

AN ASSESSMENT OF THE INDIAN DIGITAL PAYMENT SYSTEM - A STATUS ANALYSIS

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Abstract

India has been moving towards the cashless economy since demonetization. Drastic changes in the growth of payments have been witnessed in India's payment system. Various payments systems including payment apps using artificial intelligence and machine learning technology have been announced by the Government of India. Government of India have introduced a national mission "digital India" programme. Now there is a digital payment revolution witnessing a lot of payment platforms such as paytm, amazon pay and google pay. Has the disruptive policy of demonetization was a shock been able to change in people's transaction habits? or else demonetization was not required to go cashless payments. We need to check whether the demonetization process which has led to the volume and value growth over the digital payment systems in India or usual growth is only happening here? This study focuses to check growth in the value of digital payments since the period of demonetization.

Keywords: Digital payments, RTGS, NEFT, IMPS, Value, Volume, Digital India Programme

INTRODUCTION

A good payment system constitutes an important part of the country's economic system. The central bank in any country is, therefore, taking suitable actions to reduce systemic risks associated with payments and is continuously engaged in promoting a sound and efficient payment system. Demonetization was a move to change the Indian normal Indian economy to a new normal economy having a good payment system. A predominantly cash economy has to be substituted with a digital economy which will bring more money into the banking system and will lead to better revenue generation. Now the country is slogan is going towards the 'cashless economy' or 'less cash economy'. After the demonetization process since November 8, 2016, Govt. of India has implemented 'The Digital India programme' is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society. "Faceless, Paperless, Cashless" is one of the professed roles of Digital India.

STATEMENT OF THE PROBLEM

India has been moving towards the cashless economy since demonetization which was happened on November 8, 2016. As a part of this process, a drastic change happened in the Indian economy, various payments systems which has been announced by the Government of India and were implemented to grow the digital payments. 100 days after the government scrapped 86% of the currency in circulation, where do digital transactions stand? Has the disruptive policy shock been able to change in people's transaction habits? We need to check whether the demonetization process which has led to the volume and value growth over the digital payment systems in India or usual growth is only happening here? This study emphasizes the connection of demonetization and the cashless economy and understands the relevance of demonetization process in terms of cashless. This study focuses to check whether the demonetization process has been required to go cashless or it was an unnecessary process we did not need to go cashless system of economy.

RESEARCH OBJECTIVES

Based on the research questions the broad objective of the study is to assess the digital payment system of the country. The specific objectives of the study are as follows:

1. To analyze the trend and growth of digital payments in India
2. To understand the relationship between the value and volume relationship of individual and total digital payment transactions over some time

RESEARCH METHODOLOGY

This study is mainly based on digital payment transactions growth and trend. Hence the quantitative data published by the RBI from November 2016 to April 2017 regarding the digital payments such as RTGS, NEFT, IMPS, UPI, NACH, POS, CTS, USSD, Mobile Banking and PPI have been used. The present study has been using the RBI data regarding the payment system indicators which is being announced by the RBI, monthly during the last couple of years.

REVIEW OF LITERATURE

RBI (2016) has reported the growth level of debit and credit cards in India. The debit cards vastly outnumber the volume of credit cards issued in the country and a high number of debit cards have been issued in recent times under the PMJDY, especially to customers in rural areas and smaller towns. While debit cards registered a growth of 64% between Oct 2013 and Oct 2015, during the same period ATMs increased by around 43% while POS machines increased by around 28%. Debit cards usage is predominantly taking place at ATMs as compared to POS; as a result, there are issues of costs and risks associated with cash management of ATMs. The usage of debit cards at ATMs account for nearly 90% of the overall debit card transactions in terms of volume and around 95% in terms of value. This shows that major parts of debit card transactions were used in ATM withdrawals and not cashless transactions.

Redbook statistics (2015) reported that the cross-country statistics of Statistics on payment clearing and settlement systems in the CPMI countries card payment transactions (including debit and credit cards at both ATM and POS) per inhabitant in India is 6.7, whereas the corresponding data for a few other countries reveal a much higher level of card usage – Australia (249.3), Canada (247.9), Korea (260.8), France (143.4), Sweden (270), United Kingdom (201.7), Brazil (54.8), China (14.4), Mexico (16.6), Russia (47).

McKinsey(2011), stated that “The Benefits of E-payments to Indian Society” has reported that the transitioning to digital payments is estimated to bring about a significant reduction in costs incurred on account of inefficiencies associated with cash and other paper-based payments. For instance, by certain estimates, transitioning to an electronic platform for government payments itself could save approximately INR 100,000 Crores annually, with the cost of the transition being estimated at INR 60,000 to INR 70,000 Crores.

Deepankar Roy, (2016) compared the payment system among the various countries and explained the areas for improvement in the efficiency in existing payment systems in India and the other countries especially regarding the liquidity risk, operational risks, access criterion, transparency etc. In the end, the paper makes a modest attempt to identify opportunities and challenges for India. Numerous major changes in the payment system would take place at a quicker pace as e-commerce becomes more prevalent in the economic activities in the country. The continuing efforts of RBI and the banks to migrate from paper to electronic payments had a favourable influence.

The Deloitte research (2017) found that 43 per cent of adult Smartphone users in developed markets uses their phones to check their balance in accounts. Here to accomplish these targets we need to build our digital infrastructure to a standard level. But while creating the digital infrastructure, it is a major challenge to ensure that benefits to reach the citizens at an appropriate time so that last-mile delivery should be ensured.

VISA (2016) “Accelerating the growth of digital payments in India a five year outlook” reported that some estimates indicated that the net cost of cash (including cost of currency operations, as well as other costs are borne by households, businesses and banks in handling cash) as 1.7% of India's real GDP in 2014-15. Similarly, estimates indicated that foregone tax revenues from the shadow economy constituting 19% of India's GDP, accounting for 3.2% of India's GDP

TRENDS AND GROWTH OF DIGITAL PAYMENTS IN INDIA

Chart 1 shows the volume levels of all digital payments in India. Here we can see the case of all payments, the volumes were top in December 2016 and further, it was decreasing. Among the digital payments, POS transactions volumes are more and RTGS volumes are less. NACH, NEFT, CTS, Mob banking, PPI, IMPS, volumes stand second position, third, fourth, fifth, sixth and seventh positions in the country so far. The table No 1 details the results of the volume of digital payments in India which shows the volumes of December are more as compared to other months due to restrictions imposed by the Government. But after that transactions volume declined has been in line with the RBI's decision to gradually

ease limits on cash withdrawals starting January, and suggests that a section of consumers may have gone back to using cash after a brief stint with digital payments amid a demonetization-induced cash crunch

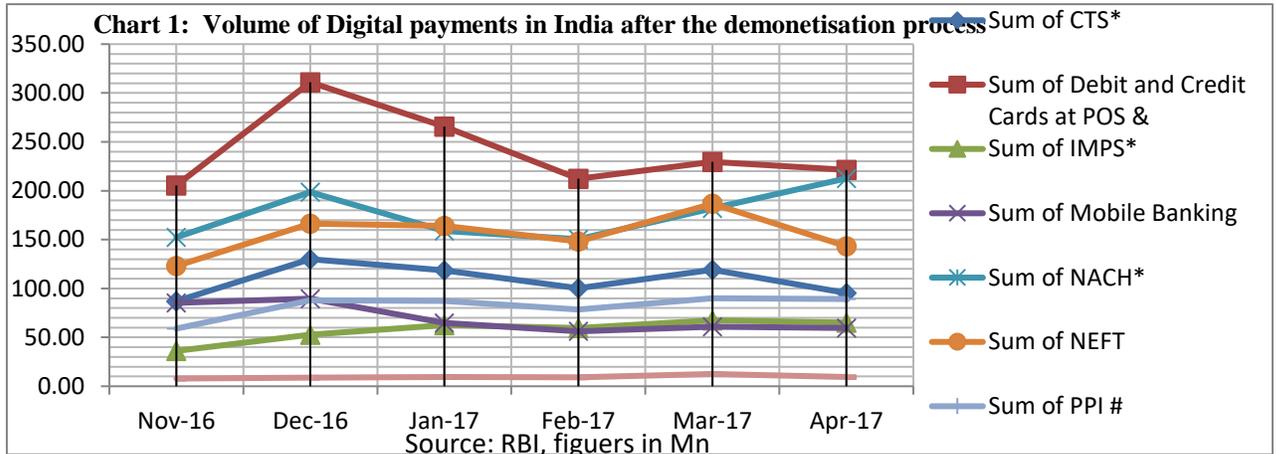


Table 1: Volumes of digital payments in India after Demonetization(in million)

Row Labels	RTGS	NEFT	CTS*	IMPS*	NACH*	POS	PPI	MoB. Banking	Total
Nov-16	7.87	123.04	87.08	36.16	152.51	205.53	59.00	85.39	671.50
Dec-16	8.84	166.31	130.01	52.78	198.72	310.99	87.80	89.61	957.50
Jan-17	9.33	164.19	118.45	62.42	158.74	265.53	87.28	64.89	870.40
Feb-17	9.10	148.21	100.44	59.75	150.45	212.32	78.36	56.18	763.01
Mar-17	12.54	186.70	119.21	67.41	182.12	229.65	89.99	60.77	893.89
Apr-17	9.54	143.17	95.26	65.08	212.63	221.53	89.21	59.55	843.50
Total Volume	57	931	650	343	1055	1445	491	416	4999.8

Source: RBI, figures in Mn.

Chart 2 shows the value of digital payments in India after the period of demonetization. This revealed that the values of RTGS transactions are bigger in size and others are lower in amounts. The values of digital payments were more in March 2017 as compared to other months might be due to the closing month transactions. But after March 2017 the value of the transaction went on decreasing. This shows that people were switching over to cash transactions after the restricted month of December 2016.

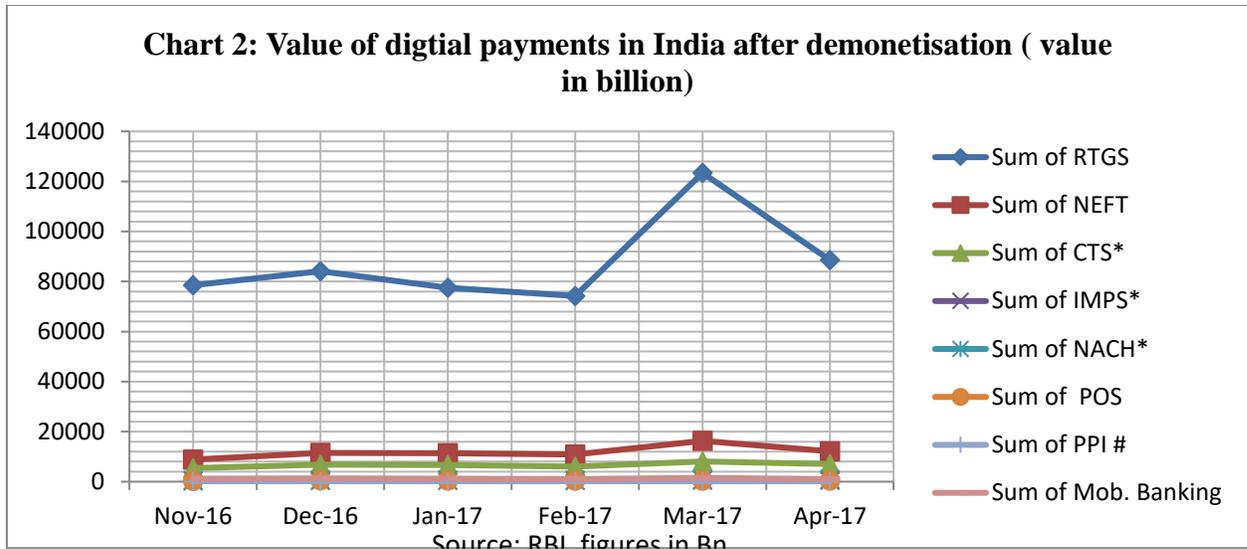


Table 2

Digital payments in India- values after demonetization

Row Labels	RTGS	NEFT	CTS	IMPS	NACH	POS	PPI	Mob. Banking	Total
Nov-16	78479.24	8807.84	5419.22	324.80	606.62	352.36	13.21	1244.85	94004.19
Dec-16	84096.48	11537.63	6811.91	431.92	626.76	522.24	21.25	1365.88	104055.32
Jan-17	77486.07	11355.08	6618.44	491.25	541.36	481.24	20.99	1206.66	97011.40
Feb-17	74218.81	10877.91	5993.95	482.21	592.03	391.47	18.74	1080.00	92594.49
Mar-17	123375.83	16294.50	8062.77	564.68	829.37	416.24	21.48	1499.89	149589.13
Apr-17	88512.19	12156.17	6990.65	562.06	905.15	411.66	22.33	1011.47	109582.50
Total	526168.62	71029.13	39896.94	2856.92	4101.29	2575.21	118	7408.75	646837.03

Source: RBI, figures in Bn.

Relationship between the value and volume of Digital payments

There are various modes of digital payments used by the Indian people to do cashless transactions. The Reserve Bank of India's data shows the volume of digital banking transactions, on channels such as mobiles and credit and debit cards, has fallen steadily between December last year and March this year. The value of transactions, however, has risen slightly in this period. Here we need to understand the relationship between the value and volume of digital transactions to ascertain whether the value and volume of transactions moving in the same direction or opposite direction. The following results

showing the value and volume relationship of digital payments in India for December 2016 and April 2017 based on the daily data of digital transactions

Table 1: Relationship between the volume and value of digital payments

Digital payments in December 2017	Correlation coefficient	Digital payments in April 2017	Correlation coefficient
RTGS volume and value	0.55	RTGS volume and value	0.67
NEFT volume and value	0.56	NEFT volume and value	0.74
IMPS volume and value	0.92	IMPS volume and value	0.95
NACH volume and value	0.61	NACH volume and value	0.39
CTS volume and value	0.86	CTS volume and value	0.71
UPI volume and value	0.68	UPI volume and value	0.88
USSD volume and value	0.95	USSD volume and value	0.96
POS volume and value	0.83	POS volume and value	0.92
Mobile Banking volume and value	0.77	Mobile Banking volume and value	0.68
PPI volume and value	0.79	PPI volume and value	0.91
Total volume and value	0.79	Total volume and value	0.90

Source: RBI data

The table shows that digital payment modes like IMPS, USSD, UPI, and PPI have resulted in the high degree of correlation between the value and volume of payment on transactions in December and April. But the digital payment modes such as RTGS, NACH has shown a very low correlation between the value and volume of transactions. The other high degree of correlated modes such as IMPS, USSD, UPI, PPI and PPI transactions.

Comparison of the December month's volumes of transactions with April month's volumes transactions

After the process of demonetization Government of India has justified that the process has been implemented for a country going towards a cashless economy and the people should have to do cashless transactions in place of cash transactions. But here it is necessary to check whether the people in the country have been using the digital mode after the

demonetization also. Hence there is a Comparison of the December month's volumes of transactions with April month's volumes transactions to check the necessity of demonetization process to go for the concepts of cashless economy. During December Government of India had imposed certain conditions on cash transactions as a precautionary measure after the demonetization and the month of December people didn't have much opportunity to use cash payments. After December the government removed those conditions and now people can freely use cash transactions. Here we trying to check the cashless transactions during December with April 2017 to ascertain the impact of demonetization process to sustain in the payment sector or not. Two-sample t-test with unequal variances for the December month total volume of transactions and March month total volume of transactions

Table 4: Two sample t-test for the volume of digital payments

Volume of DP	mean	Standard error	Standard deviation	95%confidence interval
volume December 2016	30.77	1.68	9.23	27.32
volume April 2017	28.117	2.18	11.25	22.65
difference	2.65	2.75	-2.87	26.68

Source: RBI data

Here we got the results shows that digital volume of transactions compared to December, April month volume of transactions has been decreased it is evident from the two-sample t-test and paired t-test of the total volume of transactions for December' and April 2017. This is interpreted that people of the country have tried to switch over from cashless transactions to cash transactions after December 2016 after the restrictions imposed by the government ended. The decline has been in line with the RBI's decision to gradually ease limits on cash withdrawals starting January and suggests that a section of consumers may have gone back to using cash after a brief stint with digital payments amid a demonetization-induced cash crunch.

Comparison of the December month's transactions values with April month transactions values

Here the Comparison of the December month's transactions values with April month values transactions values to check the necessity of demonetization process to go for the concept of cashless economy. Two-sample t-test with unequal variances for the December month total value of transactions and March month total value of transactions

Table 5: Two sample t-test for the value of digital payments

Value of DP	mean	Standard error	Standard deviation	95%confidence interval
value December 2016	3391.117	390.17	2137.08	2593.15

value 2017	April	3652.75	518.86	2841.95	2591.54
difference		-261.33	649.200	-1569.149	1039.096

Source : RBI data

Comparison of the December month value of transactions with April month values of transactions to check the necessity of demonetization process to go for the concept of a cashless economy. The result is interpreted as extremely opposite to the result of the volume of transactions. Here the value of transactions in April 2017 has been increased as compared to December. This shows that the value of transactions after the demonetization has been increased irrespective of the restrictions and control by the Government of India. It is interpreted that the volume of transactions has been decreased in April 2017 as compared to December 2016 and the value of transactions has been increased in April 2017 as compared to December 2016. Hence it is concluded that volume has been decreased in the sense that people were trying to reduce the number of digital transactions after demonetization and the value-wise people doing more digital transactions.

Table 6: Linear Regression Analysis of the volume data digital payments

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. regress totalvolume rtgsvolume neftvolume ctsvolume impsvolume nachvolume upi  
> me, vce(robust)
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Linear regression

Number of obs = 365
F(10, 354) = 86.59
Prob > F = 0.0000
R-squared = 0.8464
Root MSE = .09785

totalvolume	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
rtgsvolume	.8566829	.1411296	6.07	0.000	.5791249	1.134241
neftvolume	-.6545928	.103173	-6.34	0.000	-.857502	-.4516837
ctsvolume	-.4949441	.1523257	-3.25	0.001	-.7945212	-.195367
impsvolume	.7091104	.1960515	3.62	0.000	.3235383	1.094682
nachvolume	.1437816	.0415142	3.46	0.001	.0621362	.225427
upivolume	-.0651916	.1066172	-0.61	0.541	-.2748743	.144491
ussdvolume-d	-.0306952	.036184	-0.85	0.397	-.1018579	.0404675
dcvolume	.6875788	.1525269	4.51	0.000	.387606	.9875517
ppivolume	-.3112147	.3985685	-0.78	0.435	-1.095074	.4726452
mbvolume	.8840291	.1761303	5.02	0.000	.5376359	1.230422
_cons	3.567711	.6100805	5.85	0.000	2.367873	4.767549

Source: RBI data sets

Table 7: Linear regression analysis of the value of digital payments

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. regress totalvalue rtgsvalue neftvalue ctsvalueimpsvalue nachvalue upivalu us
> obust)
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Linear regression

Number of obs = 365
 F(10, 354) = 125.44
 Prob > F = 0.0000
 R-squared = 0.8827
 Root MSE = .45655

totalvalue	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
rtgsvalue	-.0307049	.2466335	-0.12	0.901	-.5157559	.4543462
neftvalue	.0367838	.6062307	0.06	0.952	-1.155483	1.22905
ctsvalue	-.0946786	.2486372	-0.38	0.704	-.5836703	.3943131
impsvalue	1.3828	.4899169	2.82	0.005	.4192864	2.346314
nachvalue	-.1871119	.1278921	-1.46	0.144	-.4386358	.0644119
upivalu	1.050056	.3433922	3.06	0.002	.3747109	1.725401
ussdvaluei~d	-.5274029	.2242634	-2.35	0.019	-.968459	-.0863468
dcvalue	2.256755	.5155704	4.38	0.000	1.242789	3.270721
ppivalu	-1.465807	1.003479	-1.46	0.145	-3.439337	.5077221
mbvalue	1.897391	.2581473	7.35	0.000	1.389696	2.405087
_cons	-2.910923	3.136751	-0.93	0.354	-9.079933	3.258087

Source: RBI data sets

Conclusion

All the variables in the linear regression analysis are considered in log form. Suppose $RTGS = \ln(RTGS)$. This is a non-linear form. Therefore every coefficient is giving the elasticity that means 1% change in an independent or explanatory variable will result in the percentage change in the total variable. To adjust the heteroscedasticity in the variable I have used robust standard error adjusted regression. Consider only p-value to determine whether the impact of explanatory variables on the explained variable is significant or insignificant. From the above analysis revealed that only two payment platforms, Unified Payments Interface (UPI) and Aadhaar Enabled Payments System (AEPS) and IMPS shows a consistent rise in value (in Rupees) and volume (number) of transactions post demonetization. All other forms have shown a decline – either consistently or in one or two months in the four months. It is observed that the decline has been in line with the RBI's decision to gradually ease limits on cash withdrawals starting January, and suggests that a section of consumers may have gone back to using cash after a brief stint with digital payments amid a demonetization-induced cash crunch. In March the value of digital payments was more because of the there is a seasonality factor as well. March is the last month of the financial year and digital payments seem to go up during the month, as people pay their taxes (advance income tax and service tax) as well as settle business payments between them. Hence we cannot treat that spike in the value of transactions as the impact of demonetization. Accept this fact after the restricted month of December all other months the volumes and value of digital transactions were decreased keeping the fact that usual growth in the digital payments still there due to the advancement of infrastructure and internet connectivity.

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