

TITLE OF THE PAPER:
**SUSTAINIBILITY OF E-BANKING TECHNOLOGIES IN THE
DUSK OF DEMONITISATION**

RESEARCH PAPER

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Abstract:

This study aims at identifying the factors affecting the sustainability of E-Banking Technologies in the dusk of Demonitisation. This article does not consider the factors of adoption but instead considers the factors affecting sustainability of these technologies in the long run. The survey has been conducted in the state of Goa from both North and South Districts via a structured online questionnaires developed over google forms. The sample size for the purpose of this study has been taken considered at 1296 respondents of Goa. Further data has been analysed using descriptive and multivariate statistical tools. Factor analysis have shown existence of two clear factor in the sustainability of E banking, further confirmatory factor analysis (CFA) is used to study sustainability related to ATM, mobile banking and Internet banking. Data has been analysed using SPSS and LISREL.

Keywords: E-Banking Technologies, Demonetization, Factor analysis.

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INTRODUCTION

8th November, 2016 a date that will be noted down in the history books for generations to come. The day best known for the announcement by Government of India for demonetisation of all the ₹500 and ₹1,000 banknotes then issued by RBI. Some of the main reason claimed was to curtail the black money thereby increasing and encouraging the use of various E-Banking technologies and the other reasons being to crack down the illicit use and counterfeit cash to fund various illegal activities and terrorism.

The markets in India BSE and NSE took a steep dip soon after the announcement. For days and months the citizens of the nations as well as tourist faced a severe cash crunch having damaging and ripple effects all across the economy. The GDP took a strun low with the economy moving at a snail pace. People seeking to exchange their old bank notes which had no longer any value had to stand in serpentine queues and underwent many hardships.

Days after the announcement there were several claims such as, digital transactions up by 100% since demonetization claimed by CEO of NPCI (National Payments Corporation of India) Mr. A.P. Hota. It was believed that the volume of people using digital banking services had shot up sharply post demonetization. A month into demonitisation, Law and IT Minister Ravi Shankar Prasad claimed that digital transactions rose between a range of 400 – 1000%.

Although there has been increase in E-Banking technology at a precipitous rate there are many questions yet unanswered.

- Are our banking system already prepared for the surge in usage of various E-Banking facilities?
- Do they have the technological upgrade to meet the needs of the online customers?
- Are are banks and their staff members ready to meet the challenge of this massive shift towards digitization?

This study looks to examine not the influencing factors on the adoption of E-Banking facilities but instead it looks to understand the factors that will lead to the sustainability of these E-Banking technologies for the future.

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LITERATURE REVIEW

- Singhal (2017), the author through her study verifies the awareness level of e-banking facilities post demonetization from respondents of both rural and urban areas. For this purpose an operation level scale in the form of a face to face interview was conducted from a sample of 100 out of which equal weightage was given to both rural as well as urban. Statistical tools such as chi-square, regression analysis was used to test the various hypotheses and a regression model was developed to test awareness level with demographic profile. Through the study it was observed that the awareness level of people living in rural areas differed significantly with those of urban areas. It was also observed that urban male youth had highest awareness and usage of e-banking facilities as compared to women.
- Chattopadhyay and Saralelimath (2012),The authors have attempted to study the relationship between demographic variable, awareness of ATM services offered, problems faced and preference to use a ATM card. Inorder to analyse and test the hypothesis data was collected from a sample size of 300 respondents who were bank customers from three different cooperative banks from the city of Pune. The authors used frequency tables, Percentages and chi square tests for data analysis and interpretation. The authors were of the opinion that banks should concentrate on educating and training the female customers as well as the older age group customers to use the ATM card. They also suggested that number of ATM's could be increased and special incentive schemes could be introduced to increase ATM usage.
- Olusanya and Fadiya (2015), The researcher through this paper seeks to measure customer satisfaction with regards to ATM services. In order to study the measure of satisfaction with this regard a questionnaire was designed with questions about the services which were again rated on a scale of 5 point of the Likert scale. The populations under study were bank customers that constituted mainly from the United of Africa within the area of Lagos. The sample size for the study was 200 respondents. The Pearson correlation and regression analysis were some of the methods used to establish a relationship and analyze the data. The author was of the opinion that ATM service should able to provide enhanced interactivity and provide a comfortable experience to the customer and secondly that banks should not only concentrate on providing short term satisfaction to ATM users but also look to retain their customers.
- Premlatha and Sharma (2012), The authors have studied the different factors that are affecting customers satisfaction for ATM services. The study is restricted to the area of Vellore district in Tamil Nadu. The sample size considered for the study was 200 bank customers. 5 different hypotheses were framed with respect to age, education, occupation and its association with ATM usage, operational problems faced and awareness of security measures. The authors adopted simple percentage and chi-

square analysis for the testing of formulated hypothesis. Some of the important findings were that with respect to the denominations, majority customer had agreed to the dispensing of those denominations as specified by them, Secondly customer strongly agreed to the need and requirement of ATM with the new age technology. Lastly customers felt safe and secured using the ATM card.

OBJECTIVES

- To explore the significant factors that lead to the sustainable use E-Banking technologies.

To explore the significant / influencing factors that lead to the sustainable use of E-banking technologies.

Influencing Factors	Associated with
<ul style="list-style-type: none">• Factors influencing prolong usage of the following:• Automated Teller Machines• Mobile Banking• Internet Banking	<ul style="list-style-type: none">• Usage of respective E-Banking Technology

- This objective looks to study the various factors which will help banks to develop and concentrate on those factors which will help in prolong and sustainable use of E-Banking Technologies.

DATA AND METHODOLOGY

Survey data

A survey has been carried out through a well-structured questionnaire which has been carried out online along with an offline questionnaires collected from respondents from various fields.

Sample Size

1. Formula by Yamane

Yamane formula for determining the sample size is given by:

$$n = N / (1 + Ne^2)$$

Where

n= corrected sample size, N = population size, and e = Margin of error (MoE), e = 0.05 based on the research condition.

$$892000$$

$$1 + 892000(0.05)^2$$

$$\frac{892000}{1 + 892000(0.00250000000000000005)}$$

$$\frac{892000}{1 + 2230.00000000000005}$$

$$\frac{892000}{2231.00000000000005}$$

$$n = 399.82070820259963$$

Sample Size = 400 Respondents

The data was collected through different forms

- a) Online questionnaire – sent to various respondents via. Whatsapp, e-mail

ANALYSIS

A) Testing of data for suitability for Factor analysis:

In order to run a factor analysis test firstly the data set was tested with Kaiser-Meyer Olkin and Bartlett's test (KMO and Bartlett's test) which suggested that data collected was suitable enough for factor analysis. The results were as follows:

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.887
Bartlett's Test of Sphericity	Approx. Chi-Square	9880.834
	df	66
	Sig.	0.000

A Principal component factor (PAF) with a Varimax (orthogonal) rotation of the 12 variables such as (Site launch, Customer care etc.) was conducted. The Kaiser-Meyer Olkin measure of sampling adequacy for the variables under study was found to be .887 . The ideal measure for this test is $KMO > .50$. The strength of the relationship among variables is studied with the help of Bartlett's test, Bartlett's test of sphericity is significant that is, its associated probability is less than 0.05, it indicates inter correlation matrix is factorable and it is come from a sample in which variables are non collinear. The following test suggested that data is suitable for factor analysis.

B) Data analysis – Exploratory Factor Analysis (EFA):

The Exploratory Factor Analysis (EFA) has been used in order to uncover the underlying structure of a relatively large set of variables. EFA is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables.

Table 2 : **Explained Variation in the data**

Total Variance Explained									
Comp onent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Varian ce	Cumulati ve %	Total	% of Varian ce	Cumulati ve %	Total	% of Varian ce	Cumulati ve %
1	6.724	56.031	56.031	6.724	56.031	56.031	4.523	37.692	37.692
2	1.439	11.991	68.023	1.439	11.991	68.023	3.640	30.331	68.023
3	.768	6.399	74.422						
4	.678	5.649	80.071						
5	.523	4.359	84.430						
6	.435	3.628	88.058						
7	.376	3.135	91.193						
8	.293	2.440	93.633						
9	.263	2.191	95.824						
10	.184	1.537	97.361						
11	.173	1.439	98.800						
12	.144	1.200	100.000						

The above table shows extractable factors from the analysis along with their eigen values along with percentage of variation explained by each factor individually. We observe that 56% total variation is explained by 1st factor, followed by second factor which has explained 12% of total variations. Altogether two factors have explained 68% of total variation in the given data. Again varimax rotated component matrix have brought more clarity in identifying factors.

Table 3 : **Factors**

	Component	
	1	2
Well informed / trained staff	.865	Service
Encouragement in E-Banking usage	.860	
Effective staff Guidance at initial stage	.855	
Reputed E-Banking services	.735	
Customer support	.732	
Prompt Response from respective tech.	.767	Performance
Availability of use	.761	
Site launches quickly	.720	
Accurate transactions	.702	
Attractive interface	.657	
Accessible machines	.600	
Resolves problems quickly	.586	

Factor analysis have suggested there is existence of two clear underlying factors namely Performance and Service. ATM, MB, IB has been analysed further with the help of above mentioned model using confirmatory factor analysis (CFA) which is a special form of factor analysis that is used to test whether measures of a construct are consistent.

C) Data analysis – Interpretation of CFA

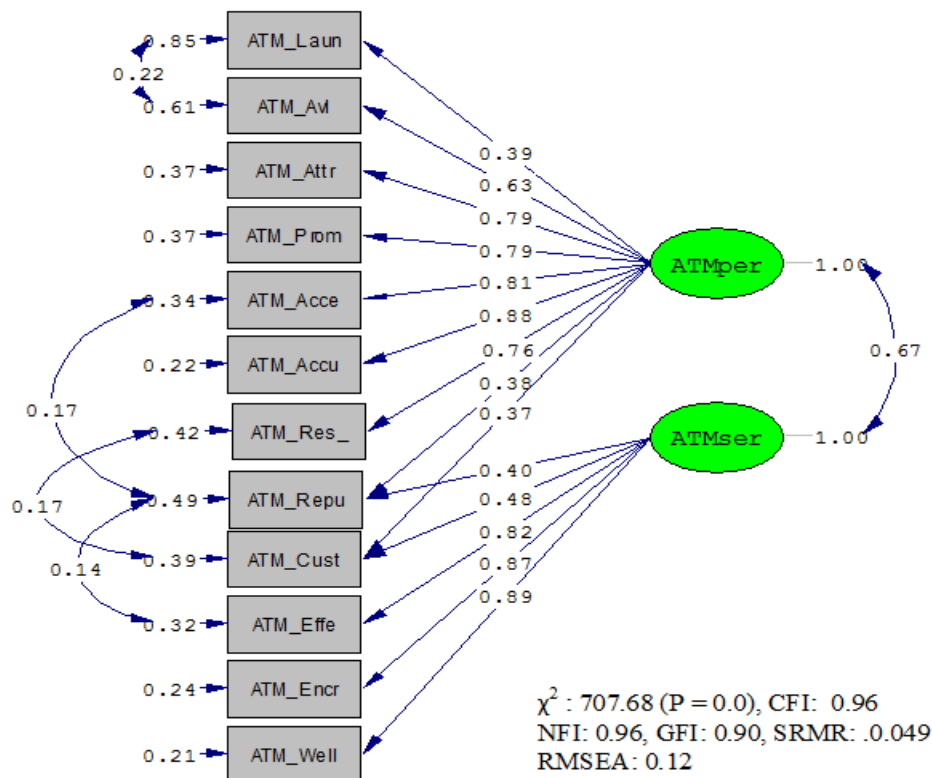
1. Interpretation of CFA for ATM

Table 4 : **Model summary for ATM**

Variables	Latent	Beta	SE	T	R-sqr
ATM_Laun	ATMper	0.45	0.036	12.5	0.15
ATM_Avl	ATMper	0.66	0.031	21.2903	0.39
ATM_Attr	ATMper	0.94	0.032	29.375	0.63
ATM_Prom	ATMper	0.81	0.027	30	0.63
ATM_Acce	ATMper	0.94	0.03	31.3333	0.66
ATM_Accu	ATMser	1.05	0.03	35	0.78
ATM_Repu	ATMper/	0.43	0.036	11.9444	0.51
ATM_Repu	ATMser	0.46	0.036	12.7778	
ATM_Res_	ATMper	0.9	0.032	28.125	0.58
ATM_Cust	ATMper	0.48	0.04	12	0.61
ATM_Cust	ATMser	0.63	0.036	17.5	
ATM_Effe	ATMser	1.02	0.033	30.9091	0.68

ATM_Encr	ATMser	1.11	0.032	34.6875	0.76
ATM_Well	ATMser	1.12	0.032	35	0.79
Error covarainces					
ATM_Avl and ATM_Laun		0.27	0.03	8.92	
ATM_Repu and ATM_Acce		0.22	0.019	11.32	
TM_Cust and ATM_Res_		0.27	0.024	11.17	
ATM_Effe and ATM_Repu		0.2	0.02	9.97	

Diagram for ATM



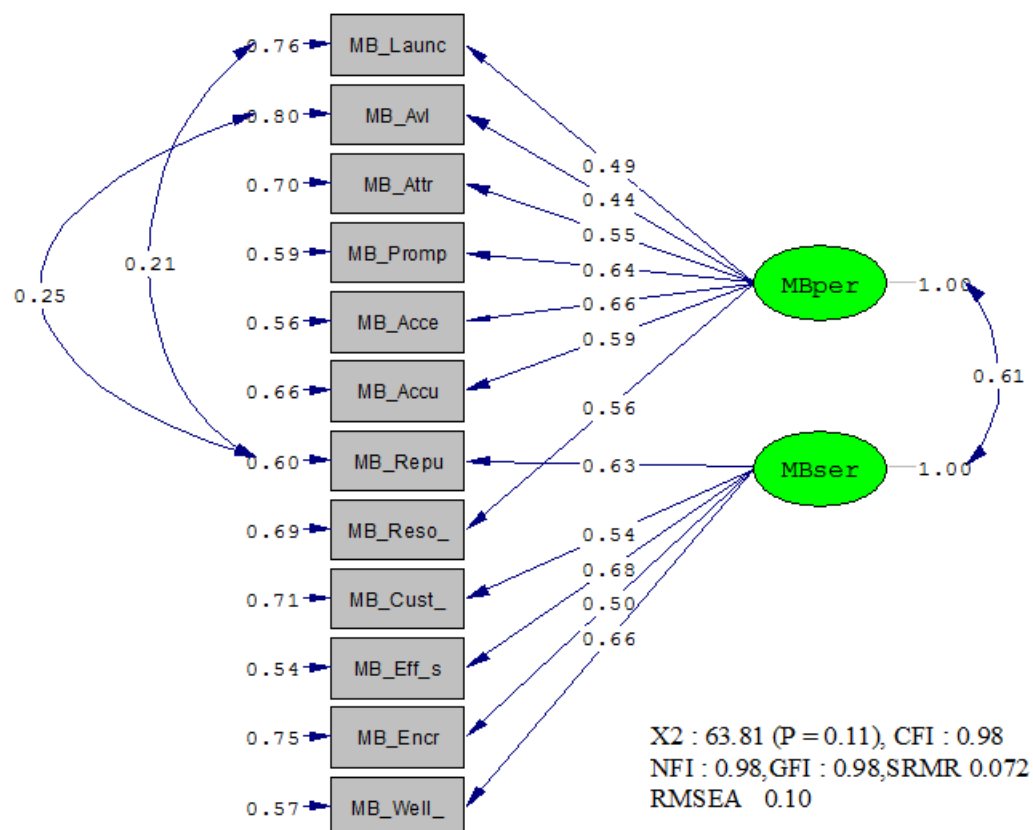
The above model shows that the two hidden variables are confirmed from above data related to sustainability of ATM, χ^2 : 707.68(P = 0.0000), CFI : 0.96, NFI : 0.96, GFI : 0.90, SRMR 0.0433 and RMSEA 0.12 leads to a stable fit of the model. Two latent variables are observed in the data (ATMper and ATMser : Performance and Service namely). We also noted that variables like ATM_Repu and ATM_Cust are found to be loading on both the latent variables. Above analysis showed that variables like ATM_Attr, ATM_Avl, ATM_Accu, ATM_Acce are highly correlated with ATMper similarly ATM_Eff, ATM_Encr and ATM_Well have shown high degree correlation on ATMser.

2. Interpretation of CFA for Mobile Banking

Table 5 : Model summary for Mobile Banking

Variable	Latent	Beta	SE	T	R-sqr
MB_Laun	MBper	0.55	0.11	5.00	0.24
MB_Avl	MBper	0.31	0.07	4.43	0.2
MB_Attr	MBper	0.51	0.092	5.54	0.3
MB_Prom	MBper	0.68	0.1	6.80	0.41
MB_Acce	MBper	0.73	0.1	7.30	0.44
MB_Accu	MBper	0.83	0.14	5.93	0.34
MB_Res_	MBper	0.68	0.12	5.67	0.31
MB_Repu	MBser	0.6	0.089	6.74	0.4
MB_Cust	MBser	0.91	0.17	5.35	0.29
MB_Effe	MBser	1.17	0.17	6.88	0.46
MB_Encr	MBser	0.46	0.094	4.89	0.25
MB_Well	MBser	0.72	0.11	6.55	0.43
Error Covariance					
MB_Repu and MB_Launc		0.23	0.076	3.03	
B_Repu and MB_Avl		0.17	0.05	3.40	

Diagram for Mobile Banking



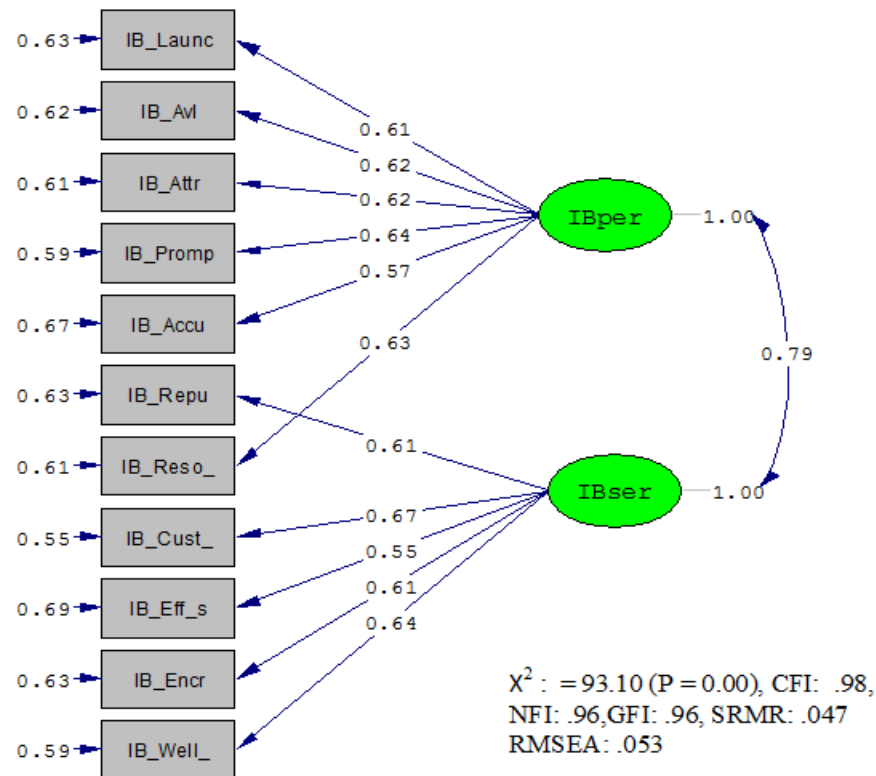
The above model shows that, two hidden variables are confirmed from above data related to sustainability of Mobile Banking, χ^2 : 63.81 (P = 0.11), CFI : .98 , NFI : 0.98 ,GFI : 0.98, SRMR 0.072 and RMSEA 0.10 leads to stable fit of the model. Two latent variables are observed in the data (MBper and MBser : Performance and Service namely). The standardized loadings represent the correlation between each observed variable and the corresponding factor. Considering first the indicators of MBper, they are MB_Laun .49, MB_Avl .44, MB_Attr .55, MB_Prom .64, MB_Acce.66, MB_Accu.59, MB_Res_ .56 . Considering the indicators of MBser , the standardized loadings are .63 for MB_Repu, MB_Cust .54, MB_Effe .68 , MB_Encr .50 and MB_Well .66 .

3. Interpretation of CFA for Internet Banking

Table 6 : Model summary for Internet Banking

Variable	Latent	Estimate	SE	T -stat	R-sqr
IB_Laun	IBper	0.93	0.074	12.57	0.37
IB_Avl	IBper	0.85	0.066	12.88	0.38
IB_Attr	IBper	0.93	0.072	12.92	0.39
IB_Prom	IBper	0.99	0.074	13.38	0.41
IB_Accu	IBper	1.03	0.088	11.70	0.33
IB_Repu	IBper	0.98	0.079	12.41	0.37
IB_Res_	IBper	1.04	0.08	13.00	0.39
IB_Cust	IBser	1.11	0.079	14.05	0.45
IB_Effe	IBser	1.07	0.097	11.03	0.31
IB_Encr	IBser	1.01	0.082	12.32	0.37
IB_Well	IBser	1.2	0.091	13.19	0.41

Diagram for Internet Banking



The above model shows that, two hidden variables are confirmed from the above data related to sustainability of Internet Banking, $\chi^2 : 93.10.42$ ($P = 0.00$), CFI : 0.98, NFI : 0.96 ,GFI : 0.96, SRMR 0.047 and RMSEA : 0.047 leads to stable fit of the model. Two latent variables are observed in the data (IBper and IBser : Performance and Service namely). The standardized loadings represent the correlation between each observed variable and the corresponding factor. Considering first the indicators of IBper , they are IB_Laun .61, IB_Avl .62, IB_Attr .62, IB_Prom .64, IB_Accu .57, IB_Res_ .63 . Considering the indicators of IBser , the standardized loadings are .61 for IB_Repu, IB_Cust .67, IB_Effe.55, IB_Encr .61 and IB_Well .64 .

CONCLUSION

In the preceding section of this report we have interpreted the Conformatory Factory Analysis conducted on 3 types of Internet Banking Technologies namely Automated Teller Machines, Mobile Banking and Internet Banking. With the help of the Exploratory Factor Analysis it is clear that there are mainly two latent variables present that is service and performance as service plays a more vital role with regards to performance.

- With respect to sustainability of ATM usage in the long run most importantly under the service variable Well informed and trained staff about updates, facilities and securities measures to use a ATM card, Encouragement by staff to use an ATM and

Effective and clear guidance during the initial stage of adopting a ATM card are factors that were found to be playing a major role for sustainable usage while under the performance variable Accuracy of a transaction while using a ATM Card and Accesibility of machines to carry out a transaction, Prompt response in the form of text or e-mail when a transaction on a ATM is carried out along with a Attractive and user friendly interface at the ATM were the key factors which mattered the most.

- While with regards to Mobile Banking under the service variable factors such as Effective guidance by staff with regards to installation and use of various facilities on the Mobile Banking application, Well informed staff about the new services offered, updates and handling of griviences as well as reputation and feedback from other bank customers played a mojour role for long term sustainability of mobile banking as compared to the performance variable Accesibility of Mobile Banking application i.e. application should not be always under maintenance or server busy and Prompt responses in the form of text or email while carrying out a transaction over the mobile banking application were factors found to be most important with respect to the sustainability of mobile banking.
- Under Internet Banking factors such as Customer support from the back end office and availability of customer support or tollfree number along with Well informed staff about the new services offered, updates and handling of various internet banking griviences under the service variable played a major role. While with regards to performance variable a major influence was Prompt responses in the form of text or email while carrying out a transaction over the internet banking, Resolving of complaints quickly by respective banks online banking, Launching of the site quickly with respect to the time taken to load the site and again availability of Internet Banking site anytime i.e. the site should not always be under maintenance.

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