Understanding the impact of Covid-19 lockdown on the increase in the usage of Unified Payment Interface (UPI)

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Abstract

The payment system has witnessed a lot of phases and has come a long way since its inception. Currently, the payment system is in a transition phase whereby it is shifting from a cash-oriented platform to a digital platform. The transition is an arduous process but the usage of the electronic modes of payment is on the rise. This process began with the implementation of plastic money in the form of cards, gradually it involved transfer of funds using the internet connectivity in the form of internet banking, which evolved further into electronic wallets and now the Unified Payment Interface or most commonly known as the UPI where funds can be transferred instantly with the click of a button. The usage of UPI has increased considerably and a sharp rise in its usage is noticed post implantation of lockdown due to Covid-19. This paper tries to investigate the rise in the usage of the different cashless modes of payment and also rationalize the sharp increase in the transactions executed through UPI in the year 2020 compared to that of the year 2019 using the Wilcoxon Signed Rank Test. The study reveals that the increase in the transactions executed post Covid-19 lockdown significantly differs from the rise in the transactions executed during the pre-Covid period. So, it can be concluded that, the pandemic has pushed the people to accept the digital modes of payment widely, thereby easing the transition process from a cash-based economy to a digital one.

Keywords: Cashless economy; UPI; Wilcoxon Signed Rank Test; Covid-19; lockdown.

Introduction

Conversion into a cashless economy is an international issue as most of the countries all across the globe have already transformed themselves into cashless economies. The mode of payment has developed with time and starting from barter system we have undergone a long way to bring currencies into existence as a medium of exchange. Now globally, the countries are working towards eliminating the concept of transacting with physical form of currencies altogether and focus on transmitting funds from one source to another. Every day innumerable number of transactions take place all across the globe and in exchange of the goods and services purchased, the most commonly accepted mode of payment here in India are either cash or cards which are either debit cards or credit cards and nowadays we see an increased usage of Unified Payments Interface (UPI). Under few circumstances when these two methods fail or are unavailable few alternative options are available in the form of making payments through E-Wallets or through Unified Payment Interface (UPI). In order to process payments through either E-Wallets or UPI, the vendor also needs to operate through the same platform or application. Such payments ensure that the funds are directly transmitted from the source wallet to the beneficiary's wallet in case of E-Wallet payments and debited from the source bank account to the recipient's bank account in case of UPI payments. Also, for security reasons and authentication protocols many people are unable to transact using the electronic mode and they also distrust the system as they fear their accounts can be hacked if they transact online (Vikram, 2021). In order to familiarize the citizens with the cashless mode of payment, the Prime Minister of India on 8th November, 2016 announced the demonetization of currency notes of denominations ₹500 and ₹1,000. The entire nation was taken aback as these two were the highest denominations currency notes in circulation and the citizens were left with currency notes of only ₹100 and its lower denominations currency notes (Nagdev, 2018). Earlier before 2016, the Government of India has undertaken the step to demonetization of its currency notes but the one of 2016 faced criticisms on the ground that the currency notes of the highest denominations were declared as invalid. But this step was not only taken to eradicate black money, counterfeit currency notes, currency used for terrorist financing and corruption but also to push the nation towards digitization. The policy of demonetization along with Digital India can help the citizens be acquainted with the system of currency less transactions to some extent and has created a separate stage for choosing electronic mode of payment as an alternative option for the consumers of India (Balaji, 2018). On the other hand, the Covid-19 pandemic has accelerated the shift that was already in process. Due to the lockdown imposed people had no other option but to keep the economy running digitally as much as possible. The social distancing norms and the restrictions imposed by the Government compelled the residents of India to seek resort to the various cashless modes and as a result a major chunk of the population transacted digitally for the very first time (Saroy, R. & et. al, 2022). As a result, the transactions involving electronic platform showed a considerable increase post implementation of lockdown and usage of UPI surpassed all other forms of electronic payment.

What is UPI?

Unified Payment Interface or most commonly known as UPI is a real time payment system that involves immediate transfer of funds between two bank accounts with the help of a smart phone. It is controlled by the Reserve Bank of India and the Indian Bank Association and was developed by National Payments Corporation of India. The users of several bank accounts that are registered with the UPI are benefitted as this platform allows the access of multiple bank accounts through a single application. In order to access the UPI, a Virtual Payment Address is created which is required to be linked by the users' bank accounts. In addition to this process, the user needs to create a UPI pin which will be automatically linked to the Virtual Payment Address. Transactions can be executed only if the UPI pin matches with the Virtual Payment Address set by the user.[1] After the set up is complete, the user can simply transfer the funds to another user by entering the amount and verifying the access through the UPI pin to execute the transaction which just requires a smart phone with internet connectivity.

Features of UPI

- UPI helps the users to transfer funds instantly from one bank account to the other.
- The users can avail the facility 24 hours and even on public holidays as it is completely based on digital platform.
- The UPI is provided by the banks for Android, Windows and IOS operating systems.
- A user can use the UPI platform to transfer funds using the recipient's mobile number or bank account details or with the help of the recipient's UPI ID or through the Quick Response Code.
- Transactions can be executed for a particular user only if the UPI pin matches with the UPI ID created by the user.
- UPI enables the user to make utility bill payments, merchant payments, in-app payments, over the counter payments and also barcode based payments.
- UPI rewards its users with frequent cash back offers which get directly credited to the users' bank account as well as gift vouchers for online shopping.

Growth of UPI in India

In order to incorporate most of the population in the banking net and to promote digital execution of transactions, India is experimenting and launching various digital payment modes which are very much user-friendly. Plastic money in the form of cards has been in circulation for a long time but it was not used by people on a large scale basis. The other modes in the form of internet banking like Real Time Gross Settlement (RTGS), Electronic Funds Transfer/National Electronic Funds Transfer (EFT/NEFT), Immediate Payment

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[1] https://www.business-standard.com/article/economy-policy/all-you-need-to-know-about-upi-the-unified-payment-interface-116041200561_1.html

Service (IMPS) were not preferred by all because of the charges laid on the payment modes previously and too much of data entry also created errors while transferring fund from one account to the other. Things started to change with the increased acceptance of smart phones and availability of proper internet connectivity. This led to the development of various payment based applications in the form of mobile banking which gradually led to the emergence of e-wallets and ultimately the launch of UPI. Due to the ease of use and the security of payments it has been widely accepted by the users and it emerged as one of the significant platforms in executing digital transactions.

Literature Review

The study conducted by Rai and Badugu (2018), shows the picture of the preferred payment system among the residents of Delhi and Varanasi pre and post the demonetization of 2016. A convenience sampling method was used in this study taking a total of 100 respondents from Delhi and Varanasi region. The study revealed that there was a significant change in the preferred method of payment pre and post demonetization with the help of Z test. As per the study, people mostly opted for cash mode of payment while most people opted for internet banking method of payment post demonetization.

A study in the differences in technology adoption behaviour of customers in Indian banks during the pre and post demonetization phase has been carried out by Sundar (2020), consisting of 200 bank customers. The study could not find constructive effects of demonetization on the adoption of digital payment platforms by the respondents chosen despite a significant growth that has been observed in the usage of digital payment system across the country post demonetization period. However, the usage of Point of Sale (POS) has increased tremendously.

The study of the trend of digital payment modes has been carried out by Hindocha and Pandya (2019) following the effects of demonetization in the Indian economy. The study aimed to analyze the impact of demonetization on the electronic fund transfers which actually is considered as a significant contributor to the nation. The study revealed that there has been a significant positive impact on e-transactions especially in respect of RTGS and NEFT both in terms of volume and value and it has also witnessed a significant growth in mobile banking as well.

The digitization of financial services equipped with the spread of information technology has changed the way people transact and this change has strengthened even more due to the Covid-19 pandemic. Romdhane (2021), in his study tried to analyze the impact of information technology on the digitization of financial services during the pre-Covid time and study the challenges that the banks are facing to manage this thereby highlighting the post-Covid stakes. The study suggests that the banks need to combine the physical proximity and the digital offer in order to give support to the current scenario and slowly transitioning into a completely digital platform

in the near future will help the economy to adopt appropriate strategic plans which would be useful to counter threats.

The availability of low cost mobile data and the increase in the usage of smart phones have helped the Government of India to shift to extensive usage of digital platforms to execute transactions. Demonetization followed by the Covid-19 pandemic have made major portion of the population of India to use the digital platforms to transact. Pandey, A. & et. al (2021), in their study tried to analyze the level of adoption of the digital modes of payment by the people from the demonetization period till the Covid era. In order to analyze it, a survey was conducted on 165 respondents and it concluded that there was a significant difference between mean usage of digital payment system post demonetization and during Covid period.

Research Question

The different modes of electronic payment methods have shown an immense growth with respect to their respective volumes and values of transactions. This growth is observed in almost all the modes of payment since the year 2013 except that of the Debit Card transactions as this mode has shown a consistent decline from the year 2018 onwards. The UPI was launched in the year 2016[2] and since then the volume and value of its transactions showed a gradual increase. But the increase in the year 2020 was quite steep compared to that of the year 2019. Therefore, this paper tries to examine and validate the sharp growth in the UPI transactions especially from the year 2020 onwards due to the lockdown imposed because of the Covid-19 pandemic.

Objectives

The objective of the current study is as follows:

➢ To analyze the status of the volume and value of transactions of the different modes of electronic modes of payment available in the Indian economy.
➢ To analyze the rationality of the drastic rise in the volume and value of the transactions related to UPI payment system.

Methodology

The different modes of electronic modes of payment that have been considered in the present study are RTGS, EFT/NEFT, IMPS, Credit Cards, Debit Cards, Prepaid Payment Instruments (PPIs) and the UPI. To analyze the trend of the above modes of payments the volume and value of the transactions of the above mentioned modes have been obtained from the RBI archives from the year 2013 till the year 2021. But for UPI, the data is considered from the year 2016 and is obtained from NCPI archives. The trend is analyzed with the help of line charts using Microsoft Excel.

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[2]https://www.livemint.com/Money/Cog3dAvOZka0OsNg8M9S8O/UPI-20-launched-Here-are-its-key-features.html

In order to understand the rationality of such an increase, the UPI data has been divided into two parts considering the first part as pre-Covid period and the second as post-Covid period both for volume and value of transactions related to UPI. The pre-Covid time period considered here is 29 months before the imposition of lockdown starting from October, 2017 to February, 2020 and the post-Covid time period considered here is from March, 2020 to July, 2022 i.e. 29 months after imposition of lockdown.

The data so obtained has been analyzed to check the normality of the series by using the Jarque-Bera Test, thereafter Wilcoxon Signed Rank Test (Dumitriu, 2011), has been carried out to find out the differences in the increase in the volume and value of the transactions between the two series.

Analysis

The different modes of electronic payment data available from the year 2013 reveal that there has been a significant growth in the different modes of electronic payment system in India. While, a significant growth in RTGS, EFT/NEFT, IMPS, Credit Cards and Prepaid Payment Instruments can be noticed, the growth in the usage of Debit Cards saw a steady rise till the year 2018 and thereby the volume of the transactions as well as the value of the transactions started to decline considerably. A new mode of electronic payment system entered the Indian economy in the year 2016 which is commonly known as UPI or the Unified Payments Interface which captured a huge mass of the Indian household to facilitate the e-payment mechanism. The ease of use made it even easier for the people to transact using this mode of payment as the funds can be transferred easily by just entering a simple PIN. A sharp growth in the usage of UPI both in terms of volume as well as value is witnessed from the year 2020 onwards. This can be linked with the Covid-19 pandemic, the social distancing norms that have led people to accept UPI in order to proceed with the transactions. The volume and value of the different modes of electronic payment is shown in the following tables along with their respective line charts.

Year	RTGS Volume (Million)	EFT/NEFT Volume (Million)	IMPS Volume (Million)	Credit Cards Volume (Million)	Debit Cards Volume (Million)	PPIs Volume (Million)	UPI Volume (Million)
2013	73.26	568.81	8.78	475.62	6,703.33	126.04	-
2014	85.53	873.03	54.22	588.88	7,560.06	236.16	-
2015	92.87	1,161.91	179.93	734.36	8,813.85	663.24	-
2016	98.94	1,481.38	389.48	986.97	10,435.43	1,248.36	2.65
2017	117.1	1,897.65	890.42	1,355.43	11,743.40	3,376.38	429.15
2018	131.15	2,218.06	1,533.81	1,680.15	13,691.85	4,348.90	3746.32
2019	145.34	2621.81	2382.97	2094.96	13256.68	5161.61	2527.17
2020	144.47	2946.33	2973.83	1793.46	4312.38	4960.45	18880.91
2021	198.78	3800.89	4338.09	2156.43	4122.85	6158.38	38733.14

(Source: RBI and NPCI)
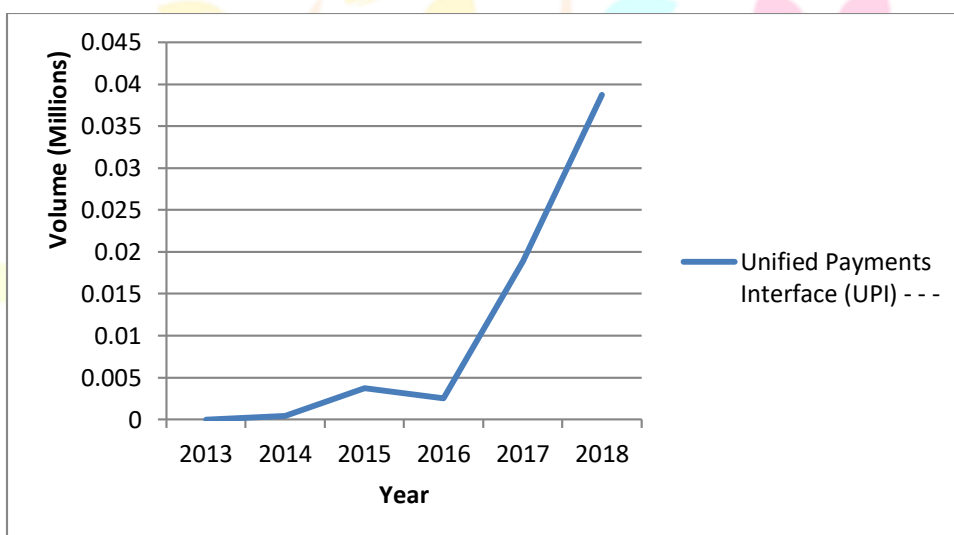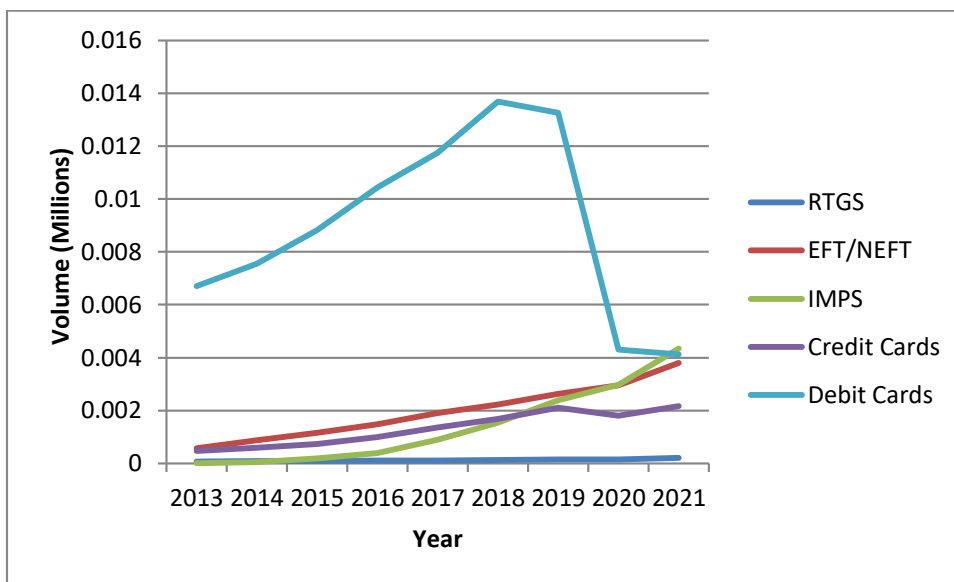
| Year	RTGS	EFT/NEFT	IMPS	Credit Cards	Debit Cards	PPIs	UPI
	Value (Billion)	Value (Billion)	Value (Billion)	Value (Billion)	Value (Billion)	Value (Billion)	Value (Billion)
2013	561,710.53	39,707.36	50.31	2,555.90	35,056.29	71.44	-
2014	611,898.95	55,339.48	390.36	1,827.73	22,948.86	158.7	-
2015	676,957.62	75,985.56	1,328.04	2,276.60	25,940.71	409.23	-
2016	802,344.99	106,103.90	3,111.86	2,984.31	26,935.40	683.73	8.9307
2017	993,269.88	157,997.27	7,660.25	4,335.74	31,573.07	1,311.95	570.2087
2018	1,147,748.80	216,347.88	13,926.19	5,698.41	38,292.74	2,006.90	5857.1045
2019	1,180,394.89	232,966.51	21,819.80	7,165.73	35,582.55	2,184.35	3917.5
2020	907254.77	238494.9	26838.36	5506.1419	8906.86	1895.92	33877.5
2021	1086151.29	276781.83	38283.5	8878.83	7432.95	2740.63	71576.13

(Source: RBI and NPCI)
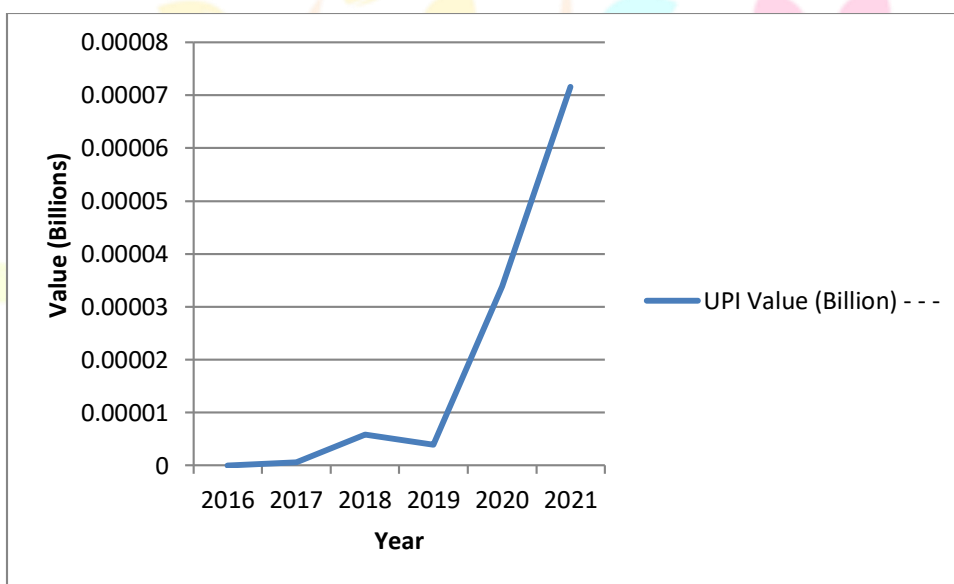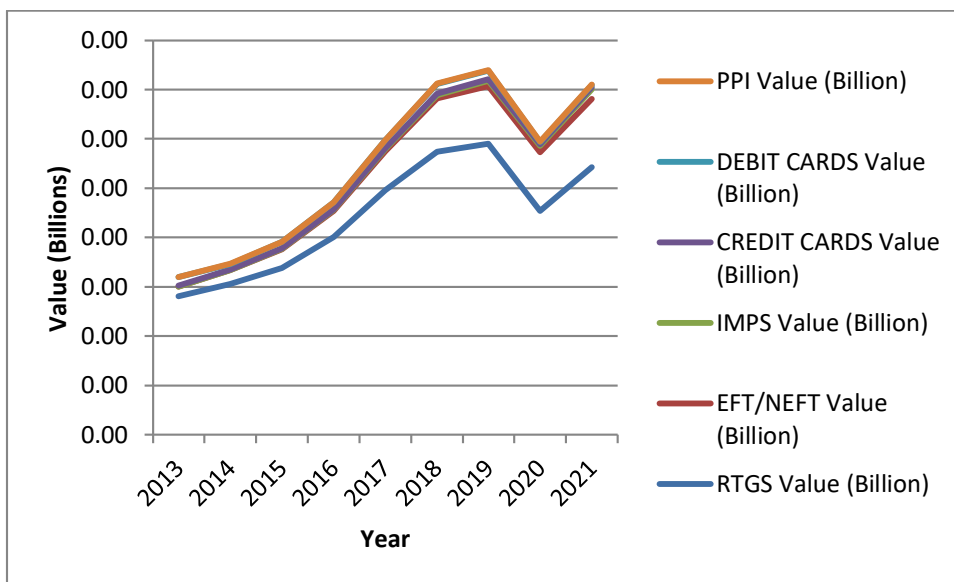
Normality Test

The Jarque-Bera test result shows whether a series is normally distributed or not. (Jarque-Bera, 1987) had proposed an omnibus test for univariate sample case using skewness and kurtosis. For the purpose of this current study to check the normality of the UPI series for both Value and Volume data, the results of the Jarque-Bera test reveals that the null hypothesis can be rejected and hence it can be concluded that the series are not normal.
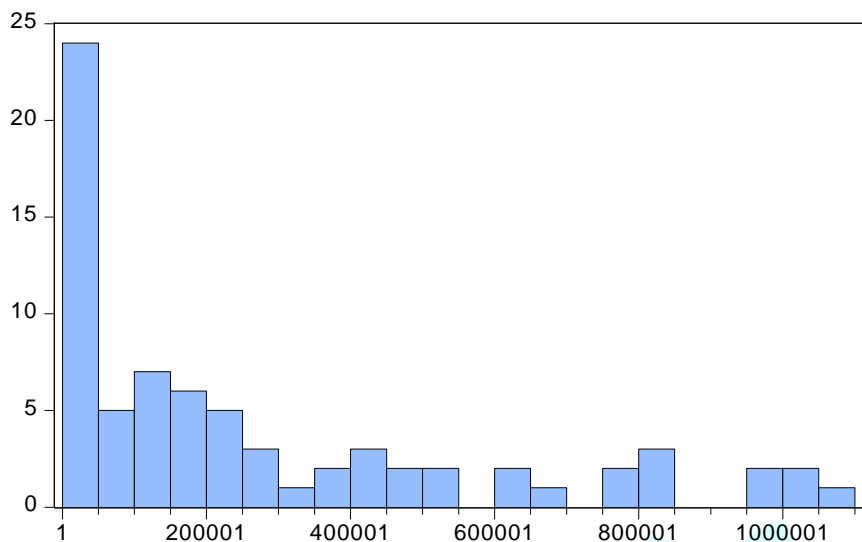
Series: VALUE__IN_CR__
Sample 2016M07 2022M07
Observations 73

Mean	270533.0
Median	151140.7
Maximum	1062992.
Minimum	0.380000
Std. Dev.	311995.3
Skewness	1.168719
Kurtosis	3.194375
Jarque-Bera	16.73342
Probability	0.000232
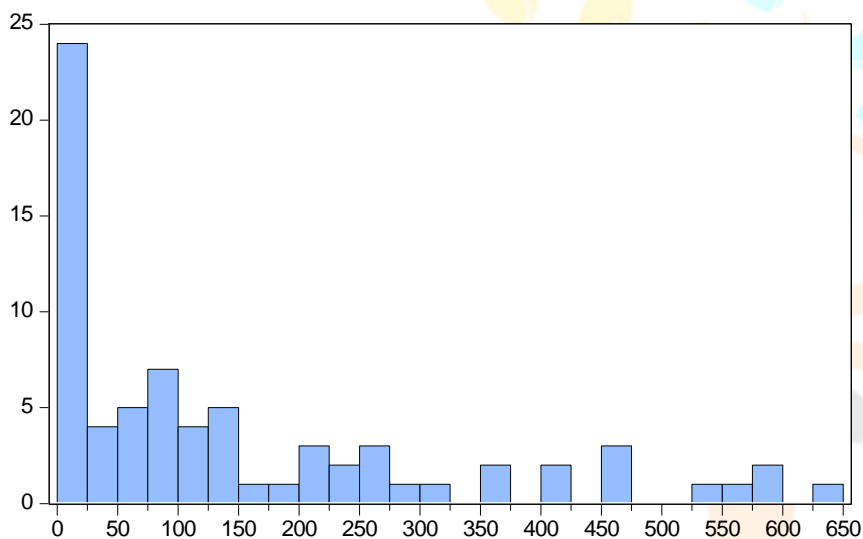
Series: VOLUME__IN_CR__
Sample 2016M07 2022M07
Observations 73

Mean	151.8230
Median	82.22900
Maximum	628.8400
Minimum	0.009000
Std. Dev.	174.2704
Skewness	1.250668
Kurtosis	3.517568
Jarque-Bera	19.84552
Probability	0.000049

Wilcoxon Signed Rank Test

In order to proceed with the analysis, the data is divided into two parts corresponding to UPI series Pre-Covid 19 and UPI series Post-Covid 19. In order to analyze the data, Wilcoxon Signed Rank Test is conducted on the series to understand whether they are significantly different from each other. The UPI volume and UPI value data is segregated into two parts, namely, the pre-Covid series of volume and value ranging from October, 2017 to February 2020 and the post-Covid series of volume and value ranging from March, 2020 to July, 2022. The results obtained from the Wilcoxon Signed Rank Test are displayed below:

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
Related-			

The results show that the null hypothesis is rejected at 5% level of significance. It can be therefore said, that the growth in the volume and the value of transactions in UPI in the pre-Covid period significantly differs from the volume and the value of transactions in UPI in the post-Covid period.

Conclusion

This study tried to analyze the impact of Covid-19 on the rise in the usage of UPI as a medium of payment using the electronic payment platform. An analysis of the various modes of electronic payment systems like RTGS, EFT/NEFT, IMPS, Credit Cards, Debit Cards, Prepaid Payment Instruments (PPIs) and UPI have been made from the year 2013 onwards and for UPI 2016 onwards. All of the modes show an increase in both volume and value of transactions except that for debit cards. Both the volume and value of transactions for debit cards show a considerable decline in usage from 2018 onwards. UPI platform was launched in India on 11th April, 2016, and very few people adopted it at that point of time and at the same time very few banks provided the facility. Gradually, with time the volume and value of transactions using UPI started increasing and people started adopting it due to its user-friendly platform. The rise in the transactions using UPI can be observed in the year 2020, as it saw a jump of 747% in its volume and 865% in its value of transactions as compared to the year 2019. Wilcoxon Signed Rank Test shows that there is a significant difference in the rise in the pattern of both the volume and value of the transactions related to UPI between the pre-Covid and the post-Covid series. So it can be said that the imposition of lockdown and the social distancing norms have led the people to adopt the UPI mode of payment rigorously for executing transactions.

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