RESEARCH PAPER

E-BANKING IN INDIA: RECENT TRENDS AND PROGRESS AT THE AGGREGATIVE LEVEL

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ABSTRACT

The concept of banking system in India is too old because the book of Manu contains some concepts about deposits, loan, rate of interest, pledged etc. However, the modern banking system in India has its inception from pre-independence period but it gets rapid pace after independence. It is undeniable that with constant encouragement from the part of the government, Indian banking system after economic liberalization gladly accepts technology which is the demand of modern era. E-banking is a technique where the banking operations are carried through the use of Internet and communication technology (ICT). E-banking allows customers to access banking services through ICT facilities which focus on the customers' operational needs through optimizing their time and resources. E-banking makes it possible to provide the banking services to customer at their office or home. Against this backdrop, our study is basically a modest attempt to explore the trends in trasactions of fund using modern technology, such as RTGS, NEFT, ECS, on-site and off-site ATMs etc., over last six years (July,2011 to June,2017) semiannually both in value and volume terms in India where a vast section of population yet not get the fruits of banking system. generation technology. This study is an empirical and aggregative level study based on secondary data. Data are taken from the online database of RBI. In this study we compute annual compound growth rate of various items of e-banking in India and variability in those components over the period of our study. So far as methodology is concerned we have used various statistical tools like annual compound growth rate, average monthly growth rate, coefficient of variations, and charts and diagrams. Tabular presentation of data is also their coupled with diagrams where necessary.

Keywords: E-banking, NEFT, ECS, RTGS, Annual Compound Growth Rate (ACGR), Coefficient of Variation (CV).

1. INTRODUCTION

The concept of banking system in India is too old because the book of Manu contains some concepts about deposits, loan, rate of interest, pledged etc. However, the modern banking system in India has its inception from pre-independence period but it gets rapid pace after independence. In India the origin of modern banking system was present in the capital city of India i.e. in Calcutta in the year 1786. As per the Indian banking history during the 1st half of the 19th century three presidency banks were founded. In 1935 these presidency banks were merged to form Imperial Bank of India. In the year 1947 there were altogether 600 commercial banks were operating in India. But, after independence for ensuring larger coverage of banking needs Government of India nationalized the Imperial Bank and renamed it as SBI w.e.f 1955. To take cushion against bank failure and safe guard the interest of the depositors a remarkable decision has been undertaken in Jul, 1969. By this legislation Govt. has nationalized all 14 commercial banks whose deposits were greater than Rs. 500 million. Today, thanks to technological development because it supports quickly payment, access of banking system from home,

payment of many charges and transfer of funds and withdraw of fund. It actually reduces the pressure of banking operations because many customers are now able to withdraw or deposit money without going to bank premises. India, a second largest country in terms of population, is now enjoying the benefits of such technological progress in banking sector subject to some problems related to security that inherent in it. It is undeniable that with constant encouragement from the part of the government, Indian banking system after economic liberalization gladly accepts technology which is the demand of modern era.

E-banking is a technique where the banking operations are carried through the use of Internet and communication technology (ICT). E-banking allows customers to access banking services through ICT facilities which focus on the customers' operational needs. These non-conventional banking facilities give the opportunity to use "electronic currency" and offer advantages which allows customers as well as banks to optimize their time and resources. E-banking makes it possible to provide the banking services to customer at their office or home. Introduction of e-

banking has several benefits. As for example it reduces the transaction cost; customer gets twenty four hours banking services with greater accessibility of information, it reduces the risk problems associated with cash handling and provides traders with a wider range of opportunity in the area of various transactions, it provides assurance of quick payments so on and so forth. Moreover, banks are also enjoying numerous benefits as for example cost of infrastructure becomes lower and it helps in enhancement of profits. As we all know every coin has two sides, therefore e-banking also has got some serious drawbacks. Basic problem is security oriented i.e. mainly the fear of attack from internet criminals. They can attack bank's server or client's personal computers. There exist few studies which throw light on customer satisfaction after launching of e-banking, on the other hand, some studies measure popularity of E-banking, again some have concentrated on customers awareness regarding e-banking. Mols, (1999) and Raghavan, (2006), they found that operational cost becomes lower and customer satisfaction becomes higher. On the other hand, Hassan, (2002), Filotto et. al, (1997) and Agarwal et. Al. they found that introduction of e-banking plays a significant role in retaining customer and ATM facility becomes popular among young generation. Again there exist some studies which focus on the customer's awareness relating to e-banking like Uppal and Chawla, (2009) and Sharma, (2011). Their study reflects that e-banking helps in improving the relationship between bankers and customer. Moreover, Uppal and Chawla in their region specific study have observed that customers' are facing some problems like existence of poor network etc.

Against this backdrop we, our study is a modest attempt to capture the trends in nature and progress of e-banking in India over the period from July 2011 to June 2017. This paper is structured as follows: section 2 describes data and methodology; section 3 depicts analysis and findings, where we discuses about the annual compound growth rates of the various components of e-banking over the period of our study; the trends in transactions through NEFT, RTGS, ECS (both debit and credit) and transfer of funds through debit cards and credit cards. Section 4 describes ATM and Mobile banking which includes the trends in the number of on-site and off-site ATMs in India at the aggregative level and analyses of trends in mobile banking and also measure the inter-temporal change in the installation of ATMs. Finally, section 5 represents our concluding observations.

2.   DATA & METHODOLOGY
This study is an empirical and aggregative level study based on secondary data. Data are taken from the online database of RBI. We, in our study, try to make an attempt to capture the trends in various components of electronic banking in India during post-reform period. Our study

hovers around 2011 to 2017 and for this purpose we have taken trends in RTGS, NEFT and ECS etc. Apart from these we have also considered trends in number of on-site and off-site ATMs and also change in the number of debit as well as credit cards coupled with transfer of fund through debit and credit cards over the period of our study. This study also has made an attempt to capture the trends in the mobile banking in India during the same period.

In this study we compute annual compound growth rate of various items of e-banking in India and variability in those components over the period of our study. We, in our study also have made a modest attempt to capture the monthly average change in those said components of e-banking components in India by first computing semi-annual change and after that averaging it. So far as methodology is concerned we have used various statistical tools like annual compound growth rate, average monthly growth rate, coefficient of variations, and charts and diagrams. Tabular presentation of data is also their coupled with diagrams where necessary.

3.   ANALYSIS AND FINDINGS
We, in our study as already have been mentioned, is trying to capture the trends and progress of e-banking in India over the period of July. 2011 to June 2017. We, in this respect have computed the annual compound growth rate (ACGR) of the several items included in e-banking system. In case of NEFT in volume terms the ACGR is found to be 39.95%, where as in value terms the picture is almost same and it is found to be 39.44% over the period of our study. Again, in\case of RTGS in volume terms we find a negative annual compound growth rate of 0.61087% for interbank transaction and 11.8821% ACGR for transactions by customer. On the other hand, the RTGS in value terms for both interbank and customer transaction are a little bit high than volume terms (-3.05602% and 13.45752% respectively. Moreover, the ACGR for ECS in volume terms for credit and debit transactions are found to be 34.96327% and 43.78700% respectively. ACGR for ECS in value terms for both credit and debit are 36.23924% and 46.98702% respectively. Again, the annual compound growth rate for transactions through credit cards in terms of volume is slightly higher than in value terms (18.41546% and 13.72039% respectively). On the other hand, ACGR for the transactions through debit cards in volume terms and value terms are found to be almost similar (8.0877% and 8.277% respectively for volume and value terms). Moreover, the ACGR for number of on-site and off-site ATMs are found to be 15.34912% and 14.60572% respectively. Interestingly, the annual compound growth rate for mobile banking transactions are quite high than the other components of e-banking items. The ACGR for mobile transactions in terms of volume is 81.84075% and in terms of value it is found to be 199.1139% (see fig: I and appendix table: 1)

Figure-I : Component-wise ACGR of different E-banking items
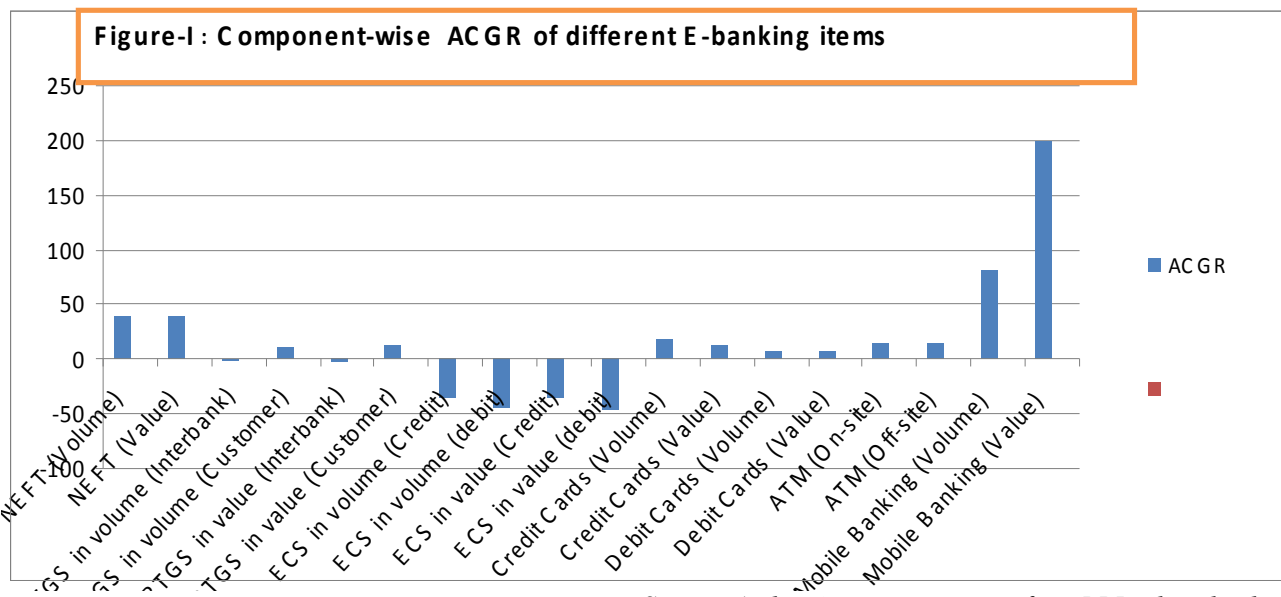
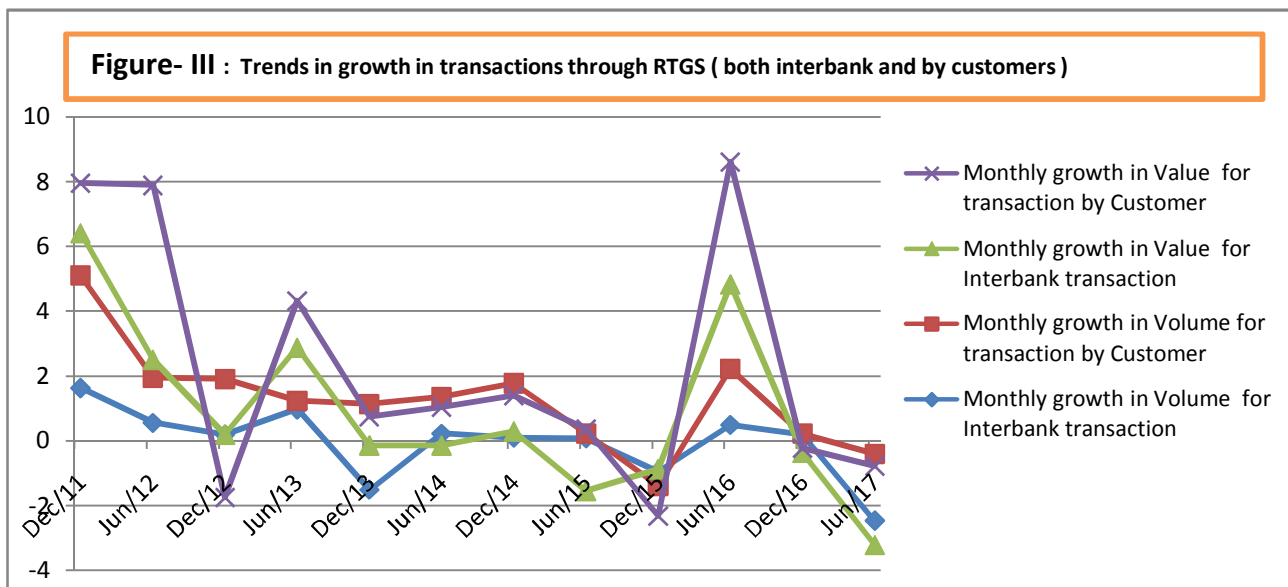*Source: Authors' own computation from RBI online database*

In this part we are trying to portray the status and trends in the various components of transferring of fund that are included in the common umbrella named e-banking system. One of the popular methods of transferring of fund is NEFT. NEFT (National electronic fund transfer) was introduced in October 2005. It is a nation-wide electronic payment system facilitating one-to-one fund transfer from one back branch to another bank branch. We have found that monthly average growth of NEFT in terms of volume is highest in Dec. 2016 and it is found to be 7.65282%. Monthly average growth hovers around -1.39953% to 6.765282 % (see fig: II and also appendix table: 2). On the other hand, in value terms we found almost same picture over the period of our study. In the year Dec. 2016 in value terms the average monthly growth in NEFT is found to be highest. In this case the average monthly growth rate hovers around 1.256725% in Jun. 2016 to 5.146968 % in Dec. 2016. Moreover, the variability which is measured in terms of CV reflects that transaction in value terms has less variability than the transaction through volume terms.

Figure- II : Trends in monthly growth in NEFT (both in volume and value)
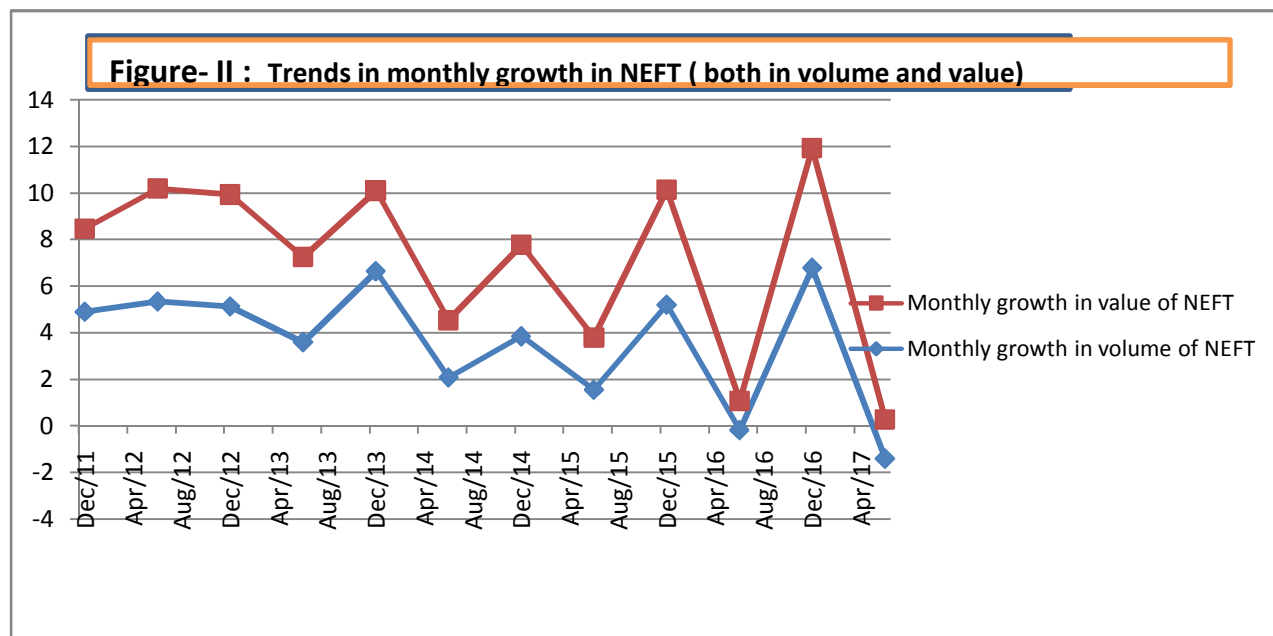
Source: Authors' own computation from RBI online database

The another popular component of e-banking is RTGS. RTGS (Real time gross settlement system) is a popular mechanism refers to continuous settlement of fund transfers. This mechanism is based on 'real-time' and on 'gross' basis. The monthly average growth rate of RTGS for interbank transaction in terms of volume is highest in Dec, 2011; interestingly the monthly average growth rate for the same in terms of value is highest in June, 2016. On the other hand, monthly average growth rate of RTGS for transaction by customer in terms of volume is highest in Dec, 2013 and in terms of value it is highest in June, 2012. Moreover, the CV of interbank transfer is severely high in case of both volume

terms and in value terms over the period of our study. However, in terms of volume and value we find comparatively low levels of variability in case of transactions by customer than that of the inter-bank transfer (See fig: III and also appendix table : 3).

Figure- III : Trends in growth in transactions through RTGS (both interbank and by customers)

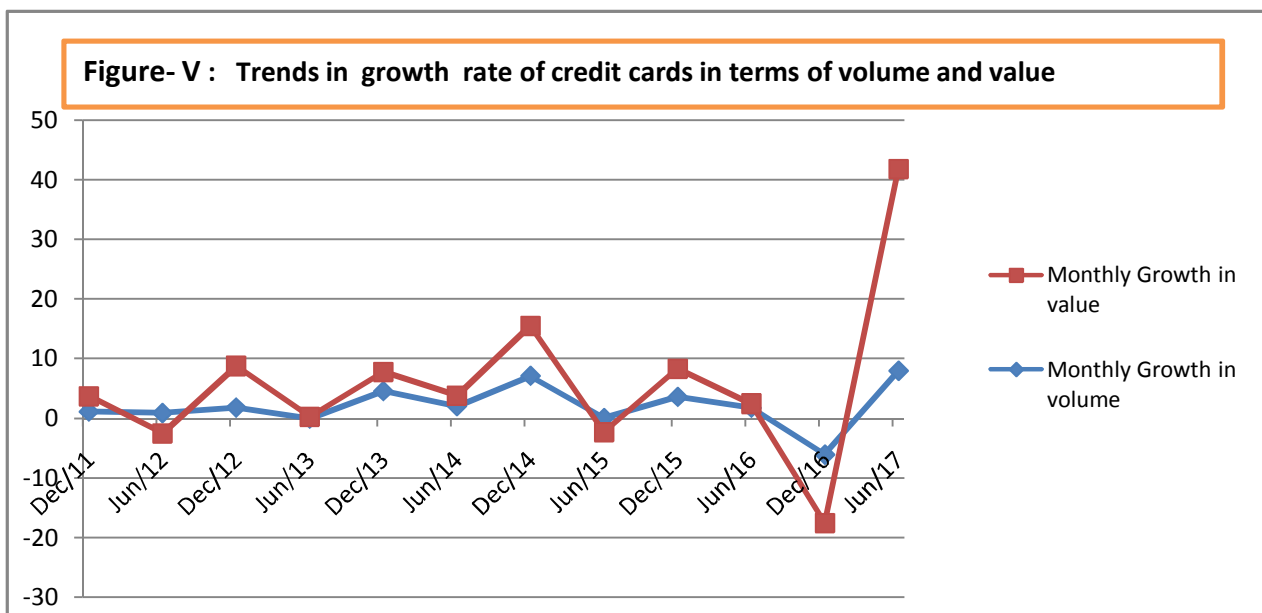*Source: Authors' own computation from RBI online database*

On the other hand we can define ECS (electronic clearing service) as an electronic mode of fund transfer from one bank account to another bank account. For payment purpose, ECS (credit) is used and for receipt purpose, ECS (Debit) is used. In our study, we find that the monthly average growth rate for ECS (Credit) in both volume and value terms are highest in June, 2013 being the value of 13.61807% and 11.06271% respectively. On the other hand, the monthly average growth rate for ECS (Debit) in terms of volume is highest in Dec, 2015 (9.5847%) and in terms of value it is found to be highest in June, 2014 (3.4193%). Again, the variability measured in terms of CV of ECS (Credit) in both volume and value terms are found to be 364.302% and 582.753% respectively. On the other hand, the CV of ECS (Debit) for both volume and value are found to be 421.82% and 417.027% respectively and in all the cases we find negative variability (see fig: IV and appendix table: 4)

Figure- IV : Trends in growth rate of ECS (Credit) and ECS (Debit) in terms of volume and value
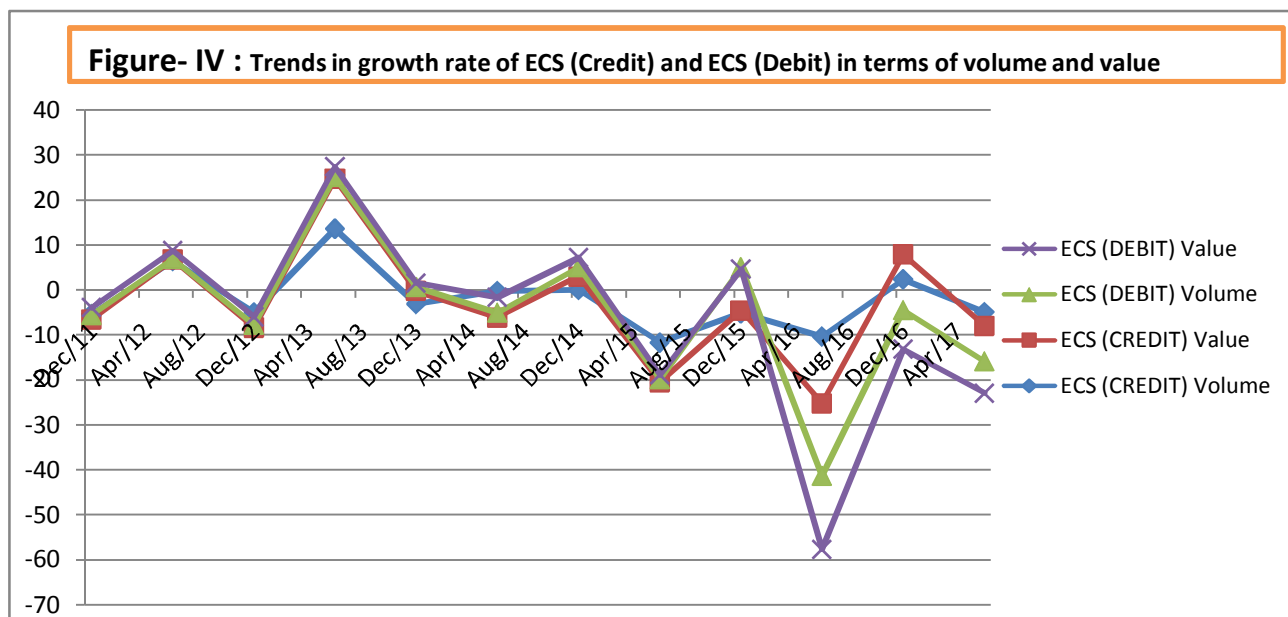
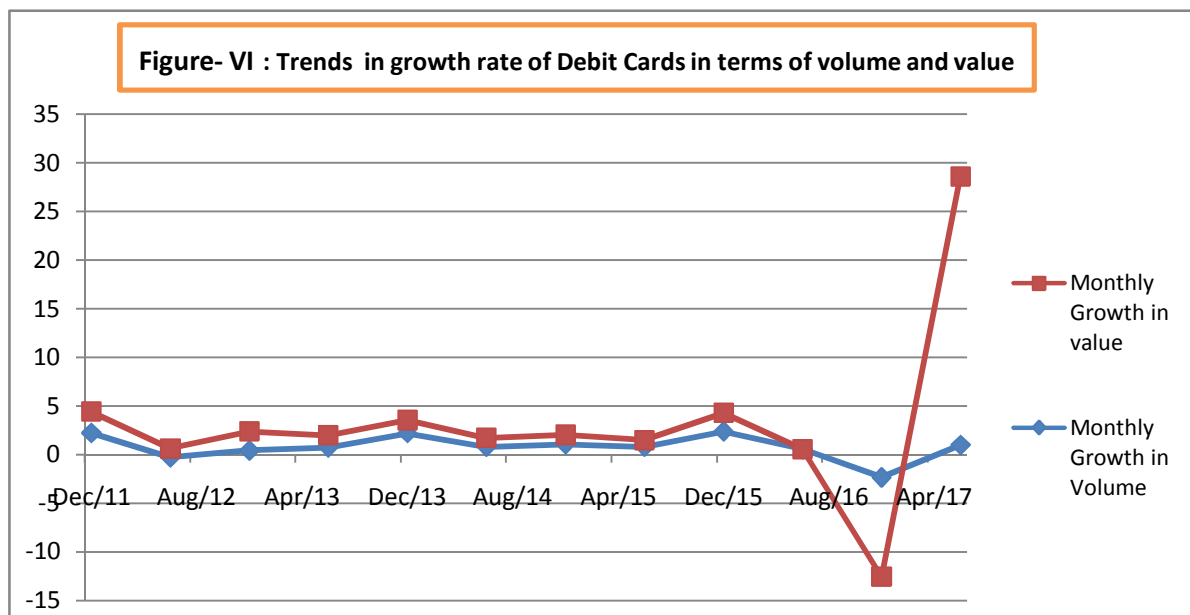*Source: Authors' own computation from RBI online database*

Credit card provides an opportunity to buy something without immediate cash payment. The monthly average growth rate of Credit card in terms of volume and value touches its peak in June, 2017 which are found to be 7.9377% and 33.8687% respectively (See fig: V and also appendix table : 5). The monthly average growth rate in terms of volume and

value hovers around -6.065% to 7.9377% and -11.5272% to 33.8687% respectively. The CV of credit card transaction is 176.045% and 289.025% in terms of volume and value respectively.

Figure- V : Trends in growth rate of credit cards in terms of volume and value

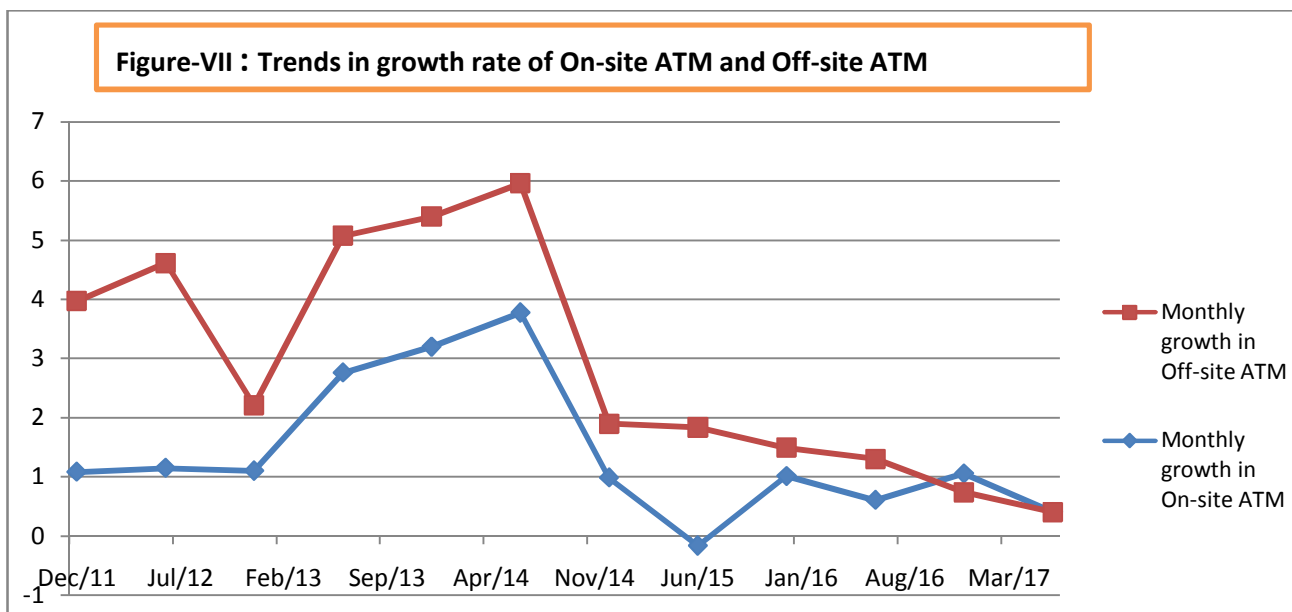*Source: Authors' own computation from RBI online database*

We all know that debit card is used for withdrawing of cash from savings account. The monthly average growth rate for Debit cards in terms of volume is found to be highest in Dec, 2015 (2.38912%) and it hovers around -2.31514% to 2.38912%. Again, in terms of value it is highest in June, 2017 (27.6211%) and hovers around -10.2453% to 27.6211%. Moreover, the CV of transactions through Debit card in volume and value terms is found to be 158.045% and 3490812% respectively (see fig: VI and appendix table: 6)

Figure- VI : Trends in growth rate of Debit Cards in terms of volume and value

Source: Authors' own computation from RBI online database

4.   ATM AND MOBILE BANKING

It is well known that ATM brings a revolution in delivery channel. The average monthly growth in number of on-site ATMs is highest in June, 2014 (3.7743%) and that of off-site ATMs in June, 2012 (3.4612%). Moreover, the CV of on-site and off-site ATMs are found to be 83.9092% and 79.1474% respectively (see fig: VII and appendix table: 7)

Figure-VII : Trends in growth rate of On-site ATM and Off-site ATM

Source: Authors' own computation from RBI online database

We all know that mobile banking is an integral part of internet banking. Now, people use cellular devices to perform banking transactions. Form our study it is evident that the monthly average growth rate in mobile banking in terms of volume is highest in Dec, 2011 (14.9353%) followed by Dec, 2015 (13.4257%). On the other hand, average monthly growth rate of mobile banking in terms of value is highest in Dec, 2014 (30.6874%) followed by Dec, 2015 (23.6048%). Moreover, the CV of mobile banking transaction both in volume and value terms are found to be 56.7350% and 48.5579% respectively (see fig: VIII and appendix table: 8)

Figure-VIII : Trends in growth rate of Mobile Banking in terms of volume and value
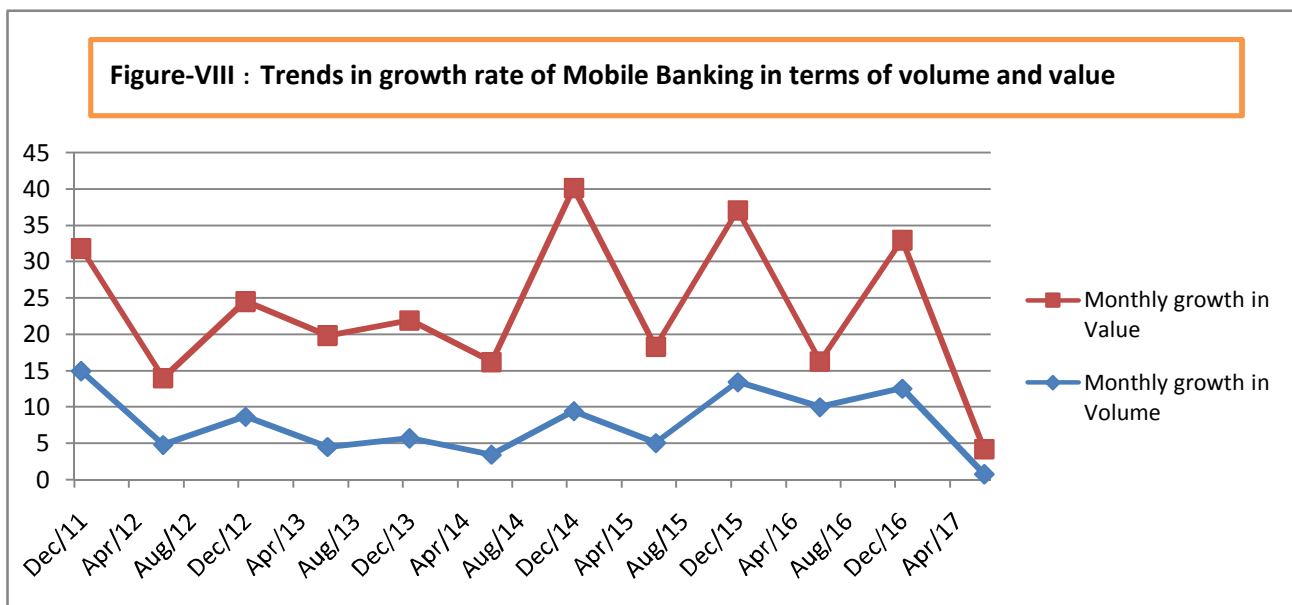
Source: Authors' own computation from RBI online database

5.   CONCLUSION

Our study is basically a modest attempt to explore the trends in trasactions of fund using modern technology over last six years semiannually both in value and volume terms in India where a vast section of population yet not get the fruits of banking system. For this purpose we have selected several items that are being used for transferring of fund through using new generation technology. However, from our study the following conclusions have emerged:

First, Mobile banking both in value and volume terms registered significant growth over the period of our study followed by NEFT both in volume and value terms. On the other hand, incase of transferring of fund through ECS have shown negative annual compound growth over the period of our study.

Second, incase of average monthly growth in NEFT the variability in case of volume is much larger than that of

variability in the growth of NEFT in value terms.

Third, incase of RTGS the picture is quite surprising as it depicts significantly larger variability for monthly growth in volume for interbank transaction. The picture remains unchanged when value is come under consideration. However, monthly growth in volume for transaction by customer the variability is much lower than the previous one. However, in value terms it shows relatively higher variability over the period of our study.

Fourth, like previous items of e-banking system ECS (Credit) have registered negative monthly growth for few period and positive for other periods both in volume and value terms and with larger variability over the period of our study which is measured in terms of CV. The same situation persist incase of growth in ECS (Debit).

Fifth, trends in the growthg of Credit cards and volume of fund transferred have shown larger variability with negative monthly growth rate for few periods considered for the purpose of our study. On the other hand, incase of Debit cards we find that barring December, 2016 and June, 2012 (incase of volume) the average monthly growth has shown positive sign with higher variability both in valome and value. However, the component 'value' has larger variability over the component 'volume' during the period of our study.

Finally, incase of ATM, both on-site and off-site the variability also much higher in both cases over the period of our study and incase of mobile banking we find that its average monthly growth both incase of volume and value is positive through out the period of our study and also the growth rate in both the cases has shown wide fluctuations like other components of e-banking in India oner the period of our study.

6. REFERENCES

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Appendix Table 1

Component wise ACGR of different E-banking items

ITEM	ACGR
NEFT (Volume)	39.95140287
NEFT (Value)	39.44360832
RTGS in volume (Inter bank)	-0.610870952
RTGS in volume (Customer)	11.88210311
RTGS in value (Inter bank)	-3.056018399
RTGS in value (Customer)	13.45752308
ECS in volume (Credit)	-34.96327
ECS in volume (debit)	-43.78700
ECS in value (Credit)	-36.23924
ECS in value (debit)	-46.98702
Credit Cards (Volume)	18.41545516
Credit Cards (Value)	13.72039126
Debit Cards (Volume)	8.087741547
Debit Cards (Value)	8.277660509
ATM (On-site)	15.34911631
ATM (Off-site)	14.60571615
Mobile Banking (Volume)	81.84074776
Mobile Banking (Value)	199.1139484

Source: RBI online Database

Appendix Table 2

Trends in monthly growth in NEFT
(both in volume and value)

	Monthly growth in volume of NEFT	Monthly growth in value of NEFT
Dec-11	4.882894	3.579681
Jun-12	5.323497	4.852159
Dec-12	5.114414	4.809496
Jun-13	3.589167	3.65733
Dec-13	6.624694	3.464485
Jun-14	2.070793	2.461174
Dec-14	3.838541	3.931829
Jun-15	1.544682	2.246448
Dec-15	5.18565	4.934791
Jun-16	-0.18337	1.256725
Dec-16	6.765282	5.146968
Jun-17	-1.39953	1.670713
SD	2.602774	1.33356
MEAN	3.613059	3.500983
CV	**72.03794**	**38.091**

Source: RBI online Database

Appendix Table 3

Trends in growth in transactions through RTGS (both inter bank and by customers)

	Monthly growth in Volume		Monthly growth in Value	
	For Interbank transaction	For transaction by Customer	For Interbank transaction	For transaction by Customer
Dec-11	1.631789933	3.46020617	1.319735699	1.538746886
Jun-12	0.560278717	1.383520671	0.561331422	5.381729056
Dec-12	0.19188582	1.709407715	-1.708554366	-1.937235721
Jun-13	0.972248672	0.26102446	1.641918328	1.43898291
Dec-13	-1.512186064	2.646700089	-1.2756167	0.894789475
Jun-14	0.223518058	1.129879901	-1.494258062	1.184516868
Dec-14	0.103792992	1.666931702	-1.476192055	1.102216129
Jun-15	0.072843474	0.145299127	-1.765702002	1.910536091
Dec-15	-0.951667536	-0.442850042	0.521731818	-1.443526838
Jun-16	0.492484534	1.724036756	2.610394736	3.778730565
Dec-16	0.201001417	0.014658098	-0.588226928	0.156979806
Jun-17	-2.466345161	2.052241273	-2.797213245	2.436496778
Mean	-0.040029595	1.312587993	-0.370887613	1.370246834
SD	1.110435138	1.15461402	1.663369716	2.000360823
CV	**2774.03539**	**87.96469464**	**448.4834916**	**145.9854366**

Source: RBI online Database

Appendix Table 4

Trends in growth rate of ECS (Credit) and ECS (Debit) in terms of volume and value

	ECS (CREDIT)		ECS (DEBIT)	
	Volume	Value	Volume	Value
Dec-11	-5.34114	-1.21746	1.0004	1.64223
Jun-12	6.445251	0.310804	0.181515	1.814986
Dec-12	-4.96943	-3.40895	0.657891	1.778518
Jun-13	13.61807	11.06271	0.39992	2.332249
Dec-13	-3.07285	2.834876	0.86033	0.948162
Jun-14	-0.18345	-5.98081	1.095996	3.419274

	ECS (CREDIT)		ECS (DEBIT)	
	Volume	**Value**	**Volume**	**Value**
Dec-14	0.007544	2.968369	2.07179	2.115659
Jun-15	-11.661	-8.80742	0.593257	1.045933
Dec-15	-5.161	0.606824	9.584703	-0.3868
Jun-16	-10.3282	-14.8745	-16.1409	-16.3152
Dec-16	2.39143	5.530728	-12.4158	-8.67847
Jun-17	-4.91189	-3.05909	-7.88864	-7.04789
Mean	-1.93055	-1.16949	-1.66663	-1.44428
SD	7.033031	6.815258	7.030187	6.023037
CV	**364.302**	**582.753**	**421.82**	**417.027**

Source: RBI online Database

Appendix Table 5

Trends in growth in credit cards in terms of volume and value

	Monthly Growth in volume	**Monthly Growth in value**
Dec-11	1.127009413	2.571197456
Jun-12	0.90053428	-3.42536777
Dec-12	1.802775719	6.969855202
Jun-13	-0.027639965	0.225612969
Dec-13	4.555529188	3.189943028
Jun-14	2.020381042	1.739101407
Dec-14	7.127057898	8.407790452
Jun-15	0.048550486	-2.424579236
Dec-15	3.596034369	4.726718536
Jun-16	1.777464891	0.655817708
Dec-16	-6.065745826	-11.52725075
Jun-17	7.937772481	33.86877058
Mean	2.066643665	3.748134132
SD	3.638232965	10.83305002
CV	**176.04549**	**289.0251426**

Source: RBI online Database

Appendix Table 6

Trends in growth in Debit Cards in terms of volume and value

	Monthly Growth in Volume	**Monthly Growth in value**
Dec-11	2.230397545	2.182135659
Jun-12	-0.264581694	0.89551786
Dec-12	0.436240587	1.955419369
Jun-13	0.728031997	1.25819282
Dec-13	2.214667577	1.333669911
Jun-14	0.800025019	0.920401853
Dec-14	1.056927716	0.974634541
Jun-15	0.801184646	0.693920156
Dec-15	2.381921967	1.921639961
Jun-16	0.568981965	-0.001054606
Dec-16	-2.315149059	-10.24532884
Jun-17	0.987092699	27.62116876
Mean	0.80214508	2.459193121
SD	1.267750972	8.602560365
CV	**158.0450972**	**349.8123142**

Source: RBI online Database

Appendix Table 7

Trends in growth rate of On-site ATM and Off-site ATM

	Monthly growth in On-site ATM	**Monthly growth in Off-site ATM**
Dec-11	1.082806044	2.883784462
Jun-12	1.150009203	3.461264259
Dec-12	1.102295502	1.103589865
Jun-13	2.761950904	2.310645209
Dec-13	3.197231412	2.196252593
Jun-14	3.774352536	2.182329409
Dec-14	0.984551227	0.912172287
Jun-15	-0.164484871	1.999615805
Dec-15	1.011026753	0.480789846
Jun-16	0.60553073	0.697056525
Dec-16	1.054473454	-0.314534599
Jun-17	0.406311674	-0.001698912
Mean	1.413837881	1.492605562
SD	1.186340278	1.181358575
CV	**83.90921574**	**79.14740537**

Source: RBI online Database

Appendix Table 8

Trends in growth rate of Mobile Banking in terms of volume and value

	Monthly growth in Volume	**Monthly growth in Value**
Dec-11	14.93533542	16.84472381
Jun-12	4.784306589	9.152720015
Dec-12	8.650444147	15.83618027
Jun-13	4.504705701	15.31343884
Dec-13	5.681003338	16.17109731
Jun-14	3.440849272	12.70676315
Dec-14	9.40589499	30.68747451
Jun-15	5.053383267	13.19958896
Dec-15	13.42578949	23.60488239
Jun-16	9.993125356	6.227041826
Dec-16	12.5236373	20.40923972
Jun-17	0.767030931	3.44267994
Mean	7.76379215	15.29965256
SD	4.404788299	7.429197244
CV	**56.7350106**	**48.5579474**

Source: RBI online Database

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