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Investigating the Effect of Electronic Services` Qualities on the Use of Electronic Banking through the Intermediation of Customer Satisfaction and Customer Attitude

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Abstract: *The purpose of this research was to examine the effect of electronic services` qualities on the use of electronic banking through the mediating role of customer satisfaction and customer attitude. This research was practical regarding its purpose. It has used survey method for data collection purposes. All customers of Mellat Bank were selected from district 3 branches of Tehran. Due to the large number of people in the population, the statistical society was unlimited. Therefore, simple random sampling method with unspecified sample size was used for sampling. Cochran's formula was used to determine the sample size. According to Cochran's formula, the sample size was 384 people. In addition, the researcher used 10 organizational and academic experts to confirm the validity of the questionnaire. Collected data from questionnaires were analyzed using structural equation technique in LISREL software. The results of the research's hypotheses showed that the quality of electronic services was effected by the customer's attitude, customer satisfaction and the use of electronic banking services. In addition, the positive effect of customer attitude and customer satisfaction on the use of electronic banking services was confirmed. Finally, the role of the mediator of customer satisfaction and attitude on the impact of the electronic services` quality on the use of electronic banking services was verified.*

Keywords: *Electronic Services` Quality, Customer Satisfaction, Customer Attitude, Use of Electronic Services, Structural Equation Technique.*

INTRODUCTION

The transformation of the world has created a profound transformation in the communication and information transfer process through information technology, Internet, and consequently e-government and e-commerce, which in turn is derived from information technology. These conditions have created a framework for facilitating business, which has led to increased competition among organizations (Mehdi Nejad and Qaedmohammadi, 2017). Undoubtedly, customer satisfaction is one of the most strategic issues in the last decades. Organizations cannot be unwilling to meet the expectations and demands of customers. Satisfaction is a sense of willingness in people after using goods or services (Racedi et al., 2016).

Banking has always been known as a special information activity. Especially in the last few decades, IT has strongly affected the electronic banking industry. The emergence of electronic banking services has broadly changed the nature of financial services provided to customers. Through the provision of these services, banks can save considerable costs and reduce the number of branches and staff employed in the department and headquarters. Still, Internet banking services are an unknown concept from the customer's point of view, and their attitude toward this type of banking is not desirable (Abdulwand and Barwand, 2010).

Background of the research

Khodadad Hossini et al. (2017) conducted a study on the effect of electronic service quality on electronic loyalty by explaining the role of electronic satisfaction, perceived value and advertising of electronic advisories; case study: electronic retailers in Tehran. The results showed that the quality of electronic services, directly and indirectly, influenced customer loyalty and its indirect effect (0.633) was more than direct effect (0.269). In addition, electronic consent was the most important factor in creating loyalty among customers.

Mehdi Nejad and Qaedmohammadi (2017) conducted an investigation on the quality of electronic services on the satisfaction of customers at the National Bank of the Branch of Islamic Azad University, Roudehen Branch in 2016. The results indicated that there was a significant relationship between the quality of service banking variables (efficiency, completeness, availability, confidentiality, responsiveness and compensation service) on customer satisfaction.

Ismaeil Poor (2016) conducted a research study on the effect of the quality of electronic services on customer satisfaction and willingness to choose an electronic banking service. The results showed that the quality of web services had a positive and significant effect on the satisfaction and willingness of the customers of the agricultural bank. Additionally, customer satisfaction had a significant effect on customers' willingness. In addition, computer skills for easy use of e-banking services have a significant effect; but the perceived risk does not have a significant impact on the quality of web services and customer satisfaction.

Kharqani et al. (2015) investigated the effect of quality of e-banking services on customer satisfaction (Case Study: National Bank). The results showed that all variables had a significant effect on customer satisfaction.

Ghaffari et al. (2012) conducted a study entitled the relationship between service quality dimensions and customer satisfaction in the banking industry: a comparative model of traditional and electronic services. The results indicated that customer perceptions of the quality of electronic services had a positive effect on the preference for traditional services. On the other hand, customers' perceptions of the quality of electronic services had a greater impact on customers' perceptions of the quality of traditional services than on customer satisfaction.

Heidarzadeh and Adelpoor (2010) evaluated the role and impact of electronic service quality, overall service quality and customer satisfaction on the decision-making process for consumer purchases in online purchases. The results showed that among the dimensions of quality of electronic services, the beauty of the site only affected the overall quality of the services and had no direct relation with customer satisfaction from online stores in Iran. Responsiveness and security/privacy were dimensions that had a positive effect on the overall quality of services and customer satisfaction. However, there was no significant relationship between the dimensions of trust, reliability, and personalization with the overall quality of services and customer satisfaction in Internet purchases in Iran.

Iio et al. (2016) conducted research on the behavior of e-banking users: the quality of electronic services, attitude, and customer satisfaction. Based on the results, these relationships were confirmed. Also, the effect of attitude on actual use was confirmed, but the impact of customer satisfaction on actual use was rejected.

Beige et al. (2016) conducted a research on the impact of the quality of e-banking services on customer satisfaction and customer loyalty. In their research, they concluded that the quality of electronic banking services had a positive and significant impact on customer satisfaction.

Ayadinli and Sinorek (2016) conducted research entitled "Measuring the impact of service quality dimensions on customer satisfaction: used by GSM users in Poland", and concluded that each of the 5 dimensions of the Servqual model affected customer satisfaction.

Alhavari (2015) in research findings, "How do individual values of retail bank customers interfere in the relationship between service quality and loyalty?" showed that overall service quality affected customer loyalty. Quality services played a more important role in stimulating the customer. For individuals at lower individual levels, individual characteristics affected the relationship between customer service quality and customer loyalty.

Erif et al. (2014) conducted a research on the impact of e-service quality and customer satisfaction on loyalty. This research was conducted in the field of electronic banking. The results showed that all technical and aesthetic dimensions affected the quality of service, and the quality of service and customer satisfaction could affect the loyalty of individuals.

Research Methodology

The research method used in this research was descriptive. This research was a cross-sectional survey based on the type of survey method used. Moreover, according to the main purpose of the research, in terms of the relationship between variables, this research was descriptive-correlative. Considering that the purpose of this research was to investigate in the electronic banking industry of the Mellat Bank, this research could be considered as an objective of the practical type. To collect theoretical foundations and research literature, library method and clipping tools were used and the field method was used to collect the research data. After the final confirmation of the questionnaire, the researcher designed a questionnaire and provided them electronically to customers who at least once used electronic services from the Mellat Bank. Data collection instrument was a questionnaire. To measure the variables in the model, the questionnaire of articles by Iio et al. (2016) and Erif et al. (2014) was used. Questions were scored using the Likert five-option spectrum. In this research, Cronbach's alpha method was used to determine the reliability of the test. According to the results, since the reliability of the indices and dimensions was larger than 0.7 and the total reliability was equal to 0.983; the reliability of the practical questionnaire has been confirmed. Data analysis was performed using SPSS, LISREL, AMOS or SmartPLS softwares.

Population and sampling

The research society in this study consisted of two groups of experts and customers as follows:

Society of experts: A total of 10 banking and academic experts have been used to confirm the validity of the questionnaire.

Statistical society: All customers of the Mellat Bank of district 3 branches of Tehran formed the statistical society of the present study. Considering the use of structural equation technique for data analysis, the number of sample individuals, according to the following formula, was considered between 5 and 15 times the questionnaire items.

$$Q * 5 \leq n \leq Q * 15$$

Therefore, considering that the number of items in the questionnaire included 48 items, the number of samples should not be less than 240 persons.

$$5 \times 48 = 240 \leq \text{the number of sample} \leq 15 \times 48 = 720$$

Additionally due to the unlimited statistical society, the researcher considered the minimum number of samples based on the unlimited Cochran formula of 384 people, the volume that was also covered by the structural equation technique.

$$= \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384n = \frac{z_{\alpha}^2 pq}{\epsilon^2}$$

In the above formula, Z was the normal standard distribution value with a confidence level of 95% and a 5% probability error, as well as d^2 , were considered 1.96 and 0.05, respectively. Based on similar research in this area, p was the ratio of the attribute studied in the statistical society that was considered to be 0.5. Therefore, according to the above formula, the minimum sample size included 384 members. Sampling method was also simple random sampling.

Research hypotheses:

Hypothesis 1: The quality of electronic services affects customer satisfaction.

Hypothesis 2: The quality of electronic services affects customer attitudes.

Hypothesis 3: The quality of electronic services affects the use of electronic banking.

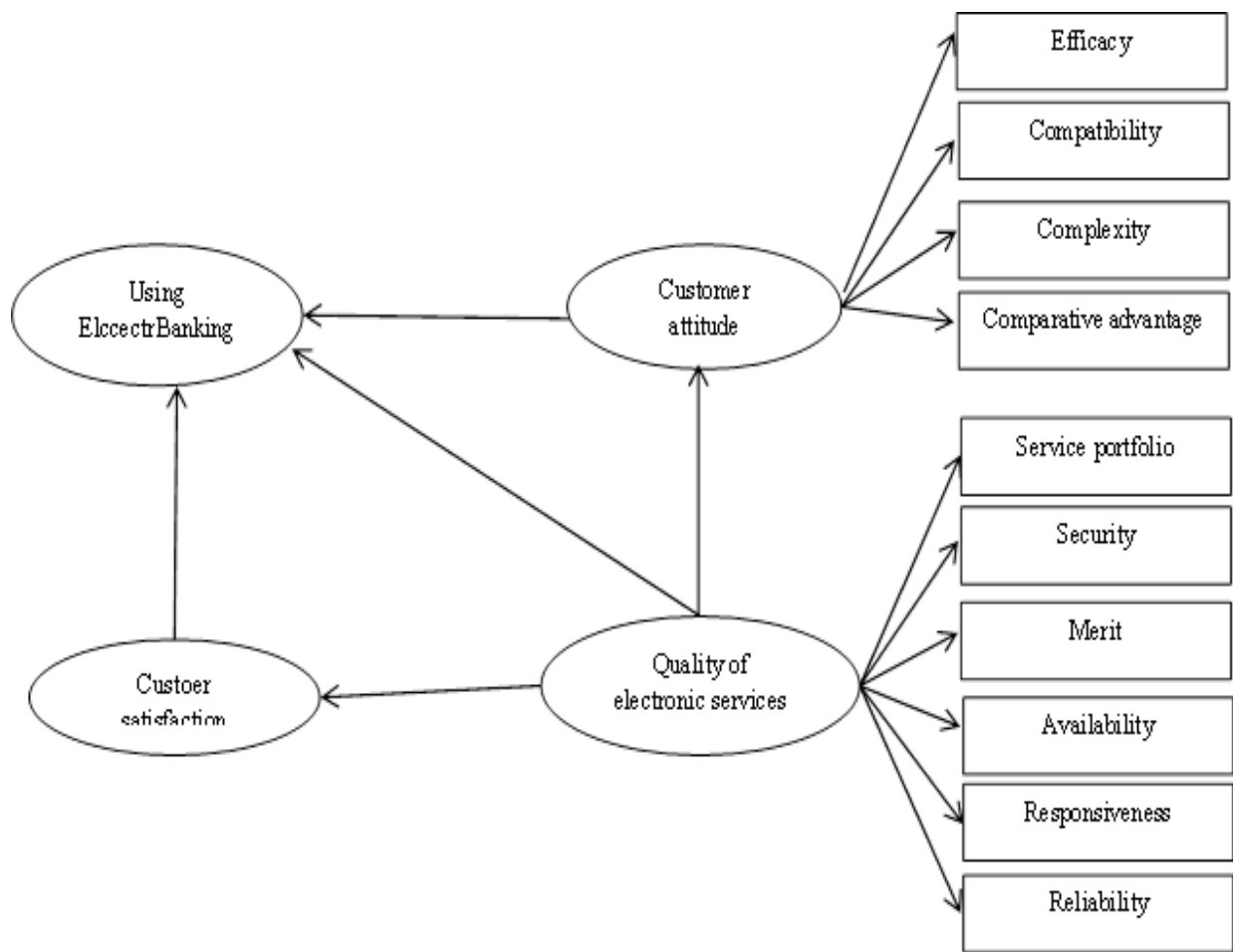
Hypothesis 4: The quality of electronic services affects the use of e-banking by mediating customer satisfaction.

Hypothesis 5: The quality of electronic services affects the use of e-banking by mediating the customer's attitude.

Hypothesis 6: Customer Satisfaction affects the use of electronic banking.

Hypothesis 7: The customer's attitude influences the use of electronic banking.

Conceptual model of the research:



Research Findings

Quantitative description of research variables

In this section, after collecting data and information, descriptive statistics were used, which includes central indicators and distribution, such as percentages, charts, and tables that describe the sample.

Table 1: Descriptive value of research variables

Variable	Average	THE standard deviation	Minimum	First quarteR	Middle	Third quarteR	Maximum
Satisfaction	3.0092	0.4808	1.4700	2.7025	3.0100	3.3300	4.1800
Use of electronic banking	2.9934	0.4686	1.4900	2.6500	3.0000	3.2800	4.3200
The quality of service	3.0252	0.5001	1.7400	2.6600	3.0200	3.3700	4.3900
Attitude	3.0170	0.5108	1.6000	2.6725	3.0050	3.3775	4.5200

The results showed that the average quality of service variables was higher than other variables and therefore it could be stated that most respondents believe that the quality of services was at a good level.

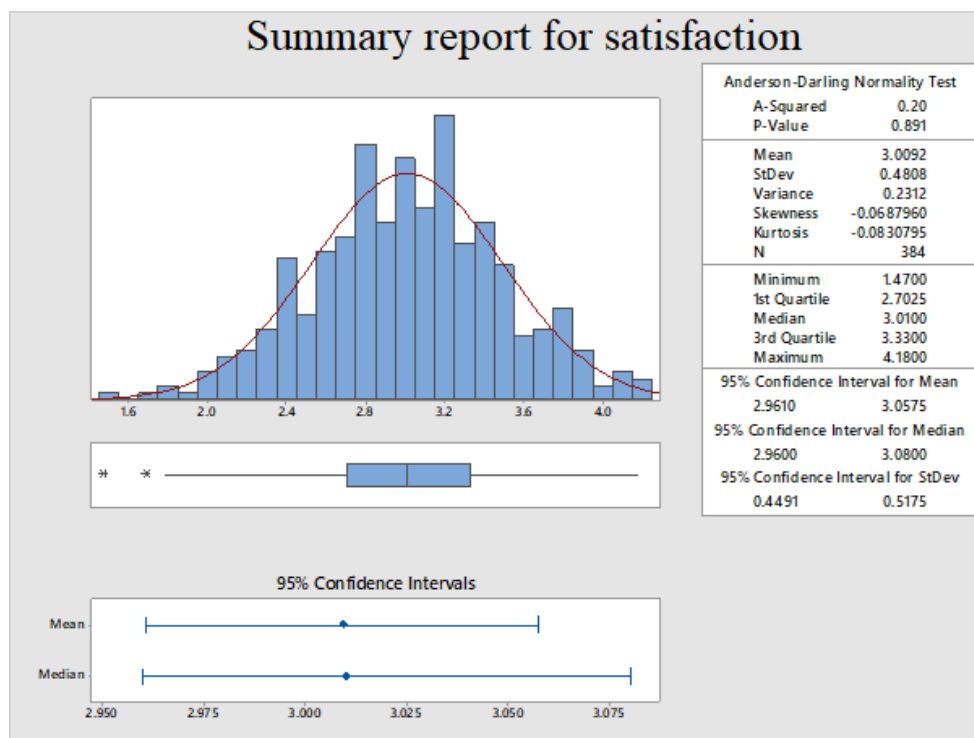


Chart 1: Histogram for customer satisfaction variable

According to the results of the above chart, it could be stated that the meaningfulness of the test of normalization of the customer satisfaction variable was 0.890 and more than 0.05. As a result, the assumption zero of the test based on the normality of the variable was accepted, and thus the customer satisfaction variable was normal.

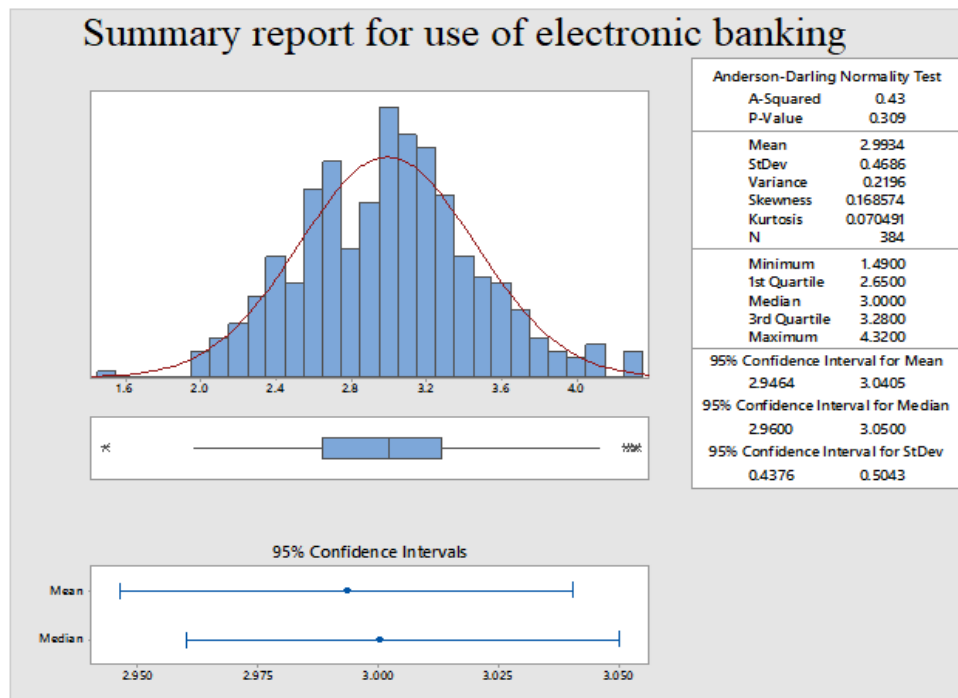


Chart 2: Histogram for variable Electronic Banking usage

According to the results of the above chart, it could be stated that the meaningfulness of the test of normalization of the service usage variable was 0.30 and more than 0.05. Hence, the assumption zero of the test based on the normality of the variable was accepted, and therefore, the service usage variable was normal.

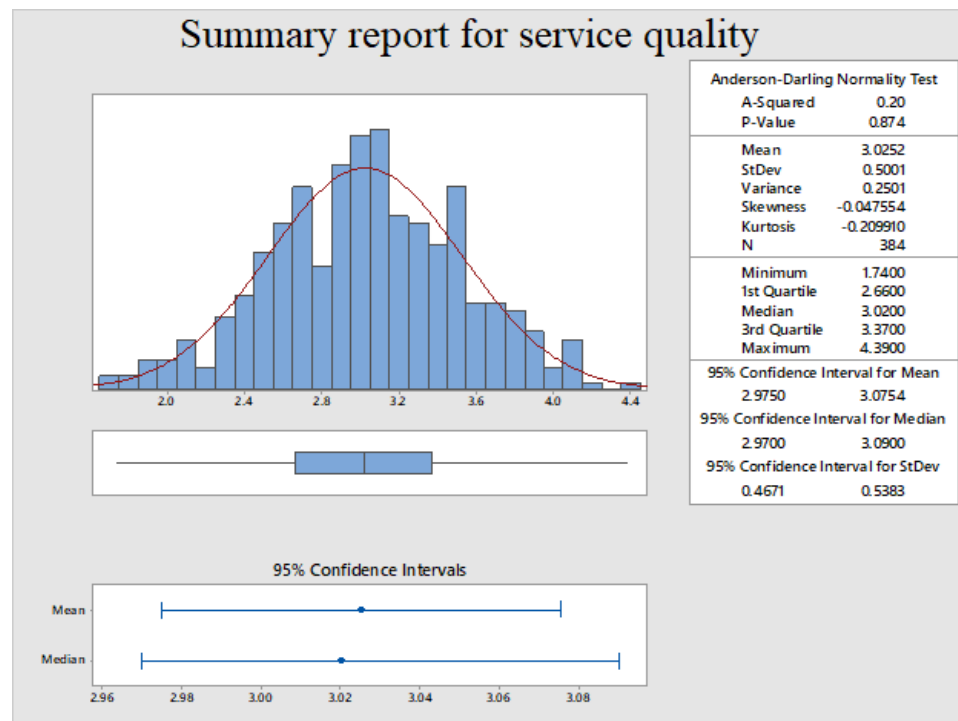


Chart 3: Histogram for quality service variable

According to the results of the above chart, it could be stated that that the meaningfulness of the test of normalization of the quality service variable was 0.87 and more than 0.05. As a result, it can be mentioned that the assumption zero of the test based on the normality of the variable was accepted, and therefore, it could be said that the quality service variable was normal.

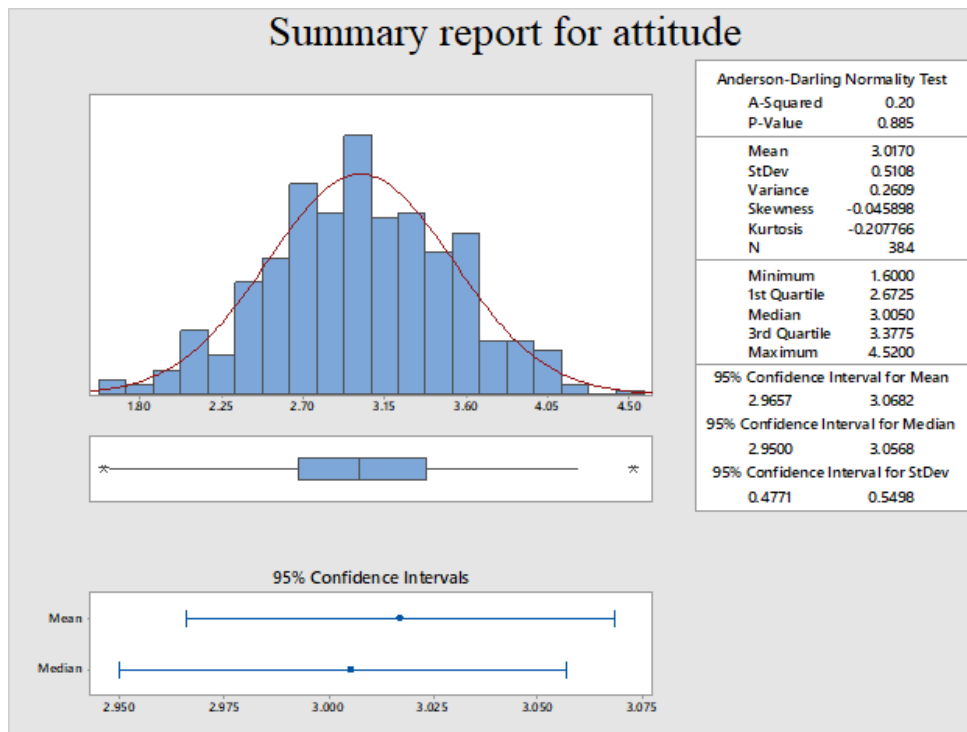


Chart 4: Histogram for the attitude variable

According to the results of the above chart, It could be said that the meaningfulness of the test of normalization of the attitude variable was 0.880 and more than 0.05, it can be stated that the assumption zero of the test based on the normality of the variable was accepted, and therefore, it can be said that the attitude variable was normal.

Modeling of Structural Equations

Structural equations’ modeling has two main applications:

- A) Measuring models (confirmatory factor analysis)
- B) Structural models (structural equation modeling).

Confirmatory Factor Analysis

The power of the relationship between the hidden agent variable and the visible variable was shown by the factor load. The factor load was between zero and one. If the factor load was less than 0.3, the weak relationship was considered and discarded. The factor load was between 0.3 and 0.6, and if it was greater than 0.6, it would be very desirable. Once the correlation of the variables was identified, it turned into a meaningful test. To test the significance of the relationship between variables, t-test or t-value test was used. Model estimation in T-value mode was used to estimate the coefficients of t. The model in the state of the t coefficients or the meaningful state indicated the values of the t-statistic that were used to judge the significance of the relationships. Thus, if the values of t-statistic were between 1.96 and -1.96, then the coefficients were not significant and led to the rejection of the research hypotheses and were meaningful in

the case that they were outside of this range. It should be noted that at the error level of 0.05 and the two-way test (normal default), the critical values of the numbers were 1.96 and -1.96.

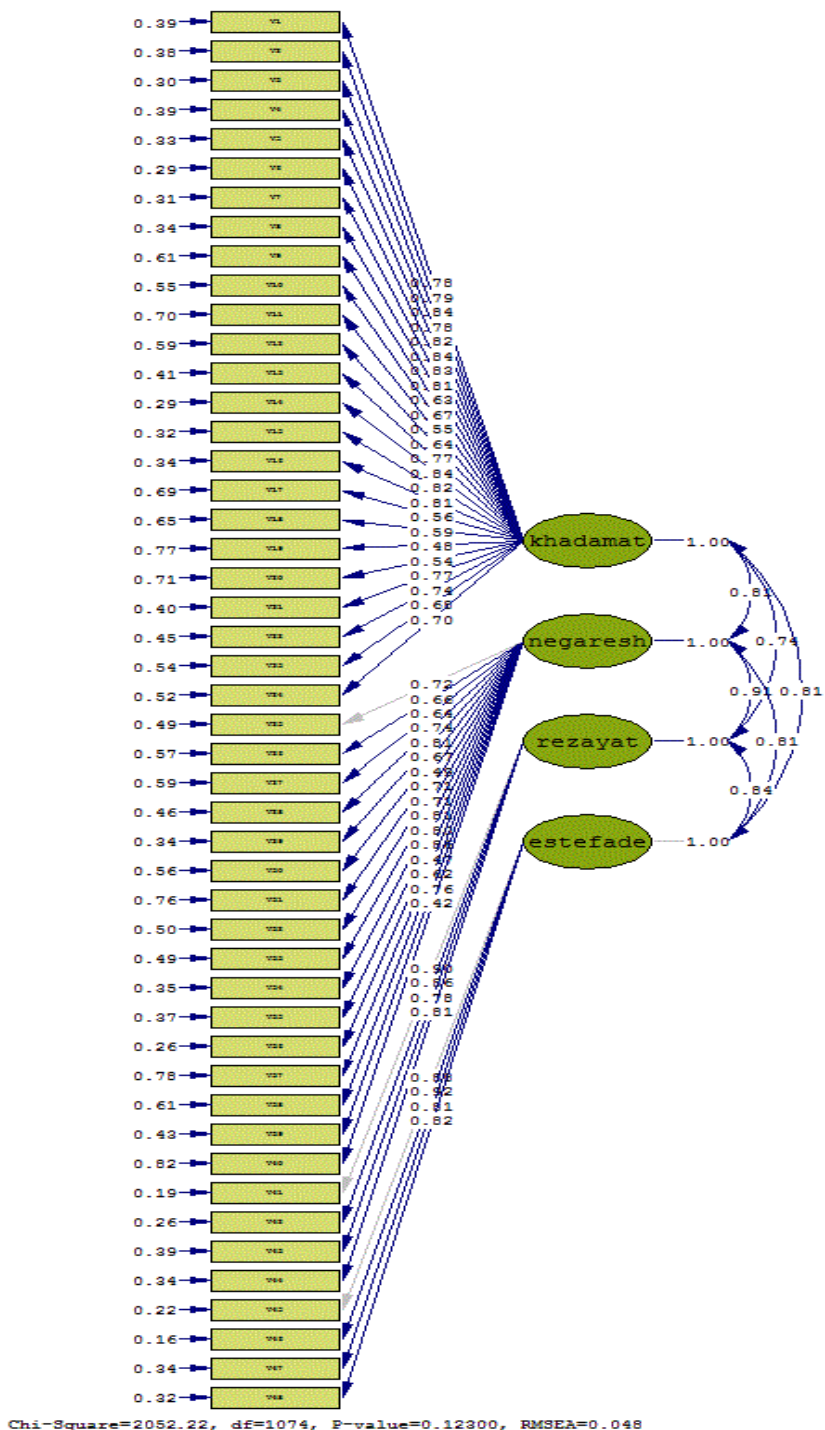


Figure 1: Standard factor load for confirmatory factor analysis

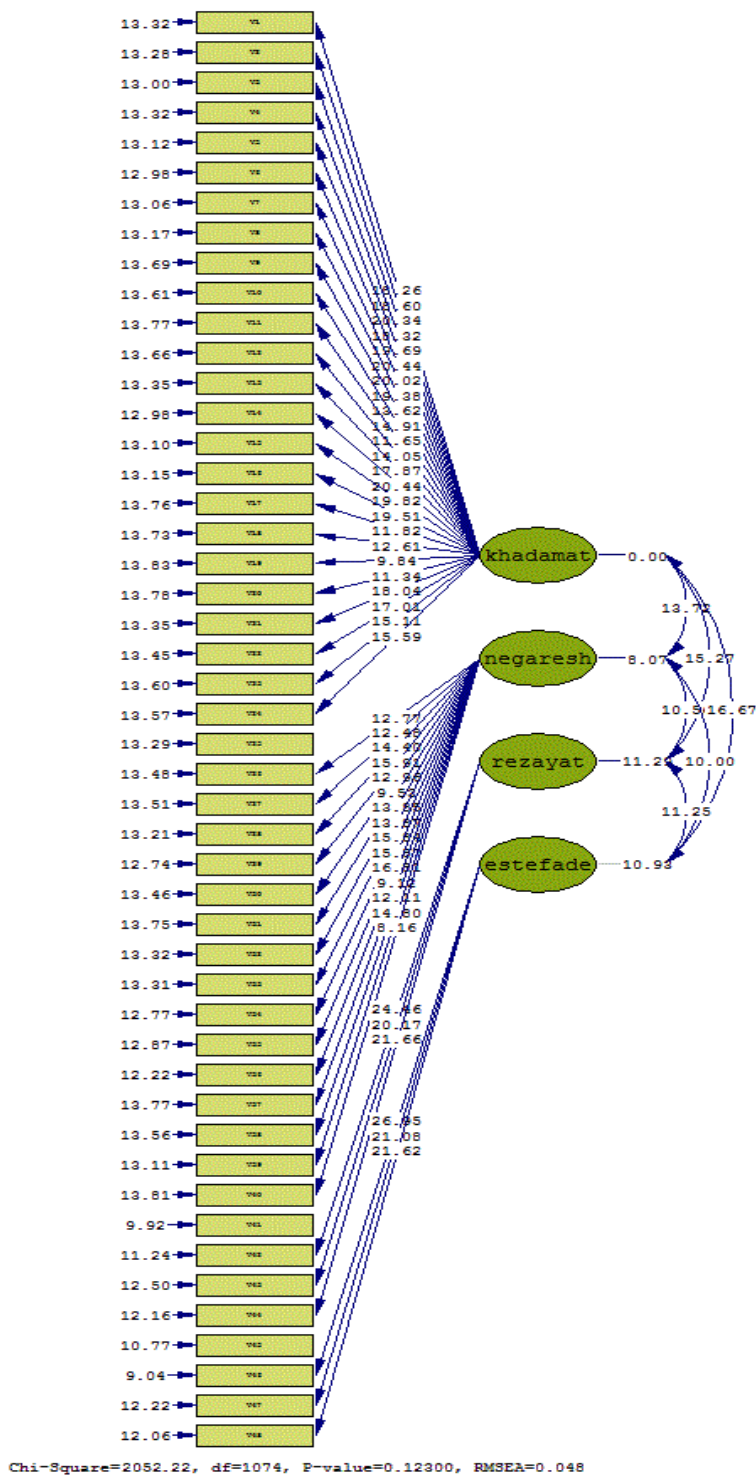


Figure 2: Significant statistics for confirmatory factor analysis

The standard load factor of confirmatory factor analysis for verifying the power of the relation of these variables to their observable variables (items of the questionnaire) in all cases, with the exception of the items 19, 31, and 40, was greater than 0.5. Therefore, the questionnaire's factor structure for these variables could be verified.

The goodness fit index (GFI) and the adjusted goodness of fit index (AGFI) indicated that the model had a high degree of fitness. The adjusted index was also based on the degree of freedom. The literature on fitness indicators recommended a value greater than 0.9 for this index. The root means square of the residual index (RMR) and its standardized value (SRMR) was the second roots mean square of the residual, i.e., it was the difference between the elements of the observed matrix in the sample group and the elements of the estimated or predicted matrices. Some researchers claimed that the RMSEA value for models that have good fitness is less than 0.05, therefore, researchers found the value of this index to be reasonable to be 0.1, and even some studies found that some higher values were accepted. The goodness of fit indicators obtained from the software is shown below.

Table 2: Characteristics of the goodness of the model

Row	Index	Symbol	Standard value	Obtained value
1	Normal fit index	(NFI)	Above 0.9	0.92
2	Relative fit index	(RFI)	Above 0.9	0.9
3	Instrument fit index	(IFI)	Above 0.9	0.93
4	Comparison fit index	(CFI)	Above 0.9	0.94
5	Goodness fit index	(GFI)	Above 0.9	0.96
6	Adjusted goodness of fit index	(AGFI)	Above 0.8	0.82
7	Not normal fit index	(NNFI)	Above 0.8	0.93
8	Purified relative fit index	(PNFI)	Above 0.8	0.81
9	The significance of the test	(P-Value)	Above 0.5	0.123
10	Purified goodness fit index	(PGFI)	Above 0.8	0.79
11	The root mean square of residual	(RMR)	Below 0.07	0.036
12	Root mean square error of approximation	(RMSEA)	Below 0.05	0.048
13	Degrees of freedom	(DF)		1074
14	Minimum square Chi-square	(MMFC)		2052.22

Structural model

After confirming the factor analysis, at this stage, the relationships between the research structures were tested .For this purpose, the relevant model was implemented in LISREL software. In this section, the conceptual model of research was plotted in the form of a path diagram and was measured using different methods of fit. Some fit indicators were also visible at the bottom of these Figures.

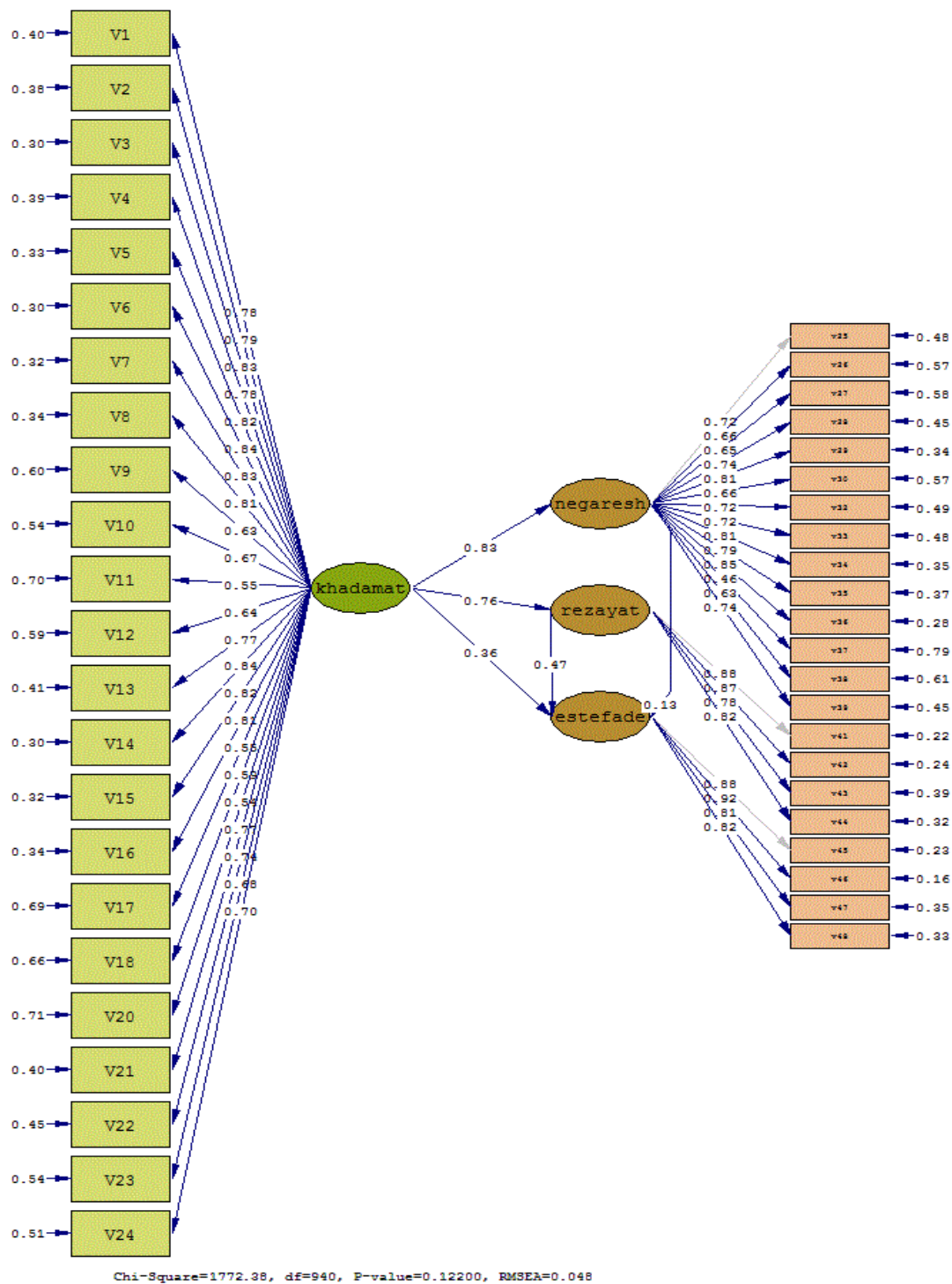


Figure 3: Standard estimation coefficients of the structural model of research

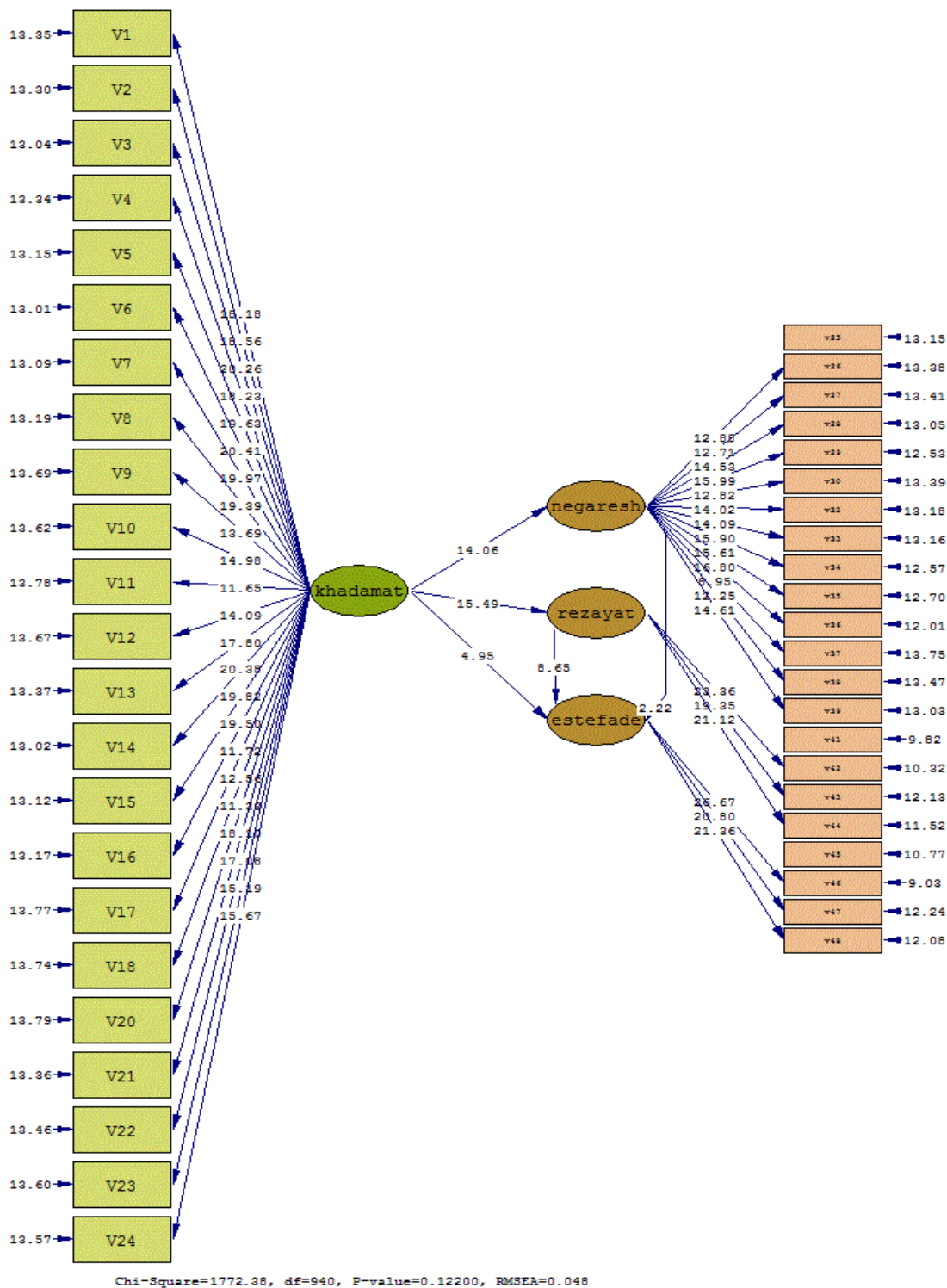


Figure 4: Meaningful numbers of the structural research model

In order to fit the structural model, the main hypotheses of the research have also used a number of goodness of fit indicators. The results of computing the goodness of fit indicators are shown in Table 3.

Table 2: Characteristics of the goodness of the model

Row	Index	Symbol	Standard value	Obtained value
1	Normal fit index	(NFI)	Above 0.9	0.91
2	Relative fit index	(RFI)	Above 0.9	0.91
3	Instrument fit index	(IFI)	Above 0.9	0.92
4	Comparison fit index	(CFI)	Above 0.9	0.93
5	Goodness fit index	(GFI)	Above 0.9	0.92
6	Adjusted goodness of fit index	(AGFI)	Above 0.8	0.88
7	Not normal fit index	(NNFI)	Above 0.8	0.9
8	Purified relative fit index	(PNFI)	Above 0.8	0.8
9	The significance of the test	(P-Value)	Above 0.5	0.122
10	Purified goodness fit index	(PGFI)	Above 0.8	0.8
11	The root mean square of residual	(RMR)	Below 0.07	0.041
12	Root mean square error of approximation	(RMSEA)	Below 0.05	0.048
13	Degrees of freedom	(DF)		940
14	Minimum square Chi-square	(MMFC)	---	1772.38

Considering the output of the conceptual model of research (output of LISREL software), the research hypotheses were discussed. The results of the output of the conceptual model equations are presented below.

Table 4: Output of Conceptual Model Equations

Hypothesis	Path coefficient	T statistics	Result
Hypothesis 1: The quality of electronic services affects customer satisfaction.	0.76	15.49	Confirmation
Hypothesis 2: The quality of electronic services is influenced by the customer's attitude.	0.83	14.06	Confirmation
Hypothesis 3: The quality of electronic services affects the use of electronic banking.	0.36	4.95	Confirmation
Hypothesis 6: Customer satisfaction affects the use of electronic banking.	0.47	8.65	Confirmation
Hypothesis 7: Customer attitudes affect the use of electronic banking.	0.13	2.22	Confirmation
Hypothesis	Sobel test		Result
Hypothesis 4: The quality of electronic services affects the use of e-banking by mediating customer satisfaction.	7.552		Confirmation
Hypothesis 5: The quality of electronic services affects the use of e-banking by mediating of customer attitudes.	2.192		Confirmation

Discussion and Conclusion

Hypothesis 1: The quality of electronic services affects customer satisfaction.

To evaluate this hypothesis, the structural equation technique has been used. Since the calculated t-statistic was higher than 1.96 and was equal to 15.49, the assumption of the effect of the quality of electronic services on customer satisfaction was accepted. Furthermore, since the path coefficient calculated was positive and equal to 0.76, the present result implied that the dimensions of the service quality included reliability, accountability, availability, competency; security and new portfolio could lead to increased customer satisfaction. The results were in line with the results of the research conducted by Iio et al. (2016) because they also accepted the impact of the quality of electronic services on customer satisfaction with a path coefficient of 0.700.

Hypothesis 2: The quality of electronic services affects the customer's attitude.

To evaluate this hypothesis, the structural equation technique has been used. Since the calculated t-statistic was higher than 1.96 and was equal to 14.06, the assumption of the effect of the quality of electronic services on customer's attitude was accepted. Furthermore, since the path coefficient calculated was positive and equal to 0.83, the present result implied that the dimensions of the service quality included reliability, accountability, availability, competency; security and new portfolio could lead to strengthening the dimensions of customer attitude, including comparative advantage, complexity, adaptability, and self-efficacy. The results were in line with the results of the research conducted by Iio et al. (2016) because they also accepted the impact of the quality of electronic services on customer's attitude with a path coefficient of 0.288.

Hypothesis 3: The quality of electronic services affects the use of electronic banking.

The first step to reject or accept the hypothesis was to refer to the number of t-statistics calculated for that hypothesis. Since the calculated t-statistic was higher than 1.96 and was equal to 4.95, the assumption of the effect of the quality of electronic services on the use of electronic banking was accepted. In the next step, to determine the direction of impact, the path coefficient was considered. Since the path coefficient calculated in this study was 0.36, this hypothesis implied that efforts to improve the quality of services by improving reliability, responsiveness, availability, competency, security, and new portfolio could lead to encouraging customers to use electronic banking services. The results were in line with the results of the research conducted by Iio et al. (2016) because they also accepted the impact of the quality of electronic services on the use of electronic services with a path coefficient of 0.495.

Hypothesis 4: The quality of electronic services affects the use of electronic banking by mediating customer satisfaction.

In this research, Sobel statistics was used to investigate the role of customer satisfaction mediation on the impact of electronic services from the use of electronic banking. Since the calculated statistic was higher than 1.96 and equal to 7.552, this means that if the bank strived to improve the quality of its services in the field of electronic and in this way affected customer satisfaction, finally, it could lead to increased use of e-banking. The results were consistent with the results of research conducted by Erif et al. (2014) because they also accepted the mediator role of customer satisfaction in the impact of service quality on the use of services.

Hypothesis 5: The quality of electronic services affects the use of electronic banking by mediating of customer's attitude.

In this research, Sobel statistics was used to investigate the role of customer's attitude mediation on the impact of service quality from the use of electronic banking. Since the calculated statistic was higher than 1.96 and equal to 2.192, therefore, the impact of the quality of electronic services on the use of electronic banking through the customer's attitude could be accepted. The results were consistent with the results of research conducted by Erif et al. (2014) because they also accepted the mediator role of customer's attitude in the impact of service quality on the use of services.

Hypothesis 6: Customer satisfaction affects the use of electronic banking.

To evaluate this hypothesis, the structural equation technique has been used. Since the amount of t-statistic calculated in the present study was higher than 1.96 and was equal to 8.65. Therefore, the assumption of the effect of customer satisfaction on the use of electronic banking has been accepted. In addition, since the path coefficient calculated was positive and equal to 0.47, it is concluded that if the client was satisfied with the service received from the bank and the services were in line with his expectations, the client intended to continue to receive the services from the bank. These results were in contradiction with the research findings of Iio et al. (2016) because they rejected the impact of customer satisfaction on the use of electronic services.

Hypothesis 7: Customer attitudes affect the use of electronic banking.

The first step to reject or accept the hypothesis was to refer to the number of t-statistics calculated for that hypothesis. Since the calculated t-statistic was higher than 1.96 and was equal to 2.22, the assumption of the effect of the customer attitudes on the use of electronic banking was accepted. In the next step, to determine the direction of impact, the path coefficient was considered. Since the path coefficient calculated in this study was 0.13, therefore, it could be concluded that with 1 unit increase in customer attitude, the use of electronic banking would increase by 0.13. This hypothesis suggests that improving the dimensions of comparative advantage, complexity, adaptability, and self-efficacy in the customers could lead to their encouragement in the use of electronic services. The results were in line with the results of the research conducted by Iio et al. (2016) because they also accepted the impact of the customer attitudes on the use of electronic services with a path coefficient of 0.10.

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