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Trend and dynamics of card payment system in India

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ABSTRACT

Payment system in India has undergone a dramatic change in recent years. The payment through cards, using both debit and credit cards, is one of the early innovations in the modern payment system in the country. Several intermediaries are involved in the effective functioning of card payment mechanism. As a result, the card payment infrastructure has grown remarkably well across India. The volume of payments made through these devices as well as the value of card payments increased rapidly in the last two decades. Among the commercial banks, the State Bank of India dominates in the maintenance of ATM infrastructure, the issue of cards and in the volume and value of card transaction. The private sector banks dominate in the installation of POS terminals and HDFC bank tops in the POS credit card transaction. However, the recent trend shows that the transaction through cards as a percentage of total retail electronic payments has been declining in India, as other retail payments platforms have become popular.

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1. Introduction

The card payment mechanism, which substitutes cash and cheque for transactions, constitutes an important innovation in the modern payment system. Credit cards and debit cards are the important variants of cards. The credit card allows the holder to get a revolving credit as per card agreements for making payments. The debit card makes payment possible by deducting a specific amount from the particular debit account. Initially, the use of card was specific to individual store, later it got access to use in multiple business stores¹. The formation of card association and the interoperability in multiple platforms increased the popularity of card transaction. The card transaction satisfies liquidity requirement, removes the difficulty and the threats of carrying cash and offers many rewards and cash backs².

The first launch of credit cards and debit cards in India took place in 1981 and 1999 respectively (RBI, 2009). In India, domestic as well as foreign card payment networks exist. Rupay brand launched in 2012 by the National Payments Corporation of India Ltd is the domestic card network and the other entities having license for the business include American Express Banking Corp., USA, Diners Club International Ltd., USA, MasterCard Asia/Pacific Pte. Ltd., Singapore and Visa Worldwide Pte. Ltd., Singapore. The banks in India issue different types of cards in association with these card payment networks³⁻⁸. The stakeholders in the card business include card holders, merchant, acquiring bank, card issuing bank and the card network operators.

Several factors affect the adoption of specific payment instrument by the users. It is pointed out those individual characteristics of the users influence the choice of payment instrument (Carow & Staten, 1999; Stavins, 2002; Zinman,

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2005; Yang & Ching, 2009; Schuh & Stavins, 2013). The product attributes also influence payment choice (Hirschman, 1982; Jonker, 2005; Schreft, 2006; Huynh et al., 2020). Moreover, the rewards offered to the users can also encourage a particular method of payment (Borzekowski, et al., 2008; Ching & Hayashi, 2008; Simon et al., 2010). The decision to accept a particular payment instrument is obstructed by the costs (Akerberg & Gowrisankaran, 2006) and various risks associated with the payment instrument (Arango & Taylor, 2008). Since the spring of New Economic Policy in 1991, many favourable changes have taken place in the socio-economic, educational, employment and demographic aspects of beneficiaries across India and also in the attributes of payment instruments^{9,10}. Moreover, the Government of India has been trying to promote digital payment towards the goal of achieving cash-less economy^{2,10–15}. In this context, the present paper examines the trends and dynamics of card payment/transaction in India, and the role of scheduled commercial banks in its effective delivery mechanism.

2. Materials and Methods

For analyzing the broad changes in the card payment segment, the study is exclusively based on secondary data. The payment system data from Database on Indian Economy by the Reserve Bank of India, the bank wise ATM/POS/Card Statistics provided by RBI, various reports of RBI, State Bank of India, Public Sector Banks excluding SBI, Private Sector Banks and Foreign Banks, etc. are used for the study. For analysis, statistical tools like Average, Percentage, Growth Rate Indexes, Compound Annual growth rates, Ratios and Trend Analysis are applied.

3. Results, Analysis and Discussion

3.1. Developments in card payments

The availability of sufficient number of cards, the Point of Sale (POS) terminals and the Automated Teller Machines (ATMs) make the card transaction effective and efficient. In India, the card payment infrastructure has grown over the years to promote card payments. Table 1 presents the outstanding number of cards at the end of March for the period from 2007 to 2021. In 2007 the total number of outstanding cards was 981.03 lakh, which increased to 9602.51 lakh in 2021. Obviously, the total number of credit and debit cards registered a Compound Annual Growth Rate (CAGR) of 18 percent during the period. However, the distribution of cards is heavily skewed in favour of debit cards.

As per the payment system data by the RBI, there were 75645 bank owned ATMs in April 2011 and the number increased to 213575 at the end March 2021. During the same period the POS machines increased from 5.96 lakh to

Table 1: Number of credit and debit cards in India

End - March	Credit Cards (No. in lakh)	Debit Cards (No. in lakh)
2007	231.23 (24%)	749.8(76%)
2008	275.47(21%)	1024.4(79%)
2009	246.99(15%)	1374.3(85%)
2010	183.31(9%)	1819.7(91%)
2011	180.39(7%)	2278.4(93%)
2012	176.50 (6%)	2782.8(94%)
2013	195.54 (6%)	3311.97 (94%)
2014	191.82 (5%)	3944.22 (95%)
2015	211.11 (4%)	5534.52 (96%)
2016	245.05 (4%)	6615.36 (96%)
2017	298.42 (4%)	7716.49 (96%)
2018	374.85 (4%)	8610.76(96%)
2019	470.89 (5%)	9058.13 (95%)
2020	577.45 (7%)	8285.62 (93%)
2021	620.49(6%)	8982.02(94%)

Source: Database on Indian Economy, RBI. The share is shown in the parentheses.

47.2 lakh. It is to be noted that there were 51.38 lakh POS machines at the end of March 2020. The number of ATMs recorded a CAGR of 10.9 percent during the period. The growth of ATM was inadequate because the average number of cards per ATM increased from 3250 in 2011 to 4496 in 2021. The POS machines showed a CAGR of 23 percent during 2011-21. The growth of POS machines reduced the number of cards per POS from 413 in 2011 to 203 in 2021.

The cards can be used at the POS and the ATMs. The use of card in POS reflects increase in non-cash payments and a transition to less cash economy. The details of volume and value of card transaction undertaken in POS are provided in Table 2. It shows that the volume and value of card transaction grew continuously until 2019-20. The decrease in card transaction in 2020-21 can be attributed to the covid-19 pandemic, which resulted in lower level of economic activity. The immediate post demonetisation period showed impressive growth in card transaction.

Table 3 Resents the result of quadratic time trend in the volume and value of card transaction and shows that the time trend variable (t) is highly significant and that the volume and value of card transaction in POS grow by 26 and 25 percent per annum respectively. Since the squares of the time trend variable (t²) are not significant, there is neither acceleration nor deceleration in the card payment.

Notwithstanding the upward trend in volume and value of card transaction, the card transaction in POS as a ratio to the total retail electronic transaction is declining. This is presented in Figure 1. At one point, the volume of card transaction was more than fifty percent of the total electronic transaction and now it has come down to 13 percent. Similarly, the value fell from a maximum of 16.8 percent to 3.6 percent. The decline in the ratio is due to the popularity of other retail payment tools like National Electronic Fund

Table 2: Card transaction in POS

Year	Volume (Crore)	Growth rate (%)	Value (in Billion)	Growth rate (%)
2006-07	22.97	-	495.33	-
2007-08	31.65	37.78	705.06	42.34
2008-09	38.72	22.34	839.01	19.00
2009-10	40.44	4.44	882.41	5.17
2010-11	50.22	24.18	1142.07	29.43
2011-12	64.58	28.59	1500.46	31.38
2012-13	86.36	33.38	1972.81	31.48
2013-14	112.82	30.64	2494.36	26.44
2014-15	142.32	26.15	3112.65	24.79
2015-16	195.93	37.67	3995.88	28.38
2016-17	350.43	78.86	6582.89	64.74
2017-18	474.86	36.20	9190.35	39.61
2018-19	617.69	30.08	11968.99	30.23
2019-20	727.68	17.81	12586.70	5.16
2020-21	580.96	-20.16	12869.10	2.24

Source: Database on Indian Economy, RBI.

Table 3: Trends in card payments

	Dependent variable: Natural log of volume of card payment			Dependent variable: Natural log of value of card payment		
	Coefficient	Std. Error	p-value	Coefficient	Std. Error	p-value
Constant	4.801	0.0763	<.001***	7.867	0.0571	<.001***
T	0.263	0.0117	<.001***	0.254	0.0088	<.001***
T ²	0.003	0.0031	.29	0.003	0.0023	.35
R-squared	.97			.98		

Note: *** Significance at 0.001. Sample for the period from 2006-07 to 2020-21

Table 4: Percentage share of ATMs, POS and cards

Bank Group	Facility	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
SBI	ATMs	29.5	28.4	28.8	28.9	27.8	29.3
	POS	23.3	22.0	19.8	15.5	13.1	15.8
	Cards	35.8	33.2	31.7	34.1	32.6	31.8
Public sector banks	ATMs	42.1	42.9	41.7	40.2	38.0	36.5
	POS	14.4	20.1	17.4	16.6	13.6	12.1
	Cards	44.9	47.3	48.4	39.8	34.9	36.1
Private banks	ATMs	27.9	28.2	29.0	29.5	32.9	32.8
	POS	58.5	55.9	60.4	65.6	69.3	65.9
	Cards	18.2	18.3	18.6	19.0	22.7	21.9
Foreign banks	ATMs	0.5	0.5	0.5	0.5	0.4	0.4
	POS	3.7	2.1	2.4	2.1	1.0	1.0
	Cards	1.1	1.1	1.2	1.3	1.3	1.1

Source: Calculated based on RBI data on bank wise ATM/POS/Card Statistics.

Transfer (NEFT), Immediate Payment Service (IMPS), and Unified Payments Interface (UPI).

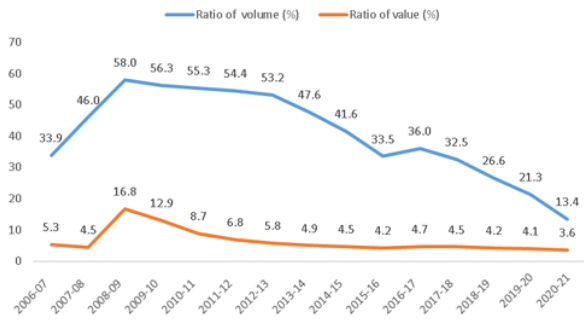
A change has happened in the card payment in which the use of cards in POS has improved and the ATM withdrawal has dropped. Figure 2. depicts the percentage share of card transaction in POS terminals.

The percentage share of volume of card transaction in POS increased from an average of 15 percent in the first five-year period to 39 percent in the second five-year period and the value increased from 11 percent to 26 percent in the

same period.

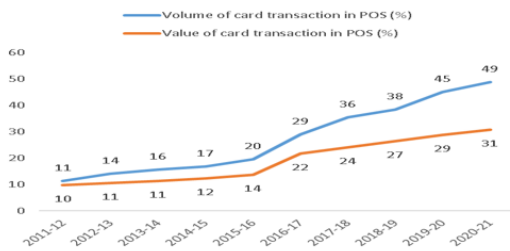
Credit card holders usually restrict transactions in ATM due to higher fee for cash withdrawals. Therefore, the share of credit card in POS transaction will be higher.

The calculation based on the RBI data showed that the volume of credit card transaction in POS increased from 99.3 percent in the period 2011-16 to 99.5 percent in the period 2016-21. The average share of value of transaction for the above period increased from 98.8 percent to 99.3 percent. The debit card usage in POS has been increasing



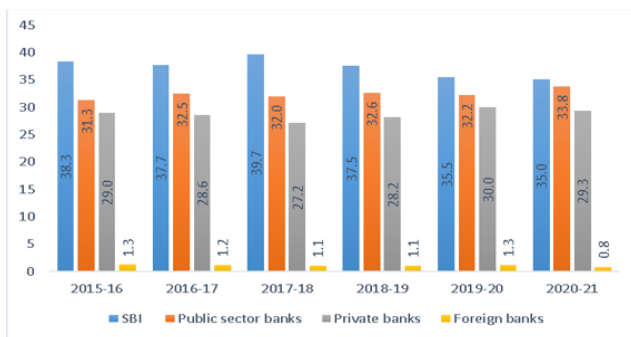
Source: Calculated using payment system data from Database on Indian Economy, RBI.

Fig. 1: Ratio of card transaction in pos to total retail electronic transaction



Source: Calculated based on payment system data from Database on Indian Economy, RBI.

Fig. 2: Share of card transaction in pos



Source: Calculated using data on bank wise ATM/POS/Card Statistics, RBI.

Fig. 3: Percentageshare of banks in the card transaction

which is reflected in the fact that the volume of transaction increased from an average of 9 percent to 31 percent and the value of transaction increased from an average of 38 percent to 50 percent comparing the two five-year periods of 2011-16 and 2016-21.

3.2. Commercial banks and the card payment

The infrastructural facilities for the card transaction offered by the different bank groups are given in Table 4. The data show that the share of public sector banks in the total number of ATMs has been decreasing, still retaining the highest position as a group. During the period, the share

of SBI was almost consistent and owned largest number of ATMs. The share of ATM ownership of private sector banks increased and the foreign banks fell marginally from its already lowest levels.

In the installation of POS devices, private sector banks with HDFC as the leader maintain top position and the SBI comes next. The public sector banks increased its share initially, but declined subsequently in the reference period and the share of foreign banks is very small. In the issuance of cards, public sector banks have largest share and the SBI alone issues on an average one-third of the total cards. The SBI and the other public sector banks together maintain more than two-third of ATMs and the cards.

The percentage share of different bank groups in the value of card transaction is presented in Figure 3. It shows that the share remained almost consistent during the reference period. It is also evident that more than one-third of the value of card transaction is completed through SBI cards.

With respect to the credit card – POS transaction, the private sector banks and the SBI increased the share and in the debit card-POS transaction share of SBI and other public sector banks increased over the years. Independently, HDFC bank followed by the SBI lead in credit card –POS transaction and vice versa for the debit card- POS transaction.

4. Conclusion

India has made expansion in the infrastructure for card-based transaction towards achieving the goal of a cashless economy. As a result, the payment system in India has intensely changed during the last two decades. The total number of outstanding credit and debit cards registered a Compound Annual Growth Rate (CAGR) of 18 percent growth during the period. There were 75645 bank owned ATMs in April 2011 and the number increased to 213575 at the end March 2021 recording a CAGR of 10.9 percent during the period. The POS machines increased from 5.96 lakh to 47.2 lakh with a CAGR of 23 percent during 2011-21. However, the growth of ATM was inadequate because the average number of cards per ATM has increased from 3250 in 2011 to 4496 in 2021.

The share of POS transaction using cards made rapid increase and so the ATM withdrawal has come down. The volume and value of credit card transaction indicates that it is exclusively used for POS transaction and the volume and value of debit card transaction in POS are also on the rise over the years. There is dominance by the SBI in the maintenance of ATM infrastructure, the issue of cards and in the volume and value of card transaction. The private sector banks dominate in the installation of POS terminals. The private sector HDFC bank tops in the POS credit card transaction. In short, the analysis reflects that the preference for card transaction improved very much and the

card transaction plays an important role in promoting digital payments in India.

5. Source of Funding

None.

6. Conflict of Interest

None.

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