



## **Impact of Demonetization on Consumer Behavior towards Mobile Payment Applications: An Empirical Study**

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### **Abstract**

The purpose of the research is to study the perception of consumers towards Mobile Payment Applications; to understand the impact of demonetization on consumer's behaviour towards Mobile Payment Applications and their reliance on cash for daily transactions; and lastly, to find out various factors influencing usage of Mobile Payment Applications. The authors have used a mixed research method approach in the study and the data was collected by a survey using a structured questionnaire. Convenience sampling was carried out due to the nature of the research. Chi-square, Kruskal Wallis, Mann-Whitney and Friedman's ANOVA were used for the analysis by using jamovi statistical software. A few notable findings of the study are i) Companies need to make the payment interfaces compatible to feature phones to attract the consumers who either don't have smartphones or the internet facility, and ii) Customer segmentation should be done by age and not on gender. Demonetization may have failed to curb black money or to provide the expected stimulus to the economy, but it surely got tremendous success in terms of pushing consumers towards a 'less cash' economy. The authors also propose that the government should eliminate different charges to promote usage of Mobile Payment Applications.

**Keywords:** Behavioural Economics, Mobile Payment Applications, Demonetization, Consumer Behavior, Government Policy and Regulations, Money Demand and Supply

**JEL Classification:** E41, E51, E58, E71, M21, M38

**Paper Classification:** Research Paper

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### **Introduction**

On November 8th, 2016, the Government of India decided to demonetize the higher denomination currency notes of value INR 1,000 and INR 500. The move took 86 per cent of cash out of circulation in an economy whose dependence on cash is nearly 90 per cent (Chakravorti, India's Botched War on Cash, 2016). It had a massive impact on the lives of the common men across the country and received mixed responses from the civil society and the corporate alike. State Bank of India's (SBI) Chairman Arundhati Bhattacharya (Worstall, 2016), HSBC India's Chief Executive Stuart Milne (Panchal, 2016) extended their support to the move and stated that the move would strengthen the economy while promoting investments. On the contrary, notable personalities like Economist, Arun Kumar (Kumar, 2016), Noble laureate, Amartya Sen (Iyengar, 2016), Steve Forbes (Forbes, 2016), and former Prime Minister Dr. Manmohan Singh



(Tharoor, Fratzscher, & Haass, 2016) criticized the move for its probable future negative impact on economy.

A 2017 RBI report revealed that 98.96 per cent of the withdrawn higher value currency notes amounting to INR 15.28 lakh crore had returned to the banks which was opposite to the government's initial assumption that around INR 5 lakh crore in old notes would remain undeclared. As per the official figures, only INR 16,000 crore or 1.04 per cent of demonetized currency did not come back (Saha, 2017; Mazumdar, 2016; & Singh, 2017). Later in October 2018, another RBI report revealed that 99.3 per cent of the demonetized notes had returned to the banks (Reserve Bank of India, 2018). The government may have gained politically in the state elections of 2017, but the real impact of demonetization is much diffused. One of the primary government's objective for demonetization, i.e., to bring down the black money, failed on the main fronts. Moreover, India's domestic GDP growth slowed down to 6.7 per cent in 2018 which can be directly attributed to the onset of demonetization and GST (Singhal, 2018). The impact was even more severe and long-lasting than anticipated by IMF in its 2017 Article IV 'Consultation' on India (International Monetary Fund, Asia and Pacific Dept., 2018) which led to nearly 1.5 million job loss in the first four months of 2017 (Vyas, 2018).

While the primary aim of demonetization was to fight black money and corruption but the best results obtained could be changing the payment behaviour of the consumers and shifting people towards less cash economy. After demonetization, the mobile wallet companies such as Paytm, Oxigen, and Mobikwik witnessed a soaring growth in their user base, and newer investments started pouring in for them (Rai, 2016). Demonetization was expected to be good for e-commerce firms; mainly online retail and mobile wallet companies (Bennett, 2017). Demonetization changed consumer's payment habits by enabling different cashless technologies, thereby stimulating the transition from cash-based to digitally enabled economy (Agarwal, 2018). According to the Ministry of Electronics and Information Technology, Government of India, number of daily transactions through e-wallet service providers such as Oxigen, Paytm, MobiKwik, and Freecharge, rose from 1.7 million on November 8 to 6.3 million on December 7. Moreover, in one month after the move was announced, there was a surge of 503 per cent in payments through RuPay Cards, 267 per cent through e-wallets, 677 per cent through UPI and, 1,300 per cent through USSD. The definite winners of the move were the mobile wallet players, with market leader, Paytm, claiming to have 170 million users, with a traffic increase of 435 per cent, and a 250 per cent increase in overall transactions and its transaction value (Kashyap, 2016). Today, online payment options are convenient, but they are not free. Different kinds of taxes and fees are attached to the cost of convenience. These were relaxed for some duration post the announcement of demonetization, but now banks and other specified payment facilitator companies have again started charging it. These charges are there in spite of Niti Aayog spending Rs 340 crore on giving away gifts and awards (The Indian Express, 2016) as Lucky Grahak Yojana and Digi-Dhan Vyapar Yojana to push digital payments. To succeed in the objective of cashless, there needs to be more relaxation in transaction fees and taxes related to digital payments. The digital payments ecosystem in India needs further support for increasing its reach and usage (Nambiar, 2018). It's lesser critical to study the impact of demonetization on the nation's economic parameters as that covers formal sector and also, the informal sector plays a disproportionate yet significant role in India's economy; by an estimate, it produces 45 per cent of the output and employs around 94 per cent of the workforce. Moreover, it was difficult to get reliable direct data in case of the informal sector. The informal sector is mostly the cash-reliant and bore the real brunt of the demonetization.

Henceforth with such high speculations about positive and negative impacts of demonetization with its aim of moving towards cashless mode or the usage and acceptance of mobile payment

wallets among the consumers, the research was done to find out the actual impact on Mobile Payment Applications through a primary research by using survey method.

### Objectives

1. To study the perception of consumer towards Mobile Payment Applications.
2. To explore the impact of demonetization on the consumer's behaviour towards Mobile Payment Applications and their reliance on cash for daily transactions; in short run\* and long run\*\*.
3. To find out the impact of gender and age on the consumer's perception towards demonetization and Mobile Payment Applications.
4. To find out various factors influencing usage of Mobile Payment Applications.
5. To explore the relationship between Mobile Payment APP usage and cash reliance of the consumers.

\* Short run is the period within 50 days of the announcement of demonetization, i.e. up to December 28, 2016.

\*\* Long run is the period from 50 days to 150 days of the announcement of demonization, i.e. till April 07, 2016.

### Research Hypothesis

There are several different reports which forecasted the effects of demonetization on e-commerce and use of mobile wallets. Like the one where it was found that demonetization will increase the digitization of payments for electronic commerce companies or cash-on-delivery demand would reduce (Businesswire, 2016). According to Nandan Nilekani, creator of Aadhar card scheme, digital transactions would increase in the period of three to six months of demonetization announcement to the rate that would otherwise have taken three to six years, and the short-term setbacks will be reimbursed through achieving digitization of the system and financial inclusion of the population (Pandit, 2016). Demand for mobile wallets will rise (Holmes, 2016). According to Google India by 2020, digital transactions in India would happen at 10 times the current level (Chakravorti, India's Botched War on Cash, 2016). This digital revolution is irreversible and will stay for long (Pandit, 2016) but an uncertainty of cash supply would increase the demand for cash by 50 per cent (Kumar, 2016; Chakravorti, Early Lessons from India's Demonetization Experiment, 2017). The BHIM APP, developed by National Payments Corporation of India, facilitated electronic transfers between bank accounts; works on an ordinary feature phone also, with no internet-enabled smartphone requirement. If it continues to expand, it has the potential of dethroning the top players in India's complex market of mobile payment applications. Initial growth could be mainly due to the shortage of cash, once the cash crunch is over people will once again move back to conventional mediums (Chester, 2016; Daigle, George, & Press, 2016). Moreover, these forecasts and assumptions were mainly not empirical in nature; hence the researchers tried to find it empirically; with the following hypotheses.

H1: There is a significant difference in the preference of Mobile Payment Applications on the basis of gender.

H2: There is a significant difference in the consumer's perception towards demonetization and Mobile Payment Applications on the basis of gender.

H3: There is a significant difference in various motivational factors influencing the consumer to use Mobile Payment Applications on the basis of gender.

- H4: There is a significant difference in various demotivation factors influencing the consumer to use Mobile Payment Applications on the basis of gender.
- H5: There is a significant difference in the preference of Mobile Payment APP between different age groups.
- H6: There is a significant difference in the consumer's perception towards demonetization and Mobile Payment Applications between the various age groups.
- H7: There is a significant difference in various motivational factors influencing the consumer to use Mobile Payment Applications between different age groups.
- H8: There is a significant difference in various demotivation factors influencing the consumer to use Mobile Payment Applications between different age groups.
- H9: There is a significant impact of demonetization decision on the consumer's Mobile Payment APP usage in a short and long run.
- H10: There is a significant impact of demonetization decision on the consumer's cash reliance in a short and long run.

### Methodology and Research Design

A mixed research method, that is, both descriptive and exploratory study designs were used in the study. The sampling method used was convenience sampling, respondents were selected in the Delhi NCT on the simple basis that they should be aware of Mobile Payment Applications. The questionnaire had 24 items of both five-point scale, and open-ended questions. Before sending the questionnaire for final study, a pilot survey with 30 items was done on 15 respondents, and their face and content validity got checked through experts after which a questionnaire with 24 items was finalized. The sample size used was 133, because of the item to cases ratio of 1:5 as minimally suggested by Heckler (1996) & De Vaus (2002). 133 questionnaire out of 180 sent were received duly filled in and was analyzed. The related literature and government reports were reviewed from November 08, 2016 till October 05, 2018, covering nearly 22 months.

Before analyzing the results and application of techniques; tested the underlying assumptions of parametric tests on the data. After the analysis of variable through histogram, Skewness, Kurtosis, and finally through Kolmogorov-Smirnov and Shapiro-Wilk Tests, the data was found to be non-normal as the value of p found was less than 0.05 for all the variables (Massey Jr, 1951). Homogeneity of Variance was tested by using Levene's Test; here values of p were found more than 0.05 in all the variable, based on their means, trimmed mean and medians; making variances not significantly different (Anderson, 2006), indicating that the assumptions of homogeneity were met. The rest two assumptions were also met, i.e., data was on interval or ratio scale form, and scores were independent of each other. To achieve the normality in the data for parametric analysis, it was transformed using the log and square root transformations, but still, the values of K-S test were found significant, making the data non-normal. Henceforth further analysis was done using non-parametric substitute test (Gibbons & Chakraborti, 2011). Assumptions of nonparametric tests, i.e., randomness, independence of entries, expected frequency of at least five, were checked and found fulfilling. For Kruskal Wallis, Mann-Whitney and Friedman's ANOVA, at least the ordinal scales were taken. All the tests are done at the confidence interval of 95 per cent in this whole study. IBM SPSS Statistics software was used for the analysis.

## Findings and Analysis

Out of the total 133 respondents; 54.9 percent (n= 73) were male and 45.1 percent (n= 60) were females. The average age of the respondents was 28.54 years. Majority of respondents i.e. 62.4 per cent (n=83) lies within the age group of 21-30, and the total range is 37 (Max. = 55, Min. = 18).

Most preferred device for online payment purpose among the respondents was smartphone i.e. 78.2 per cent (n= 104); followed by the laptop preferred by 15.8 per cent (n=21) and only 6 per cent (n=8) respondents opted for feature phones. Payment application most used by the respondents was Paytm, used by 64.7 per cent (n=86), followed by BHIM (launched on December 30, 2016) used by 13.5 per cent (n=18) and Freecharge and State Bank Buddy used by 4.5 per cent (n=6) of respondents each.

### Consumer's Preference towards Mobile Payment Application

To test how the consumer preference towards mobile payment application changes with the change in the demography of the respondent, the following study was performed by using the chi-square test. There was a significant difference in the people's preference towards mobile Payment APP (Chi-square (7) = 346.218,  $p=0.000 < 0.05$ ). As the differences were found, the chi-square test was performed again to find specific differences on the basis of gender and age. And it was found that there was no significant association between the gender and the preference towards mobile Payment APP (Chi-Square (7) = 7.692,  $p=0.361 > 0.05$ ). Therefore, researchers failed to reject the null hypothesis H01; there is no significant difference in the preference of Mobile Payment Applications on the basis of gender. Researchers applied the same test to find the impact of the change in age group, and it was found that there was a significant association between the age and the preference towards mobile Payment APP (Chi-square (21) = 67.38,  $p =0.00 < .05$ ). Therefore, the null hypothesis H05 is rejected; there is a significant difference in the preference of Mobile Payment APP between different age groups. It was found that the older generation prefers more the BHIM while the youngsters are more inclined towards Paytm (Table: 01).

**Table 1: Most used mobile payment APP**

Age in intervals	Most used mobile payment APP								Total
	Paytm	Freecharge	Airtel Money	BHIM	Mobikwik	State Bank Buddy	None	Net Banking	
Less than or equal to 20 years	13	0	0	1	0	0	1	0	15
20-30 years	62	4	1	4	0	5	5	2	83
30-40 years	7	2	0	9	0	1	0	0	19
Above 40 years of age	4	0	0	4	1	0	7	0	16
Total	86	6	1	18	1	6	13	2	133

### Consumer's Frequency of Mobile Payment Application Usage Before and after Demonetization

To check the number of times consumer used the APP before and after the demonetization, the descriptive statistics was used. Mean of the APP usage per week before demonetization was 0.820 (S.D. = 1.125). Mean of the App usage per week within 50 days of Demonetization was 3.711 (S.D. = 2.859). Mean of the App usage per week now or after the completion of 50 days of demonetization is 4.763 (S.D. = 3.312). Hence, it's quite clear that there is 480 per cent growth in the usage of APP now from the period before demonetization. In fact, it is even 28 per cent

more than the period just after the demonetization was announced, hence although growth rate reduced; the usage of Applications didn't decrease even after the problem of cash scarcity had reduced. To strengthen the results, the Friedman's test was used to check whether the changes were significant and the results were that APP usage significantly increased after the move even after the period when cash crunch was nearly finished, and money was available with bank and ATMs (chi-square(2) = 165.459,  $p=0.000 < .05$ ). Therefore null hypothesis H09 is rejected; there is a significant impact of demonetization decision on the consumer's Mobile Payment APP usage in the short and long run. And as per post hoc test, i.e., Bonferroni Test, all the values of  $p$  were more than 0.05, representing a significant change in all the three periods.

### **Consumer's Cash Reliance by Studying their ATM Withdrawals before and after Demonetization**

To check the consumer's propensity to use cash, respondents were asked to mention the average amount of cash they withdrew from the ATMs in a week. Mean of the ATM withdrawal per week before demonetization was INR 2,036 (S.D. = 2832). Mean of the ATM withdrawal per week within 50 days of demonetization was increased to INR 3,212 (S.D. = 3374). Mean of the ATM withdrawal per week now or after the completion of 50 days of demonetization again reduced to INR 1,555 (S.D. = 1,758). Hence by using descriptive statistics, it is concluded that although there was an increase in the amount of ATM withdrawals per week just after the demonetization after the cash crunch was over, that is, after 50 days of demonetization, it, in fact, reduced to even lesser than the amount withdrawn before demonetization. To strengthen the results, Friedman's test was used (chi-square(2) = 32.148,  $p=0.000 < 0.05$ ) to check whether the changes were significant, and results were that ATM withdrawal significantly increased after the move and after the period of 50 days, when cash crunch was nearly over the ATM withdrawal reduced,. And as per post hoc test, i.e., Bonferroni Test, all the values of  $p$  were more than 0.05, representing a significant change in all the three periods. Hence null hypothesis H010 is rejected; there is a significant impact of demonetization on the consumer's cash reliance in the long and short run. Demonetization move had a significant positive effect on the people's ATM withdrawals, in both short and relatively long run, in short run it increased but in the longer run, it reduced proving that the demonetization had a significant positive impact on reducing the people's reliance on cash.

### **Consumer's cash reliance by studying cash in their pockets before and after demonetization**

To check the consumer's propensity to use cash, respondents were asked to mention the average amount of cash they keep in their pockets. Mean of the cash in the pocket of the respondent before Demonetization was INR 1,131 (S.D. = 766.472). Mean of the cash in the pocket of respondent within 50 days of Demonetization was increased to INR 1,735 (S.D. = 2173.241). Mean of the cash in the pocket of respondent now or after the completion of 50 days of demonetization again reduced to INR 784 (S.D. = 588.372). Hence by using descriptive statistics, the researcher concluded that although there was an increase in the amount of cash in the pocket of respondent just after the demonetization after the cash crunch was over that is after 50 days of demonetization, it, in fact, reduced to even lesser than that of before demonetization. To strengthen the results, Friedman's test was used (chi-square (2) = 28.612,  $p=0.000 < 0.05$ ) to check whether the changes were significant and results were that cash in the pocket of respondents significantly increased after the move and when after the period of 50 days when cash crunch was nearly finished, the cash reliance of the respondents or cash in their pockets reduced, and

as per post hoc test, i.e., Bonferroni Test, all the values of p were more than 0.05, representing a significant change in all the three periods. Hence null hypothesis H010 is rejected; there is a significant impact of demonetization decision on the consumer's cash reliance in a short and long run. So it is concluded that demonetization move had a significant effect on the people's reliance on cash, in both short and relatively long run. In short run, it increased, but in the longer run, it reduced proving that the demonetization had significant positive impact on reducing the people's reliance on cash.

## Consumer Perceptions towards Demonetization and Mobile Payment Applications on the Basis of Gender and Age

Table 2: Results of Mann-Whitney Test

Variables	Mean			Mann-Whitney	Sig. (2-tailed)
	Total	Male	Female		
My frequency and volume of internet usage has increased after demonetization	3.11	3.21	2.98	1960.500	.288
I got to know about mobile payment APPs only after demonetization	2.36	2.29	2.45	2086.500	.624
I used mobile payment APPs just after the demonetization, but don't use it now as the cash is easily available	2.16	2.26	2.03	1908.500	.184
I believe that my spending increases when I pay through Apps rather than cash	3.42	3.27	3.60	1857.000	.120
I feel that a number of retailers and service providers have started accepting payments through m-payment apps after demonetization	3.33	3.49	3.13	1884.500	.156
I believe that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies, lately, created a more positive impact on mobile payment acceptance than demonetization.	3.88	3.96	3.78	2003.500	.369

From the Table: 02, it is quite evident that the number of males than females thinks that their frequency and volume of internet usage has increased after Demonetization. Number of females thinks that they got to know about Mobile Payment Applications only after the demonetization. Number of males think that they used Mobile Payment Applications just after the demonetization, but don't use it now when the cash is readily available. Number of females thinks that their spending increases when they pay through Applications rather than cash. Number of males feels that higher number of retailers and service providers have started accepting payments through m-payment applications after demonetization. Number of males believes that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies, lately, created a more positive impact on Mobile payment acceptance than demonetization.

To test the significance of these differences, Mann-Whitney Test was applied (results mentioned in the Table: 02) all the values of p are more than 0.05, leading to the interpretation that all the differences may be visible through descriptive but when measured through Mann-Whitney the results were proven non-significant. Hence study failed to reject null hypothesis H02; there is no significant difference in the consumer's perception towards demonetization and Mobile Payment Applications on the basis of gender.

**Table 3: Results of Kruskal-Wallis Test**

Age in intervals	Age Group	Statistic Mean	Chi-Square	df	Asymp. Sig.
My frequency and volume of internet usage has increased after demonetization	1.00	2.60	11.766	3	.008
	2.00	2.95			
	3.00	3.89			
	4.00	3.44			
I got to know about mobile payment APPs only after demonetization	1.00	2.47	28.270	3	.000
	2.00	1.98			
	3.00	2.32			
	4.00	4.31			
I used mobile payment APPs just after the demonetization, but don't use it now as the cash is easily available	1.00	2.40	18.726	3	.000
	2.00	2.28			
	3.00	2.32			
	4.00	1.13			
I believe that my spending increases when I pay through Apps rather than cash	1.00	3.27	36.168	3	.000
	2.00	3.31			
	3.00	2.74			
	4.00	4.94			
I feel that a number of retailers and service providers have started accepting payments through m-payment apps after demonetization	1.00	3.13	1.703	3	.636
	2.00	3.29			
	3.00	3.53			
	4.00	3.50			
I believe that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies, lately, created a more positive impact on Mobile payment acceptance than demonetization.	1.00	3.87	.197	3	.978
	2.00	3.90			
	3.00	3.79			
	4.00	3.88			

It is evident from Table 03; number of older age people than younger, believe that their frequency and volume of internet usage increased after Demonetization, they got to know about Mobile Payment Applications only after demonetization, and they believe that their spending increases when they pay through Applications rather than cash. In fact, older people are even more consistent in the usage of Mobile Payment Applications now also after the cash crunch is over. The significance of it tested through Kruskal-Wallis Test and in first four of the variable in the table the difference was found significant ( $p < 0.05$ ) and in two variables found insignificant ( $p > 0.05$ ). Hence in total null hypothesis  $H_0$  is rejected as there is a significant difference in the consumer's perception towards demonetization and Mobile Payment Applications between different age groups.

When the responses were studied individually in the Table 04 to Table 09 for having a better understanding of consumer's perception towards demonetization and Mobile Payment Applications, the results found were as follows:



**Table 4: Usage of Internet after Demonetization**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	18	13.5	18	26.6	-8.6
Disagree	29	21.8	29	26.6	2.4
Neutral	30	22.6	30	26.6	3.4
Agree	33	24.8	33	26.6	6.4
Strongly Agree	23	17.3	23	26.6	-3.6

As per Table 04, there was no significant variation/differences in the responses to the question "My frequency and volume of internet users have increased after Demonetization" (Chi-Square (4) = 5.459,  $p=0.243 > 0.05$ ). So the value of the residuals cannot be decided on about which response is given most by the respondents.

**Table 5: Awareness of Mobile Payment Apps only after Demonetization**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	53	39.8	53	26.6	26.4
Disagree	34	25.6	34	26.6	7.4
Neutral	13	9.8	13	26.6	-13.6
Agree	11	8.3	11	26.6	-15.6
Strongly Agree	22	16.5	22	26.6	-4.6

As in Table: 05, there was significant variations/differences in the responses to the question "I got to know about Mobile Payment Applications only after demonetization?" (Chi-Square (4) = 45.158  $p=0.000 < 0.05$ ). So the value of the residuals can be decided that majority of the respondents disagree or strongly disagree that they got to know about Mobile Payment Applications only after demonetization, which implies that they were aware of them even prior to demonetization move, but the move either motivated them or forced them to use Mobile Payment Applications.

**Table 6: Preference for Usage of Cash**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	48	36.1	48	26.6	21.4
Disagree	41	30.8	41	26.6	14.4
Neutral	25	18.8	25	26.6	-1.6
Agree	13	9.8	13	26.6	-13.6
Strongly Agree	6	4.5	6	26.6	-20.6

As per Table 06, there was significant variation/differences in the responses to the question "I used Mobile Payment Applications just after the demonetization, but don't use it now as the cash is easily available?" (Chi-Square (4) = 48.015  $p=0.000 < 0.05$ ). So the value of the residuals can be decided that majority of the respondents disagree or strongly disagree that they used Mobile Payment Applications just after the demonetization, but don't use it now as the cash is easily available, which implies that the changes brought were long-term in nature and not just short-term as mentioned by many predictors earlier.

**Table 7: Increase in Spending Through Apps**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	12	9	12	26.6	-14.6
Disagree	21	15.8	21	26.6	-5.6
Neutral	27	20.3	27	26.6	0.4
Agree	45	33.8	45	26.6	18.4
Strongly Agree	28	21.1	28	26.6	1.4e

As per Table 07, there was significant variations/differences in the responses to the question "I believe that my spending increases when I pay through Applications rather than cash" (Chi-Square (4) = 22.000  $p=0.000 < 0.05$ ). So the value of the residuals that majority of the respondents agree or strongly agree to believe that their spending increases when they pay through applications rather than cash can be decided. The results strengthened the past studies (Feinberg, 1986) and (Roberts & Jones, 2001); where it was found that spending increases when payment is made through no cash modes.

**Table 8: Increase in Retailer and Service Providers Using m-payment Apps after Demonetization**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	14	10.5	14	26.6	-12.6
Disagree	25	18.8	25	26.6	-1.6
Neutral	25	18.8	25	26.6	-1.6
Agree	41	30.8	41	26.6	14.4
Strongly Agree	28	21.1	28	26.6	1.4

As per Table 08, there was significant variations/differences in the responses to the question "I feel that a number of retailers and service providers have started accepting payments through m-payment applications after demonetization" (Chi-Square (4) = 14.030  $p=0.007 < 0.05$ ). So the value of the residuals can be decided that majority of the respondents agree or strongly agree to believe that a number of retailers and service providers have started accepting payments through m-payment applications after demonetization, which strengthens the report of Business Standard (2016).

**Table 9: Internet Revolution and Mobile Payment Acceptance**

Response	Frequency	Percent	Observed	Expected	Residual
Strongly Disagree	3	2.3	3	26.6	-23.6
Disagree	11	8.3	11	26.6	-15.6
Neutral	22	16.5	22	26.6	-4.6
Agree	60	45.1	60	26.6	33.4
Strongly Agree	37	27.8	37	26.6	10.4

As found in Table 09, there was a significant variations/differences in the responses to the question "I believe that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies, lately, created a more positive impact on Mobile payment acceptance than demonetization" (Chi-Square (4) = 76.887  $p=0.000 < 0.05$ ). So the value of the residuals that majority of the respondents agree or strongly agree to believe that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies,

lately, created a more positive impact on Mobile payment acceptance than Demonetization can be decided as also mentioned in the report of Kleiner, Perkins, Caufield and Byers (KPCB), that Reliance Jio is a significant force behind the increased digital payments (Malik, 2017).

### Positive and negative motives to use Mobile Payment Applications

The next most essential dimensions were motivating, and demotivating factors influencing Mobile payment APP usage.

**Table 10: Factor Encouraging use of Mobile Payment Application**

Response	Percent	Observed	Expected	Residual
Propensity to try new technology	12.8	17	26.6	-9.6
Cash crunch	26.3	35	26.6	8.4
Find the checkout process quick	15	20	26.6	-6.6
Find it efficient mode of payment	24.8	33	26.6	6.4
Find it more convenient	21.1	28	26.6	1.4

As found in the Table 10, there was no significant variations/differences in the responses to the question “The most important factor which motivates you to use Mobile Payment Application” (Chi-Square (4) = 9.368,  $p=0.053 > 0.05$ ). So the value of the residuals cannot be decided on about which response is given most by the respondents. But still going through descriptive, factors which motivate the Mobile payment application most are due to a cash crunch and because they believe it to be a more efficient mode of payment. When the impact of age and gender on the respondent’s views on the motivating factors were studied, the following results were found; (Chi-Square (12) = 76.372,  $p=0.000 < 0.05$ ) and (Chi-Square (4) = 7.097,  $p=0.131 > 0.05$ ) respectively leading to the interpretation that although age does influence the factors influencing respondents (elder people had only cash crunch in mind, younger population had mixed views) gender does not. Hence study failed to reject null hypothesis H03; there is no significant difference in various motivational factors influencing the consumer to use Mobile Payment Applications on the basis of gender. And null hypothesis H07 is rejected; there is a significant difference in various motivational factors influencing the consumer to use Mobile Payment Applications between different age groups.

**Table 11: Factors Discouraging use of Mobile Payment Application (MPA)**

Response	Percent	Observed	Expected	Residual
Mobile doesn't support	6	8	14.8	-6.8
Internet unavailability	9.8	13	14.8	-1.8
Finding process complicated	12	16	14.8	1.2
Retailers don't accept this mode	20.3	27	14.8	12.2
Extra fee to be paid while using	32.3	43	14.8	28.2
Availability of sufficient cash	3	4	14.8	-10.8
Find payment through laptop better	11.3	15	14.8	0.2
Find the mode less secure	4.5	6	14.8	-8.8
I am satisfied and use MPA	0.8	1	14.8	-13.8

As found in the Table 11, there was significant variation/differences in the responses to the question “The most important factor which influences you not to use Mobile Payment

Application” (Chi-Square (8) = 93.353,  $p=0.000 < 0.05$ ). So, the value of the residuals about which response is given most by the respondents can be decided. Factors which demotivate the Mobile payment application most are extra fees which they have to incur and that the retailers don’t accept the mobile payments. When the impact of age and gender on the respondent’s views on the demotivating factors, they got the following results; (Chi-Square (24) = 49.582,  $p=0.002 < 0.05$ ) and (Chi-Square (8) = 9.197,  $p=0.326 > 0.05$ ) respectively leading to the interpretation that although age does influence the factors influencing respondents not to use mobile payments but gender does not. Hence the study failed to reject null hypothesis H04; there is no significant difference in various demotivation factors influencing the consumer to use Mobile Payment Applications on the basis of gender. And H08 is rejected; there is a significant difference in various demotivation factors influencing the consumer to use Mobile Payment Applications among different age groups.

**Table 12: Significant Correlated Variables**

Spearman’s rho		APP-50	APP-NOW	ATM-NOW	CASH-NOW
APP-BEFORE	Correlation Coefficient	0.463**	0.230**	-.177*	
	Sig. (2-tailed)	0	0.008	0.042	
APP-50	Correlation Coefficient		0.444**		
	Sig. (2-tailed)		0		
APP-NOW	Correlation Coefficient				-.183*
	Sig. (2-tailed)				0.035

APP-50=App usage per week within 50 days of Demonetization;  
 APP-NOW=App usage per week now;  
 ATM-NOW= ATM withdrawal amount now;  
 CASH-BEFORE= Cash in pocket before demonetization;  
 CASH-NOW= Cash in pocket now;  
 APP-BEFORE=App usage per week before Demonetization

When studying the relationship between Mobile Payment Applications usage and cash reliance, it was evident from the Table 12 that the “App usage per week before demonetization had significant positive correlation with App usage within 50 days of demonetization and App usage after 50 days, whereas negative correlations with cash reliance, i.e., ATM withdrawal amount now” which shows negative association between Mobile Payment Applications usage and cash reliance.

“App usage per week within 50 days of demonetization had a significant positive correlation with App usage now” which represents that the changes, i.e., increase in the usage of Mobile Payment Applications, which come were not just for the short run but for a long run”.

“App usage per week now is showing significant negative correlation with the cash in the pocket now.” The people who are using Mobile Payment Applications more tend to keep less cash in their pockets and vice versa.

### Conclusions and Policy Implications

As the most preferred device for online payment purpose among the respondents was smartphone and the least favoured were feature phones, the companies need to improve the interface of Mobile Payment Applications on smartphones and try to make the payment interfaces compatible to feature phones to attract the new consumers who either don’t have smartphones or internet facility.

The most used mobile payment application by the respondents was Paytm, followed by BHIM, Freecharge and State Bank Buddy. During the informal discussion during the surveys, it was found that for significant transactions (up to Rs. 10,000) consumers used BHIM and for minor shopping, Paytm was used. And lately, respondents stopped using Paytm as it started collecting service charge to transfer money back into one's bank account from Paytm wallet. Therefore the retailers/service providers also stopped accepting payment through it. It was found that there was no significant difference in the preference of Mobile Payment Applications on the basis of gender, but when coming to different age groups, people had different preferences. Older generation prefers using BHIM whereas the youngsters were more inclined towards Paytm. Although there were differences in the consumer's perception towards demonetization and Mobile Payment Applications, those were insignificant. Motives behind using Mobile Payment Applications on the basis of gender were insignificant; although on the basis of age, significant differences were found.

The frequency and volume of internet usage increased for old age population vis-à-vis the younger generation, post demonetization. They got to know about Mobile Payment Applications only after demonetization, and they believe that their spending increases when they pay through Applications rather than cash. In fact, older people are even more consistent in the usage of Mobile Payment Applications now even after the cash crunch is over. So the segmentation of the consumers by the Mobile Payment Wallet companies should be done on the basis of age and not gender while providing offers or in the formation of promotional campaigns or events. Factors influencing usage of Mobile Payment Applications doesn't depend on gender, but on age so while framing promotions this thing should be kept in mind. The older population still don't consider it a convenient or efficient mode of payment; this belief needs to be changed by proper marketing.

According to the study, there was 480 per cent growth in the usage of Mobile Payment Applications in the long run from the period before demonetization. In fact, it is even 28 per cent more than the period just after the demonetization was announced, hence although growth rate reduced, the usage of Applications didn't decrease even after the problem of cash scarcity was removed, which disproves the predictions that people used Mobile Payment Applications only due to cash crunch and change was temporary. This was also authenticated through a research conducted by Bloomberg (Barua & Arora, 2017).

Majority of the respondents disagreed that they used Mobile Payment Applications just after the demonetization, but don't use it now as the cash is readily available, which implies that the changes brought were long-term in nature. So the move may have failed miserably to curb black money or to improve the economy, it did not achieve much success in terms of bringing consumers towards less cash economy. In fact, findings that the consumer's propensity to use cash reduced after demonetization also strengthens that the move had a positive impact in moving towards less cash economy but the RBI Annual Report for 2018 reveals that currency worth Rs 17.97 lakh crore was in circulation on November 4, 2016, which further increased to Rs. 18.03 lakh crore by March 2018 (Reserve Bank of India, 2018) which implies that the cash reliance has decreased is not completely right.

The study found that respondents believe their spending increases when they pay through Mobile Payment Applications rather than cash, so Mobile Payment Wallet companies and the government need to change this belief and bring a different image in the minds of the users that usage of Mobile Payment Applications gives more control and power to consumers over their transaction process and the expenses.

Majority of the respondents agreed that a number of retailers and service providers have started accepting payments through m-payment applications after demonetization. This is, in fact, true but as found in casual discussions with the retailers, they later stopped accepting payments through Mobile Payment Applications since the cash crunch got over and the e-wallet companies also started charging for doing transactions.

Majority of the respondents believe that internet revolution brought by Reliance Jio and the subsequent reduction in the price of data packs of all the companies, lately, created a more positive impact on mobile payment acceptance than demonetization, which in fact was supported by many studies as well, hence the government need to strengthen online infrastructure to promote Mobile Payment Applications rather than taking decisions like that of demonetization in future.

There were two significant motivations influencing consumers to use Mobile Payment Applications: i) cash crunch, and ii) consumers' belief of the application being an efficient mode of payment. As the first motive got eliminated, which means, the second motive must be influencing the user's decision to move towards mobile payments. Whereas, the most essential motive which influences the consumers not to use Mobile Payment Applications were extra transaction charges; henceforth the government needs to curb different charges and fees to really promote usage of Mobile Payment Applications by providing incentives to both customers and retailers which will further bring India towards a less cash economy.

### **Limitations and Future Scope of Study**

The Indian demonetization policy was so macro in nature that data collected from a particular place or class of people could not help in generalizing or representing the entire population. The sample used for the study was small and selected through convenience sampling. The selected respondents were from Delhi NCR only. In future studies, a bigger sample with more diverse population, culturally and demographically, is suggested.

The present research was not a test-retest study; better would have been the one which was done before and after the move, which is not possible now from citizen's point of view. In future, a collaborative mixed study on the topic is suggested. A longitudinal study over a span of time could also be beneficial. A qualitative research by interviewing the experts is advisable but demonetization being such a macro-economic affair, influenced politically; it is difficult to obtain unbiased responses, so all the results should be validated through actual secondary data analysis. Secondary research on the same topic with data from different government organizations will further strengthen the findings. A comparative study with other nations where demonetization was implemented in the past can also be undertaken.

The present research primarily focuses on the Mobile Payment Applications in the name of digital payment systems in the short run (50 days) and long run (150 days). Other parameters of digital payment systems should be discussed in future in the short run, long run and even very long run, i.e. 150 days. Additionally, the effect of demonetization on other variables like foreign exchange rate, stock prices, FDI/FII inflows GDP growth rate, Indexed of Industrial Production (IIP), unemployment rate, consumer and wholesale price index should be studied.

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