DETERMINANTS OF THE ADOPTION OF TECHNOLOGY BASED SELF-BANKING SYSTEM - EVIDENCE FROM SRI LANKA

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Abstract

Banking industry is a crucial industry in the Sri Lankan economy. With the development of technology, the self-banking concept has been introduced in the island and it has now become an integral part to both customers as well as the banking institutions. Therefore, this study focused on the determinants of the technology based self-banking system in Sri Lanka. The main objective of the study was to identify whether usefulness, ease of use, risk and contribution of banking institutions can be a determinant on the adoption of the self-banking system in Sri Lanka. This research tries to make an extension to the Technology Acceptance Model introduced by Davis, (1989). The quantitative data were gathered using a structured questionnaire and the sample size was 164. Cluster sampling was used. Univariate, bivariate and multivariate analytical methods were applied to analyze the data. The findings of the study revealed that there was a moderately high level of self-banking adoption. Furthermore, there is a significantly strong positive relationship between perceived usefulness and perceived ease of use with the adoption of self-banking, while the risk and contribution of banking institutions imply a weak positive relationship with the adoption of self-banking. On one hand, the Multiple regression analysis recognized that perceived usefulness and perceived ease of use are significant determinants for the adoption of self-banking. On the other hand, the risk and contribution of banking institutions do not determine cause of adoption of self-banking. Moreover, usefulness determines the increment in the adoption level of customers more than the ease of use. According to the results of the study, it can be suggested to the banking authorities to build and maintain self-banking technologies in a way that they would increase the usefulness to the customers.

Keywords: Self-banking, Self-service banking, Technology Acceptance Model

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1. Introduction

The Sri Lankan banking industry plays a major role in the stability and development of the Sri Lankan economy. According to the Central Bank of Sri Lanka, all the Financial Institutions in Sri Lanka can be classified into three (3) sectors. They are; Licensed Commercial Banks (LCBs), Licensed Specialized Banks (LSBs) and Licensed Finance Institutions. At present, there are 26 Licensed Commercial Banks, 06 specialized banks and 42 Financial Institutions in the Sri Lankan financial sector ('Banking sector', 2020). Licensed Commercial Banks are authorized to maintain Current Accounts, Fixed Deposits, Savings Accounts, to Grant Loans and conduct other financial services. Both Specialized Banks and Other Licensed Finance Institutions do not have the authority to offer Current Account facilities to their respective customers. All Financial Institutions are monitored and operated under the rules and regulations of the Central Bank of Sri Lanka. Licensed Commercial Banks as well as Licensed Specialized Banks are beneficial for maintaining the economic stability of the country. They enable to balance the smooth flow of liquidity of the economy. Other than accepting deposits and lending funds, there are some other functions operated by Licensed Commercial Banks, namely maintaining saving accounts, time deposits, current accounts, issuing debit and credit cards, locker facilities, pawning facility etc. Licensed Specialized Banks also provide the customers with the above facilities, except maintaining current accounts.

However, before the intervention of information technology in the banking industry, all such banking functions were operated physically in the premises of the bank branches. The speedy growth of technology replaced the physical/paper banking with paperless/virtual banking. With the help of Information Technology, the banking industry continue to introduce more innovative services, thus leading the banking industry towards new dimensions. Internet was first introduced to the world in 1967 (Rajapakse, 2017) and since then new banking services such as Internet/online banking, mobile banking, ATM banking, CDM banking etc. have been introduced. The technological revolution in Sri Lanka started in late 1980s with the introduction of ATMs by Hatton National Bank (Jayamaha, 2008). In early 1988, Sampath Bank created a network connecting all its branches thus enabling the customers to carry out transactions from any branch and also introduced ATMs to carry out transactions at any time of the day. As the first South Asian country, Sri Lanka initiated unrestricted commercial internet facilities in 1995. At the inception, internet banking was used more as an information delivery channel. But with the continued development of information technology, the information delivery mode was replaced with a transaction mode (Ajanthan, 2018). Customers who used internet banking, were able to access the bank's web portal using their unique user ID and password. The internet banking platform enabled the customer to check his/her account balances, transfer funds, request loans, to pay utility bills etc. Now electronic banking enables customers to carry out their transactions through the computer, mobile phones, short message services etc. Apart from Internet banking, ATM, mobile banking, credit and debit cards are most popular delivery channels which use the latest technology. These delivery channels enable customers to carry out their banking activities without the assistance of the bank officials. These types of channels can be called as self-banking technologies or self-service banking technologies. Self-

Banking enables customers to carry out their transactions without physically visiting the branch location. Also, the advancement of technology leads to improve the quality of the banking activities.

However, according to discussions with several Branch Managers from both the state and corporate banks, the ATM is the most popular self-banking channel in Sri Lanka and lesser customers use online banking, mobile banking and internet payment gateways. On one hand, It indicates that people consider some factors or criteria when adopting and using self-banking. On the other hand, banking authorities must take steps to make those self-banking channels popular among their customers. This research clearly describes the factors which can affect the adoption of technologically based self-banking system provided by the Licensed Commercial Banks in Sri Lanka with the use of an extended Technology Acceptance Model. As per the previous researches, (Nayanajith, Damunupola and Pastor, 2020; Jayasiri, Gunawardana and Dharmadasa, 2016) there is a vacuum of academic framework which clearly describes the adoption of self-banking system in Sri Lanka provided by Licensed Commercial Banks. Therefore, this research tries to fill this research gap. Accordingly, the problem statement of the study can be stated as; Does Perceived Usefulness, Perceived Ease of Use, Perceived Risks and Contribution from banking institutions to customers' adoption of self-banking be determinants of the adoption of Technology based Self-Banking system by customers in the Banking Industry in Sri Lanka?

Based on the above problem statement, the following objectives can be derived:

1. Identifying relationships between those factors and the adoption of technology based self-banking.
2. Determining a level of adoption of customers with regard to technology based self-banking.

2. Literature Review

In accordance with Davis, (1989) usefulness refers to anything which may enhance a person's performance. That means, if a person can perform any task within a shorts time period using a particular system, it may also be referred to as perceived usefulness. Venkatesh & Bala, (2008) had proposed some determinants for perceived usefulness. They are Subjective Norm, Image, Job Relevance, Output Quality and Result Demonstrability. With the use of the technology acceptance model, most of the researchers found perceived usefulness as a strong determinant for the adoption of self-banking channels. A distinctive research conducted in North Cyprus discovered that usefulness affect the intention towards acceptance and adoption of any kind of e-banking (Yousefi, 2015). Hasan et al., (2016) showed a positive correlation between perceived usefulness and attitudes towards self-banking technologies. Moreover, the research stated that if any technology is easy to use and useful for the consumers, then the marketers or any other authorities should take advantage of it. As per Kumari, (2015), customers in Colombo district, Sri Lanka were more willing to search convenience and usefulness when adopting electronic banking. Jayasiri, Gunawardana and Dharmadasa, (2016), found that perceived usefulness is one of the most influential factors for the adoption of Internet banking in Sri Lanka. Ravichandran & Madana, (2016) stated that usefulness was mainly

linked with the productivity of personnel. Also, the study proved that usefulness may be a strong determinant in the usage of mobile banking. It had discovered that perceived usefulness which may directly and indirectly impact on the ease of use (Thowfeek & Mirzan, 2017). Also, the research makes it evident that usefulness may influence the adoption of internet banking. In line with Ayoobkhan, (2018) the attitude towards mobile banking was influenced by the perceived usefulness of the system. A research conducted in India revealed that adoption of internet banking had a significant positive influence through perceived usefulness (Chauhan, Yadav, & Choudhary, 2019). Nayanajith, Damunupola, & Ventayen, (2019) found that action towards adoption of technology-based self-banking services may increase by its perceived usefulness. Perceived usefulness had been found as a robust factor for self-banking technologies (Magotra, Sharma, & Sharma, 2019, p.). However, a research found that technology self-efficacy under perceived usefulness did not predict the adoption of smart banking (D.A.Gayan Nayanajith, Damunupola, & Pastor, 2020).

Davis, (1989) defined perceived ease of use as the belief of a person that a particular IT related system would be free of effort to use. Also it may refer to the user-friendliness of a system (Goonetilake, 2011). According to Venkatesh & Bala, (2008) there are some determinants for perceived ease of use. They are Computer Self-Efficacy, Perception of External Control, Computer Anxiety, Computer Playfulness, Perceived Enjoyment and Objective Usability. Researchers had thoroughly mentioned that bank authorities should pay more attention on improving the ease of use of respective customers (Hasan et al., 2016) and they have declared that perceived ease of use plays a major role in the acceptance of information systems (D.A.Gayan Nayanajith & Dissanayake, 2019). Hasan et al., (2016) made it evident that ease of use highly influenced ATM banking, mobile banking, and online banking practices. Not only the adoption of mobile banking, but also the satisfaction of mobile banking may be influenced by the perceived ease of use (Kumari, 2015). Yousefi, (2015) emphasized that perceived ease of use may highly influence the adoption of any kind of self-banking system. Wijayaratne, (2015) said that banks must confirm the ease of use of any technology related banking systems. A research on attitude towards internet banking revealed that attitude towards online banking had a positive relationship with ease of use (Priyangika, Perera, & Rajapakshe, 2016). Also, the researchers stated that perceived ease of use was an important factor in the attitude towards internet banking. Perceived ease of use has an indirect effect on adoption of internet banking (Jayasiri et al., 2016). It also found that ease of use affects the usefulness as well. Thowfeek & Mirzan, (2017) hypothesized that adoption of Internet banking may be influenced by the ease of use, and it was accepted by the findings of the research. A research conducted in Sri Lanka about self-banking technologies revealed that ease of use was higher in the private banking sector (Madhusanka & Paranthaman, 2018). A research on mobile banking found that ease of use was one of the most important factors towards adoption of mobile banking (Ayoobkhan, 2018). Chauhan et al., (2019) determined that adoption of Internet banking was influenced by perceived ease of use. In line with that, the research stated that perceived ease of use was better than other perceived characteristics in promoting technology based self-banking services in Sri Lanka. According to Nayanajith et al., (2020) technology self-efficacy and adoption of smart banking may be positively

influenced by the perceived ease of use. Nonetheless, some researchers have found that there was no significant impact on attitude towards self-banking channels from the perceived ease of use (Aboelmaged & Gebba, 2013; Magotra et al., 2019). However, most of the researchers found that adoption of technology based self-service banking services may increase with the ease of use (D.A.Gayan Nayanajith et al., 2019).

Jayasiri et al., (2016) introduced six specific risks; namely, security, privacy, social, time, performance and financial risk. Another research emphasized on nine dimensions of perceived risk (Arora & Kaur, 2018). They are security risk, financial risk, time risk, psychological risk, social risk, performance risk, privacy risk, physical risk and functional risk. Perceived risk was one of the barriers identified by Wijayaratne, (2015) for the low adoption of Internet banking. These findings were supported by Shiraj, (2015) and the research had critically shown that for the decision of non-adoption or adoption of Internet banking was strongly influenced by the perceived risk factors. Researchers had found that adoption of Internet banking was strongly influenced by the perceived security risk as well as perceived privacy risk (Jayasiri et al., 2016). Yousefi, (2015) found that perceived risk impact on the adoption of any kind of electronic banking systems. According to Priyangika et al., (2016) attitudes towards Internet banking had a weak positive impact from perceived risk. A research conducted in Bangladesh stated that perceived risk had an impact on attitude towards ATM banking (Hasan et al., 2016). Also, it indicates that mobile banking as well as online banking had a negative correlation with perceived risk. Another research on mobile banking revealed that there was a relationship between perceived risk and adoption of mobile banking as well as risk negatively impact on the adoption of mobile banking (Ravichandran & Madana, 2016). The security risk, as one of the risk factors, is very important in making decisions regarding adopting internet banking (Thowfeek & Mirzan, 2017). It has also been proved through research findings significant positive impact between security and adoption of internet banking. A research had found that adoption of e-banking was affected by perceived risk (Safeena, Kammani, & Date, 2018). However, another research on adoption of mobile banking revealed that the risk does not influence customers when adopting mobile banking in Sri Lanka (Ayoobkhan, 2018). Madhusanka & Paranthaman (2018) conducted comparative research, between state and private banks. According to this research both private and state bank customers were satisfied with the prevailing security measures taken by the respective banks. Therefore, banks should conduct trust making activities in order to reduce the perceived risk of customers (D.A.Gayan Nayanajith & Dissanayake, 2019). However, Pratheesh and Pratheeba, (2019) found that the majority of the respondents were satisfied with the information on security provided by the respective banks.

Some researchers had examined the effect of the contribution of banking institutions on the customer's adoption of self-banking technologies. The banking institutions had a major role in influencing the attitudes of customers (Hettiarachchi, 2013). Rajapakse, (2017) clearly mentions that not only the customers but the employees of banking institutions too should pay more attention to adopting new technologies. In line with Yusnaini (2010), Ling, (2015) too stated that customers were seeking for more service quality technology-based banking transactions offered

by banks and it was a strong determinant for the adoption of online banking. Wijayaratne (2015) found that the higher efforts of banking institutions on promoting internet banking may lead to an increase in the adoption rate of customers. Also, the researcher suggested that some incentives be offered to customers in order to motivate them to engage in transactions through online platforms. Wijayaratne, (2015) critically examined the adoption rate of different banks. It was found that the banks which had high adoption rates promoted Internet banking daily and especially the employees of those banks were using Internet banking. Most scholars had found the importance of the Technology Acceptance Model and bank officials as well as marketers should take advantage of this by promoting the positive points of TAM (Hasan et al., 2016). The findings of this research also revealed that banking institutions should try to reduce the perceived risk factors attached to different types of self-banking technologies. In line with Madhusanka and Paranthaman (2018), bank managers must bear the responsibility of understanding weak areas of self-service technologies and make suggestions and implement them in those areas in order to increase the satisfaction level of the customers. Also, it stated that only investing on the implementation was not adequate, but they should be upgraded over time. Moreover, the researcher suggested that more customer-oriented services, development of more infrastructure facilities etc. may lead to higher satisfaction of the customers. In line with Hettiarachchi (2013), Ayoobkhan (2018) also emphasized that if there is a need to increase the customer awareness on e-banking, the banking institutions must use effective marketing strategies, especially for the rural sector. When considering overall facts regarding the contributions of banking institutions, it is evident that they are responsible of creating self-banking channels which are user friendly and also the marketers and bank officials should promote the importance and benefits of such channels in order to raise awareness among customers (D.A.Gayan Nayanajith & Dissanayake, 2019). This may lead to an increase in the adoption level of self-banking technologies.

3. Methodology

Primary data were gathered for identifying the determinants of the adoption of Technology-based Self-Banking system in Sri Lanka. Therefore, a structured questionnaire was distributed through e-mails among the customers who were using at least one self-banking channel. The questionnaire consisted of two parts. The first part of the questionnaire attempted to gather socio-economic and demographic information of the respondents. In the second part, the questionnaire attempted to obtain the opinion of the respondent under each variable. There were some statements to measure each variable. They were measured under the five-point Likert scale. The five-point Likert scale can be stated as Strongly Disagree (1), Disagree (2), Neither Disagree nor Agree (3), Agree (4) and Strongly Agree (5).

The Cluster sampling technique was used to select the sample. The sampling population of this study was the academic staff of the University of Sri Jayewardenepura who use technology-based self-banking channels and the sample size was 600. However, due to the pandemic situation only 164 responses were received.

As per the study, there were five variables, four independent variables and one dependent variable. The Independent variables of this study were Perceived Usefulness, Perceived Ease of Use, Perceived Risk and Contribution of Banking Institutions. The dependent variable was the adoption of Self-Banking. Both perceived usefulness and ease of use were the precursors of the Technology Acceptance Model. The other two independent variables can be added as an extension to the TAM. Perceived Risk can be measured through Risk Dimensions such as Performance Risk, Financial Risk, Security Risk, Time Risk, Psychological Risk, Social Risk and Privacy Risk (Arora & Kaur, 2018). The contributions of banking institution was measured through dimensions such as advertising, over the counter awareness, providing incentives to adopt self-banking etc. (Lee, 2009a; Rakesh & Ramya, 2014a). According to the variables of the study, the following conceptual framework can be constructed for this research:

Figure 1: Conceptual framework

Source: Researcher compiled, based on evidence, 2020

Methods of analysis

As the first step, the Reliability Test was used to measure the internal consistency of the statements used to measure each variable and then the Validity Test was used to validate the selected statements for constructing indices. The Univariate analysis was conducted to gain an idea about the sample. The correlation analysis was used as a bivariate analysis and it measures the strength (strong/weak) of the relationship between two variables (independent and dependent variables). As a multivariate analysis, the multiple regression analysis was used and it tried to describe the nature of the relationship between one dependent variable and the independent variables. That means, the regression analysis estimates to which extent the independent variables affect the dependent variable. Therefore, in this research, the regression analysis was the most essential analysis technique and it tried to find the impact of independent variables of the study (perceived usefulness, perceived ease of use, perceived risk, and contribution of banking institutions) on the dependent variable (adoption of self-banking). It is essential to satisfy some assumptions to conduct the regression analysis. They are, assumption of normality, nonexistence of outliers,

multi-collinearity, serial correlation, and homoscedasticity. The test should satisfy all the assumptions. If not, it is necessary to carry out some remedies for the unsatisfactory assumptions.

4. Data Analysis and Findings

Reliability and validity test

According to Table 1, all the Cronbach's alpha values are greater than 0.7. Adoption of self-banking factor consists of ten variables and its alpha value is 0.954. Perceived usefulness consists of 10 variables with 0.923 alpha value. Perceived ease of use recorded 0.910 alpha value for ten variables. Another ten statements belong to perceived risk (alpha=0.888). Contribution of banking institution had ten variables and its alpha value was recorded as 0.908. Since all the Cronbach's alpha values were beyond the satisfactory level, it satisfied the reliability factor and all the statements used to measure the factors of the study are suitable in constructing composite indices for advanced statistical analysis.

Table 1: Reliability test results

Factor	Cronbach's Alpha value
Adoption of Self-Banking	0.954
Perceived Usefulness	0.923
Perceived Ease of Use	0.910
Perceived Risk	0.888
Contribution of Banking Institute	0.908

Source: Field survey, 2020

Table 2 represents the KMO test values for the variables of the study. The KMO test value for adoption of self-banking is 0.944, for perceived usefulness it is 0.918, for perceived ease of use it is 0.900, for perceived risk it is 0.889 and for contribution of banking institution it is 0.924. It can be observed that all the KMO test values are beyond 0.5. Therefore, it can be concluded that the sampling adequacy can be validated for all five factors of the study. When considering the Bartlett's test, the test value for all the five variables is below the alpha value (0.05). Bartlett's test value for all the five variables is 0.000. Therefore, it can be determined that overall, all the variables which belong to five factors including one dependent variable and four independent variables are validated for constructing indices for further analysis.

Table 2: KMO and Bartlett's test results

Factor	KMO test	Bartlett's test
Adoption of Self-Banking	0.944	0.000
Perceived Usefulness	0.918	0.000
Perceived Ease of Use	0.900	0.000
Perceived Risk	0.889	0.000
Contribution of Banking Institute	0.924	0.000

Source: Field survey, 2020

Univariate Analysis

This research is based on five variables, four independent variables and one dependent variable. The dependent variable of the study is adoption of self-banking and the independent variables are perceived usefulness, perceived ease of use, perceived risk and contribution of banking institution. Under this section, the researcher attempt to figure out the descriptive statistics for the above-mentioned variables and it can be expressed through Table 3 as follows.

Table 3: Descriptive statistics for variables

Summary Measures	Adoption	PU	PEOU	PR	Contribution of Bank
Mean	82.36	82.50	77.51	64.07	65.57
Median	82.96	82.76	74.99	64.46	66.83
Maximum	100.00	100.00	100.00	95.21	100.00
Minimum	50.00	50.00	46.83	32.10	25.00
Std. Dev.	11.68	11.74	13.42	11.91	15.02
Skewness	-0.43	-0.38	0.01	0.04	-0.09
Kurtosis	2.68	2.62	2.44	3.13	3.14
Jarque-Bera	5.72	4.91	2.15	0.16	0.34
Probability	0.06	0.09	0.34	0.92	0.84
Observations	164	164	164	164	164

Source: Field survey, 2020

According to Table 3, the average level of adoption can be observed as moderately high level of adoption and it can vary by 11.68 from the mean level of adoption. It indicates a negative skewness. About 83 percent of perceived usefulness indicates and emphasizes that perceived usefulness has a large impact on the adoption of self-banking. On the other hand, it can change between 72 percent and 94 percent. There is also a skewness. Perceived ease of use of the sample showed around 78 percent. It also highlights that there is a greater impact of perceived ease of use on the adoption of self-banking. As per the findings, the perceived ease of use can change between 64.09 percent and 90.93 percent. As per the findings, perceived risk also indicated an impact on the adoption of self-banking and it is about 64 percent. It may vary by 52.09 percent to 75.91 percent. About 66 percent of the contribution of banking institution was shown and it may vary from 50.98 to 81.02. It can also be identified as a favourable impact for the adoption of self-banking. There was a negative skewness for all the variables. By analyzing the mean and standard deviation of all the four dependent variables, it can be stated that much of the sample accept that perceived usefulness, perceived ease of use, perceived risk and contribution of banking institution greatly influence the adoption of self-banking.

According to the Jarque-Bera test (Table 3), it is hypothesized that the variable considered follows a normal distribution and probability value below significance level indicating the rejection of the hypothesis that data follows a normal distribution. For all the tests, the significance value is 0.05. Therefore, all the variables including the dependent variables, adoption of self-banking (JB=5.72, p=0.06), perceived usefulness (JB=4.91, p=0.09), perceived ease of use (JB=2.15,

p=0.34), perceived risk (JB=0.16, p=0.92) and contribution of banking institution (JB=0.34, p=0.84) followed a normal distribution.

There were some outliers in both the dependent and independent variables, and they were replaced by the respective median values. According to the box plot in Figure 2, it can be observed that there are no outliers in both dependent and independent variables. Therefore, all the variables satisfy the assumption of the absence of outliers.
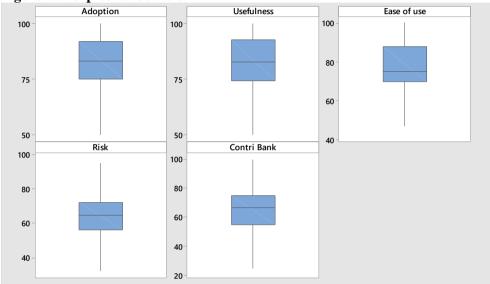
Figure 2: Boxplot for outliers

Source: Field survey, 2020

Identifying the level of adoption of customers with regard to technology based self-banking

By means of accomplishing one of the objectives of the study, it is essential to find out the prevailing level of adoption of banking customers in Sri Lanka. According to the collected data in this study, the adoption level of each respondent can be categorized using the visual binning option in the SPSS as follows:

Table 4: Categorizing the level of adoption

Category	Number of Respondents
<=50	2
50.01-62.50	4
62.51-75.00	43
75.01-87.50	52
87.51+	63
Total	164

Source: Field survey, 2020

Table 4 represents the categories which were calculated by the researcher according to the adoption levels of the respondents of the sample and the number of respondents who belong to each category. It can be clearly observed that fewer number of respondents belonged to the category of low level of adoption (<=50). Also, according to the Table, when the level of adoption increases, the number of respondents who belong to each category also increases. Moreover, the highest number of respondents (63 respondents) belonged to the category of high level of adoption (87.51+). Therefore, as a conclusion it can be stated that the respondents of the sample had a moderately high-level adoption of technology based self-banking system in Sri Lanka.

Identifying the relationship between adoption of self-banking and other independent variables

As one of the objectives it is essential to find out whether there is any significant relationship between the dependent variable, adoption of self-banking and independent variables which are perceived usefulness, perceived ease of use, perceived risk and contribution of banking institute. This objective can be satisfied by conducting a correlation analysis. For the above objective it can be first observed from the scatter plot in Figure 3 for the independent variables.
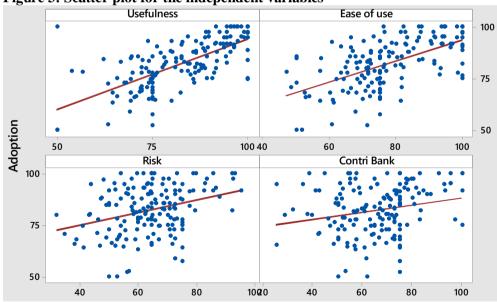
Figure 3: Scatter plot for the independent variables

Source: Field survey, 2020

According to the scatter plot, a linear relationship between independent variables namely perceived usefulness, ease of use, risk and contribution of banking institute with the adoption of self-banking can be observed. The correlation analysis can be used to check whether the linear relationship shown in the scatter plot is

statistically significant or not. Table 5 represents the results of the correlation analysis of this study.

Table 5: Correlation analysis results

	Adoption	PU	PEU	PR	Contribution of Bank
Correlation	1.00	0.69	0.58	0.31	0.22
Probability		0.00	0.00	0.00	0.00

Source: Field survey, 2020

As Table 5 implies, perceived usefulness is significantly correlated with adoption of self-banking (p=0.00) and it indicates a strong positive relationship. Perceived ease of use has a moderate positive relationship with adoption of self-banking, and it is significant at 0.05 significance level. Perceived risk is also significantly correlated with the adoption of self-banking (p=0.00) and it implies a weak positive correlation. Similarly, contribution of banking institute is significantly correlated with the dependent variable, and it indicates a weak positive relationship. The findings of the study revealed that there is no relationship between perceived usefulness, ease of use, risk and contribution of banking institutes and the adoption of self-banking. Therefore, it can be concluded that perceived usefulness, perceived ease of use, perceived risk and contribution of banking institutions have significantly positive correlation with the dependent variable, adoption of self-banking.

Analyzing the impact of usefulness, ease of use, risk and contribution of banking institutes on the adoption of self-banking

As the main objective of the study, it is necessary to find out whether there is any impact of perceived usefulness, perceived ease of use, perceived risk and contribution of the banking institutes on the adoption of self-banking. The above-mentioned objective can be satisfied by conducting a multiple linear regression analysis. Table 6 represents the results of the regression model.

Table 6: Regression Analysis Results

Factor	Coefficient	St. error	t-value	Significance value
Constant	22.44	5.12	4.39	0.00
Perceived usefulness	0.55	0.07	7.39	0.00
Perceived ease of use	0.19	0.07	2.60	0.01
Perceived risk	0.08	0.07	1.16	0.25
Contribution of Bank	-0.09	0.05	-1.66	0.10

Source: Field survey, 2020

According to Table 6 above, both perceived usefulness and perceived ease of use are statistically significant at 0.05 significance level. As per the literature, perceived risk has been found as a significant factor. However, this research has found that perceived risk does not impact on the adoption of self-banking. The reason for this may be due to the sample consisting educated respondents. Accordingly, it leads to a conclusion that perceived risk decreases when the education level and interaction with technology increases. According to the findings, it can be concluded
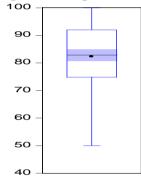
that perceived usefulness and perceived ease of use have an impact on the dependent variable, adoption of self-banking.

Model validation and adequacy

It is needed to check the validation of the above created model by evaluating the assumptions of the regression model. As the first assumption the independent variable of the above-mentioned model do not satisfy the assumption of the outliers. Figure 4 indicates that the box plot for the adoption of self-banking is free from outliers.

When considering the assumption of normality, the model is normally distributed (p=0.25, α=0.05). The normality plot of Figure 5 makes it evident that the model follows a normal distribution.
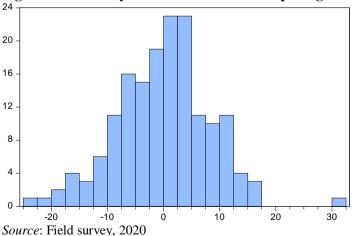
Figure 4: Boxplot for adoption of self-banking

Source: Field Survey, 2020

Then this model does not exhibit a high correlation among independent variables, and it leads to validate the assumption of the multi-collinearity. The following VIF Table (Table 7) is evidence for that.

Figure 5: Normality test results for the multiple regression model

Series: Residuals	
Sample 1 164	
Observations 164	
Mean	-1.84e-15
Median	0.181306
Maximum	30.00978
Minimum	-23.03413
Std. Dev.	8.164681
Skewness	-0.038183
Kurtosis	3.630081
Jarque-Bera	2.752700
Probability	0.252498

Source: Field survey, 2020

Table 7: Multi-collinearity test results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
USEFULNESS	0.005539	92.28622	1.821677
EASE_OF_USE	0.005555	82.48750	2.384845
RISK	0.004872	49.63346	1.648523
CONTRI_BANK	0.002732	29.66267	1.471079
C	26.16831	62.79868	NA

Source: Field survey, 2020

Thirdly, the assumption of serial correlation must be checked for the model. As per the Table of serial correlation results in Table 8, residuals are randomly distributed, and it satisfied the assumption of serial correlation.

Table 8: Serial Correlation Results

F-statistic	1.163655	Prob. F (2,157)	0.3150
Obs*R-squared	2.395564	Prob. Chi-Square (2)	0.3019

Source: Field survey, 2020

As the last assumption, this model does not satisfy the assumption of homoscedasticity. As per the homoscedasticity test result in Table 9, the model follows heteroscedasticity indicating that the size of the error term differed between independent variables.

Table 9: Heteroscedasticity results

F-statistic	4.799738	Prob. F (4,159)	0.0011
Obs*R-squared	17.66917	Prob. Chi-Square (4)	0.0014
Scaled explained SS	21.84047	Prob. Chi-Square (4)	0.0002

Source: Field survey, 2020

Though one of the assumptions is not satisfactory, since the overall significance of the model is significant (p=0.00, α=0.05) as per Table 10, the model can be validated for further studies.

Table 10: Summary Statistics of Multiple Linear Regression Model

R-squared	0.511669	Mean dependent var	82.36396
Adjusted R-squared	0.499384	S.D. dependent var	11.68375
S.E. of regression	8.266744	Akaike info criterion	7.092372
Sum squared resid	10865.91	Schwarz criterion	7.186880
Log likelihood	-576.5745	Hannan-Quinn criter.	7.130739
F-statistic	41.64979	Durbin-Watson stat	2.227334
Prob(F-statistic)	0.000000		

Source: Field survey, 2020

The adequacy of the model can be measured using the adjusted R^2 of the model. Table 10 implies the adjusted R^2 and according to that the model explains about 49 percent of variability of the independent variables. Furthermore, it can be evidently concluded that the above developed model is adequate for future studies. Therefore, the following equation for multiple linear regression model for adoption of technology based self-banking in Sri Lanka can be constructed.

Adoption of self-banking = 22.44+0.19*Ease of use+0.55*usefulness

According to the above equation, without any effect of usefulness and ease of use, the adoption of self-banking may remain at the level of 22.44. When the ease of use increases by one-unit, adoption may also increase by 0.19 and when the usefulness increases by one unit, adoption too may increase by 0.55. As per the equation it can be concluded that usefulness is the most important factor in increasing the adoption level of customers in self-banking and ease of use also can be identified as another important determinant for the increment in the adoption level of customers in self-banking.

5. Discussion

This research was conducted in order, to find out whether there are any impacts of perceived usefulness, ease of use, perceived risk and contribution of banking institutions on the adoption of technology based self-banking in Sri Lanka. According to the study, there were five variables including one dependent variable and four independent variables. The dependent variable of the study was adoption of technology based self-banking. Perceived usefulness, perceived ease of use, perceived risk and contribution of banking institutes were independent variables of the study. Since the study was based on the Technology Acceptance Model, perceived usefulness and ease of use was derived from TAM. Perceived risk dimensions were derived from the theory of perceived risk and contribution of banking institutes were derived according to the literature.

According to the multiple linear regression model, perceived usefulness was found as the most important factor in predicting the adoption of self-banking. According to the study, it was revealed that there was a significant positive relationship between usefulness and adoption of self-banking. In the Sri Lankan context as well as in the international context, there were a handful of research which covered the adoption of self-banking. However, these results were in line with most of the research outcomes related to Internet Banking, Mobile Banking and ATM banking. In this study, it indicates a higher value of regression coefficience, thus indicating that usefulness has a larger effect on the adoption of self-banking. These results were in line with some of the research findings on internet banking such as those by Jayasiri, Gunawardana and Dharmadasa (2016), Ayoobkhan (2018) and Chauhan, Yadav and Choudhary (2019). However, some of the researches on adoption of mobile banking, like those by Ravichandran and Madana (2016), Thowfeek and Mirzan (2017) can be supported by the results of this study. Also Nayanajith, Damunupola and Ventayen (2019) revealed that the action towards adoption of technology based self-banking services may increase by the perceived usefulness. In 2015 Wijayaratne (2015) stated that the lack of usefulness of self-banking technologies was a huge barrier to the adoption of different kinds of self-

banking services. Moreover, these results have changed according to this research and usefulness of self-banking technologies has increased in 2020. This study is also in line with Kumari (2015), confirming that customers were more likely to perceive usefulness of self-banking technologies rather than other factors. Most of the scholars have found that the perceived usefulness is a robust factor in self-banking technologies and hence, as a conclusion, it can be stated that the research finding of this study on usefulness is consistent with previous researches.

As per the findings of this research, perceived ease of use can be identified as another important factor for the adoption of technology based self-banking system in Sri Lanka. On the other hand, ease of use has been significantly and positively correlated with the adoption of self-banking. That result can be supported by (Perera, 2013) indicating that online banking has a positive relationship with ease of use. It indicates that customers seek more easiness of handling their banking activities through technological platforms while compared to traditional banking. Prior researchers also found that ease of use has a significant impact on different kinds of self-banking technologies. Scholars have identified that ease of use is highly important in accepting information systems (D.A.Gayan Nayanajith & Dissanayake, 2019). This statement can be supported by this research since the ease of use of this study has a higher regression coefficient. On the topic of Internet banking as one of the self-banking channels, most scholars have tried to find the determinants of the adoption and usage of internet banking. In line with the results of this study, they also found that there is a significant effect of ease of use on the adoption or usage of self-banking (Perera, 2013, Jayasiri, Gunawardana and Dharmadasa, 2016 and Rajapakse, 2017). The ease of use has a significant effect not only on internet banking but also on the other self-banking channels such as mobile banking and ATM banking. (Ayoobkhan, 2018; Hasan et al., 2016; Rakesh & Ramya, 2014b). According to the study, usefulness is better than the ease of use. However, according to Nayanajith, Damunupola and Ventayen (2019), perceived ease of use is better than perceived usefulness in the adoption of self-banking.

Most of the researchers have made various attempts to identify the impacts of different kinds of risk dimensions on the adoption of self-banking technologies. According to this study, the perceived risk factor was measured using some of the risk dimensions, namely performance risk, financial risk, security risk, time risk, psychological risk, social risk and privacy risk. Since the self-banking technologies were related to the financial activities of the customers, they expect some risks with their experience in self-banking. In the Sri Lankan context as well as in the international context, the impact of perceived risk has been identified as a significant factor (Hasan et al., 2016; Ravichandran & Madana, 2016; Safeena et al., 2018; Yousefi, 2015). The correlation analysis of the study revealed that there was a weak positive relationship between perceived risk and adoption of self-banking. That result was in line with Perera (2013). However, the results of the regression analysis revealed that there is no impact of risk on the adoption of self-banking. This outcome is completely different from the results of past researches and only Ayoobkhan (2018) found the same results in his study. But the majority found that perceived risk may be a higher impact of different kinds of self-banking technologies. On one hand, according to Lee (2009), perceived risk can be a strong determinant on the adoption

of internet banking. On the other hand, Wijayaratne (2015) stated that perceived risk was a huge barrier to the low adoption of internet banking. According to the study, it was found that the adoption level of the respondents was at a moderately high level. Therefore, it can be derived that in the recent past, banking authorities have paid more attention to the risk factors attached with all types of self-banking technologies. Moreover, the sample of the study consisted of graduate customers. It may derive another conclusion that while the level of education of the customer increases, the perceived risk of the customer too may decrease. It can be observed that customers using different types of self-banking technologies who participated in this survey were satisfied over the risk factors involved in self-banking technologies.

Some of the scholars have addressed the impact of the contribution of bank institutions on the adoption of self-banking. Banking officials bear the responsibility of raising the awareness of customers regarding self-banking services. Hettiarachchi (2013) emphasized that the banking institutions play a major role in influencing the attitudes of the customers. However, findings of this research do not support the above statement. The output of the regression analysis of this study revealed that the contributions of banking institutions have no impact on the adoption of technology based self-banking but the correlation analysis indicates a weak positive relationship between contributions of banking institutions and the adoption of self-banking. Bank officials endeavor to conduct aggressive marketing by using multiple advertising channels to raise the awareness of customers on different types of self-banking channels. Further, bank tellers and bank assistants may be a stronger media which can be used to increase customer awareness on different banking services. Wijayaratne (2015) found that a high-level effort of banking institutions in promoting internet banking may lead to an increase in the adoption rate of customers. But the research findings of this study do not confirm the above research findings. The reason for this may be the composition of the sample. As graduates they have the capability to understand the pros and cons of self-banking on their own without any assistance. Hence, it is easy to increase the adoption level of educated customers since they need lesser contributions from the banking institutions.

Due to the COVID-19 pandemic almost all the banks that operate in Sri Lanka made huge attempts to increase the interest of customers to use self-banking channels in order to carry out bank transactions. Advertising and awareness raising programmes on self-banking were clearly mentioned as plus points of self-service banking technologies for both customers as well as bank officials. Also, they have highlighted the low risk of contracting COVID-19 by the use of contact-less banking. Therefore, most of the bank customers have moved away from the traditional banking practices to self-banking. The output of the study emphasizes that there is a moderately high level of adoption of self-banking by customers who participated in the survey. The reason for this may be the risk of infection by COVID-19 through interaction during physical banking.

As a summary of the discussion, it can be stated that both the ease of use as well as usefulness supported prior researches while the perceived risk and the contributions of banking institutions do not align with prior researches for some reasons.

6. Conclusion

The study was used to check whether there were any relationships among the independent variables, namely perceived usefulness, ease of use, risk and contribution of banking institutions with the dependent variable, adoption of self-banking. All the four independent variables showed a significant relationship (p=0.000, α=0.05). Perceived usefulness and ease of use indicate a strong positive relationship while the other two variables, risk and contribution of banking institutions indicate a weak positive relationship. However, it can be concluded that there is no relationship among perceived usefulness, ease of use, risk and contributions of banking institutions and hence the adoption of self-banking can be rejected, and it leads to a conclusion that there is a significant relationship between perceived usefulness, ease of use, risk and contributions of banking institutions and adoption of self-banking.

Finally, the research tested whether there is any impact of perceived usefulness, ease of use, risk and contributions of banking institutions and the adoption of self-banking. A multiple linear regression was conducted for this objective. and it can be concluded that there is no impact of perceived usefulness, ease of use, risk and contributions of banking institutions on the adoption of self-banking. This can be accepted for two variables and can be rejected for two variables. As per the research findings, there is an impact of perceived usefulness (p=0.0000, α=0.05) and perceived ease of use (p=0.0013, α=0.05) on the adoption of self-banking. Therefore, it can be rejected for both perceived usefulness and ease of use. However, it was found that there is no impact of perceived risk (p=0.2396, α=0.05) and contributions of banking institutions (p=0.1455, α=0.05) on the adoption of self-banking. Moreover, it was found that the model with two independent variables explains 50.33 percent of variability of the independent variables.

As another objective of the study, it revealed that the adoption level of customers indicates a moderately high level. It has been shown that the majority belongs to the adoption level of 87.51 percent and above. Due to the level of education of respondents, it shows a high level of adoption. Therefore, it derives a conclusion that when the education level increases the adoption level of self-banking may also increase.

As one of the objectives of the study the researcher tried to find out the most important risk factor on the adoption of self-banking. According to the relative important index, nine risk dimensions were considered in this study which can be categorised as time risk, social risk, performance risk, security risk, risk of accessibility for external parties, psychological risk, privacy risk, risk of losing cards, passwords and PIN numbers and finance risk. The time risk was found as the most important risk dimension which can affect the adoption of self-banking. Therefore, banking authorities should pay more attention to ensure that filling in the required information and making the transaction through self-banking platforms should not be a waste of the customers' time.

Though self-banking channels are not a new concept to Sri Lanka, still there is evidently a low level of adoption by daily customers. However, the research findings express that the level of adoption is in a positive level among graduate customers of licensed commercial banks in Sri Lanka. As per the main concern of

this study, it was found that both perceived usefulness and ease of use had a significant impact on the adoption of the technology based self-banking system in Sri Lanka. It indicates that more customers seek usefulness of different self-banking channels and hence banking authorities must design such user-friendly channels for the customers.

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