A Tale on Paper Based Payment System: A study from India in respect to Demonetization and Covid-19

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Abstract:

It is the era of instant-ness and ease; accordingly, the business world is having no exception to it. Business works on exchange of goods or services through a medium such as money, gold etc. A payment system in simple words: a system that supports the transfer of funds from one to another. Sole aim of this paper is to study the impact of demonetization and Covid-19 on paper-based payment systems. Both mentioned events had given remarkable impact on the economy and financial system.Digital payments emerged and conquered the market, these systems crushed the share of paper-based system.

Keywords: Covid-19, Demonetization, Paper-based payment system, Regression.

Introduction:

A payment is the transfer of one form of goods, services or financial assets in exchange for another form of goods, services or financial assets in proportions that have been previously agreed upon by all parties involved. World have made a significant advancement in terms of payment systems and speed of exchange with evolution of internet. The speed of evolution internet has been changing the fate of payment-systems rapidly. Government of India is encouraging digital payments and transactions to replace cash.

Chronology and Evolution of Digital Payments in India:

Currency had replaced precious metals which had replaced the barter system of trade. With introduction and evolution of banking system enabled bank accounts and the transfer of money to bank accounts. Such transfers require payment instruments such as Cheque. Thus, a system consisting of cheque as payment instruments and infrastructure around the cheque consisting of drawee bank, drawer bank and the cheque clearing houses came on the scene, were known as a payment system.Development of information and communication technology (ICT) and related information infrastructure has resulted in different kinds of payment instruments and innovations in the instruments and payment systems evolved. Magnetic Ink Character Recognition **(**MICR**).** For a long time, MICR cheque is the main payment instrument and payment system that existed in the country was cheque and cheque clearing systems. Even the cheque clearing systems have evolved from manual clearing system to MICR clearing systems

Cheque Truncation System (**CTS**)

Cheque Truncation System was introduced to restrict the physical movement of cheques and to enable the use of images of cheque for payment processing. For this, CTS-2010 Standard cheque only in circulation in India to achieve this purpose. Now non-CTS-2020 are not valid for any purpose.

Electronic Clearing Services (**ECS**)

After implementation of MICR, it made cheque clearing quick and efficient. To resolve thechallenges arose pertaining to inherent issues while using MICR for bulk and repetitive payments such as the collection of utility payments, payment of dividends in the form of dividend warrants etc. ECS is designed and implemented. ECS Credit to facilitate one-to-many payments such as

dividend, salary, interest payments, etc. and ECS Debit to facilitate many-to-one payments such as utility payments. One more advancement to ECS is the National Automated Clearing House (NACH) by National Payments Corporation of India (NPCI). This is a pan-India system for processing bulk and repetitive payments and the ECS is gradually being replaced and subsumed into NACH.

Government and RBI aimed to reduce the use of paper for transactions and to foster digital transactions. It would take long time to completely move to the electronic mode from paper-based transactions.

Today, India boasts of a robust and well-established payment system; The payment methods consist ofNational Electronic Funds Transfer (NEFT), Immediate Payment Service (IMPS), Aadhaar-Enabled Payment System (AEPS) under this to perform payment biometric based authentication required through UIDAI portal, and Unified Payments Interface (UPI) etc. Bulk and repetitive payment systems is handled by systems such as Electronic Clearing Service (ECS), the National Automated Clearing House (NACH) and Aadhar Payment Bridge System (APBS). In development and deployment of retail payment systems,the National Payment Corporation of India (NPCI) has emerged as an exemplary organization& NPCI acts as an umbrella for all retail payments in India and was set up by the RBI along with the Indian Banks Association.

Role of Central Bank:

The Payment and Settlement Systems Act 2007 regulates and supervises payment systems in India and designates the Reserve Bank of India as the authority for all its purposes and related matters. The Board for Regulation and Supervision of Payment and Settlement Systems (BPSS), a sub-committee of the Central Board of the Reserve Bank of India is the highest policy making body on payment systems in the country. Under the act, section 4 of the PSS Act provides for a mandatory RBI approval to commence or operate a payment system.

Demonetization of High Values Currencies:

Government of India announced and implemented the scheme of Demonetization on8th November, 2016, the Government of India announced the demonetisation of all ₹500 and ₹1,000 banknotes of the Mahatma Gandhi Series which were higher denominated currency notes at that time. The major objectives of demonetisation in India are as follows: 1) To stop the circulation of black money in the market. 2) To help in reducing the interest rates of the prevalent banking system. 3) To help in creation of cashless economy. Third major objective of the demonetization aimed to reduce cash transactions; experts were opined that could curb the share of the paper-based payment systems in big way.

Covid-2019 Pandemic:

In the modern age, Covid-19 had long and ever lasting impact on the businesses and lives of all living being. After eruption of covid pandemic a new normal situation establishing and flouring. With the speared of covid-19, human behaviour modified social gathering to social distance and Shake hand to Namaste with folded hands. There are studies stating that Covid-19 infection can spread through paper and Currency. Experts were opined that it could drive the share of Paper-based payment system to lowest level possible.

Literature Review:

There are several studies on digital payment systems and related aspects as well. No or little research done on paper-based systems in the recent past. Kavitha and Others(2018) stated that technological innovations and information technology have great impact on Banks and Payment Systems according.According to the study made by Thaiyalnayaki and G Divakara ReddyPayment system plays vital role in profitability and liquidity risk management.

Data:

The Study is based on secondary data extracted from the Reserve Bank of India website; the data is archived by RBI for research. The extracted data is reliable and authenticated apart from that it is cost effective. Month-wise transactions volume is the variable to study with regression for prediction.The data used for study is between November-2007 to October-2020.

Table-1

S08	S09	S10	S11	S12	S13	S14	S15	S16	**S17**	S18	S19	**S20**
1247.70	1250.50	1244.00	1134.00	1191.13	1127.25	959.51	947.80	880.25	**964.10**	989.14	898.07	**866.12**
1120.80	1091.70	1085.00	1112.80	1007.41	984.52	1037.73	890.15	851.13	**943.74**	880.56	828.04	**865.46**
1144.30	1115.20	1175.00	1116.70	1074.42	1064.81	978.41	913.91	883.43	**948.07**	945.10	878.22	**887.17**
1223.90	1200.90	1187.00	1162.40	1131.78	1106.03	1051.81	969.41	858.89	**953.52**	953.86	937.13	**884.95**
1125.40	1122.40	1104.00	1052.20	1062.74	1036.25	958.40	902.98	864.30	**954.66**	972.99	839.64	**710.34**
1171.40	1102.30	1111.00	1121.30	1123.62	1036.34	999.17	911.33	852.20	**1016.28**	967.71	921.11	**176.82**
1189.10	1109.00	1175.00	1097.50	1049.98	1091.18	999.18	943.69	882.57	**999.71**	924.67	897.93	**306.77**
1279.40	1247.10	1340.50	1308.00	1295.30	1187.51	1105.05	1027.96	980.47	**1279.85**	1056.49	997.57	**496.68**
1244.10	1088.00	1076.40	1081.00	1054.40	1113.45	938.93	936.58	877.91	**1079.44**	935.61	869.93	**532.38**
1313.90	1138.60	1124.70	1105.00	1110.90	1082.53	1041.45	974.08	874.88	**1311.67**	990.59	944.28	**519.83**
1242.90	1173.40	1177.30	1194.00	1070.80	1078.16	1071.20	1095.72	937.46	**1388.20**	964.38	925.24	**612.71**
1180.50	1104.40	1092.10	1104.00	1090.50	1031.84	970.11	946.51	813.71	**934.99**	985.99	866.56	**643.08**

Note: 1). S08 to S20 represents the total number of Paper-based payment system transaction held during the respective month in Millions.

2). Column S08 is October-2008 to November-2017sequentially.The same fashion is followed with respect to other columns as well.

3). Column S17 represents November-2016 to October-2017; It represents demonetization year.

Column S20 represents October-2019 to October-2020; It represents Covid-19 affected year for the purpose of study in the time frame.

Research Methodologies:

Multiple linear regression (MLR), also known simply as multiple regression, is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. The goal of multiple linear regression (MLR) is to model the linear relationship between the explanatory (independent) variables and response (dependent) variable.

Multiple regression is the extension of ordinary least-squares (OLS) regression because it involves more than one explanatory variable.MLR is used extensively in econometrics and financial inference.

Linear regression is a function that allows an analyst or statistician to make predictions about one variable based on the information that is known about another variable. Linear regression can only be used when one has two continuous variables—an independent variable and a dependent variable. The independent variable is the parameter that is used to calculate the dependent variable or outcome. A multiple regression model extends to several explanatory variables.

The coefficient of determination (R-squared) is a statistical metric that is used to measure the variation in outcome can be explained by the variation in the independent variables. R^2 can only be between 0 and 1, where 0 indicates that the outcome cannot be predicted by any of the independent variables and 1 indicates that the outcome can be predicted without error from the independent variables.

Hypotheses:

Hypothesis on Demonetization impact

H_{10}: Demonetization affected the Paper-based Payment system.

H_{1A}: Demonetization was not affected the Paper-based Payment system.

Hypothesis on Covid-19 impact

H_{20}: During Covid-19 the Paper-based Payment System affected.

H_{2A}: During Covid-19 the Paper-based Payment System does not affected.

Data Analysis and Interpretation:

Table-2 Pertaining to Demonetization

S.No	Observed Values	Forecasted Values	Residual
1	964.10	966.82	-2.72
2	943.74	947.05	-3.31
3	948.07	937.35	10.72
4	953.52	949.98	3.54
5	954.66	954.75	-0.095
6	1016.28	1017.95	-1.67
7	999.71	1006.72	-7.01
8	1279.85	1281.24	-1.39
9	1079.44	1079.92	-0.48
10	1311.67	1308.54	3.13
11	1388.20	1388.04	0.16
12	934.99	935.87	-0.88

Observed Value and Forecasted Value relationship:

R square (R^2) equals **1.0.** It means that the predictors explain 99.9% of the variance.
Adjusted R square equals **1.0.**
The coefficient of multiple correlation (R) equals **1.0**. It means that there is a very strong direct relationship between the predicted Value and the observed Value.
Overall regression: right-tailed, $F_{(1,2)}$ = **314.73**, p-value = **0.0032**. Since p-value < α (0.05), we reject the H_{10}.

Line Chart of Observed Values Vs Forecasted Valuesfor Demonetization Period

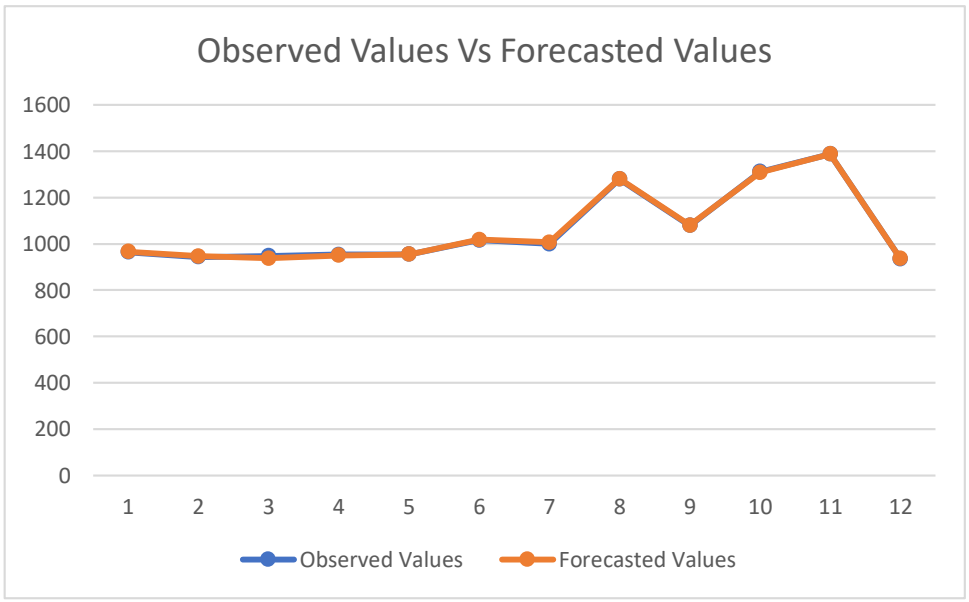


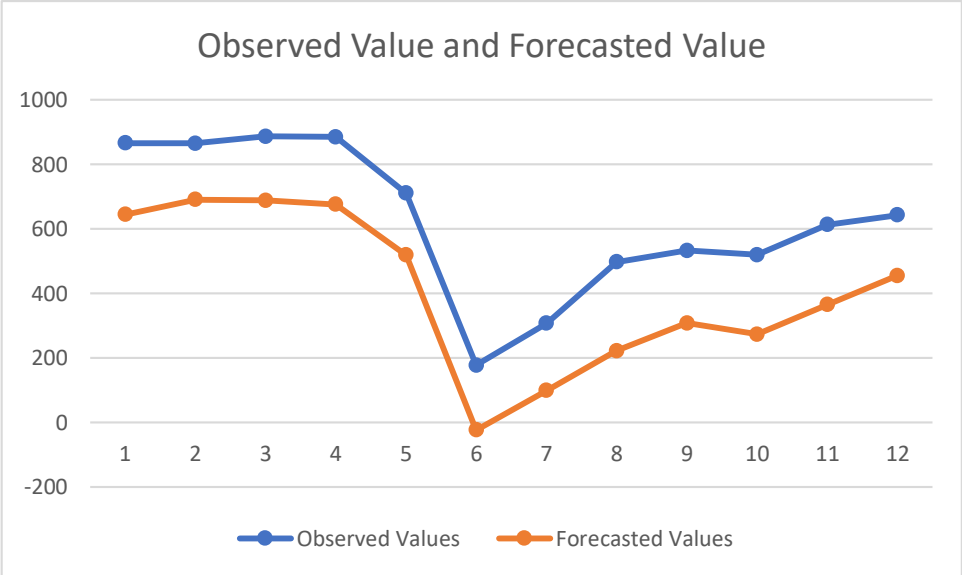
Table-3 Pertaining to Covid-19 Period

S.No	Observed Values	Forecasted Values	Residual
1	866.12	644.77	221.35
2	865.46	690.47	174.99
3	887.17	688.19	198.98
4	884.95	675.70	209.25
5	710.34	518.46	191.88
6	176.82	-24.52	201.34
7	306.77	98.40	208.37
8	496.68	221.35	275.33
9	532.38	307.62	224.76
10	519.83	272.86	246.97
11	612.71	364.45	248.26
12	643.08	454.56	188.52

Observed Value and Forecasted Value relationship:

R square (R^2) equals 0.050. It means that the predictors explain 5.0% of the variance.
Adjusted R square equals 11.45.
The coefficient of multiple correlation (R) equals 0.22. It means that there is a weak direct relationship between the predicted Value and the Observed Value.
Overall regression: right-tailed, $F_{(1,-1)}$ = -0.0044, p-value = 1.00. Since p-value ≥ α (0.05), we accept the H_{20}. Observed values are more than Forecasted values in all cases we can say that it impacted favourably by Covid-19 pandemic.

Line Chart of Observed Values Vs Forecasted Values for Covid-19 Period



Note: Forecasted value at serial number 6 is negative but it never supposed to go below zero hencetreated it as negligible one.

The Conclusion:

The Demonetization implemented by Government of India have not affected the Paper-Based Payment system.Whereas Covid-19 has impacted positively on Paper-Based Payment System literally it propelled to increase count of transactions with the Paper-Based Payment System.

Limitations:

1. The study is excluded other external events factors.
2. Conducted for specific limited duration.

References:

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