



**DELHI SCHOOL OF BUSINESS**

**By Vivekananda Institute of Professional Studies TC**

**IMPACT OF DIGITAL PAYMENTS ON HOUSEHOLD SENTIMENTS-  
EVIDENCE FROM INDIA**

**A PROJECT STUDY SUBMITTED IN PARTIAL FULFILLMENT  
FOR THE REQUIREMENT OF THE  
TWO YEAR (FULL-TIME)  
POST-GRADUATE DIPLOMA IN MANAGEMENT  
(2022-24)**

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**April, 2024**

**DELHI SCHOOL OF BUSINESS**

Date.....

**CERTIFICATE**

This is to certify that the present study is based on my original research work and my indebtedness to others' works, publications, etc. wherever cited in this study has been duly acknowledged at appropriate places.

This work has not been submitted either in part or in full for the award of any diploma or degree in any university/ Institute and is now being submitted for evaluation in partial fulfilment for the requirement of the Two-year Full Time Post-Graduate Diploma in Management (Finance).

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**The student consulted me while doing this Final Research Project.**

**Extent of Plagiarism: \_\_\_\_\_ %**

**Prof. \_\_\_\_\_**

Faculty Guide

## DECLARATION

I hereby declare that the project report entitled “**Impact of Digital Payments on Household Sentiments- Evidence from India**” submitted by Aditi Gupta and Khyati Gupta to Delhi School of Business in partial fulfillment of the requirement of award of the degree of post graduate diploma in management is a record of bonafide project work carried out by me under the guidance of Prof. ANURAG BANERJEE. I further declare the work reported in this project has not been submitted and will not be submitted either in part or in full, for award of and other degree or diploma in any institute or university.

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**ADITI GUPTA & KHYATI GUPTA**

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## EXECUTIVE SUMMARY

The study aims to explore the causal relationship between household sentiments and digital payments in India. For the study, we use data on the Consumer Confidence Survey from the Unit-Level data of the Reserve Bank of India from November 2019 and November 2023, across several rounds for 19 major Indian cities. Our total sample size amounts to approximately 1,50,000 respondents. Thereafter, we also use the data on digital payments from the payments system indicators of the RBI corresponding to the survey dates and estimate the impact of the rise in the use of Digital Payments on the households' perception of their general economic condition at present vis-à-vis a year ago and also a year ahead from the date of the survey.

Our findings highlight that both PGEC and OGEC are significantly impacted by the use of Digital Payments. Such findings also holds true even with the successive inclusion of demographic control variables.

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## CHAPTER 1 INTRODUCTION

Households form an important part of aggregate economy that impacts the overall economic activity of any nation. Existing studies highlight the importance of studying the impact of household sentiments across different parameters. For instance Throop (1992) finds that the consumer sentiments across USA (using Michigan survey index) move in line with present economic situation under normal scenario. Further such sentiment can deviate from present economic situation during exceptional economic or political situation like the Gulf war of 1990. Under such cases these sentiments can predict future consumption patterns and provide additional insights. Matsusaka and Sbordone (1995) show that unfamiliar decline in sentiments can lead to recession situation. Likewise Fuhrer (1993) show that different macroeconomic factors like unemployment rate, inflation conditions, movement in real interest rates as well as national income can elevate fluctuations in the Michigan consumer Sentiments Index.

Nonetheless, this provides information that a general economic analysis cannot possibly explain. Carroll et al. (1994) also discover that consumer attitudes can serve as a crucial predictor of household expenditure. According to Ludvigson's (2004) research, consumer attitudes have the ability to forecast increases in future labour income and non-stock market wealth. Barsky and Sims (2012) demonstrate, using data from the Michigan survey, that a notable change in household perceptions of their future economic circumstances can forecast changes in macroeconomic variables. According to Lahiri and Zhao (2016), household sentiment is typically influenced by general economic aggregates, which also have an impact on their current perspective, expectations for the future, and likelihood of employment and financial stability. They discover that news-related information obtained through regional channels greatly influences these kinds of opinions. Dees (2017) demonstrates how mood swings serve as a crucial stimulant for actual economic activity. Real GDP and spending patterns can both rise as a result of these emotion shocks.

Evidence on impact of household sentiments across different indices is closely available from existing gamut of literatures that shows the impact of parameters like policy uncertainty, COVID-19 indices, other policy related implications that can act as significant drivers of such household sentiments. For instance Baker et al. (2016) finds that economic policy uncertainty can negatively impact overall economic activity. Likewise Van Dalen et al. (2017) employs a monthly data as a time series estimate from Denmark's consumer sentiments and finds that news based on uncertainty elevates pessimism across such sentiments. In another related study

Roop et al. (2024) finds that increase in policy uncertainty significantly exerts a negative influence on household sentiments in India. Additionally Roop et al. (2023) also show a negative shock due to COVID-19 also exerts a negative impact on such sentiments.

For both market players and policy officials, predicting economic activity is essential to decision-making (Galimberti, 2020). It is well known that household attitudes influence many economic decisions in an economy. Jansen & Nahuis (2003) claim that investor decisions in the financial markets can be influenced by household sentiments. As per the European Commission (2016), one of the primary spending parameters is household emotions. This kind of attitude is sometimes described as a leading indicator of the overall environment (Acemoglu & Scott, 1994).

According to Binder and Makridis (2020), local petrol price information can be a reliable indicator of how American households perceive and anticipate the real economy. In a similar vein, Makridis (2019) contends that regional shocks to housing prices can similarly influence people's perceptions and views about the economy, which in turn affects the overall state of the economy. However, Makridis (2022) uses micro-level Gallup data collected nationwide between 2008 and 2017 to primarily analyse the influence of local variables on respondents' beliefs and draws conclusions about their impact on attitudes. Furthermore, Das et al. (2019) discover that regional economic factors such as personal income and unemployment might account for variations in macroeconomic beliefs.

Over the years the development of digital payment has gained pace across the nation. With the introduction of bank based applications, tie up with third party platform, electronically enabled chip based cards as well as initiatives by Government of India to boost digital India program has contributed much towards the growth of economic ecosystem in India. The introduction of digital payment instruments including POS, NPCI enabled fastag and one tap payment mechanisms has smoothened the consumption pattern of Indian households. Data released by RBI under the payment system indicators shows significant growth in the volume of digital payments besides the amount involved. Various studies highlights the combination of digital payments and its effective impact on consumption pattern. For instance Dreger and Kholodilin (2013) uses survey based data to study the patterns of consumer confidence. Similarly Vosen and Schmidt (2011) uses data based on Google Trends while Duarte, Rodrigues, and Rua (2017) uses data on electronic payments. All such indicators plays a vital role in predicting the consumer patterns (Vosen and Schmidt 2011). According to Reserve Bank of India (2020) the



advent of digitalisation has transformed the delivery of payment and settlement system by providing the consumers a wide range of choices to select from. According to the report published by Internet and Mobile Association of India (IAMAI) in November 2019 has paved the way towards increase use of wireless and wired broadband facilities. Rooj and Sengupta (2021) highlights that the increase volume of digital payments has significantly elevated the private consumption growth in India. The benefit of data on digital payment is that such data is available electronically without any error and is released by the RBI on a monthly basis starting from November 2019. We perceive that given the association between volume of digital payment and growth in private consumption as highlighted by various existing authors there can be a linkage between the digital payments and the sentiments of Indian households towards their general economic condition. We use data on digital payments from the RBI's payment system indicator and consumer mood from a unique poll on consumer confidence that the RBI releases every two months across 19 major Indian cities in order to test our hypothesis.

The rest of the study is organised as : Chapter 2 deals with methodology and data, Chapter 3 presents the results from our empirical exercise and Chapter 4 presents the conclusion and policy implications of our study .

## CHAPTER 2 DATA AND METHODOLOGY

Based on the above discussion we intent to explore the following hypothesis:-

H1: Digital payment has a significant impact on household sentiments in India

H2: Digital payments alone and I the presence of controlled variables can impact the household sentiments.

The data for this study comes from the RBI's unit level data on consumer sentiments survey (CCS) conducted by RBI on a bi-monthly basis across several rounds for 19 major Indian cities<sup>1</sup>. For our analysis we consider a sample period from November 2019 (round 51) to November 2023 (round 75). In each round the respondents were asked to express their opinion about their present perception as well as expectation towards the general economic conditions compared to a year ago and one year ahead on the date of the survey. Besides their opinion on general economic conditions there also asked to express their beliefs towards other parameters of household consumption like perception and expectation on : household income, household spending, spending on essentials and non-essentials, employment scenario, general price level and inflation situation. Additionally, the poll provides information on the age, gender, income level, educational background, family size, and number of wage earners among the surevy respondents. Approximately 5000 respondents are asked to weigh in on their current economic circumstances as compared to a year ago (PGEC) and their forecast for the upcoming year (OGEC) in each survey round. Based on the names of responders from pooling booths, a new sample list is created for each round, and the survey is then carried out using that list. As a result, it is extremely improbable that the same household will appear again in subsequent rounds.

The data on digital payments comes from the payment system indicator of the RBI that releases the data across different forms of digital payments on a monthly basis. For our analysis we consider the data from November 2019 onwards corresponding to our survey period. We identify two key variables that can best define the household sentiments towards general economic conditions. Following the works of Andrade et al., 2021; Buchheim et al., 2020; Das

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<sup>1</sup> Ahmedabad, Bangalore Bhopal, Chennai, Delhi Guwahati, Hyderabad, Jaipur, Kolkata, Lucknow, Mumbai, Patna, Thiruvananthapuram, Bhuvneshwar, Chandigarh, Jammu, Nagpur, Raipur, Ranchi.

et al., 2019 When comparing perception to a year ago, we define PGEC as follows: =1 indicates improvement, 0 indicates stability, and -1 indicates decline. In a similar vein, we define OGEC as follows: -1 indicates a worsening of the outlook, 0 indicates no change, and 1 indicates an improvement.

To explore the impact of digital payments on household sentiments we estimate the following regression equation :-

$$CONFIDENCE_{idmt} = \alpha + \beta DIPAY_m + \gamma X_{idmt} + \phi_d + \delta_m + \theta_t + \epsilon_{idmt}$$

Here subscript  $i$  indicates individual household,  $d$  indicates the city of domicile  $m$  denotes monthly frequency and  $t$  denotes year.  $X$  is the vector of demographic controls (controlled variable) at household level for age, gender, education, income, family size etc. Since our data represents both cross section and time, thus  $\phi_d$  refers to the set of the city fixed effect that is ought to eradicate the fluctuations across the households and the cities that might vary across different locations due to market situation, economic growth rate as well as heterogeneity in beliefs and experience.  $\delta_m$  incorporates the monthly affects that can control the fluctuations across the confidence. Lastly  $\theta_t$  is likely to absorb any unobserved deviation in the macroeconomic environment across the cities that can impact the household sentiments for an individual year.  $\epsilon_{idmt}$  denotes the error term. Our smallest identification unit is a city where an individual respondent is domiciled and we perceive that the increase in digital payment has a positive impact on the individual belief. All standard errors are clustered at city level and are heteroskedasticity and autocorrelation adjusted.

The variable  $CONFIDENCE_{idmt}$  interchangeably denotes PGEC and OGEC respectively. Our variable of interest is  $\beta$  and we perceive that  $\beta$  will be positive. The following table shows the variables included in our study are as follows:

**TABLE 1**

<b>Variables</b>	<b>Measurement</b>
<b><i>Dependent Variables</i></b>	
PGEC	=1 if respondents think that overall economic conditions have improved, 0 if they think they have stayed the same, and -1 if they think they have become worse.
FGEC	=1 for the respondent's perception of an improvement in the future state of the overall economy, 0 for a stay the same, and -1 for a decline.
<b><i>Main Independent Variables</i></b>	
LDIPAY	Log of digital payments
<b><i>Other Controls</i></b>	
AGE22T29	=1 in the case that the respondent is between 22 and 29 years; else, = 0
AGE30T39	=1 in the case that the respondent is between 30 and 39 years, 0 otherwise.
AGE40T59	= 1 in the case that the respondent is between 40 and 59 years, 0 otherwise.
AGE60P	=1 in the case that the respondent is 60 years or above, 0 otherwise.
FEMALE	=1 if the respondent is female, 0 otherwise.
INCOME1BL1	=1 if the respondent's household income is < ₹1 Lakh per annum, else 0.
INCOME1TL3	=1 if the respondent's household income is > ₹1 Lakh and < ₹3 Lakh, per annum, else 0.
INCOME3TL5	=1 if the respondent's household income is > ₹3 Lakh and < ₹5 Lakh, per annum, else 0.
INCOME5P	=1 if the household's annual income is >= ₹5 Lakh, else 0.
ILLITERATE	=1 if the respondent's education level is illiterate, else 0.
EDUBP	=1 if the respondent's education level is below primary, else 0.

*Continued on the following page*

**TABLE 1 (continued)**

<b>Variables</b>	<b>Measurement</b>
<i>Other Controls</i>	
EDUL5	=1 if the respondent's education level is below primary (class 5), else 0.
EDU5TL10	=1 if the respondent's education level is more than or equal to the 5 <sup>th</sup> standard but is lower than 10 <sup>th</sup> , else 0.
EDU10T12	=1 if the respondent's education level is more than or equal to 10 <sup>th</sup> standard but is lower than 12 <sup>th</sup> standard, else 0.
EDUGRADP	=1 if the respondent's education level is graduate or above, else 0.
FAMSZ1T2	=1 in cases where a family has between one and two members, else 0.
FAMSZ3T4	=1 in cases where a family has between 3 to 4 members, else 0.
FAMSZ5P	=1 in cases where a family has 5 or more members, else 0.
RETIRED	=1 in the event that the responder is retired, esle 0.
HOUSEWF	=1 in the event that the responder is a housewife, else 0.
SALARIED	=1 in the event that the responder is salaried, else 0.
DAILYWG	=1 in the event that the responder is a daily wage earner, else 0.
SELFEMP	=1 in the event that the responder is self-employed or has business, else.
NEARMW1	=One if there are exactly one earning member; else, zero.
NEARNMG1	=1 if there are more earning members than 1, 0 otherwise.

*Source: Own calculations*

### **CHAPTER 3**

## **EMPIRICAL RELATIONSHIP BETWEEN DIGITAL PAYMENTS AND HOUSEHOLD SENTIMENTS**

In this section we present our findings from the regression equation stated above. We estimate two different models to explore the impact of digital payments on household sentiments. Model 1 includes only digital payments while Model 2 includes other control variables. We follow a similar approach for both PGEC and OGEC. Table 2 and Table 3 lists our result from the regression equation.

The calculated coefficient of DIPAY for PGEC in Table 2 is found to be positive and statistically significant for both models. Thus, the result suggests that digital payments have a positive effect on the household's present attitude. The calculated DIPAY coefficient in Model 2 is 1.177, meaning that a one-unit increase in digital payments throughout the cities multiplies the household's current feelings.

Next, we explore the affect of DIPAY on household sentiment on their outlook a year ahead towards their general economic condition (OGEC). Our model estimates reveal that for both Model 1 and Model 2 the impact of digital payment is positive and statistically significant indicating that a rise in digital payment significantly enhances the household's belief towards their future economic condition. Our results therefore significantly highlight the growing importance of digital payments in India and its role in enhancing the household sentiments at a micro level.

**Table 2**

Variables	PGEC	
	Model I	Model II
	Coeff. (P-value)	Coeff. (P-value)
DIPAY	1.1523***	1.1770***
	( 0.000)	(0.000)
Individual Controls	No	Yes
City, Month, & Year Fixed-Effects	Yes	Yes
Observations	151660	151660

Note: \*p < .10, \*\*p < .05, \*\*\*p < .01. The reference group for age 22-29 years, male for gender, annual income below 1 lakh for income, illiterate for education, 2 and 3 for family size, unemployed, retired and housewives for employment, 1 for number of earning members.

**Table 3**

Variables	PGEC	
	Model I	Model II
	Coeff. (P-value)	Coeff. (P-value)
DIPAY	0.476***	0.480***
	(0.001)	(0.001)
Individual Controls	No	Yes
City, Month, & Year Fixed-Effects	Yes	Yes
Observations	151660	151660

Note: \*p < .10, \*\*p < .05, \*\*\*p < .01. The reference group for age 22-29 years, male for gender, annual income below 1 lakh for income, illiterate for education, 2 and 3 for family size, unemployed, retired and housewives for employment, 1 for number of earning members.

Source: own calculations

## **CHAPTER 4**

### **CONCLUSION**

Digital payments in India are progressing at a good pace with the coming years. Most of the digital payment activities received a big push after demonetization and during the pandemic. On one hand there is an initiative by the Government to boost up digital payments in India on continuous basis while on the other hand there is an eagerness of using the digital payment platforms amongst the households to meet their daily requirements. This study explores how the digital payments impacted the household sentiments in India.

Using data from a novel unit level survey conducted by RBI we show that information on digital payments significantly impacts the household sentiments in India. We specifically measure the effect of digital payments on present perception about the economy (compared to a year ago) and future outlook (a year ahead) from the date of the survey, along with examining the implications of digital payments use in India.

Our findings show that the growth in digital payments has a substantial positive impact on Indian households' perceptions of their overall economic circumstances, both now and in the future. Our findings have significant ramifications for people's growing usage of digital payments. Every nation's household sector plays a significant role in the economic ecology, and tracking shifts in household mood can help inform decisions that have an effect on the national economy as a whole. According to our research, households' economic attitudes are greatly impacted by the growing use of digital payments, which has a knock-on effect on their ability to make a living. As a result, this study can help policymakers make decisions when



economic factors such as digital payments affect household attitudes and allow households to benefit from the convenience of making payments, which raises GDP. This may result in a rise in demand from households wanting to purchase goods whenever they want using digital payment methods that are simple to use.

The study is focused only on general economic conditions of households under different time span and paves the way for further analysis in terms of other fields contained in the CCS survey like household income, household spending, spending on essential and non-essential, employment scenario, general price level, inflation situation. Also heterogeneity analysis can be conducted across certain socio-demographic characteristics of households to understand a more in-depth behavior of household sentiment.

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