

# Structured Review of Research Methodologies Applied in Internet Banking

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## Abstract

Internet banking has been studied for about last two decades. This study conducts a review of the research techniques used in internet banking domain for last fifteen years (2002 to 2017). The research papers were selected from various reputed databases and subjected to content analysis before inclusion. The study will enable the researchers and bankers to understand the rigor of analysis, choose appropriate research technique and further develop methodologies for conducting research in the field of internet banking.

**Keywords:** Internet banking, sampling methods, survey instrument, data analysis techniques

## Introduction

Money is the lifeline of business as well as society. Therefore the banking sector has an important role to play in today's rapidly growing economy. The rapid strides in Information and Communication Technology (ICT) and widespread use of internet through mobiles, even in rural areas, has made it possible for a person to do most banking transactions from a remote location even without stepping into a bricks and mortar structure of a retail banking branch. Thus the emergence of e-banking is viewed as a revolutionary milestone in the banking sector (Boyes and Stone, 2003; Yang et al., 2007). The e-banking is also popularly known as internet banking.

The growth of internet banking has generated interest of academic researchers, bankers and policymakers to analyze its various dimensions. The researchers have used various methodologies to investigate the different facets of internet banking like privacy, trust, service quality, customer satisfaction, web design, etc. The choice of methodology provides rigor and credibility to the particular research. This study revisits all the methodologies adopted over a period of fifteen years (2002-2017) in this field. The underlying objective of this research was to provide a holistic view of past research methodologies to the researchers and particularly to those working in the domain of internet banking. It may also help them choose appropriate research methodology for their future work.

## Literature Review

All the research papers published in last fifteen years (2002-2017) on the internet banking in the reputed journals were searched using different databases. The starting period was deliberately kept at 2002 as internet banking in India emerged only in early twenty-first century. The literature review of 52 relevant articles was conducted. The journals were collected from databases like Ebsco, Emerald, Science Direct, Jstor, Proquest, etc. The synoptic view of the literature review is given in Table 1.

**Table 1: Research Methodologies in Internet Banking**

<i>Author, Year, Journal, Country of research</i>	<i>Research Methodology techniques adopted</i>
Liao and Cheung, 2002, Information and Management, Singapore	Woodruff procedure was adopted; Survey method; Regression analysis used for checking interdependencies between various attributes
Bradley and Stewart, 2003, Marketing and Intelligence Planning, Ireland and USA	Delphi Study was used; Results from Delphi study were analyzed using SPSS
Boon and Yu, 2003, International Journal of Bank Marketing, Malaysia	Success factors affecting usage of e-channels; Factor Analysis and Spearman Correlation Coefficient
Singh, 2004, Aslib Proceedings, South Africa	Cross-tabulation; Survey method; Data analysis was done using bar charts and pie diagram.
Gonzalez et. al., 2004, Managing Service Quality, Spain	Cross-tabulation; Survey method; Focus on banking kiosks and phone banking
Laforet and Li, 2005, International Journal of Bank Marketing, China	Intercept Interview; Focus on consumers perceptions and attitudes to new technology, retail banking, online banking products etc.
Eriksson et al., 2005, International Journal of Bank Marketing, Estonia	Survey method; EFA (Exploratory Factor Analysis) and CFA (Confirmatory Factor Analysis)

Seth, 2005, International Journal of Quality and Reliability Management, USA	Service Quality models were reviewed in the context of relationships between various service attributes, Focus on Information technology and measurement issues
Littler and Melanthiou, 2006, Journal of Retailing and Consumer Services, United Kingdom	Survey method; Factor Analysis; Convenience sampling was adopted
Pikkarainen et al., 2006, International Journal of Bank Marketing, Finland	Survey method; Factor Analysis (CFA with LISREL)
Treiblamer, 2006, Journal of Electronic Commerce Research, Austria	Survey of online bank customers; Factor Analysis (structural equation modeling and multi-group invariance analysis)
Yiu et al., 2007, International Journal of Information Management, Hongkong	Survey method; Mainly telephonic survey; Pearson's coefficient; t-test.
Eriksson and Nilsson, 2007, Technovation, Estonia	Survey method; Sample drawn from Union Bank of Estonia; SEM (Structural Equation Modeling) using Lisrel
Hernandez and Mazzon, 2007, International Journal of Bank Marketing, Brazil	Survey method; Content and Construct validity; EFA models were tested with the help of multiple linear regression and multinomial logistic regression
Katuri and Lam, 2007, Journal of Financial Services and Marketing, USA	Survey method; Stepwise regression
Maenpaa et al., 2008, Journal of Retailing and Consumer Services Finland	Survey method; Sample was drawn from internet banking users in Finland; EFA
Mark Durkin et al., 2008, Journal of Retailing and Consumer Services, United Kingdom	Survey method; Sample was drawn from retail banking customers from United Kingdom; Correlations Analysis - Spearman's rank correlation coefficient
Casalo et al., 2008, International Journal of Bank Marketing, Spain	Web survey; EFA and CFA conducted; SEM used for testing hypotheses
Loonam and O' Loughlin, 2008, Marketing Intelligence and Planning, Ireland	Interview method; Content analysis
Poon, 2008, Journal of Business and Industrial Marketing, Malaysia	Survey method; One -way ANOVA
Herington and Weaven, 2009, European Journal of Marketing, Australia	Survey method; Sample was drawn from Gold Coast region in Australia at a drive through petrol station; Correlation analysis; EFA; Multiple regression analysis
Ilias Santouridis et al., 2009, Total Quality Management, Greece	Survey method; EFA; Multiple regression analysis
Chuang and Lu, 2010, Journal of Global Issues, Taiwan	Survey method; EFA
Ladhari, 2010, Journal of Retailing and Consumer Services, Canada	Survey method; Content Analysis; EFA
Seyal and Rahim, 2011, e-service Journal, Brunei	Survey method; Hierarchical Regression
Huang et al., 2011, Advances in Accounting, Taiwan	Focused Group Discussions (FGD); Experimental method; Path analysis using Partial Least Square method
Zavareh et al., 2012, Procedia Social and Behavioural Sciences, Iran	Survey method; EFA and CFA; Pearson's correlation coefficient; Multiple regression analysis
Radomir and Nistor, 2012, Procedia Economics and Finance, Romania	Survey method; EFA and CFA
Nasri and Charfeddine, 2012, Journal of High Technology Management Research, Tunisia	Survey method; EFA and CFA; SEM using Lisrel
Ariff et al., 2012, Procedia Social and Behavioural Sciences, Malaysia	Web survey; EFA and CFA conducted
Cabinillas, 2013, Industrial Management and Data Systems, Spain	Web survey; Sample was drawn from customers of a national financial institution in southern Spain; EFA and CFA conducted; SEM using Lisrel
Nimako, 2013, International Journal of Scientific and Technology Resource, Ghana	Web survey; Adopted the Internet Banking Service Model (IBSQ) as proposed by Ho and Lin (2010)
Nochai and Nochai, 2013, International Journal of Humanities and Management Sciences, Bangkok	Survey method; Sample was drawn from customers of top three Bangkok banks; Logistic Regression analysis

Alsudari, 2013, International Journal of Business Management, Saudi Arabia	Survey method; Developed level 2 model as per business model defined by Oserwalder et al. (2005); Different theories and ideas from information systems and services marketing literature were used for conceptualization and validation of model
Goudarzi et al., 2013, Australian Journal of Basic and Applied Sciences, Australia	Survey method; Focused on impact of 'trust' in internet banking; Factor Analysis
Patsiotis et al., 2013, Journal of Services Marketing, Greece	Survey method; Focused on consumer's resistance behavior for adoption of internet banking; Sample collected in Athens, Greece; Multi-Dimensional Scaling (MDS), EFA and Hierarchical cluster analysis
Thaichon et al., 2014, Journal of Retailing and Consumer Services, Thailand	Survey method; Sample was drawn from database of ISP in Thailand; EFA, CFA and SEM; Regression test and Chi-Square test was also conducted
Al-Qeisi et al., 2014, Journal of Business Research, United Kingdom	Survey method; Sample drawn from mall customers in UK; EFA, CFA, and SEM
Santouridis and Kyritis, 2014, Procedia Economics and Finance, Greece	Survey method; Sample drawn from bank branches and internet cafes at Thessaly in Greece; EFA and Regression Analysis
Fonseca, 2014, Journal of Retailing and Consumer Services, Portugal	Survey method; Sample was drawn from two datasets – Eurostat and Portuguese citizens; Cluster Analysis
Aliyu, 2014, Procedia Social and Behavioral Sciences, Malaysia	Survey method; CFA and SEM
Levy, 2014, Journal of Services Marketing, Israel	Survey method; EFA, CFA, and SEM
Sikdar et al., 2015, International Journal of Bank Marketing, India	Survey method; CFA and SEM
Sunder and Antony, 2015, Production Planning and Control, India	Survey method; Kano model survey method was used; Sample drawn from call centres in Japan, New Jersey, and Canada; EFA, CFA and SEM; Critical To Quality (CTQ) metric was derived to find out customer's needs
Ling et al., 2016, Procedia Economics and Finance, Malaysia	Survey method; Sample drawn from working professionals in Malacca in Malaysia; Multiple regression
Asad et al., 2016, Procedia Economics and Finance, Iran	Survey method; Sample was drawn from students and professors; DEMATEL method was used for allotting ranks based on values of R, D, R+D, R-D. R denotes effectiveness of a factor on other factors D denotes influence of other variable on a factor
Mittal, 2016, Case studies in Banking Sector, U.S.A.	Case Research Method; Three banks were chosen for data collection for the case study based research; FGD (Focused Group Discussion) and in-depth interview were conducted with customers and bank managers; Qualitative research; Multivariate statistical analysis
Amin, 2016, International Journal of Bank Marketing, Malaysia	Survey method; EFA, CFA, and SEM
Raghu and Jayshree, 2017, Asian Social Science, India	FGD; Thematic analysis

#### *Literature review on applicability of EFA, CFA, and SEM in Internet Research*

The survey research has dominated the research in relationship marketing (Table 1). MacCullum et al. (1999) analyzed the requirements of the adequacy of sample size for conducting successful factor analysis. Comrey and Lee (1992) advised researchers to collect samples of 500 or more for conducting factor analysis. They concluded that researchers should reduce the number of variables iteratively so as to ensure good levels of communality.

Fabrigar et al (1999) examined the use of EFA in psychological research. They recommended that methodological decisions should be taken by a researcher before implementation of EFA. They suggested that researchers should include 4 to 6 variables for each common factor for good results. EFA should be applied when researcher wants to find out the latent constructs determining a number of measuring variables. They stated that the usage of both EFA and CFA can be beneficial for estimation of fitness of model.

Anderson et al. (1988) reviewed the practical applications of SEM for testing of theory and model development. They recommended the use of two-step modeling approach for testing goodness of fit. It was specified that convergent validity could be determined if the pattern coefficient of an indicator was greater than double of its standard error of related construct. Further discriminant validity can be confirmed if significantly low chi-square value could be found in the model in which trait correlations did not tend towards unity as stated by Bagozzi and Philips (1982). They suggested that the sequential chi-square difference tests (SCDT's) would be useful in the two-step approach.

Farrell and Rudd (2009) studied the practical issues related to factor analysis, extraction of average variance, latent variable and testing of discriminant validity. They stated that the discriminant validity could be explained

if a latent variable could explain the variance in the associated observed variables rather than the usage of measurement error in other related constructs developed on the basis of the conceptual framework. They recommended that the researchers should apply EFA first for identification of cross-loading items and then conduct CFA for confirming factor structure.

Schreiber et al. (2006) conducted a review for analyzing and presenting the results based on CFA and SEM. They commented that CFA is “a theory-driven confirmatory technique”. They stated that SEM involves the use of both EFA as well as multiple regression (Ullman, 2001). They reviewed sixteen articles published in the period of 1984-2004 in ‘The Journal of Educational Research’. They commented that sample size should be adequate enough to include at least ten participants for every estimated parameter. They reaffirmed that Hu and Bentler’s (1999) criteria for confirming goodness of fit i.e. RMSEA < 0.06 and CFI > 0.95. They concluded that SEM technique can be applied to a large sample size for analysis.

Ullman (2006) focused on EFA, CFA and SEM techniques and its applications in research. He stated that EFA is an exploratory technique used for estimating different solutions for a large set of variables with the help of different factors and different types of rotation. The best solution is then selected based on theoretical support and statistical measures. CFA is a confirmatory technique applied for establishing the proposed relationship prevailing between the measured variables and proposed constructs whereas SEM looks overall strength of the relationship between the factors. He concluded that the maximum likelihood technique of SEM is the best for a large sample size of over 120 as supported by Monte Carlo studies conducted by Kano (1992) and Hu and Bentler (1998).

### Review of research methodology techniques applied in internet banking

#### *Sampling Methods used for data collection*

The sampling methods are to be selected depending on the scope of the study, the cost to be incurred for data collection, representativeness of the sample, time involved and nature of the study. It was observed that several sampling methods were used for data collection (Table 2).

**Table 2: Sampling Methods**

<i>Sampling method adopted</i>	<i>Author</i>
Convenience sampling	Littler et al. (2006), Pikkarainen et al. (2006), Poon (2008), Herington and Weaven (2009), Radomir and Nistor (2012), Qeisi et al. (2014), Levy (2014) and Amin (2016)
Probabilistic sampling	Yiu et al. (2007)
Quota sampling	Maenpaa (2008), Nochai et al. (2013)
Purposive sampling	Loonam and Loughlin (2008)

#### *Survey instrument*

Sekaran and Bougie (2012) mentioned that a measurement scale provides a mechanism or tool for measuring individual differences associated with the study variables. Mostly Likert scale has been used by various researchers for measuring the degree of agreement or disagreement of an individual associated with the given statement (Table 3).

**Table 3: Survey Instrument**

<i>Type of survey instrument used for data collection</i>	<i>Author</i>
5 Point Likert Scale	Littler et al. (2006), Pikkarainen et al. (2006), Chuang and Lu (2010), Seyal and Rahim (2011), Huang et al. (2011), Nasri and Charfeddine (2012), Cabinillas (2013), Aliyu (2014), Levy (2014) Sikdar et al. (2015), Amin (2016)
6 Point Likert Scale	Hernandez and Mazzon (2007)
7 Point Likert Scale	Katuri and Lam (2007), Radomir and Nistor (2012)

#### *Method of administering the survey instrument*

The method of administering the survey instrument depends on the type of study, time and cost constraints (Table 4).

**Table 4: Administration of the Survey**

<i>Method of data collection</i>	<i>Author</i>
Personally administered	Nasri and Charfeddine (2012)
Web-based online survey	Radomir and Nistor (2012), Thaichon (2014), Aliyu (2014), Asad (2016)
Telephonic survey	Yiu et al. (2007)
Kano model survey	Sunder et al. (2015)

*Generation of Items*

Oberseder, Schlegelmilch, Murphy, and Gruber (2014) stated the different steps of development of a survey instrument. These steps include construct definition, item generation, initial item purification, and instrument refinement. A construct explains a theoretical phenomenon (Edwards and Bagozzi, 2000). Rossiter (2002) emphasized that the conceptual definition of variables in the construct is an essential step for questionnaire development. Different researchers have used a variety of ways for item generation (Table 5).

**Table 5: Item Generation**

<i>Method applied for generation of items</i>	<i>Author</i>
Literature review	Aliyu (2014), Ling et al (2016)
Principal component analysis was done for identifying items measuring customer satisfaction	Santouridis et al. (2014)
Critical to Quality (CTQ) metric was derived to find out customer satisfaction variables	Sunder et al. (2015)
FGD and in-depth interviews were conducted with customers, employees and top management for preparing survey instrument	Mittal (2016)

*Purification of Items*

Sekaran and Bougie (2012) reported that the items identified for conducting a survey should be checked for the goodness for fit. The goodness of measures provides the scientific rigor. It also leads to the confirmation that the instrument measures the variables accurately. As the accuracy of the research outcome depends on the accuracy of the measures used; hence goodness of measures needs to be checked in terms of validity and reliability. The validity ensures that the items of survey instrument measure the right concept whereas the reliability of survey instrument deals with stability and consistency of the instrument. The various methods used for purification in internet banking research are given in Table 6.

**Table 6: Purification of Scale**

<i>Method used for purification of items</i>	<i>Author</i>
Calculation of average importance ratings, correlation and factor analysis and varimax rotation	Herington and Weaven (2009)
Kaiser-Meyer-Olkin(KMO) test used for checking fitness of data for factor analysis	Zavareh et al. (2012)
Barlett's test of Sphericity conducted for testing significance of analysis	Zavareh et al. (2012)
Barlett's test of Sphericity done to test correlation between variables	Santouridis et al. (2014)
KMO confirmed suitability of sample for factor analysis	Santouridis et al. (2014)
Regression analysis and Chi square test conducted	Santouridis et al. (2014)
Bias Correct Bootstrapping was conducted as per Preacher and Kelley (2011) to test mediation	Thaichon (2014)
Six Sigma methodology, benchmarking study, Pareto analysis, Fishbone analysis and Round robin method used for increasing customer satisfaction in banking call centre	Sunder et al. (2015)
Multivariate analysis used for data analysis. Systems theory applied for creating customer satisfaction Strategy Maps	Mittal (2016)
Squared multiple correlations ensured correctness of variables measuring customer satisfaction	Amin (2016)
Multiple regression confirmed the suitability and significance of variables for study	Ling et al. (2016)
Grey based DEMATEL method used for data analysis	Asad et al (2016)

*Scale dimension analysis*

Majority of researchers adopted Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) for analyzing dimensionality of scale (Table 1). Table 7 provides a synoptic view of this trend.

**Table 7: Research Methodologies**

<i>Statistical Technique Applied</i>	<i>Applied for</i>	<i>Literature Support</i>
Exploratory Factor Analysis	Factor extraction, factor reduction, identify key factors in the area of research	Pikkarainen (2006), Hernandez and Mazzon (2007), Casalo et al. (2008), Cabinillas (2013), Levy (2014) and Santouridis (2014).
Confirmatory Factor Analysis	factor structure verification, reliability and validity, checking discriminant and convergent validity Goodness of Fit Index(GFI) and Root Mean Square Error of Approximation (RMSEA) was used for acceptance of hypothesis Construct validity and model fitness	Pikkarainen (2006), Casalo (2008), Ariff et al. (2012),Thaichon (2014), Al-Geise et al. (2014), Aliyu (2014), Levy (2014)), Sikdar (2015) and Amin (2016).
Structural Equation Modelling	hypothesis testing, for model estimation and for parameter estimation	Floh and Treiblamer (2006), Eriksson (2007), Casalo et al.(2008) and Thaichon (2014).

**Establishing scale reliability and validity**

*Internal consistency*

Sekaran and Bougie (2012) reported that the reliability of the accuracy of the survey instrument can be checked on the basis of stability and consistency. The stability of the survey instrument can be assured by confirming the consistency of the instrument. The consistency of the instrument can be checked by inter-item consistency reliability. Churchill Jr (1979) reported that inter-item consistency reliability test has been predominantly and popularly used test which checks for the high correlation between items and the subsets. Churchill Jr (1979) and Nunnally (1994) reported that determining the coefficient of reliability is an important step of scale refinement.

Sekaran and Bougie (2012) opined that in case of multipoint scaled items the Cronbach's coefficient of alpha is calculated for confirming inter-item consistency reliability. Hair, Black, Babin, and Anderson (2010) mentioned that the acceptable Cronbach Alpha value is 0.6 and considered great above 0.7. The internal reliability of scales is often checked by calculation of Cronbach's Alpha or by Jorskog's p coefficient (R. Ladhari, 2010). Internal consistency and construct reliability exist if the value of Cronbach alpha is greater than 0.70 (Nunnally, 1978, Fornell and Larcker, 1981, R.Ladhari, 2010). Most of the studies (Liao and Cheung, 2002; Hernandez and Mazzon, 2007; Maenpaa et al., 2008, Herington and Weaven, 2009; Chuang and Lu, 2010; Zavareh et al., 2012; Cabinillas, 2013; Santouridis, 2014; Amin, 2016) have used Cronbach alpha for confirming internal consistency.

*Convergent validity*

Convergent validity denotes that the set of items clubbed under a construct are highly correlated. This has been actually verified in different research papers. Liao and Cheung (2002) have used Karl Pearson's coefficient for confirming convergent validity. Eriksson (2007) checked convergent validity with the help of factor loadings, t and R square values. T values were used for establishing convergent validity by Pikkarainen (2006).

*Discriminant validity*

Discriminant validity explains the degree to which unrelated constructs, in reality, do not relate to each other. Eriksson (2005) extracted t values of correlation and AVE values greater than 0.5 to confirm discriminant validity (Fornell and Larcker,1981). Nasri and Charfeddine (2012) confirmed discriminant validity as average variance extracted for all variables was well above 0.50 (Fornell and Larcker,1981). Thaichon (2014) confirmed discriminant validity as all squared correlation coefficients were below AVE's (Fornell and Larcker,1981).

**Conclusion and future implications**

The review highlights that the following approach may be adopted for conducting research, particularly in internet banking domain. Initially the researcher has to identify the particular aspect (dimension) of research in the internet banking. It can be in the interface area of online aspect and banking aspect with a particular spatial context. Then the following standard steps may be followed:

- Conducting a Literature Review for identification of research gaps
- Selection of sampling technique
- Selection of representative sample

- Generation of items from literature review, expert opinion, customer interaction etc.
- Developing a questionnaire (survey instrument)
- Purification of items
- Conducting a pilot study for checking the questionnaire
- Data collection
- Reliability of survey instrument measured by Cronbach Alpha and Split-half test
- Propose a conceptual model linking the relationships between different constructs.
- Check the construct validity by using various statistical techniques like Exploratory Factor Analysis, Confirmatory Factor Analysis, etc.
- SEM should be applied for estimating the degree of fitness of a hypothesized model.

It was found that convenience sampling technique was the most popular technique among internet banking researchers for data collection. The data was collected mostly using five-point Likert Scale. Literature review was the basis for the generation of items. The review emphasizes that the literature review needs to be supplemented by expert interviews. The experts are executives from the banking industry who have many years of experience and another pool of executives are those who have joined in last five years. It has the potential of bringing in new variables covering the latest technological and human-related issues or best practices which may otherwise be missed. This was a gap where the majority of previous studies on internet banking had only relied on literature study for generating a pool of relevant variables for conducting factor analysis.

Correlation, Kaiser-Meyer-Olkin(KMO) test, Barlett's test for Sphericity were employed for purification of items. Exploratory Factor Analysis, Confirmatory Factor Analysis, and Structural Equation Modelling were applied by most researchers for analysis of scale dimension. Internal consistency and construct reliability were checked. Convergent and discriminant validity has been confirmed with the help of factor loadings, t values of correlation, R Square values and Average Variance Values (AVE). Nomological validity was checked with the help of Goodness of Fitness Index (GFI), Root Mean Square Error of Approximations (RMSEA) and CFI. Thus it can be concluded that the research methodology techniques adopted in the field of internet banking can be extensively applied to any other area of research.

The review also highlights that there is a need for using experimental and ethnographic research methodology in internet banking. There is hardly any research paper which has used ethnography approach for data collection in internet banking. There is over-dominance of survey research in the field of internet banking. In ethnographic research approach, the researcher follows an immersive approach where s/he visits the place where the respondent is working or located and mixes with them during data collection phase. It takes into consideration various cultural aspects also. This approach would help in getting newer consumer insights about the internet banking besides giving solution to the internet banking adoption and dis-adoption issues.

Majority of previous studies on internet banking had used factory analysis (EFA and CFA) approach for data analysis. The factor analysis has its own limitations like lack of causality and appropriate nomenclature issues of factors. The future research methodology in internet banking should other techniques like multiple regression, experimentation methods using eye-tracking, FGD, text-analytics, and mixed method approach. This would help in analyzing the problem from multi-dimensional perspective and help in obtaining convincing results.

This study may be further extended into a systematic literature review and meta-analysis studies on internet banking. The researchers may take a particular research methodology like EFA, CFA, SEM etc. and explore its evolution & usage in internet banking research. The research methodology may be critiqued on its applicability, implementation challenges, and outcome ambiguity. The research methodology adopted in domain of internet banking across geography and industry may also be compared and analyzed by future researchers.

## References

- Aliyu, A., Rosmain, T., Takala, J. (2014), "Online Banking and Customer Service Delivery in Malaysia: Data Screening and Preliminary Findings", *Procedia Social and Behavioral Sciences*, 129, pp. 562-570.
- Alsudari, M. (2013), "The Effects of Self -Service Web Portals on Online Banking Service Quality: A Theoretical Model", *International Journal of Business Management*, Vol. 8, No. 18, pp. 121-139.
- Amin, M. (2016), "Internet banking service quality and its implication on e-customer satisfaction and e-customer loyalty", *International Journal of Bank Marketing*, Vol. 34, No. 3, pp. 280-306.
- Anderson, J. and Gerbing, D. (1988) "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach", *Psychological Bulletin*, Vol. 103, No. 3, pp. 411-423.
- Ariff, M., Shoki, M., Yun L., Zakuan, N. and Ismail, K. (2012), "Examining Dimensions of Electronic Service Quality for Internet Banking Services", *Procedia-Social Behavioral Sciences*, 65 pp 854-859.
- Ariff, M., Shoki, M., Yun L., Zakuan, N. and Ismail, K. (2013), "The impacts of service quality and customer satisfaction on customer loyalty in Internet banking", *Procedia- Social and Behavioral Sciences*, 81, pp-469-473.

- Asad, M., Mohajerani, N., Noursresh, M. (2016), "Prioritizing Factors Affecting Customer Satisfaction in the Internet Banking System Based on Cause and Effect Relationships", *Procedia Economics and Finance*, 36, pp. 210-219.
- Bradley, L. and Stewart, K. (2003), "A Delphi Study of Internet Banking", *Marketing Intelligence and Planning*, 21/5, pp 272-281.
- Casalo, L., Flavian, C. and Guinaliu, M. (2008), "The role of satisfaction and website usability in developing customer loyalty and positive word of mouth in the e-banking services", *International Journal of Bank Marketing*, Vol.26, Iss.6 pp.399-417.
- Chan, L., Yer, H., Lo, H., Tse, S., Tso, G., Wu, M. (2003), "Consumer Satisfaction Index: new practice and findings", *European Journal of Marketing*, Vol. 37 Iss.5 pp.872-909.
- Chuang, C. And Dr. Hu, M. (2010), "Exploring Customer's perceptions of e-banking service", *Journal of Global Business Issues*, summer 2010:4, pp. 37-42.
- Durkin, M., Jennings, D., Mulholland, G. and Worthington, S. (2008), "Key Influencers and inhibitors on adoption of the Internet for banking", *Journal of Retailing and Consumer Services*, 15 pp. 348-357.
- Eriksson, K., Kerem, K., and Nilsson, D. (2005), "Customer acceptance of internet banking in Estonia", *International Journal of Bank Marketing*, Vol. 23, No. 2, pp. 200-216.
- Eriksson, K. and Nilsson, D. (2007), "Determinants of the continued use of self service technology: The case of internet banking", *Technovation*, Vol. 27, pp. 159-167.
- Fabrigar, L. Maccallum, R., Wegener, D. and Strahan, E. (1999), "Evaluating the use of Exploratory Factor Analysis in Psychological Research", *Psychological Methods*, Vol. 4, No. 3, pp. 272-279.
- Farrell, A. and Rudd, J. (2009), "Factor Analysis and Discriminant validity: A Brief Review of some Practical Issues", *ANZMAC*, pp. 1-9.
- Fonseca, J. (2014), "e-banking culture: A comparison of EU 27 countries and Portuguese case in the EU 27 retail banking context", *Journal of Retailing and Consumer Services*, 21, pp 707-716.
- Floh, A. and Treiblmaier, H. (2006), "What keeps the e-banking customer loyal? A multigroup analysis of the moderating role of consumer characteristics on e-loyalty in the financial service industry", *Journal of Electronic Commerce Research*, Vol.7 No. 2, pp. 97-110.
- Gonzalez, M., Quesada, G., Picado, F. and Eckelman, C. (2004), "Customer satisfaction using QFD: An e-banking case", *Managing Service Quality*, Vol.14 No. 4 pp.317-330.
- Goudarzi, S., Ahmad, M., Soleymani, S. and Hosseini, N. (2013), "Impact of Trust on Internet Banking Adoption : A Literature Review", *Australian Journal of Basic and Applied Sciences*, 7(7), pp. 334-337.
- Ha, H. and Janda, S. (2008), "An empirical test of a proposed customer satisfaction model in e-services", *Journal of Services Marketing*, Vol. 22, No. 5 pp. 399-408.
- Herington, C. and Weaven, S. (2009), "E-Retailing by banks: e-service Quality and its importance to customer satisfaction", *European Journal of Marketing*, Vol. 43 No. 9/10, pp- 1220-1231.
- Hernandez, J. and Mazzon, J. (2007), "Adoption of internet banking: proposition and implementation of an integrated methodology approach", *International Journal of Bank Marketing*, Vol. 25 No. 2 pp. 72-88.
- Huang, S., Shen, W., Yen, D. and Chou, L.(2011), "IT governance: Objectives and assurances in internet banking", *Advances in International Accounting*, 27, pp 406-414.
- Hway-Boon, O. and Yu, C. (2003), "Success factors in e-channels: the Malaysian banking scenario", *International Journal of Bank Marketing*, Vol. 21, pp.369-377.
- Katuri, S. and Lam, M. (2007), "Switching customers from branches to internet: A Credit union's journey", *Journal of Financial Services Marketing*, Vol. 11, Iss. 3, pp. 229-248.
- Ladhari, R.(2010), "Developing e-service quality scales: A literature review", *Journal of Retailing and Consumer Services*, 17, pp 464-477.
- Laforet, S., and Li, X., (2005), "Consumers attitudes towards online and mobile banking in China", *International Journal of Bank Marketing*, Vol. 23, No.5, pp.362-380.
- Lekakos, G., Vlachos P. and Koritos, C. (2014), "Green is good but is usability better? Consumer reactions to environmental initiatives in e-banking services", *Ethics Information Technology*, 16, pp. 103-117.
- Liao, Z. and Cheung, M. (2002), "Internet based e-banking and customer attitudes: an empirical study", *Information and Management*, 39, pp 283-295.
- Liebana-Cabanillas, F., Munoz- Leiva, F. and Rejon-Guardia, F. (2013), "The determinants of satisfaction with e-banking", *Industrial Management and Data Systems*, Vol. 113, No. 5, pp. 750-767.
- Ling, G., Fern, Y., Boon, L., Huat, T. (2016), "Understanding Customer Satisfaction of Internet Banking: A case study In Malacca", *Procedia Economics and Finance*, 37, pp. 80-85.
- Loonam, M. and Loughlin, D. (2008), "Exploring e-service quality: a study of Irish online banking", *Marketing Intelligence and Planning*, Vol.26 No. 7, pp. 759-780.
- Maenpaa, K., Kale, S., Kuusela, H. and Mesiranta, N. (2008), "Consumer perceptions of internet banking in Finland: The moderating role of familiarity", *Journal of Retailing and Consumer Services*, 15, pp 266-276.



- Mittal, V. (2016) "Developing and Implementing a Customer-Focused Strategy in Banks: Customer Satisfaction Strategy Maps." Available at SSRN: <https://ssrn.com/abstract=2783075> or <http://dx.doi.org/10.2139/ssrn.2783075>
- Nagaraju, S. and Parthiban, L. (2015), "Trusted Framework for online banking in public cloud using multifactor authentication and privacy protection gateway", *Journal of Cloud Computing*, Vol. 4 :22, DOI 10.1.186/S 13677-015-0046-4.
- Nasri, W. and Charfeddine, L. (2013), "Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior", *Journal of High Technology Management Research*, 23, pp.1-14.
- Nimako, S., Gyamfi, N., Wandaogou, A. (2013), "Customer Satisfaction with Internet Banking Service Quality in the Ghanaian Banking Industry", *International Journal of Scientific and Technology Resource*, Vol.2, No. 7, pp. 165-175.
- Nochai, R. and Nochai, T. (2013), "The Impact of internet banking service on customer Satisfaction in Thailand: A Case study in Bangkok", *International Journal of Humanities and Management Sciences*, Vol. 1, No. 1, pp.101-105.
- Patsiotis, A., Hughes, T. and Webber, D. (2013), "An examination of consumer resistance to computer based technologies", *Journal of Services Marketing*, vol.27/4, pp. 294-311.
- Pikkarainen, K., Pikkarainen, T., Karjaluoto, H., and Pahnala, S. (2006), "The measurement of end-user computing satisfaction of online banking services : empirical evidence from Finland ", *International Journal of Bank Marketing*, Vol. 24, No. 3, pp. 158-172.
- Poon, W. (2008), "Users adoption of e-banking services: the Malaysian perspective", *Journal of Business and Industrial Marketing*, Vol.23, No. 1, pp.59-69.
- Qeisi, K., Dennis, C., Alamanos, E. and Jayawardhena, C.,(2014) "Website design quality and usage behavior: Unified Theory of Acceptance and use of Technology", *Journal of Business Research*, Vol. 67 , pp 2282-2290.
- Radomir, L. and Nistor, C. (2012), "High-educated consumer perceptions of service quality: an assessment of the SSTQUAL Scale in the Romanian banking industry", *Procedia Economics and Finance* 3, pp 858-864.
- Raghu, P. R., Jayshree, S. (2017), "Customer Satisfaction Index Model for Indian Banking Industry: A Qualitative Study", *Asian Social Science*, Vol. 13, No. 1, pp. 114- 129.
- Santouridis I., Trivellas, P. and Reklitis, P. (2009), "Internet service quality and customer satisfaction: Examining internet banking in Greece", *Total Quality Management*, Vol.20 No.2, pp. 223-239.
- Santouridis, I. and Kyritsi, M. (2014), "Investigating the determinants of internet banking adoption in Greece", *Procedia Economics and Finance* 9, pp.501-510.
- Schreiber, J., Stage, F., King, J., Nora, A. and Barlow, E. (2006) "Reporting Structural Equation Modelling and Confirmatory Factor Analysis Results: A Review", *The Journal Of Educational Research*, Vol. 99, No. 6, pp. 323-337.
- Seth, N., and Deshmukh, S., (2005), "Service Quality Models: a review", *International Journal of Quality and Reliability Management*, Vol 22, No. 9, pp913-949.
- Sikdar , P., Kumar, A., and Makkad, M., (2015), "Online banking adoption : a factor validation and satisfaction causation study in the context of Indian banking customers ", *International Journal of Bank Marketing*, Vol. 33, No. 6, pp. 760-785.
- Sharma, G. and Lijuan, W. (2015), "The effects of online service quality of e-commerce websites on user satisfaction", *The Electronic Library*, Vol. 33, No. 3, pp. 468-485.
- Sunder, V., and Antony, J., (2015), " Six-sigma for improving Top-Box Customer Satisfaction score for a banking call centre ", *Production Planning and Control*, Vol. 26, No.16, pp. 1291-1305.
- Thaichon, P., Lobo, A., Prentice, C. and Quach, T. (2014), "The development of service quality dimensions for internet service providers: Retaining customers of different usage patterns", *Journal of Retailing and Consumer Services* <http://dx.doi.org/10.1016/j.jretconser.2014.06.006>.
- Ullman, J. (2006) "Structural Equation Modelling: Reviewing the Basics and Moving Forward", *Journal of Personality Assessment*, Vol. 87, No. 1, pp. 35-50.
- Yu, P., Balaji, M. and Khong, K. (2015), " Building Trust in internet banking : a trustworthiness perspective ", *Industrial Management and Data Systems*, Vol. 115 No. 2, pp. 235-252.