theory of Reasoned Action (TRA), such as Attitudes and Subjective Norms, and factors from Technology Acceptance Model (TAM), such as Perceived Usefulness and Perceived Ease of Use. The research model is tested using Online Survey and sample of 387 respondents. To analyze collected data Partial Least Squares (PLS) method was used to understand the impact of each factor on the customers intention to use Internet banking and Logistic Regression methods was used to understand the main demographic differences between Internet banking users and non-users. The results of PLS analysis indicate that Trust, Attitudes, Perceived Usefulness and Perceived Ease of Use are statistically significant and have positive affect on the customers intention, but Risk does not have significant affect and, also Subjective Norms have negative affect on the customer's intention to use Internet banking. As a result of Logistic regression, it is found that Job sector has no effect on customers intention, but Education levels have impact on the intention to use Internet banking. This study can be helpful for academic readers and students, as well as Bank departments, such as Marketing department and Strategy and research department. It can help banks to understand what kind of concerns customers have toward Internet banking and what are the main barriers in adoption of Internet banking by customers.

Keywords: Internet banking, Trust, Risk, Theory of Reasoned Action, Technology Acceptance model

Contents

1. Introduction

Banking sector heavily relies on the information technology (IT). Using IT banks gather, analyze and deliver the information to their customers. In order to stay competitive in the market, banks should use that information to find new ways to differentiate their services and products. As, we live in very rapidly growing and changing world, banks should constantly update their approaches to deliver the information and innovate to provide secured, reliable and practical services to their customers, also by this way attract new audiences.

One of the revolutionary approaches to deliver banking services and products was considered the new platform: **the Internet**. The invention of the World Wide Web in 1990 was an important breakthrough in all aspects. The way people were communicating with one another, the way they were shopping or consuming entertainment, and finally how they see themselves in the world, has changed because of the Internet. And these changes are continuing, even accelerating. People born after 1985, more than half the world's population, have no idea what a world without the Internet is like.

One of the crucial impacts of the Internet and digital tools is a destabilizing of the status quo. In this case, all industries are vulnerable to change when a product or service comes along that meets user needs in an unprecedented way (Stokes,2018).

Of course, the banking sector is not an exception. In order to catch up with the development of services and products, also constantly growing needs of customers, many banks started to change the way they were operating.

The rapid spread of the Internet has presented big range of opportunities for banks and also for customers. Use of Internet has increased the level of awareness among customers, which, in its turn, has led to costumers' increased preferences. Nowadays, customers require much more from banking sector. They want more convenience and flexibility, also easier way to use financial tools, products and services that traditional bank branches could not provide. According to Nehmzow (1997) and Seitz (1998) "the Internet is considered as a strategic weapon and will revolutionize the way banks operate, deliver, and compete against one another, especially when competitive advantages of traditional branch networks are eroding rapidly". Now it is reality and banks are competing in the online platform too and this competition is getting tougher. Thus, banks should accumulate their resources to be able to survive.

This major trend has caused the retail banking sector to focus considerable attention on their distribution channel strategies. In order to stay competitive in the market banks created new products and services using advantages provided by the new distribution channel-the Internet. One of these products is **Internet Banking (IB)**.

There are many ways to define what is IB. In its simplest form, it means the provision of information about the services and products provided by the bank via a computer, television, telephone, or mobile phone. It is the type of services through which bank customers can request information and carry out most retail banking services such as balance reporting, interaccount transfers, bill-payment, etc., via a telecommunication network without leaving their homes or organizations (E. Daniel,1999). Sara Naiami Baraghani (2007) states that it is a connection between bank and customer in order to prepare, manage and control financial transactions.

To summarize, IB is a system or platform through which customers can access their accounts, get information and carry out banking activities at home or work. By this way, banks are able to offer their customers an inexpensive and direct way of exchanging information.

Nowadays, the usage of IB is growing and there are huge benefits that banks and customers can gain, such as inexpensive delivery of services, user-friendliness, real time upgradation of customers' data, ease of use, 24/7 online banking services and so on. But, it is well-known that adoption process of new technology is quite difficult, since there are many factors that customers take into account before making final decision to use that innovation or not and there are many problems that should be solved before Internet banking will be completely adopted by customers. Many behavioral and psychological issues can be mentioned as challenging obstacles, such as web usability issue, security and privacy, information quality issue, willingness to accept the change, impersonality of provided services by IB and so on. In order to understand the causes of these problems and find reasonable solutions appropriate research need to be conducted to find out the factors that can have impact of the customer decision to use IB.

During many years many researchers have been interested about customers' adoption of new technologies and what are the main factors that can have impact on adoption process. Thus, many investigations have been conducted to find out that factors and how they can affect customers intention to use new technology. Based on the findings of these researches different theories were suggested, such as Theory of Reasonable Action (TRA), Technology Acceptance Model (TAM), Prospect Theory regarding perceived risk, different approaches to explain Trust and so on. **The**

TRA (Fishbein, Ajzen, 1975) is one of the most popular theories used and is about factors that determine individual's behavioral intention, such as **attitudes** and **subjective norms** toward his/her behavior. The next theory is **TAM**, which is based on TRA and was developed by Davis (1989) to explain acceptance of IT for different tasks. TAM establishes that user adoption of a new information system is determined by the user's intention to use the system, which is in its turn is determined by the user's beliefs about the system. Davis identified that there are two basic determining factors in information system -**perceived usefulness(PU)** and **perceived ease of use(PEOU).** Taking into account these theories and arguments that authors brought why these factors are important for new technology adoption several determinants from TRA and TAM have been chosen and discussed in this study to understand which factors are more important for Armenian customers during Internet banking adoption:

- ➢ Trust
- ➢ Risk
- ➢ Attitudes toward new technology (TRA)
- ➢ Subjective norms (TRA)
- ➢ Perceived usefulness (TAM)
- ➢ Perceived ease of use (TAM)

However, beyond these factors presented in theories mentioned above, there are many other factors that can affect customers adoption of IB, such as awareness about internet banking services, trust (security, privacy, reliability), risks to transact via IB, information quality, accessibility, bank reputation, flexibility, age and gender of customers.

So, research questions that are discussed in this study are:

- ➢ What is the impact of Trust and Risk on the Armenian customers' adoption process of Internet Banking?
- ➢ What are the other factors that can have influence on the Armenian customers' adoption of Internet Banking?

In Armenian banking sector IB is quite new and do not have wide awareness among customers. It was launched in 2009, although IB has gained popularity around the world long before. Now, there are 17 operating banks in Armenia and all of them are using Internet banking. According to the data provided by World Bank 41,5% of population aged 15 and above made or

received digital payments in 2017[1]. We can compare this indicator with countries like Georgia (Tax/GDP=23.4%), Uruguay (Tax/GDP=24%) and Slovakia (Tax/GDP=18%) in Armenia (Tax/GDP=22%)[2] (Turkey Tax/GDP=18%) which have almost the same Tax to GDP ratio as Armenia. This indicator is quite low, since in mentioned countries it is 53%, 60%, 82% and 64% respectively. But since 2013 there was huge progress and this indicator increased from 13% to 41.5%. This talks about new strategies that banks are trying to use to raise awareness of services provided by IB. Banks should find different ways or approaches for different target groups to present the advantages of IB from customers' point of view based on the main characteristics that selected target group does have and also, as was mentioned above, what are the main factors that can affect customers intention to use IB. In developing countries like Armenia acceptance process of innovation or new technology is quite slow. Thus, the main motivating factor to conduct this research is the obvious fact that Armenian banking sector needs to find out reasons why considerable part of population does not use IB and try to create new ways to reach target audiences more effectively based on the factor analysis of customers intention to use IB.

Data for this research was collected by Online survey. Questionnaire consists of two sections. The first section includes Specific questions about factors that are discussed in the study and used in the model. The Second section includes General questions to gather demographic information about respondents. The respondents were mainly from Yerevan (with around 1mln population), which is the most developed city in the country with 1/3 of its population. Sample size was calculated with 95% confidence level and 5% margin of error. At the end 387 responses were collected, with 227 respondents who has ever used IB and 160 who has never used IB.

To conduct data analysis two tools were used. For first part of the research *Partial Least Square(PLS)* approach was used to measure impact of each factor based on the data gathered. *Logistic regression* model was run to factors contributing to the IB usage and understand what the main demographic differences between IB users and non-users are.

Research paper includes 5 Chapters. *Chapter 1 -* Introduction provides general information and background of the research, problems, purpose and research question of the study, also

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[1] The percentage of respondents who report using mobile money, a debit or credit card, or a mobile phone to make a payment from an account, or report using the internet to pay bills or to buy something online in 2017. It also includes respondents who report paying bills, sending or receiving remittances, receiving payments for agricultural products, receiving government transfers, receiving wages, or receiving a public-sector pension directly from or into a financial institution account or through a mobile money account in 2017

[2] www. data.worldbank.org

highlights motivation to conduct this research. *Chapter 2-* Literature review provides detailed and relevant information about several theories regarding the factors, which have significant influence on customers intention to use IB. The main theories are Prospect theory regarding Risk, different approaches to explain Trust, TRA (Theory of Reasoned Action) and TAM (Technology Acceptance Model). In *Chapter 3* Research Methodology is provided with basic research approach, Sampling plan and Data collection process. *Chapter 4* presents general information about the respondents, Logistic regression in order to understand main differences between IB users and non-users, PLS (Partial Least Squares) analysis and interpretation of factors' impact on the Intention and also data validity and reliability methods are presented. *Chapter 5* includes conclusions made from the data analysis and provides recommendations based on the results mentioned above. Chapter 6 is about the main limitations of the study and based on that limitation what kind of further research can be conducted.

2. Literature Review

2.1 Internet Banking

As was mentioned above, Internet Banking is a new channel or distribution mean through which customers can perform wide range of transactions electronically. E. Daniel (1999) considers four different delivery types(means) of these transactions:

- ➤ **PC banking** - proprietary software, distributed by the bank and is installed by the customer on their PC. They then access the bank via a modem linked directly to the bank.
- ➤ **Internet banking –** Using Internet customers can access their accounts.
- ➤ **Managed network** - The bank makes use of an online service provided by another party.
- ➤ **TV-based** - The use of satellite or cable to deliver account information to the TV screens of customers.

Wah (1999) mentioned that electronic banking does not necessarily have to be on a computer screen. It can, for example, be on the tiny screen of a mobile phone or any other wireless device. Now it is reality and is called **Mobile banking**, which is available everywhere and any time customer needs to use.

According Mu Yibin (2003) there are three types of Internet banking:

- ➤ **Informational:** In this case via Internet banks provides needed information about provided services and products to the customers. It is mostly meant for marketing purposes and customers cannot do transactions. There is no connection to the bank's main computer systems.
- ➤ **Communicative:** In this case, there is limited interaction between the bank and customers, such as account balances, new account updates, loan or mortgage applications, contact information updates.
- ➤ **Transactional:** It is the most popular and used type of Internet Banking. In this case, customer can carry out different transactions online and have complete control over their accounts.

Nowadays, the usage of Internet banking is growing and there are huge benefits that both banks and customers can gain.

The main **benefits for banks** are cost savings, since Internet is the cheapest delivery channel for banking products as it allows banks to reduce their branch networks and downsize the number of service staff (A. Mashhour, Z. Zaatreh, 2008), targeting and reaching new segments of the

population, efficiency, enhancement of the bank's reputation, better customer service and satisfaction (Brogdon, 1999; Jayawardhena and Foley, 2000) and real-time upgradation of customers' data.

According to Sheshunoff (2000), the most important driving force behind the implementation of full-service Internet banking by banks is the need to create powerful barriers to customer exiting. He states that once a customer moves to full-service Internet banking, the likelihood of that customer moving to another financial institution is significantly diminished. The main reasons for this behavior can be found in the consumer behavior theory: switching always requires much time and effort from the individual consumer.

The major advantages of Internet banking for customers are the convenience and accessibility because it is available 24 hours-a-day, seven days a week and customers can use it everywhere they want. Internet banking offers all services that are provided in the traditional way and is fast and efficient since basic banking services such as paying bills and making transfers between accounts can be done almost immediately, specifically if accounts are opened in the same bank. Also, services and products provided by Internet banking are easy to use and perform. From customers viewpoint, Internet banking is a quite inexpensive delivery of services since benefits overweight the money? that customer should pay.

2.2 Theoretical framework

2.2.1 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was developed by Ajzen and Fishben in 1975 and is one of the basic theories, which is used to explain human behavior. TRA is a widely studied model in social psychology, which is concerned with the determinants of consciously intended behaviors (Fishbein and Ajzen, 1975).

According to TRA **Behavioral Intention (BI)** is a measure of individuals intention to perform a specific behavior. BI can be explained by the two main factors:

> ➤ **Attitudes (A)** towards the action or behavior. *Attitude* is an individual's positive or negative feelings about performing the target behavior. Attitudes are affective and based upon a set of beliefs about the object of behavior. Attitude is a combination of

behavioral beliefs (B$_i$) and **evaluations (E$_i$) of those beliefs**. B_i is defined as the individual's subjective probability that performing the target behavior will result in consequence i. E_i is defined as an individual's positive or negative feelings (evaluative effect) about performing the target behavior (Fishbein and Ajzen, 1975).

$$A = \Sigma \, B_i \, E_i$$

➢ **Subjection Norm (SN).** *Subjective norm* is defined as the person's perception of social groups, what most people think individual should or should not perform the behavior in question, such as family members or friends. SB consists of multiplicative function of individuals **Normative beliefs (NB$_i$)** and individual's **Motivation to comply (MC$_i$)**

$$SN = \Sigma \, NB_i \, MC_i$$

TRA is general model and before conducting research beliefs should be specified based on the purpose of the research and are salient to that particular behavior.

As we can see from Figure 2-1 A and SN jointly originate "intentional behavior", which in its turn leads to certain Behavior. Thus, author defined "behavior" as a result or intention.
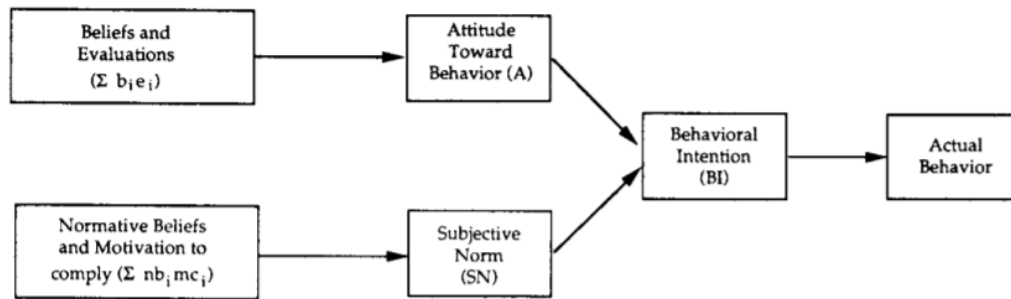

Figure 2-1 The Theory of Reasoned Action (Fishbein and Ajzen, 1975)

Based on the above-mentioned definitions, the following hypotheses are proposed:

H1: Attitudes affect customers' intention to use IB.

H2: Subjective norms affect customers' intention to use IB.

2.2.2. Technology acceptance model

The base for IB is technology, thus the acceptance of IB should be explained by technology acceptance models. One of the most used models in investigating information technologies is TAM (Technology acceptance model). First TAM model was developed by Devis in 1989. The main goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified (Davis et al., 1989). TAM is considered an adaptation of Theory of Reasoned Action (TRA), which was developed to specifically deal with modeling user acceptance of information systems and TAM provides basis for tracing the impact of external factors on internal beliefs, attitudes and intentions. TAM was formulated in an attempt to achieve these goals by identifying a small number of fundamental variables suggested by previous research dealing with the cognitive and affective determinants of computer acceptance and using TRA as a theoretical backdrop for modeling the theoretical relationships among these variables.

According to TAM the Behavioral Intention (BI) to use the new technology leads Actual system use. According to the model, there are two main factors that have primary relevance for computer acceptance behaviors: **Perceived usefulness (PU)** and **Perceived ease of use (PEOU)** (Figure 2-2). *Perceived usefulness* is a degree to which a potential user thinks that using a particular system would increase his/her job performance. *Perceived ease of use* is defined as the degree to which a potential user thinks that using a particular system would be free of effort, with effort being understood to include both physical and mental effort, and how easy it is to learn to use the system. According to Davis perceived usefulness directly influences intention, but perceived ease of use acts indirectly through usefulness.

As we can see Perceived usefulness and Perceived ease of use jointly determine **Attitude Toward using (A)** the technology with relative weights statistically estimated by linear regression. Thus:
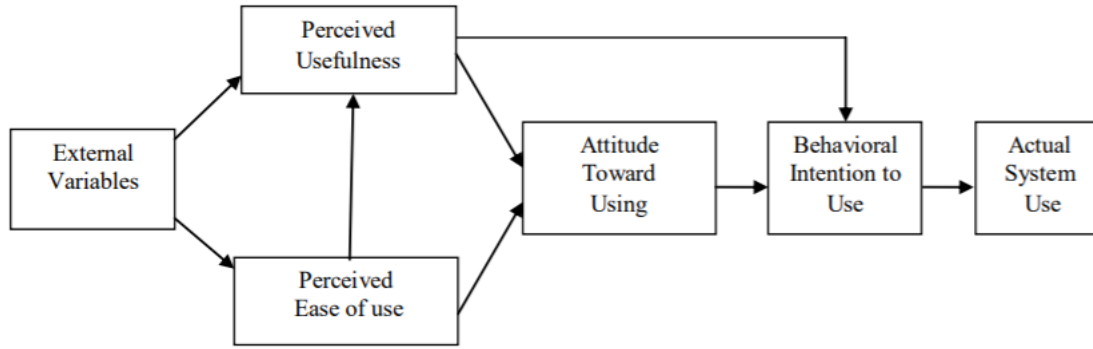
$$BI = A + U$$

$$A = PU + PEOU$$

Figure 2-2 Technology acceptance model (TAM) (Davis et al, 1989)

Based on the above-mentioned definitions, the following hypotheses are proposed:

H3: Perceived usefulness affects customers' intention to use IB.

H4: Perceived ease of use affects customers' intention to use IB.

H5: Perceived ease of use affects Perceived usefulness.

2.4 Trust and risk as factors Influencing customers adoption

2.4.1 Trust

Trust is considered as an important factor and, an issue to investigate in many research fields. Moreover, in recent years, innovation of the Internet and new products and services provided by the Internet, created new digital environment where the role of trust became more remarkable. It is known that almost every service provided by the Internet is without physical contact and in fact, trust occurs in environment where impersonality of relationships between customer and service provider is dominant. Thus, trust was monitored in the new context as an e-Trust.

There are various definitions of trust. For example, according to Gambetta (1998) "trust (or, symmetrically, distrust) is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action". Trust is an expectation that one chooses to trust will not behave opportunistically by taking advantage of the situation (Gefen D., 2000). Following the work of McKnight and his colleagues, Pavlou (2003) defines trust in B2C e-commerce as the belief that allows consumers to willingly become vulnerable to web retailers after having taken the retailers' characteristics into consideration.

Since the origination of banking system, trust was the foundation of Bank-Customer relationships, because customers must be sure that their funds, payment and personal information is secured. Consumers are increasingly concerned about privacy. To comfortably share with you the data you need, consumers must believe you will treat that data responsibly and respectfully (Stokes,2018). Stokes defines three main components of trust:

➢ **Security:** Customers need to be sure that their personal and payment information is secured and cannot be used by hackers.

➢ **Privacy:** Customers need to be sure that their personal and payment information won't be shared by bank.

➢ **Transparency:** Banks should provide insight into how their data is being used. Demonstrate how providing access to their data is contributing towards improving their experience.

There are connections between trust and TAM factors (Perceived usefulness and PEOU). Trust is one of the determinants of Perceived usefulness, since if consumers do not trust, they will not expect to gain any utility from using IB. Trust has positive effect on of Perceived usefulness, since trust allows consumers to become vulnerable to e-vendor to ensure that they gain the expected useful interaction and service (Pavlou,2003).

Perceived ease of use also is connected with trust. Service providers can promote their technology with help of Perceived ease of use because if costumer knows that service or product can be used easily without unpleasant consequences and inconvenience it would be more probable that they will purchase the product.

Thus, based on the above-mentioned arguments the following hypothesis is proposed:

➢ H8: Trust affects customers' intention to use IB.

2.3.2 Risk

As was mentioned above services provided by the Internet have impersonal nature and uncertainty creates risks, which is typical for online transactions. In many cases, in risky situations customers are not rational. According to Prospect theory (Kahneman and Tversky, 1979) there is rational explanation under the seemingly non-rationale behavior of customers. People evaluate the

alternatives when making decisions under risk, considering outcomes and their risk attitudes. Outcomes represent gains or losses compared with reference point. People choose alternative with the highest utility (value), calculating all alternatives on the basis of the possible outcomes and their respective probabilities. People also tend to be loss averse. As they tend to overvalue outcomes that are considered certain in comparison with less probable outcomes, they prefer avoiding losses to obtaining gains. Prospect theory is an appropriate theory for understanding the role of risk in intention to transact in online shopping context (Chiu et al., 2014).

To measure perceived risk, Chiu et al. (2014) focus on the likelihood of negative outcomes or loss in four aspects:

- ➢ **Financial loss:** Financial risk refers to the likelihood of suffering a financial loss due to hidden costs, maintenance costs or a lack of warranty in case of faults. In case IB this risk is very important, and customers should be careful and know exactly what they are doing and how.

- ➢ **Product performance:** Performance risk refers to the probability that a product purchased may result in a failure to function as expected.

- ➢ **Privacy risk** is the potential loss of control over one's personal information. As IB is an online platform, customers have some concerns regarding the security of IB. They want to be sure that their personal and payment information is secured and cannot be used by hackers and, also, won't be shared by the bank.

- ➢ **Product delivery**. Product delivery risk refers to the possibility of suffering a loss due to the online seller's failure to deliver the product or late delivery. In case IB late transactions can lead to huge losses.

Given the uncertain context of IB, it is expected that perceived risk would lower consumers' intentions to use IB for transactions (Pavlou P. A., 2003)

Thus, based on the above-mentioned arguments the following hypothesis was proposed:

H13: Perceived risk affects consumer's intention to use IB.

H14: Trust affects Risk.

3. Research methodology

3.1 Research approach

Quantitative research was carried out by Online survey in order to collect *primary data* and use regression models to identify correlations between different determinants, understand importance of each factor from both customers' and banks' point of view. This study uses deductive approach since there are appropriate theories within the field, such as Trust, Risk, TRA and TAM, which are discussedin Literature Review, and main factors for observations were selected from that theories, such as Trust, Risk, Attitude and Subjective Norm, Perceived Usefulness and Perceived Ease of Use.

3.2 Sampling plan

The theoretical population for this research is Yerevan's population. According to the Statistical Committee of the Republic of Armenia, the latest data (2017) on census shows that the population of Yerevan is 1,075,800. Sample size for this research paper was calculated with 95% confidence level and 5% margin of error, ending up to 384 people. It is a probability sample, which means that every person included in the sample had an equal chance to be selected from the population. Participants of the survey were contacted through social media network – Facebook, and it was drawn at my convenience, meaning that the whole communication was done through internet, specifically through personal messages to the selected people and through posts in different Facebook groups for people living in Yerevan. I have also used snowball sampling method, meaning that the survey participants were asked to share it with their friends who live in Yerevan.

3.3 Data collection

Data for this research was collected by Online survey. Questionnaire consists of two sections. First section is about customers' perception of IB usage and factors affecting the adoption of IB. Respondents were given statements about the factors and asked to rank them in seven-point Likert scale (Figure 3-1). All factors and statements are presented in Questionnaire, which is available in Appendix A.

The second section gathers general information about respondents such as demographic and income level. The Questionnaire was available via Facebook over 10 days and totally was collected 387 responses.
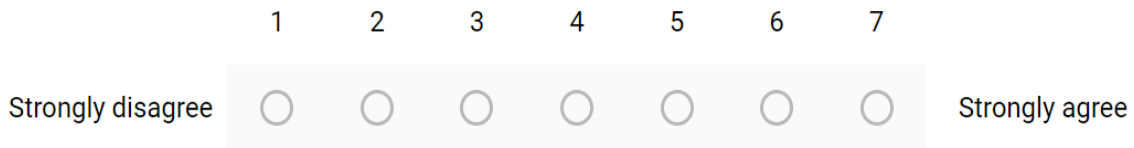
Figure 3-1 Likert scale used in Survey

4. Data analysis and Interpretation

4.1 Analysis of general information about the respondents

As a result of Online survey 387 responses were collected. Results of Survey's General section shows that 64% of respondents are Female and more than half of respondents are between 18-24 years old (55.56%). 47.27% have bachelor's degree, 26.83% are working in Financial sector and monthly expense of around 52% is up to 120.000 AMD (Appendix B).

As the survey's main goal is to research factors affecting intention of IB user's and also the reasons why respondents do not use IB. Thus, the first question of the survey was "Have you ever used IB?" with options Yes or No. Based on the answer to this question IB user skips to section with specific questions about factors and non-user skips to section with the question regarding the reasons why they don't use services provided by IB. As we can see from Figure 4-1 59% of respondents (227 out of 387) uses IB and 57% of which uses IB less than 1 time a month (Figure 4-2).
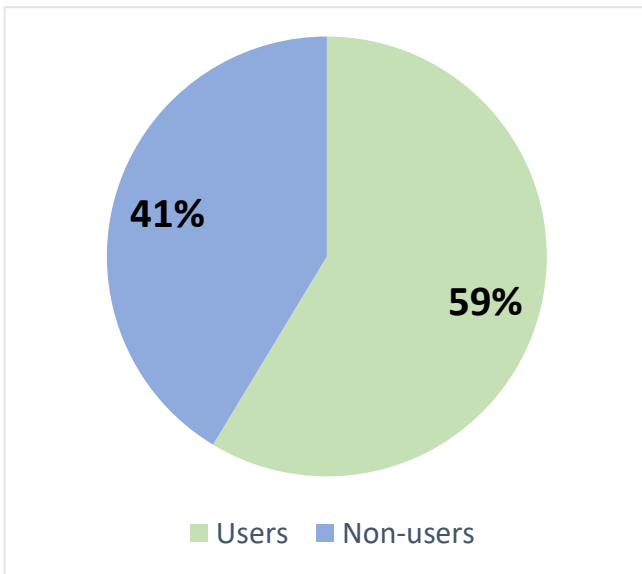
Figure 4-1 Internet banking usage
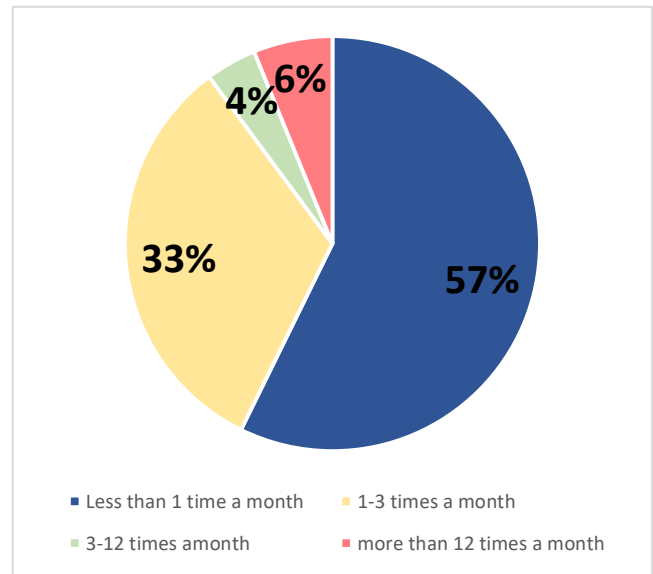
Figure 4-2 Frequency of Internet banking usage

In Figure 4-3 are presented reasons why respondents do not use IB. It is obvious that there is low awareness of services that IB provides since about 43% of non-users (70 out of 160) have chosen that option. Thus, banks should think about the new strategy and marketing campaigns to increase the awareness of Internet banking and advantages that Internet banking can provide.
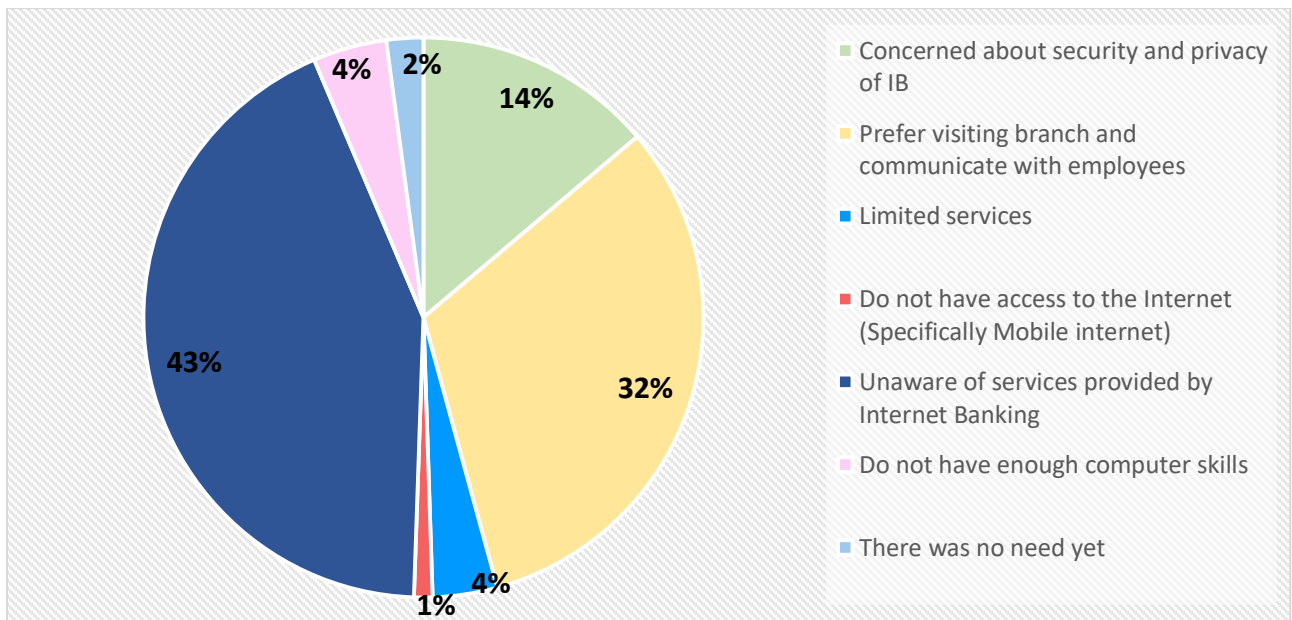
Figure 4 - 3 Reasons why people do not use Internet Banking

In order to understand main demographic differences between Internet banking users and non-users **Logistic regression** was conducted. Initial analysis of logistic regression has shown that Job sector and availability of branches near respondent's home do not have significant influence on the customers intention to use Internet banking, thus these factors were removed from further analysis.

```
                          Logit Regression Results
============================================================================
Dep. Variable:              Answer   No. Observations:                387
Model:                       Logit   Df Residuals:                    381
Method:                        MLE   Df Model:                          5
Date:             Sat, 11 Aug 2018   Pseudo R-squ.:                0.2222
Time:                     15:52:22   Log-Likelihood:               -204.11
converged:                    True   LL-Null:                      -262.42
                                     LLR p-value:                1.633e-23
============================================================================
                   coef    std err          z      P>|z|      [0.025      0.975]
----------------------------------------------------------------------------

Gender          -0.9538      0.247     -3.859      0.000      -1.438      -0.469
Age             -0.5163      0.127     -4.080      0.000      -0.764      -0.268
Education        0.6756      0.203      3.326      0.001       0.277       1.074
Monthly expenses 0.4608      0.110      4.195      0.000       0.245       0.676
Working_schedule 0.5577      0.100      5.577      0.000       0.362       0.754
============================================================================
```

Table 4 -1 Results of Logistic regression

According to Table 4-1 presented factors (Age (b=-0.5163), Gender (b=-0.9538), Education(b=0.6756), Monthly expenses(b=0.4608) and working schedule (Job type, b=0.5577) are statistically significant with p value less than 0.05.

```
Gender                 0.385292
Age                    0.596750
Education              1.965230
Monthly expenses       1.585294
Working_schedule       1.746642
```

Table 4 -2 Odds Ratios

In Table 4-2 are shown odds ratios, which shows how one unit increase or decrease in a variable affects the odds of IB usage. In case Gender, there is 38.5% less probability that Male customer will use Internet banking than Female customer. Since we have 7 groups of Age (Up to 18, 18-24, 25-34, 35-44, 45-54, 55-64, 65 and more), that means the probability of IB usage is decreasing by 59.7% during transition from one Age group to the next Age group. Based on the

Survey results 55.56% of respondents are from Age group 18-24, and this percentage is decreasing when age is increasing (Appendix B).

In case Education (Levels: High school, Bachelor's degree, Master's degree, PhD), Monthly expenses (Up to 80.000 AMD, 80-120.000 AMD, 120-200.000 AMD,200-300.000 AMD, 300.000 AMD and more) and Working schedule (Freelance, Part-time, Full-time) probability of IB usage is increasing during transaction from one level of presented factors to next level respectively 96,5%, 58,5% and 74.6%.

4.2 Structural model and results of PLS analysis

In order to analyze the data, Partial Least Squares (PLS) was employed. PLS places minimal restrictions on the measurement scales and residual distribution (Chin & Newsted, 1999). Assessing the explanatory power of a structural model, it allows a simultaneous analysis of both how well the items relate to each construct and whether the hypothesized structural paths are empirically true. Figure 4-4 shows initial path and connections between factors, which have been chosen from theories presented in the Literature review (TRA, TAM, Trust and Risk).
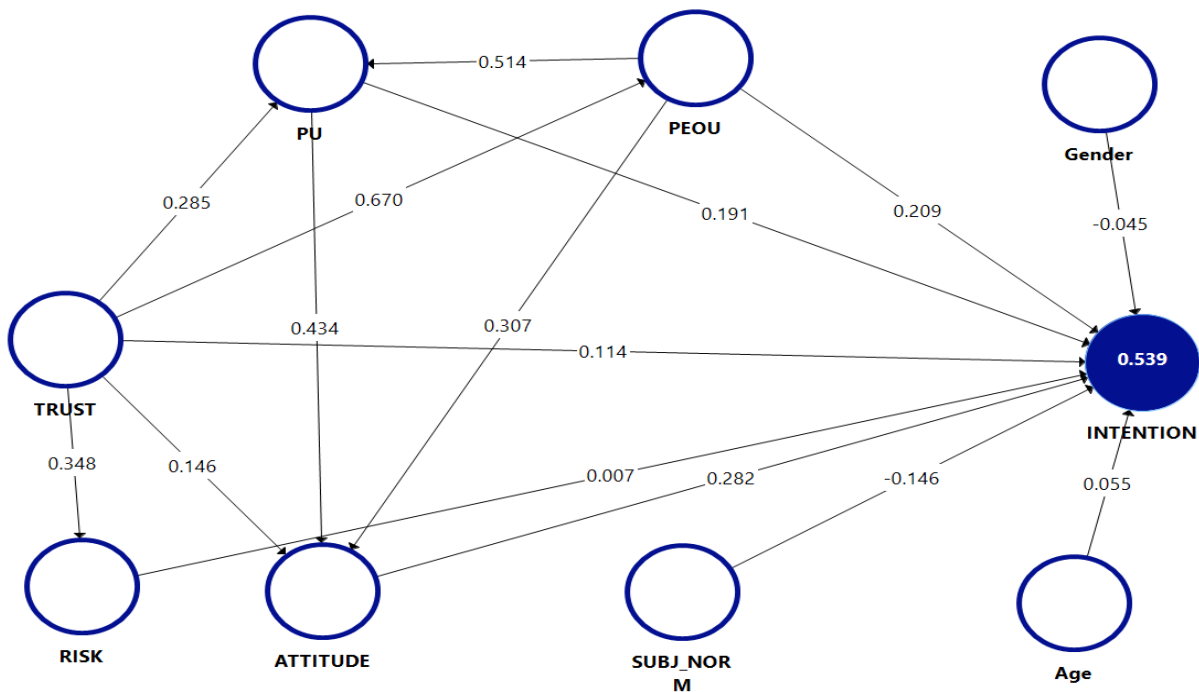

Figure 4-4 Initial model based on TRA, TAM, Trust and Risk

Table 4-3 shows the results of the structural path analysis. All of the paths represent total effects, including both direct and indirect effects. The significance of the paths was assessed by 5000 bootstrap runs. Hypotheses named as **H** are the ones which are defined in Literature Review-Chapter 2, and, also, Age and Gender were examined as factors that can affect customers intention to use Internet Banking. The other hypotheses ,which are named as **H$_{PLS}$** are connections between different factors which were examined when running PLS. Almost all paths were statistically significant with p-values less than 0.05, but as we can see there are several connections that are not significant, such as Risk to Intention (b=0.007, p>0.05), Age to Intention (b=0.055, p>0.05) and Gender to Intention (b=-0.045, p>0.05). Since these connections are not statistically significant they should be eliminated from the model. From the beginning of the research Risk was considered as one of the important determinants that can influence customers intention to use Internet banking, but results have shown the opposite. Thus, we can conclude that customers are sure that their personal and payment information won't be shared by bank and they won't have loss because of hidden costs and late transactions.

Hypothesis	Connection	Path coefficients(b)	P Values	Rejected/Supported
H1	Attitudes->Intention	0.283	0.003	Supported
H2	Subjective norms->Intention	-0.146	0.002	Supported
H3	PU->Intention	0.191	0.000	Supported
H4	PEOU->Intention	0.209	0.000	Supported
H5	PEOU->PU	0.514	0.000	Supported
H6	Trust->Intention	0.114	0.000	Supported
H7	Risk->Intention	0.007	0.878	Rejected
H8	Trust->Risk	0.346	0.000	Supported
H9	Age->Intention	0.055	0.231	Rejected
H10	Gender->Intention	-0.045	0.364	Rejected
H1$_{PLS}$	PU->Attitudes	0.434	0.000	Supported
H2$_{PLS}$	PEOU->Attitudes	0.307	0.000	Supported
H3$_{PLS}$	Trust-> PEOU	0.670	0.000	Supported
H4$_{PLS}$	Trust->PU	0.285	0.000	Supported
H5$_{PLS}$	Trust-> Attitudes	0.146	0.000	Supported

Table 4-3 PLS results of initial model

Figure 4-5 is the Final model after removing none significant indicators, factors and connections. Overall, this model indicates that **52.4%** (Table 4-4) of the variance of the customers intention to use IB is explained by presented factors. Thus, the fit of the overall model is fairly good, suggesting the predictive power of the proposed model.

	R Square	R Square Adjusted
ATTITUDE	0.631	0.626
INTENTION	0.535	0.524
PEOU	0.459	0.456
PU	0.550	0.546
RISK	0.080	0.076

Table 4-4 R Square and R Square Adjusted of Final model
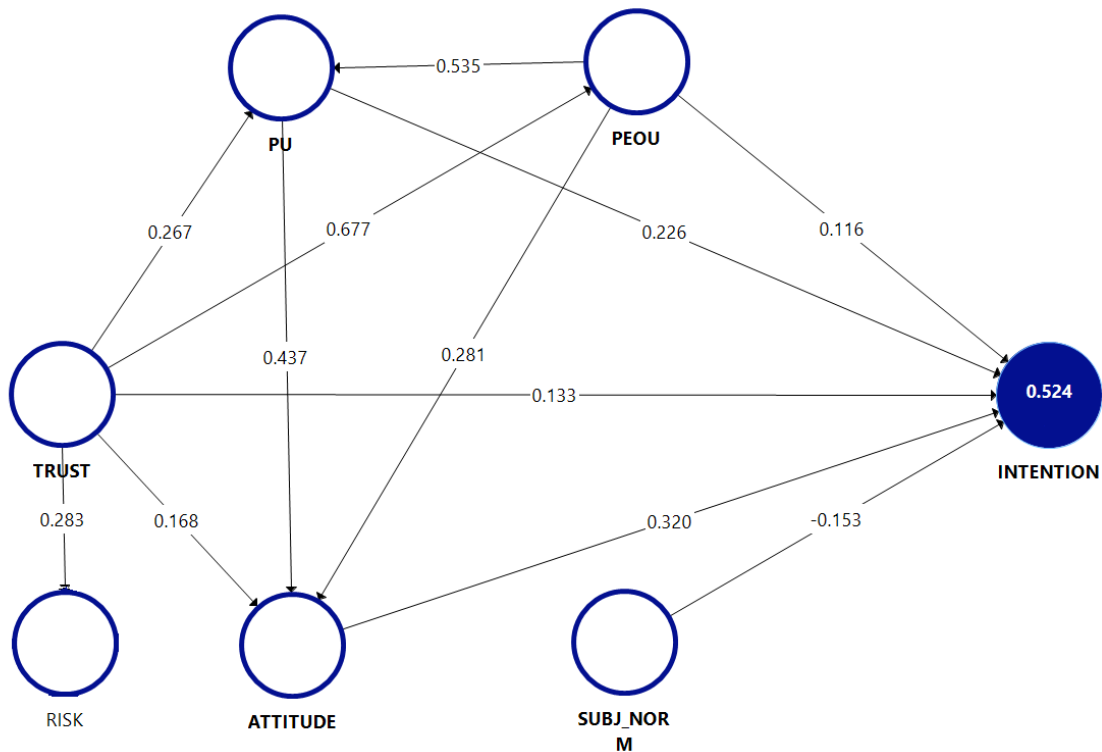
Figure 4-5 Final Model based on TRA, TAM, Trust and Risk

As shown in Table 4-5 Intention to use Internet banking is explained mainly by Trust (b=0.133, p>0.05), PEOU (b=0.116, p>0.05) and PU (b=0.226, p>0.05), thus these factors have statistically significant effect on intention to use IB. Also. PEOU has influence on PU with 0.535 path coefficient. Therefore, these three results validate TAM on intention to use IB supporting H3, H4 and H5 hypotheses.

Attitudes (b=0.320, p>0.05) and subjective norms (b=-0.153, p>0.05) also has statistically significant impact on intention to use IB. As we can see Subjective norm has negative coefficient, so we can assume that social groups like friends, family members have negative impact on the customers' intention to use Internet banking. But we also should take into account that this factor is very specific and many researchers think that it should not be included in the TRA model. But as for now H1 and H2 hypothesis presented in TRA are supported.

Attitude of cutometers' to use IB is jointly explained by PEOU (b=0.320), Trust (b=0.168) and PU (b=0.437) with 62.6% R Square Adjusted and have significant impact with p-values less than 0.05.

Hypothesis	Connection	Path Coefficients(b)	P Values	Rejected/supported
H1	Attitudes->Intention	0.320	0.001	Supported
H2	Subjective norms->Intention	-0.153	0.004	Supported
H3	PU->Intention	0.226	0.000	Supported
H4	PEOU->Intention	0.116	0.000	Supported
H5	PEOU->PU	0.535	0.000	Supported
H6	Trust->Intention	0.133	0.000	Supported
H8	Trust->Risk	0.283	0.001	Supported
H1$_{PLS}$	PU->Attitudes	0.437	0.000	Supported
H2$_{PLS}$	PEOU->Attitudes	0.320	0.000	Supported
H3$_{PLS}$	Trust-> PEOU	0.677	0.000	Supported
H4$_{PLS}$	Trust->PU	0.267	0.000	Supported
H5$_{PLS}$	Trust-> Attitudes	0.168	0.000	Supported

Table 4-5 PLS results of Final model

4.3 Validity and reliability

In order to reduce the chance of getting wrong answers attention need to be paid to *Reliability and Validity* of collected data. According to (Burns & Bush, 2014), "with a reliable measure, a respondent responds in the same or very similar manner to an identical or near-identical question". Reliability is defined as the internal consistency of a scale, which assesses the degree to which the items are homogeneous (Sara Naiami Baraghani, 2007). For example, in case Perceived ease of use First statement is "The use of IB is easy and convenient." and the second one is "It is difficult

to use IB.". These two statements are opposite and if respondent answered honestly and attentive, it means that answers to these statements should be opposite (for example, if the first one is 7, the second one should be 1). If there are some differences in answers thus something went wrong. According to Burns & Bush (2014) **validity** is defined as "the accuracy of the measurement: an assessment of the exactness of the measurement relative to what actually exists".

In order of evaluate the validity and reliability of the measurement model **Reliability, convergent validity and discriminant validity** were examined.

Reliability was examined using the **composite reliability** and **Cronbach's Alpha** values. Table 3-1 shows that all of the values were above the commonly acceptable threshold (0.7). Thus, the measures have high levels of reliability.

 Convergent validity was assessed by two criteria (Fornell & Larcker, 1981):

➢ all indicator loadings should be significant and exceed 0.7

➢ the average variance extracted (AVE) by each construct should exceed the variance due to the measurement error for that construct (i.e. AVE should exceed 0.50).

Construct	Items	Cronbach's Alpha	Composite reliability	Composite Reliability	Average Variance Extracted (AVE)
ATTITUDE	2	0.71	0.74	0.88	0.78
INTENTION	3	0.73	0.85	0.85	0.65
PEOU	3	0.78	0.80	0.85	0.73
PU	4	0.78	0.86	0.86	0.61
RISK	2	0.70	0.83	0.75	0.52
SUBJ_NORM	2	1.00	0.75	1.00	1.00
TRUST	3	0.83	0.90	0.90	0.74

Table 4-6 Descriptive statistics of constructs

All items exhibit a loading higher than 0.7 on their respective construct (Table 3-1), and all of the AVEs ranged from 0.52 to 1 (Table 3-1).

 Discriminant validity is the next measurement model that was employed. The widespread approaches for evaluating discriminant validity are the **Fornell-Larcker criterion** and the examination of **cross-loadings** (Table 3-2). Although Henseler, Ringle and Sarstedt (2015) showed that these approaches do not reliably detect the lack of discriminant validity.

	ATTITUDE	INTENTION	PEOU	PU	RISK	SUBJ_NORM	TRUST
Attitude_1	0.88	0.57	0.62	0.65	0.15	(0.03)	0.57
Attitude_3	0.88	0.59	0.63	0.66	0.13	(0.01)	0.55
Intention_1	0.61	0.84	0.56	0.58	0.12	(0.12)	0.51
Intention_2	0.60	0.85	0.61	0.57	0.09	(0.12)	0.57
Intention_3	0.38	0.73	0.27	0.38	(0.03)	(0.18)	0.29
PEOU_1	0.53	0.36	0.82	0.52	0.25	0.08	0.56
PEOU_2	0.67	0.63	0.90	0.69	0.16	(0.08)	0.60
PU_1	0.55	0.54	0.57	0.79	0.09	0.01	0.45
PU_2	0.59	0.54	0.57	0.82	0.10	0.07	0.60
PU_3	0.53	0.38	0.43	0.73	0.08	0.00	0.39
PU_4	0.64	0.49	0.63	0.76	0.17	(0.09)	0.50
Risk_1	0.16	0.07	0.23	0.14	1.00	0.10	0.28
Risk_3	(0.05)	(0.12)	0.02	(0.02)	0.20	0.12	(0.01)
Subjective_norm_1	(0.03)	(0.17)	(0.01)	(0.01)	0.09	1.00	(0.08)
Trust_1	0.53	0.47	0.55	0.50	0.27	(0.05)	0.88
Trust_2	0.46	0.43	0.52	0.49	0.22	(0.06)	0.83
Trust_3	0.63	0.55	0.66	0.62	0.24	(0.08)	0.87

Table 4-7 Cross loadings

Therefore, to assess discriminant validity we will employ these two approaches and the **heterotrait-monotrait ratio of correlations (HTMT)** approach, proposed by Henseler et al. (2015). First, the square root of the AVE from a construct is much larger than the correlations shared between the construct and other constructs in the model (Table 3-3), suggesting discriminant validity (Fornell & Larcker, 1981). Second, an examination of cross-factor loadings (Table 3-2) shows good discriminant validity, because the loading of each indicator on its assigned construct is much higher than its loadings on all other constructs.

	ATTITUDE	INTENTION	PEOU	PU	RISK	SUBJ_NORM	TRUST
ATTITUDE	0.88						
INTENTION	0.66	0.81					
PEOU	0.71	0.60	0.86				
PU	0.74	0.63	0.72	0.78			
RISK	0.16	0.07	0.23	0.14	0.72		
SUBJ_NORM	(0.03)	(0.17)	(0.01)	(0.01)	0.09	1.00	
TRUST	0.63	0.57	0.68	0.63	0.28	(0.08)	0.86

Table 4-8 Fornell-Larcker Criterion

Third, if heterotrait-monotrait ratio of correlations (HTMT) value is below 0.90, discriminant validity has been established between two reflective constructs. As shown in Table 3-4, all HTMT values are below 0.9, thus indicating good discriminant validity.

	ATTITUDE	INTENTION	PEOU	PU	RISK	SUBJ_NORM	TRUST
ATTITUDE							
INTENTION	0.89						
PEOU	0.81	0.84					
PU	0.88	0.82	0.78				
RISK	0.26	0.27	0.42	0.20			
SUBJ_NORM	0.03	0.20	0.12	0.06	0.23		
TRUST	0.81	0.72	0.92	0.76	0.35	0.08	

Table 4-9 Heterotrait-Monotrait Ratio (HTMT)

5. Conclusion

The results of PLS analysis were surprising due to the preliminary set expectations and existing marketing of Armenian banks. Almost every bank highlights the low or non-existent risk levels while using its services, assuming that people do consider it as an important factor while moving through their customer buying journey. However, the results of PLS analysis showed a completely different picture, stating that risk has no impact on the intention of people to use the online banking services based on a very high P value (0.878).

According to my own judgment this may have 4 different explanations. First of all, in the Armenian modern market there was no scandalous story with a bank fraud. Take into account the Wells Fargo account fraud scandal, which is associated with the creation of millions of fraudulent savings and checking accounts on behalf of their clients without informing them. There was no such case in the Armenian market and as people have not seen that, they may not expect that from the Armenian banks. My next explanation is very similar to and is even correlated with the previous one. Armenians trust the traditional banks, thus the creation of an alternative-online version of them wouldn't change much in their attitude towards the same services and same banks. The third explanation would be that the Armenian banks are very stable. A good example for that is the state of banks during the Armenian Velvet Revolution, when everything starting from the streets and ending with the major companies was in a "paralysis". At that point of time banks, especially Central Bank of Armenia were working with their regular schedule and completing their works as planned. The last explanation, may be connected to the cultural and social aspects of Armenian nation. Armenians subconsciously trust each other, due to the fact that they belong to the same nation. Thus, for them trusting their national, local banks is not associated with risk.

While risk proved to be the least important factor people look at while using online-banking systems, the most important and statistically significant factors according to the analysis done by PLS are Perceived Usefulness and Perceived Ease of Use with P values lower than 0.05. This may be associated with the fact that not everyone using bank services is tech-savvy, thus if they think about using online-banking services, they expect them to be fast, convenient, useful and most importantly simple in order to use them easily.

The main findings of PLS analysis mentioned above lead to one recommendation from my side regarding the marketing of online-banking services of modern Armenian banks. Many of latter put the risk factor at the top of the mentioned benefits in their websites, banners, billboard ads, TV

ads, etc in order to attract people and convert them into potential customers. However, according to the results customers would care about seeing Perceived Usefulness and Perceived Ease of Use as the main benefits of online-banking, rather than low or non-existent Risk factor.

6. Limitations and Further research

One of the limitations is the fact that there is no public information about number of Internet banking current users and its dynamics. Maybe it is because Internet banking is quite new, and competition is constantly growing, that's why information about IB user number is confidential. So, the sample was selected from only Yerevan's population. The next limitation is based on the previous limitation, since findings of the analysis cannot be generalized for Armenian regions. The other limitation is the fact that there are many other factors, like bank reputation. Thus, based on the mentioned limitations and in order to get deeper understanding about Internet banking adoption process in Armenia further research should be conducted. It would be good idea to collect data about their residence and compare the results of respondents who live in Yerevan and regions. Also, for more personalized approach, respondents can be asked about which bank's IB services they use and conduct analysis for each bank.

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Appendix

Appendix A: Questionnaire

Specific Questions about the factors:

Internet banking Usage:

Have you ever used Internet Banking?

- Yes
- No

How frequently do you visit the branch and use the IB per month?

- Less than 1 time
- 1-3 times, 3-12 times
- over 12 times a month?

What Internet banking operations do you use the most?

- Money transfers
- Loan payments
- Deposit opening and replenishment
- Currency exchange
- Utility payments
- Check account balances
- View loan agreements and payment schedules
- View Deposit agreements
- View Exchange rates

Factors:

Intention

- You are keen to continue to use IB in the near future.
- It is possible that you will stop using IB.
- You are planning to continue to use IB.

Trust

- You are sure that your personal and payment information is secured and cannot be used by hackers.
- You are sure that your personal and payment information won't be shared by bank.
- IB services provided by bank are reliable.

Risk

- The IB usage would not cause loss of the privacy of personal and payment information.
- The IB usage would not cause any loss like hidden costs.
- The IB usage would not generate any loss caused by late transactions.

Perceived usefulness (PU)

- IB facilitates the process of banking operations.
- Use of IB improves quality of banking services.
- IB helps to manage financial resources in more effective and productive way.
- IB is time and cost efficient and available 24/7.

Perceived ease of use (PEOU)

- The use of IB is easy and convenient.
- There are enough information, opportunities and tools to conduct needed transactions.
- It is difficult for you using IB.

Attitudes

- It is very efficient using IB.
- You like using IB.
- You enjoy using IB.

Subjective norms

- Your friend/family member had an impact on your decision to use IB.
- Different advertisements had an impact on your decision to use IB.

General Questions:

Gender

- Male
- Female

Age

- Up to 18

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 and more

Education

- High school
- Bachelor's degree
- Master's degree
- PhD

Job Sector

- Unemployed
- Freelance
- Finance
- Education
- Trade
- Services
- Healthcare
- Programming
- Public Sector
- Entrepreneur

Monthly expense

- Up to 80.000 AMD
- 80-120.000 AMD
- 120-200.000 AMD
- 200-300.000 AMD
- 300.000 AMD and more

Working Schedule

- Full-time

- Part-time
- Freelance

Do you have bank branches near your home which you are visiting?

- Yes
- No

Appendix B: Descriptive statistics of Respondents

FACTOR	OPTIONS	QUANTITY	PERCENTAGE (%)
Usage	Yes	227	58.66
	No	160	41.34
TOTAL		**387**	**100**
Gender	Male	138	35.66
	Female	249	64.34
TOTAL		**387**	**100**
Age	Up to 18	6	1.55
	18-24	215	55.56
	25-34	90	23.26
	35-44	52	13.44
	45-54	15	3.88
	55-64	8	2.07
	65 and more	1	0.26
TOTAL		**387**	**100**
Education	High school	17	4.39

	Bachelor's degree	183	47.29
	Master's degree	171	44.19
	PhD	16	4.13
TOTAL		**387**	**100**
Sector	Unemployed	94	22.93
	Financial	48	11.71
	Educational	110	26.83
	Trade	30	7.32
	Services	27	6.59
	Healthcare	37	9.02
	Programming	8	1.95
	Public sector	23	5.61
	Entrepreneur	24	5.85
	Freelance	5	1.22
	Graphic designer	2	0.49
	Law	2	0.49
TOTAL		**387**	**100**

Monthly expenses	Up to 80.000 AMD	107	27.65
	80-120.000 AMD	97	25.06
	120-200.000 AMD	81	20.93
	200-300.000 AMD	49	12.66
	300.000 AMD and more	53	13.70
TOTAL		**387**	**100**
Working schedule	Full-time	53	18.21
	Part-time	24	8.25
	Freelance	214	73.54
TOTAL		**291***	**100**

∗ Number of employed respondents