

# Economic Shocks Assessment on Digital Payments in India

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## Abstract

The economic shocks of Demonetization and Covid-19 severely affected the digital payments scenario in India. The study aims to identify the change in the value and volume of digital payment indicators due to demonetization and Covid pandemic. The study has employed ARIMA Forecasting and Paired Sample T-test to check the combined impact of these economic shocks on the selected digital payment indicators in India which include RTGS, NEFT, IMPS, PPI, Debit Cards and Credit Cards. Both the events of Demonetization and Covid-19 negatively impacted the value and volume of Debit cards and RTGS, whereas these events positively impacted all the other selected payment indicators causing increase in their respective values and volumes. Thus, Demonetization acted as a forced switch towards the usage of digital payment systems where Covid-19 emerged as a mandatory switch towards the adoption of digital payments in India causing augmentation in the value and volume of digital payments indicators of India.

**Keywords:** Digital Payments, Economic Shock, Demonetization, Covid-19, India.

## Introduction

India experienced two economic shocks of Demonetization (in 2016) and Covid-19 (in 2020) during the past decade which severely affected its economy. The **first economic shock of Demonetization** was passed on 8<sup>th</sup> November, 2016 in which the high value denomination currency notes of Rs. 500 and Rs. 1000 were declared invalid which caused to extinguish about 86 percent of the total currency in circulation (Nithin M. et. al., 2019). The Indian authorities had expected only a part of currency in circulation to come back into the banking system as a result of Demonetization, while the tax evaded cash would not return into the formal economy. But on the contrary, nearly 99 percent of the currency in circulation withdrawn, came back into the formal banking system (Chakrabarty M. et al., 2020). The 'Digital India' initiative launched by the Government of India in 2015 was also an attempt to boost the digital payment economy and promote adoption of digital payment instruments by the citizens of India.

The **second economic shock of Covid-19** hit the world economy in 2020. There was a slowdown in the trade but a surge in the digital payments during the Covid pandemic as people feared the usage of cash perceiving it as a potential carrier of the virus. So, the Covid pandemic provided another opportunity for the Digital Payments market to grow around the world and in India. Social distancing norms and safety concerns regarding the transmission of the virus led to the shift of people towards the digital payment modes. Social distancing norms accelerated the use of mobile payment applications such as mobile wallets and mobile banking, for the use and management of finances as large number of financial transactions were being conducted through the mobile wallets and mobile banking applications. Therefore, during the Covid-19 pandemic situation, digital payments became vital for the citizens to perform their basic financial

activities without needing to go anywhere and inviting a risk to their lives (Jain K. and Chowdhary R., 2021).

### Review of Literature

Kumar S. and Puttanna K. (2018) aimed to find if there was a significant shift to electronic payments from cash payments following demonetization. The study forecasted the value for payment indicators for the period of November 2016 to March 2018 based on the historical data of April 2011 to October 2016 using ARIMA forecasting in EViews and then compared the forecasted values with the actual values using Paired T-test. It was found that the actual value and volume of RTGS, EFT/NEFT, M-Wallet, Credit and Debit card usage at PoS were higher than the forecasted values following demonetization but the actual value and volume of paper-based transactions were also found to be higher than the forecasted values. Total value and volume of payment transactions did not show any significant difference between the actual and forecasted figures indicating that transactions only shifted from cash based to electronic payments following demonetization without any loss in value and volume of total transactions.

Nithin M. et al. (2019) analyzed the impact of demonetization on the use of digital payment instruments and analyzed the payment trends for digital transactions. The data was analyzed using ITSA and ARIMA for the period of April 2011 to December 2017 for various digital payment indicators. It was found that the card usage, ATM transactions and IMPS registered a rise after demonetization whereas PoS transactions and mobile transactions witnessed a decline after the demonetization. Also, after the demonetization drive, the share of digital payments in the total value of transactions declined and cash again became the preferred mode of payment.

Tut D. (2023) investigated the effect of Covid-19 on the adoption of digital payments in Kenya specifically whether Covid-19 accelerated the adoption of FinTech payment platforms. The study revealed that Covid-19 augmented the adoption of FinTech payments whereas the payment cards transactions declined during the pandemic and there was a shift towards mobile banking. Also, there was negative impact of Covid-19 on interbank transfers causing decline in interbank transfers through RTGS and ACH.

Saroy R. et al. (2022) analyzed the impact of Covid-19 on digital payment habits of Indian households and tried to discover whether the behavioral shift in payment choice was only a temporary response to the pandemic or permanent one. It was revealed that digital literacy and awareness significantly increased the adoption of digital payments by complementing the debit cards and smartphones. Also, the government aid post pandemic was a significant motivator for the digital payments specially for those who relied on such aid before the pandemic.

### Research Methodology

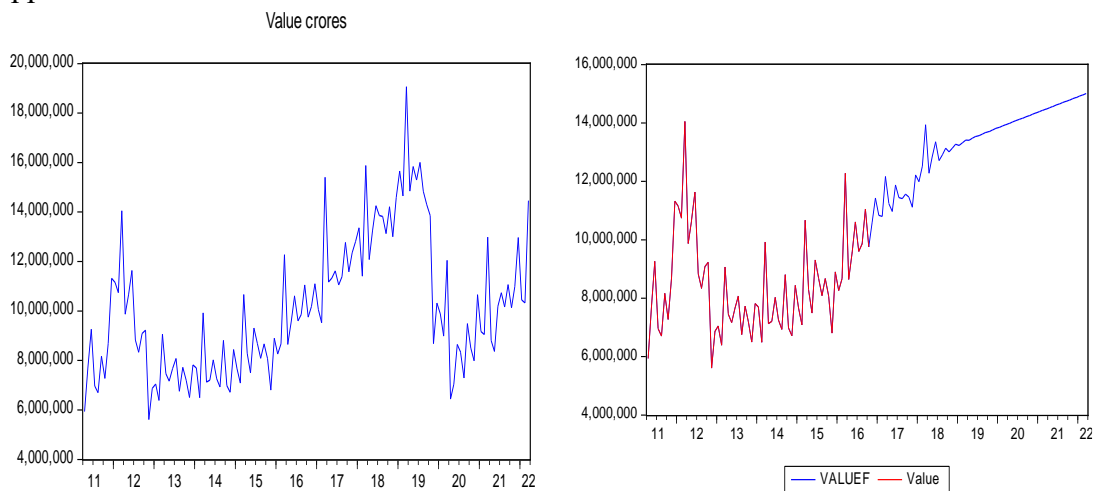
The study **aims** to identify the change (either increase or decrease) in value and volume of digital payment indicators due to demonetization and Covid pandemic. The monthly data on both the value and volume of select digital payment indicators has been extracted for the period of April 2011 to March 2022 from the RBI's Database on Indian Economy. The study has calculated forecasted value using ARIMA Forecasting in EViews, for the period of November 2018 to March 2022 to check the combined impact of Demonetization and Covid-19 on the digital payment indicators in India. The forecasted values are calculated based on the historical data of April 2011 to October 2018 of various digital payment indicators. The forecasted values are then compared with the actual values using the Paired Sample T-test to check if

the forecasted values differ from the actual values of digital payment indicators in terms of both the value and volume of various digital payment indicators.

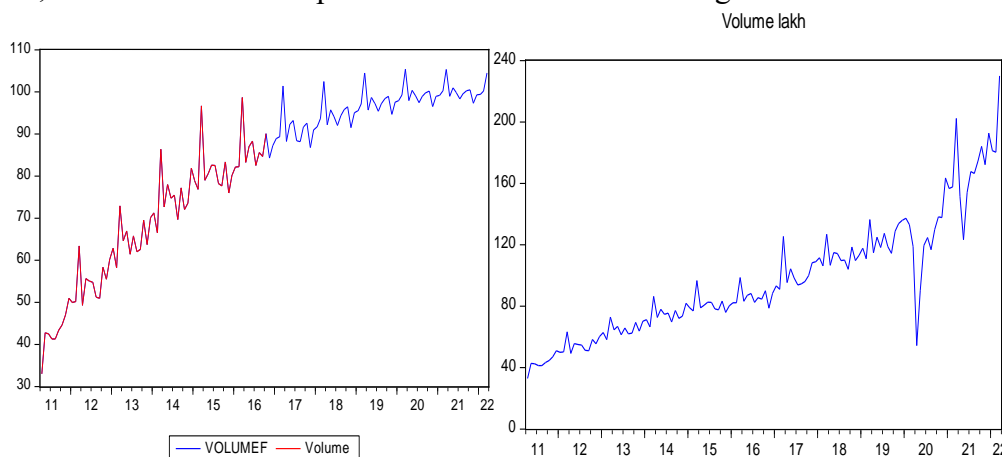
## Data Analysis and Findings

The digital payment indicators for which the data has been collected are RTGS, NEFT, IMPS, PPI, Debit Cards and Credit Cards. The actual value and volume of transactions are represented by VALUE and VOLUME and the forecasted value and volume of transactions are represented by VALUEF and VOLUMEF. The X-axis in the below graphs represent the year of transactions and the Y-axis represents the value/volume of digital payment indicators.

- 1. RTGS-** As per the RBI, “Real Time Gross Settlement (RTGS) is real time settlement of funds where the funds transfers are processed instantly i.e., as and when received and are performed individually depending upon the customer’s instructions. The minimum fund transfers can be Rs. 2,00,000 but there is no upper limit for the same”.



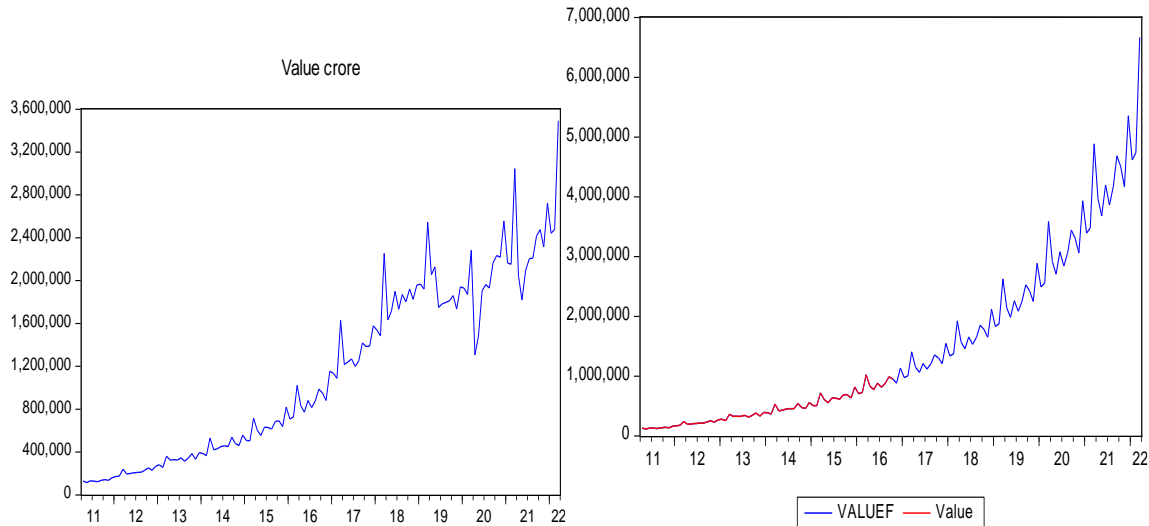
As per the Paired Sample T-test, there exists significant difference between the actual value and forecasted value of RTGS. The actual values are increasing after the Demonetization and but after the Covid pandemic, the actual value of RTGS started declining tremendously and then again started to rise. However, the forecasted values are only increasing in both the cases of Demonetization and Covid pandemic. Thus, both these events impacted the RTGS values causing much fluctuations in its trends.



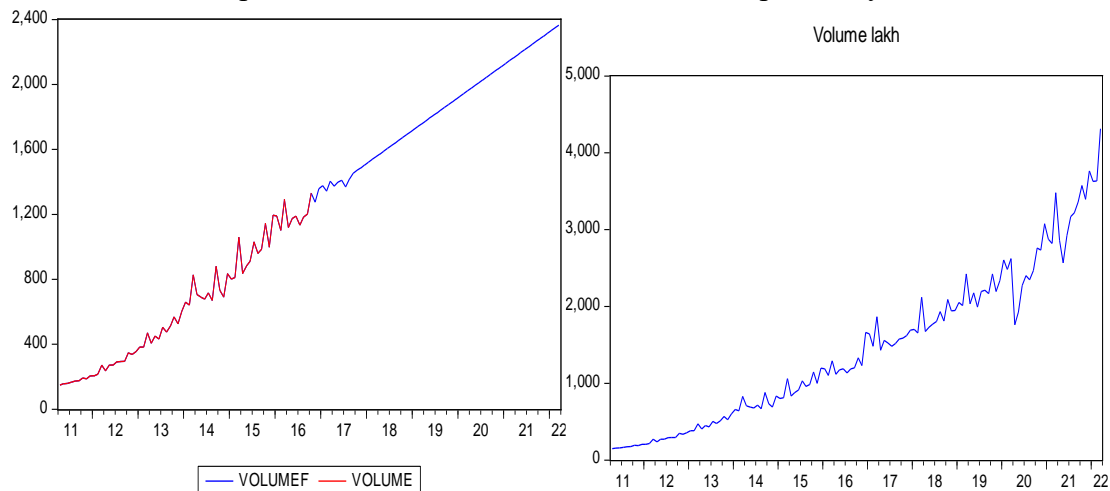
In case of Volume, there exists significant difference in the actual volume and forecasted volume of RTGS as per the Paired Sample T-test. The actual volume of RTGS increased after the Demonetization but first decreased and then again increased after the Covid pandemic, whereas the forecasted volume of RTGS

only increased after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the trends in the RTGS volume.

2. **NEFT-** As defined by RBI, “National Electronic Fund Transfer (NEFT) is a nation-wide payment scheme under which a customer, firm or corporate can transfer funds electronically from one bank branch to any other bank branch, limited to a maximum of Rs. 50,000 per transaction in hourly batches”.

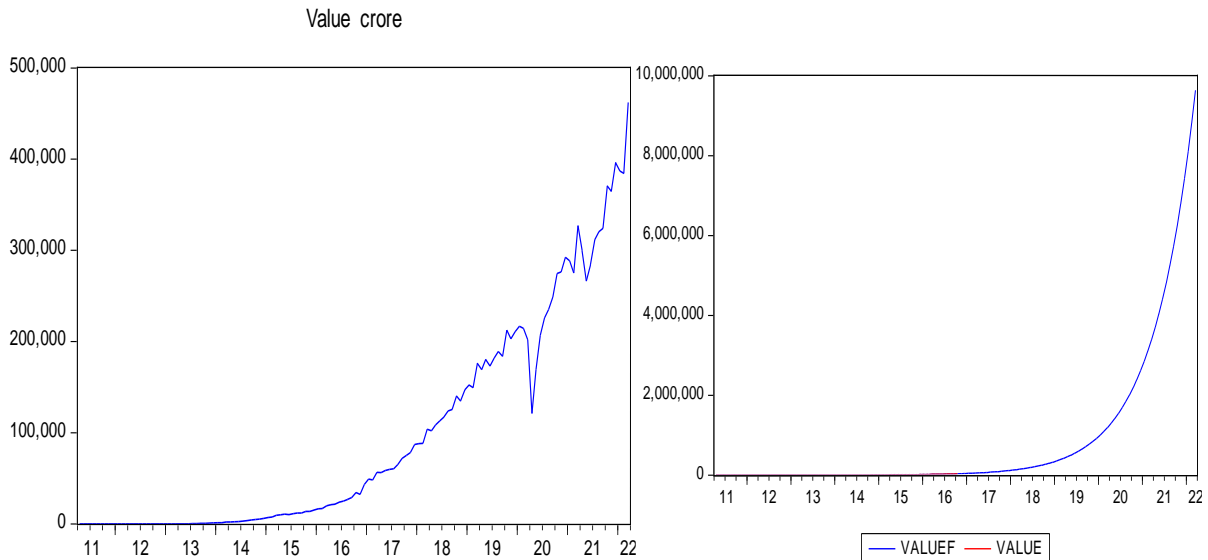


The results of Paired Sample T-test show that there exists significant difference between the actual value and forecasted value of NEFT. The actual value increased after the Demonetization but decreased and then again increased after the Covid pandemic. But the forecasted value only increased after both the events of Demonetization and Covid pandemic. Thus, the actual value was impacted by both these events.

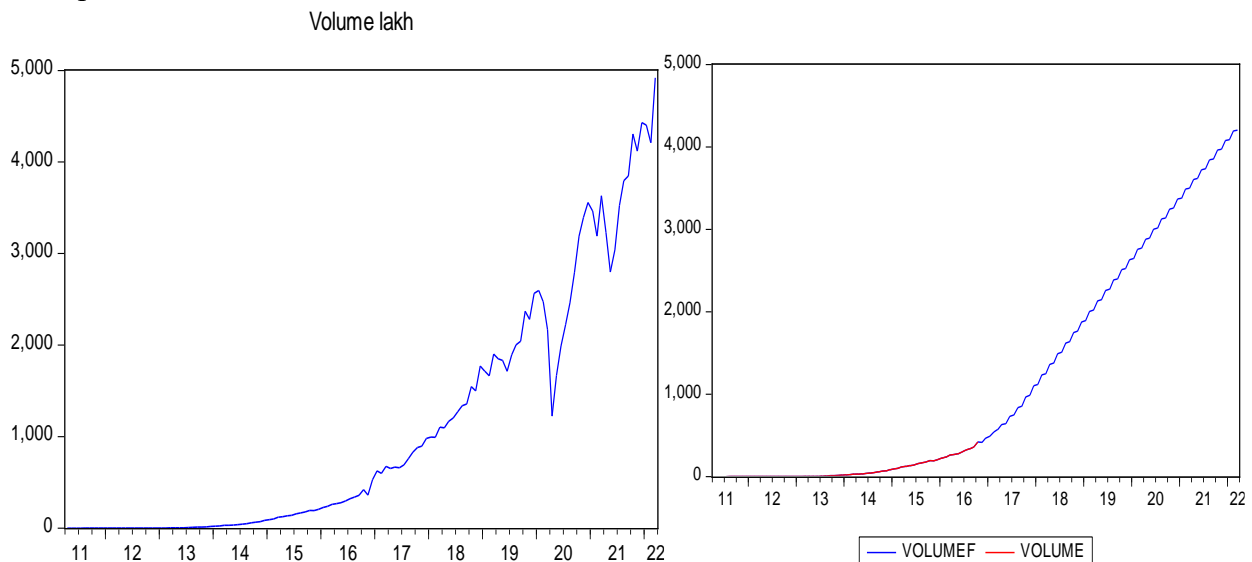


In case of Volume, there exists significant difference in the actual volume and forecasted volume of NEFT as per the Paired Sample T-test. The actual volume of NEFT is rising after the Demonetization but decreased and later increased the Covid pandemic, whereas the forecasted volume is only rising at a steeper level after both the events of Demonetization and Covid pandemic. Thus, both these events impacted trends in the actual volume of NEFT.

**3. IMPS-** “Immediate Payment Service (IMPS) facilitates instant electronic transfer of funds within the banks through internet banking, mobile banking and ATMs in the country. This service is available 24\*7 and can be accessed through the mobile number, Aadhaar number, bank account number and its IFSC code”; as defined by the RBI.

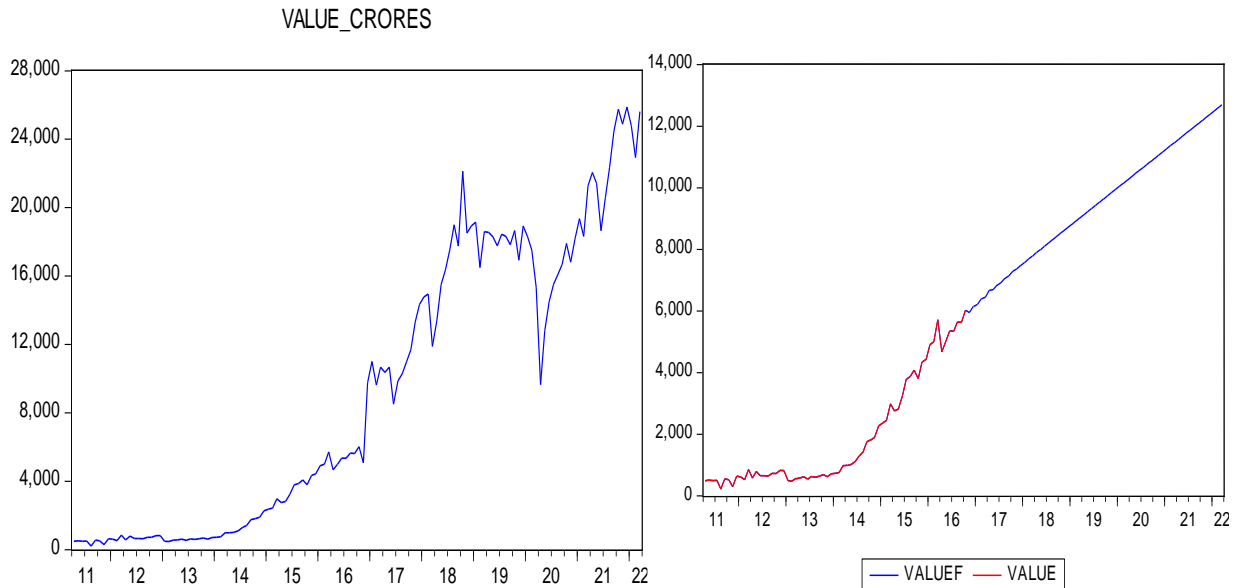


As per the Paired Sample T-test, there exists significant difference between the actual value and forecasted value of IMPS. The actual value of IMPS increased after the Demonetisation but decreased and later increased after the Covid pandemic, whereas the forecasted value of IMPS is showing only an increasing trend with no fluctuations after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the trends in the actual value of IMPS.

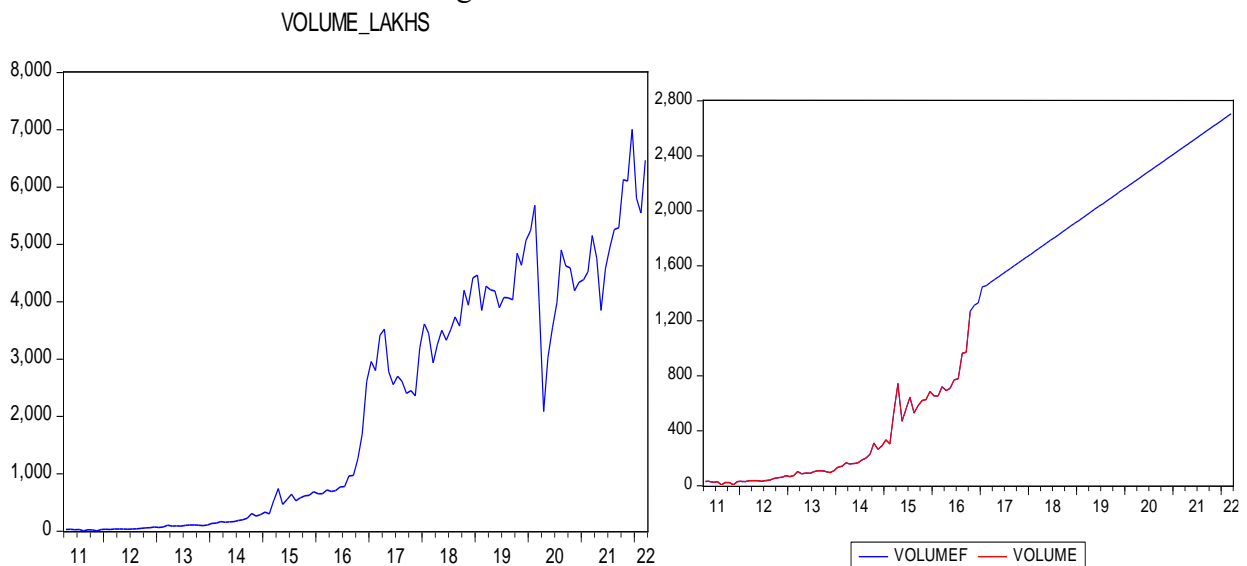


In case of Volume, there exists significant difference between the actual volume and forecasted volume of IMPS according to the Paired Sample T-test. The actual volume of IMPS increased after the Demonetization but decreased and later increased after the Covid pandemic, whereas the forecasted volume of IMPS only increased showing no fluctuations after both the events of Demonetization and Covid pandemic. Thus, both these events did impact the actual volume of IMPS causing fluctuations in its trends.

4. **PPI-** RBI defines Prepaid Payment Instruments (PPI) as the payment instruments which facilitate purchase of goods and services, financial services, remittance facilities, etc., against the value stored therein.

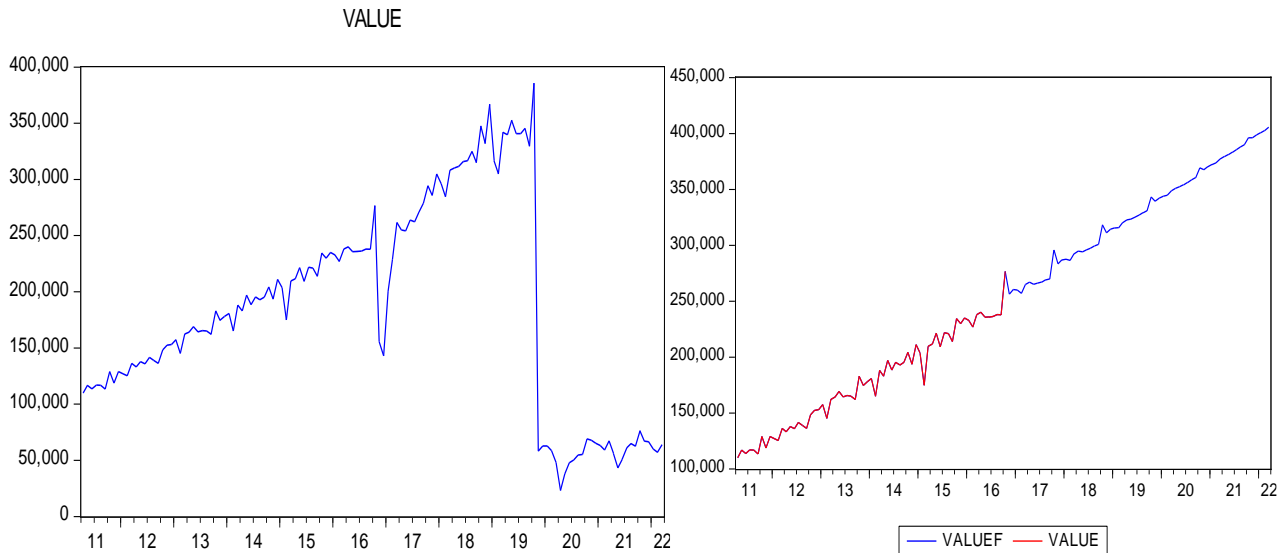


As per the Paired Sample T-test, there exists significant difference between the actual value and forecasted value of PPI. The actual value of PPI increased after the Demonetisation but decreased and later increased after the Covid pandemic, whereas the forecasted value of PPI is showing only an increasing trend with no fluctuations after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the actual value of PPI causing fluctuations in its trends.

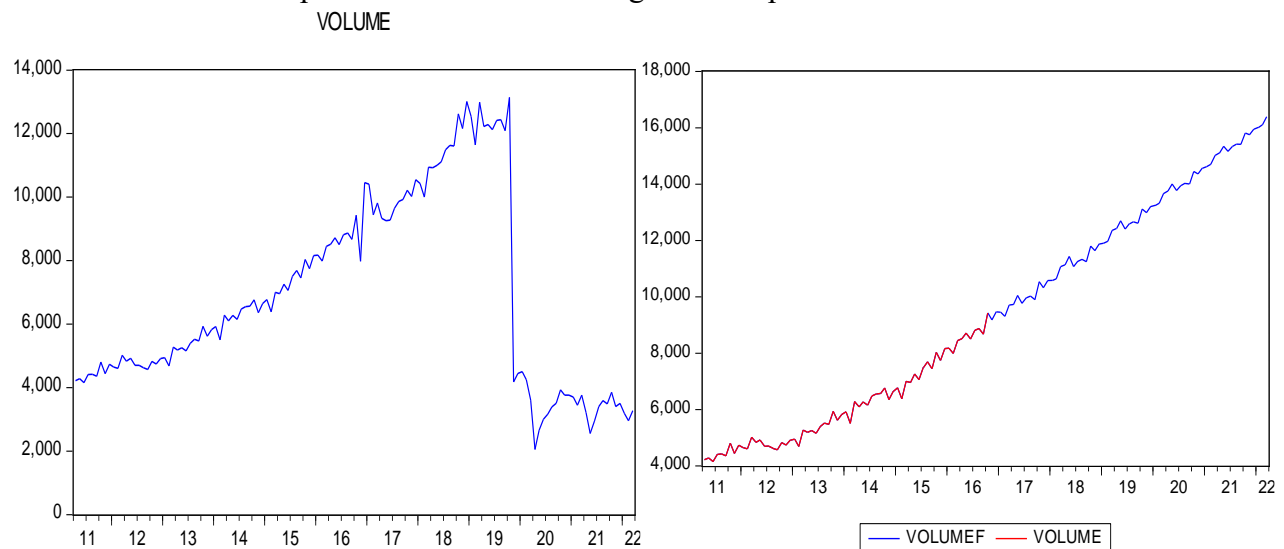


In case of Volume, the results of Paired Sample T-test show that there exists significant difference between the actual volume and forecasted volume of PPI. The actual volume of PPI has increased after the Demonetization but decreased and later increased after the Covid pandemic, whereas the forecasted volume of PPI is only showing a step increasing trend after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the actual volume of PPI causing fluctuations its trends.

**5. Debit Card-** As per the RBI, “Debit Card is a physical or virtual payment instrument containing a means of identification, linked to a Saving Bank/Current Account which can be used to withdraw cash, make online payments, do PoS terminal/Quick Response (QR) code transactions, fund transfer, etc. subject to prescribed terms and conditions”.



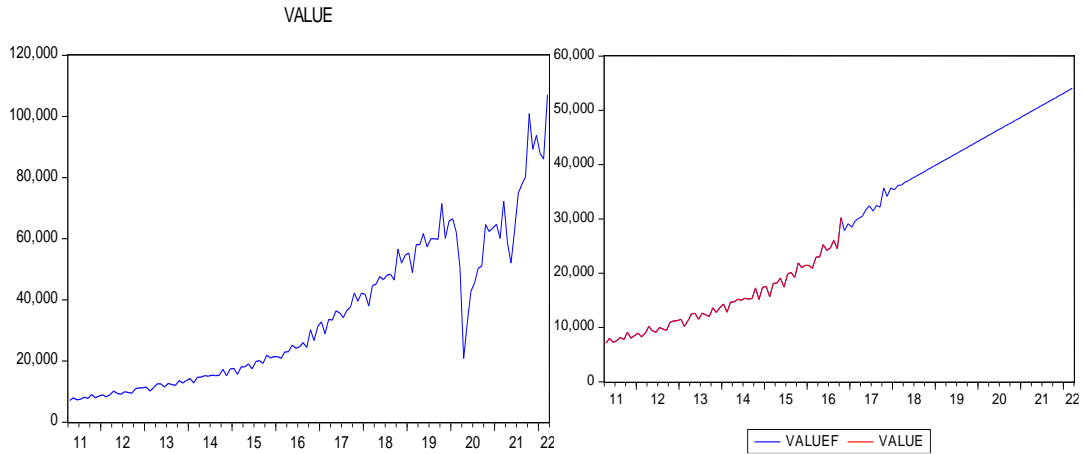
There exists significant difference between the actual value and forecasted value of Debit Cards as per the Paired Sample T-test. The actual value of Debit cards first dropped and later increased after the Demonetization but after the Covid pandemic, the value of Debit cards declined and continued to decline tremendously. However, the forecasted value of Debit cards only shows an increasing trend after both the events of Demonetization and Covid pandemic. Thus, both these events negatively impacted the value of debit cards but the Covid pandemic caused a much greater drop in its value.



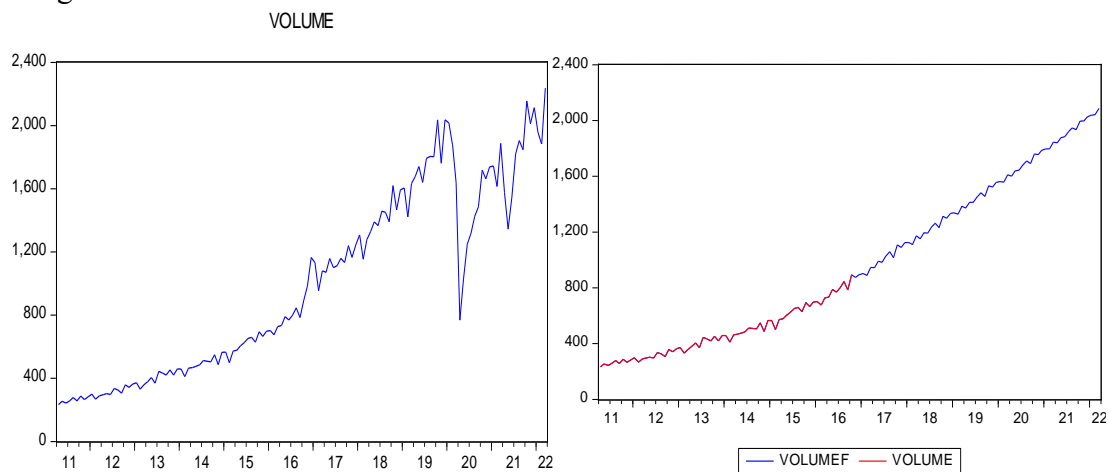
In case of Volume, the Paired Sample T-test shows significant difference between the actual volume and forecasted volume of debit cards. The actual volume of debit cards increased after the Demonetisation but decreased to a great extent after the Covid pandemic, whereas the forecasted volume of debit cards is showing only an increasing trend with no fluctuations after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the actual volume of debit cards causing first increase after Demonetization and later much decrease in its volume after the Covid pandemic.



**6. Credit Card-** As defined by RBI, “Credit Card is a physical or virtual payment instrument containing a means of identification, issued with a pre-approved revolving credit limit, that can be used to purchase goods and services or draw cash advances, subject to prescribed terms and conditions”.



The results of Paired Sample T-test show that there exists significant difference between the actual value and forecasted value of credit cards. The actual value increased after the Demonetization but decreased and later increased after the Covid pandemic. But the forecasted value only increased after both the events of Demonetization and Covid pandemic. Thus, the actual value of credit cards was impacted by both the events causing fluctuations its value.



In case of Volume, the Paired Sample T-test shows significant difference between the actual volume and forecasted volume of credit cards. The actual volume of credit cards increased after the Demonetisation but decreased and later increased after the Covid pandemic, whereas the forecasted volume of credit cards is showing only an increasing trend with no fluctuations after both the events of Demonetization and Covid pandemic. Thus, both these events impacted the actual volume of credit cards causing increase and decrease fluctuations in its volume.

### Results and Discussion

The ARIMA (p,d,q) models have been used to calculate the forecasted values and volumes of the selected payment indicators for the period of November 2016 to March 2022 to study the combined impact of Demonetization and Covid-19 on the digital payment indicators. The results of Paired Sample T-test reveal the differences between the actual and forecasted values and volumes of the selected payment indicators for the above selected time period where the actual value and volume of the digital payment indicators



was higher than the forecasted value and volume for all the selected digital payment indicators except for Debit cards.

If we talk about the impact of Demonetization on the actual value and volume of the selected indicators, the data shows that the actual value of all the selected indicators showed an increasing trend after Demonetization causing increase in the value of total digital payments except the Debit cards which showed a declining trend. Similarly, the actual volume of all the selected indicators showed an increasing trend after the Demonetization causing increase in the volume of total digital payment indicators.

If we see the impact of Covid-19 on the actual value and volume of the selected indicators, the data shows that the actual value of all the selected indicators exhibited first a declining trend and later a rising trend after Covid-19 except RTGS and Debit cards as there was a severe decline in the value of RTGS and Debit cards after Covid-19. Correspondingly, the actual volume of all the selected indicators showed first a decreasing trend and later an increasing trend after Covid-19 causing rise in the volume of digital payment indicators with the exception in the volume of debit cards which showed severe decline in its volume.

Thus, both the events of Demonetization and Covid-19 negatively impacted the value and volume of Debit cards and RTGS, whereas these events positively impacted all the other selected payment indicators causing increase in their values and volumes, indicating that the customers have adopted and shifted towards the digital payment instruments.

## Conclusion

The results of the present study concludes that both the events of Demonetization and Covid-19 led to increase in the adoption and usage of digital payment modes of transactions and increased shift of the citizens towards retail electronic payment systems such as NEFT, IMPS, PPI etc. The Demonetization drive was also pushed by the Government of India as a promoter of the digital payments in India so that people shift from the cash-based economy to the Digital economy. Moreover, favorable financial policies and financial incentives need to be further enhanced by the Government to support the digital environment rather than forced restriction on the use of cash and forced switch of citizens towards the digital modes of payment.

However, the Covid-19 pandemic made people shift towards the digital modes of payments as a mandatory option and not a forced switch as people avoided the use of cash/currency notes as a precautionary move to stay away from the virus. Banks and Financial Institutions also promoted the use of mobile banking and digital transfers without the need to visit a bank for financial services as various financial services were made available online. Thus, both the Demonetization and Covid-19 have emerged as the major factors leading to sustainability in the value and volume of digital payments (Bhavsar V. and Samanta P., 2022).

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