A Guided Research Paper

on

"The Effects of Domestic Electronic Payment System on the Velocity of Money: An Empirical Study on Bangladesh"

Prepared by:

Nabid Hassan Kafi

Student ID – 124 191 002

Supervised by:

Dr. Wahida Yasmeen

Associate Professor

School of Business & Economics

United International University

School of Business & Economics

United International University

October 31, 2020

ABSTRACT

Rapid economic development, coupled with adoption of internet and digitization across all sphere of life, electronic form of transactions has taken off in Bangladesh in last decade. At present, Bangladesh Electronic Fund Transfer Network (BEFTN), Bangladesh Real Time Gross Settlement System (BD-RTGS), and National Payment Switch Bangladesh (NPSB). are the available electronic payment systems for fund transfers between bank accounts of different banks in electronic form. These systems are managed by the central bank of the country – Bangladesh Bank. Beside these interbank payment systems, payments through mobile financial services and ATM cards, debit cards, credit cards can also be considered as electronic payment. This paper aims to evaluate the possible effects of electronic payments on velocity of money in Bangladesh. The study used secondary data obtained from the website of Bangladesh Bank. Using statistical model, this paper found that only mobile wallet transaction volume currently impacts velocity of money in Bangladesh.

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

A payment system can be defined as a system that defines the procedures, rules, standard, and instruments used to exchange financial value between two parties discharging an obligation (Listfield & Montes-Negret, 1994).

A traditional payment transaction necessitates an instrument of payment to set the terms and conditions for the transaction. The simplest form of payment instrument is cash. Cash-based payment transactions are completed when the payment instrument, i.e., cash changes hand between the involved parties.

Non-cash payments require the use of one or more banks to complete the transaction. Unlike cash, payments with traditional paper-based payment instruments such as cheque, pay order, bank draft are not completed merely by the exchange of instrument, but also requires transfer of fund through a payment system from payor's bank to payee's bank.

This posits several problems. Firstly, beneficiary of the payments remains at risk of fraud. Cheques can be dishonored or bounced back if the accountholder does not keep enough balance on their account. While pay order and bank drafts are somewhat more secure as the bank of the accountholder guarantees payment, the accountholder can always have the option to instruct their bank to cancel the instrument before the instrument is deposited by the beneficiary.

Apart from this uncertainty, the traditional non-cash payment instrument can also be expensive for the financial institutions. As cheques are paper-based instrument, there is additional cost for the banks to provide cheque books to clients and then process the cheques upon receipt. Due to these inherent risks, inefficiencies, and expensiveness of traditional non-cash-based payments, their usage has been on a decline since the 1990s. A report by Reserve Bank of Australia mentioned that cheque-based payments in Australia decline from around 50 payments per capita in the mid-1990s to fewer than 5 cheque payments per capita by 2016 (Tellez, 2017). Traditional cash and non-cash payments also have costs for the society. A study by European Central Bank found that cash payments costs European Union countries 0.493% of their total GDP (European Central Bank, 2012). Due to all these issues,

most countries of the world have moved from cash/paper-based payment to electronic payments.

An electronic payment is where instead of using cash or cheque, payment made from one bank to another via electronic means without the direct intervention of bank staff (Schueffel, 2017). Surprisingly, origin of electronic payments can be traced back to as far as 1870, when Western Union introduced the world's first ever electronic fund transfer system. After an early introduction, payments underwent a slow transformation. Federal Reserve of America began using telegraph in 2010 to transfer money. Diner's Club International established itself as the first independent credit card company in the 1950s, who were followed by American Express, who introduced the world's first plastic card for electronic payments (Francis-Poulin, 2020). The first automated clearing house (ACH) of the world was introduced in 1968 in the United Kingdom. In the early years, data was supplied on magnetic tapes, and couriers transported tapes and disks between banks and lots of manual labor was required to upload data to the system. Currently, an internet-based transfer option is used (bobsguide, 2008). At present, there are many automated clearing systems in the world, with a 2018 World Bank survey identified 108 automated clearing systems around the world. A faster electronic system called real time gross settlement (RTGS) was introduced independently in 1984, and a 2018 survey found 120 jurisdictions with real time gross settlement systems (The World Bank, 2020). Recently, many countries have introduced instant domestic fund transfer systems, such as Unified Payments Interface (UPI) in India launched in 2016. Also, there are other innovative payment systems such as mobile wallet payments, digital wallets, cryptocurrency-based payments that have been launched in the last decade.

Alongside domestic payment transfer systems, also cross-border payment system called Society for Worldwide Interbank Financial Telecommunication (SWIFT) was launched in 1973 and as of 2018 around half of all high value cross border payments were processed through SWIFT (Arnold, 2018).

Until 2009, Bangladesh's banking system had been following a paper-based payment system. The first ever electronic payment system called Bangladesh Automated Cheque Processing

Systems (BACPS) was launched in 2010. This system is used for clearing paper-based instruments such as cheque, pay order, dividend & refund warrants, etc. BACPS operates in a batch processing mode. Member banks take deposit of instruments from customers, then take digital image of the cheques and send to the central bank for clearing. The images are processed and settled at a pre-fixed time (Bangladesh Bank, 2020).

Bangladesh Electronic Funds Transfer Network (BEFTN) was the first ever end to end electronic payment processing system launched in Bangladesh. Introduced in February 2011, BEFTN is an automated clearing house and can facilitate It facilitates both credit and debit transactions. Transactions are settled twice a day and mostly low value high volume transactions are processed through BEFTN. There is no transaction limit and transactions are free (Bangladesh Bank, 2020).

Bangladesh Bank introduced Mobile Financial Services (MFS) based payment in 2011. As per Bangladesh Bank's guideline, all MFS providers must be backed by a bank. There are currently 15 banks which provide mobile wallets (Bangladesh Bank, 2020).

National Payment Switch Bangladesh (NPSB) were launched in 2012. NPSB is used for multiple purposes. Initially it was used for connecting Automated Teller Machines (ATM) and Point of Sales (POS). machines of different banks. From 2017, NPSB has been user for facilitating Internet Banking Fund Transfers (IBFT), which can process transactions between banks instantly. Bangladesh Bank is planning to introduce interoperability of Mobile Financial Services through NPSB soon (Bangladesh Bank, 2020).

In 2015, Bangladesh Real Time Gross Settlement (BD-RTGS) was launched. BD-RTGS can process their transactions within one hour. BD-RTGS can only process transactions above BDT 100 thousand and clients can be charged up to BDT 100 (inclusive of VAT) for each transaction (Bangladesh Bank, 2020).

Apart from these, there are also Payment Service Providers (PSPs) and Payment System Operators (PSOs), which provides digital wallets and online payment processing (Bangladesh Bank, 2020).

With the introduction of all these electronic payment transfers, transacting has become easier and more convenient. For example, previously a cheque-based transaction took around a week to be processed. But now a cheque can be processed within the same day, and new payment systems can allow transactions to be processed instantly. All these developments have reduced the need to carry cash in hand and increased the speed of money circulation. With increased circulation, theoretically velocity of money should also increase. The aim of the study is to review trend of electronic payments in Bangladesh and evaluate whether growth of electronic payments have had any impact on velocity of money in Bangladesh.

Following this introduction, this paper presents a review of payment systems available in Bangladesh. The following section reviews the literature on electronic payment system, money supply and velocity of money. Section 4 elaborates the methodology for the analysis and presents a brief overview of the data and characteristics of the sample. Section 5 presents findings of this paper's analysis. The final section presents the conclusion of the paper.

2. LITERATURE REVIEW

There have been many economic studies on payment system, money supply, and velocity of money. However, there has been limited interest on impact of electronic money and electronic payment system on money supply and velocity of money. However. the topic began to interest to researchers in the 1990s and the interested intensified in the current millennium with booming financial innovation.

Listfield & Montes-Negret (1994) presented an overview of payment systems in developing countries and transitional formerly socialist economies, and the challenges these countries faced in developing or modernizing payment systems. They concluded that effective, efficient payment systems are vital for the economic development of emerging economies. They discussed that payment systems help promote the development of commerce, enhance oversight of economic policy, control the innate risk of moving large values, and reduce the financial, capital, and human resources required for transfer of payments.

Durgun & Timur (2015) studied how emergence of electronic payment affected central banks and their monetary policy. They found that with emergence of electronic payment systems, central banks' ability to control money transfer have become constrained. However, they concluded that even with increased transactions through electronic payment systems, there is not much effect on a country's monetary policy.

Kelly (2015) in his book aimed to explore how emergence of alternative form of different currencies are going to affect the financial system. While doing so, he studied the history of currencies and money transfer. Kelly explained that money transfer has both monetary cost and non-monetary cost such as time spent. But such transaction costs have reduced with electronic payment systems. However, with more transactions taking place electronically, traditional statistical policy for monetary policy may become inaccurate.

Priyatama & Apriansah (2010) aimed to analyze the relationship between use of electronic payment and its correlation with velocity of money in the context of Indonesia using analytical models. They found that using electronic payment instruments as an alternative payment instrument had beneficial effects, particularly for micro-payment and retail nature.

Increased usage of electronic money directly affects central bank's control over monetary aggregates and policies. The issue of electronic payment could change the money demand function and reduce the average amount of cash held – which would increase circulation of money in the economy which also means increased velocity of money.

Wu, Chen, Zhang & Liu, (2009) evaluated the relationship between money supply and electronic payment instruments in the context of China's economy. The paper describes electronic payment instruments' impact on money supply and argues that endogeneity of money supply leads to the dilemmas of China's monetary policy. The paper used Granger Causality Test on China's macroeconomic data from December 1999 to November 2007. They found that changes in economic output may lead to changes in money supply, and the expansion of money supply may lead to the increase of money base. They concluded central banks cannot dominate money supply, and extensive usage of electronic payments would further weaken central bank's control over money supply, and so interest rate should be the key aim of monetary policies.

O. Apere, (2018) examined the link between financial innovation and money demand in Nigeria by estimating a vector autoregressive (VAR) model using data for period 1981-2016. The empirical evidence highlighted that income and interest rate influenced money demand in Nigeria, while financial innovations had almost not influence on the demand for money. The study also asserted that financial innovation could lead to instability of money demand and unpredictable velocity.

Tule & Oduh (2016) explored how financial innovation could potentially affect Nigeria's monetary policy in future. The paper used trend analysis, error correction mechanism, and a structural model estimated with generalized method of moments to examine the implication financial innovation on monetary policy. The study found that with financial innovation financial systems gain efficiency and interest rate becomes a more potent tool of implementing monetary policy. On the downside, financial innovation raises the gap in output and increases ambiguity in monetary policy environment as financial innovation increases the implementation cost of monetary policy and also impacts consistency of the money multiplier, money velocity, and demand for money.

Tak (2002) examined how development of electronic money could affect South Korea's monetary policy. The paper explained that as individuals and non-individual entities may prefer electronic deposit to physical cash, as electronic cash increases transaction convenience, reduces risk of holding physical cash, optimizes interest earning, As a result, electronic money would affect money demand. Electronic money also influences the velocity of money circulation. Electronic money reduces non-tangible expenses such as time, storage, etc. and promotes convenience – which increases volume of transaction. Electronic money also reduced private propensity to hold cash, and so currency decreases and bank deposit increases.

Boeschoten (1992) conducted empirical study on use of electronic settlement in the Netherlands, USA, Japan, and several countries and found that use of card-based electronic payments resulted in diminishing demand for currency. However, this diminishing effect was offset by automated teller machines (ATMs) in some countries and exacerbated in others.

Popovska-Kamnar (2014) found that electronic money has potential to substitute currency in circulation, which is a part of the money aggregates that form the central banks' balances sheets. However, at present the influence of electronic payment is not significant, central banks are not reporting substantial decrease in currency due to proliferation of electronic money. Innovation of electronic payment will continue, and so central banks would need to keep a close eye on electronic money. The paper also described how electronic money influence monetary policy through monetary aggregates like the velocity of money. With usage of electronic payment, transaction cost decreases and transaction volume increases – which increases the speed of money.

Tri Kartika & Budi Nugroho (2015) analyzed how electronic money transactions impacted velocity of money in ASEAN-5 countries from 2010 to 2014. For electronic money, the paper considered volume of transaction. For the Gross Domestic Product and money supply (M1), the paper used currency from each country and converted into US dollars. This study uses panel data model, classical assumption test (heteroscedasticity and multicollinearity test), and goodness of fit test (coefficient determination, f test, and t test) to analyze the

relationship between electronic money transactions with gross domestic product, money supply (M1), and velocity of money. The study found that the volumes of electronic money transactions are increasing in ASEAN-5 countries, while the velocity of money are decreasing. The study found that gross domestic product, money supply (M1), and velocity of money have positive and significant relationships to electronic money transactions. On coefficient of determination test (R2), it showed that 98.41% of dependent variable (electronic money transactions) could be explained by independent variables (gross domestic product, money supply (M1), and velocity of money). The paper posited that with increased household income, general populace become more likely to adopt advanced financial products such as electronic money and with increased use of electronic money, M1 money supply decreases and velocity of money would increase.

However, Azhari Pambudi & Mubin (2020) aimed to examine the effect of electronic money transactions on the velocity of money in Indonesia. The paper used a quantitative research approach using quarterly time series data from the period of quarter 1 of 2010 to quarter 4 of 2018. For the study, the paper derived variable velocity by dividing Gross Domestic Product (GDP). by M2, and also used other variables such as electronic money transactions, GDP per capita, and interest rates using the Error Correction Model (ECM) method. The results showed that in the long run variable electronic money transactions, income levels and interest rates were significantly positive. In the short term, interest rates and income levels were significantly positive, while electronic money transactions only had a slight effect on the velocity of money in Indonesia.

Prakash Ranjan & Kar (2014) studied to understand the behavior of velocity of money for in India for the period 1982 – 2012 along with the factors which influence velocity of money. The study evaluated fluctuations in money velocity fluctuations using random walk hypothesis. The results showed that the velocity of money does not exhibit random walk behavior. The causality tests showed that the recent developments in electronic transactions did not have any impact on money velocity.

Hassan, Khan & Haque (1993) examined determinants of income velocity of money in Bangladesh by employing a Savin-White Box-Cox parametric transformation with first order

serial autocorrelation estimation procedure. The empirical result indicated a positive relationship between income and velocity – which means that with increase of national income, velocity tend to increase as well.

3. METHODOLOGY

For the study, random walk hypothesis and regression analysis will be used. The random walk analysis will help determine whether the fluctuations in money velocity exhibits random walk behavior or not.

After that, regression analysis will be used with volume of BEFTN, RTGS, IBFT, and card-based transactions as independent variable and velocity of money as dependent variable.

Runs test, also known as the Wald–Wolfowitz runs test, is a statistical tool that is used to verify if a string of data occurs randomly from a specific distribution. The test analyzes occurrence of similar events that are separated by events that are different. This test will help determine whether velocity of money occurred random. If it is random, then it can be said for certainty that electronic transactions do not impact velocity of money. The approach is adopted from Prakash Ranjan & Kar (2014), who used Runs test to verify non-randomness of velocity of money in India between 1982 to 2012.

If velocity of money in Bangladesh proves not to be random, then it would be worthwhile to use a tool to check if our chosen variables impact velocity of money or not. To test this, regression analysis tool has been selected. This test will help determine the extent to which the variables impacted velocity of money.

The analysis is hindered by availability of transaction data. Monthly volume and amount of transaction for each type of payment was sourced from website of Bangladesh Bank and was only available from December 2018 to June 2020 for all variables. So, while the paper will analyze 19 observations, the regression analysis will be limited to a period of one and half year only. However, random walk analysis will analyze data for 48 months from July 2016 to June 2020.

Data for velocity of money is not readily available. However, data for monthly money supply is available on Bangladesh Bank's website. The study will use money demand equation to calculate the velocity of money. The formula can be described as below:

$$\text{Velocity of Money Formula} = \frac{\text{Nominal Gross Domestic Product}}{\text{Average Amount of Money that Circulates in the Country}}$$

While monthly data for money supply is available on Bangladesh Bank's website, there is no official source of monthly nominal GDP. For the sake of calculation, the study uses nominal GDP of a particular fiscal year as a proxy for the monthly nominal GDP.

Finally, the study will use M1 money supply and M1 velocity of money instead of M2 money supply. The rationale is efficiency in payment system is more likely to impact cash and checkable deposits instead of less liquid money such as savings and time deposits, certificates of deposits.

All relevant data used for this analysis can be found in annexure.

4. RESULTS & DISCUSSION

First, whether velocity of M1 money supply follows a random walk or not is evaluated. By analyzing calculated M1 velocity of money of 48 months between the period of July 2016 to June 2020 through runs test, it was found that M1 velocity of money does not follow random walk. Table 10 in annexure shows each observation.

Mean velocity of money	9.81
R (number of runs)	16
n0 (number of observations where velocity of money is less than mean)	18
n1 (number of observations where velocity of money is higher than mean)	30
n (number of observations)	48
e(R) (expected number of runs)	23.500
Var(R)	10.29
StDev(R)	3.21
Z	-2.34
p-value	0.010

Table 1: Result of runs test on M1 velocity of money (Jul 2016 to June 2020)

Next, regression testing was carried out with volume of BEFTN, RTGS, IBFT, and card-based transactions as independent variable and velocity of money as dependent variable. The result showed that P-Value of BEFTN, Card, and RTGS transactions are too high for these variables to have any significant impacts on M1 velocity of money. As such, we can disregard these variables.

	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*
Intercept	11.6978	2.1119	5.5390	**0.0001**	7.1682	16.2275
# of MFS transactions (in '000)	-0.0015	0.0008	-1.8391	**0.0872**	-0.0033	0.0003
# of BEFTN transactions (in '000)	0.0008	0.0255	0.0327	**0.9744**	-0.0539	0.0555
# of Card based transactions (in '000)	0.0073	0.0076	0.9554	**0.3556**	-0.0091	0.0237
# of RTGS transactions (in '000)	0.1046	0.3867	0.2705	**0.7907**	-0.7248	0.9340

Table 2: P-value of different variables of 1st regression analysis

However, MFS transactions has a P-value lower than 15%. So, it can be determined that MFS transactions have a significant impact on velocity of money. To evaluate this impact, another regression analysis was carried out excluding the insignificant variables will be excluded and only the MFS transaction volume was considered. The insignificant variables were excluded from the second test so that these variables do not cloud the impact of MFS transactions on velocity of money.

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	13.7316	1.4725	9.3254	0.0000	10.6249	16.8383
# of MFS transactions (in '000)	-0.00171	0.0007	- 2.5996	0.0187	- 0.0031	- 0.0003

Table 3: P-value of MFS transactions from 2nd regression analysis

The 2nd regression with only MFS transactions as volume found that P-value of this variable is less than 2%. Hence, this variable has a significant impact on M1 money supply. Based on the 2nd analysis, the following regression equation can be formed for predicting money supply:

y = 13.7316 – 0.0017 (# of MFS transactions in thousands)

5. CONCLUSION

We tried to establish whether velocity of money in Bangladesh follow random walk hypothesis. Based on runs analysis, we concluded that velocity of money is non-random. Then, we tried to evaluate the impact of electronic payment transactions on Bangladesh's velocity of money. Our regression analysis suggested that transactions volumes of BEFTN, RTGS, and Card based transactions do not have any significant impact on velocity of money, but number of mobile wallet transfer could have an impact. Further regression analysis with only number of MFS transactions as independent volume confirmed the impact of this variable on M1 velocity of money.

Due to limitation of data availability, the study considered less than two year's data only. Also, a proxy indicator had to be used for a calculating M1 velocity of money. If these challenges can be addressed, then the regression model be even more accurate.

As for impact of electronic money, while volume of BEFTN, RTGS, and NPSB may not have a significant impact on money supply, with increased adaptation of these payments will continue to balloon up and may become significant for velocity of money supply in future. As such, policy makers should keep a close tab on these transactions so that they can consider the cost implications.

6. REFERENCES

1) Listfield, R., & Montes-Negret, F (1994). *Modernizing payment systems in emerging economies*. The World Bank.
2) Schueffel, P (2017). *The concise fintech compendium*. Fribourg: School of Management Fribourg (HEG-FR).
3) *Gross Domestic Product (GDP)*. Bangladesh Bureau of Statistics (2020). Retrieved 29 September 2020.
4) *Economic Data*. Bangladesh Bank (2020). Retrieved 29 September 2020.
5) *Money Supply*. Bangladesh Bank (2020). Retrieved 29 September 2020.
6) Durgun, Ö., & Timur, M (2015). The Effects of Electronic Payments on Monetary Policies and Central Banks. *Procedia - Social and Behavioral Sciences*, *195*, 680-685. doi: 10.1016/j.sbspro.2015.06.271
7) Kelly, B (2015). *The Bitcoin Big Bang: How Alternative Currencies Are About to Change the World*. Hoboken: John Wiley & Sons.
8) Priyatama, A., & Apriansah (2010). Correlation between electronic money and the velocity of money. *Global Management Conference – Bali, Indonesia*.
9) Wu, L., Chen, C., Zhang, N., & Liu, J (2009). Electronic Payment Instruments and Endogenous Money Supply. *2009 International Conference on Management of E-Commerce And E-Government*. doi: 10.1109/icmecg.2009.18
10) O. Apere, T (2018). THE IMPLICATIONS OF FINANCIAL INNOVATIONS ON MONEY DEMAND IN NIGERIA. *International Journal of Management and Applied Science*, *4*(2).
11) Tule, M., & Oduh, M (2016). Financial innovations and the future of monetary policy in Nigeria. *Economics of Innovation & New Technology*, *26*(5), 453-476. doi: 10.1080/10438599.2016.1229854
12) Tak, S (2002). A Study on the Effects of the Development of Electronic Money on Monetary Policy in Korea. *Economic Papers, Bank of Korea*.
13) Boeschoten, W (1992). *Currency Use and Payment Patterns*. Dordrecht: Kluwer Academic Publishers.
14) Popovska-Kamnar, N (2014). The use of electronic money and its impact on monetary policy. *Journal of Contemporary Economic and Business Issues*, *1*(2), 79-92.

15) Tri Kartika, V., & Budi Nugroho, A (2015). Analysis on Electronic Money Transactions on Velocity of Money in ASEAN-5 Countries. *Journal of Business and Management*, *4*(9), 10081020.

16) Azhari Pambudi, S., & Mubin, M (2020). The Effect of Electronic Money Use on Velocity of Money: Evidence from Indonesia. *Jurnal Ilmu Ekonomi Terapan (JIET)*, *5*(1).

17) Prakash Ranjan, R., & Kar, R (2014). The Dynamics of Money Velocity, External Sectors and Electronic Transactions in India: Connecting dots using Empirical Approach. *Journal of Applied Economics and Business Research*, *4*(3), 189-209.

18) Hassan, M., Khan, M., & Haque, M (1993). Financial development and income velocity of money in Bangladesh. *The Bangladesh Development Studies*, *12*(1).

19) Tellez, E (2017). *The Ongoing Decline of the Cheque System*. Reserve Bank of Australia.

20) European Central Bank (2012). *How much does it cost to make a payment?*. Brussels: European Central Bank.

21) Francis-Poulin, M (2020). Electronic Payments: A Brief History. Retrieved 16 October 2020.

22) bobsguide (2008). BACS celebrates 40 years of automated payments. Retrieved 16 October 2020.

23) The World Bank (2020). *Payment Systems Worldwide: A Snapshot*. Washington DC: The World Bank Group.

24) Arnold, M (2018). Ripple and Swift slug it out over cross-border payments. *The Financial Times*.

25) Bangladesh Bank (2020). *Payment and Settlement Systems*. Bangladesh Bank.

ANNEXURE

Table 4: Transaction data for mobile financial services (Dec 2018 – July 2020)

Month	No of Transactions	Amount (in BDT crore)	Average transaction amount (BDT actual)
Dec-18	210,087,204	32,093	1,528
Jan-19	214,621,317	34,621	1,613
Feb-19	194,771,264	31,513	1,618
Mar-19	209,074,068	34,678	1,659
Apr-19	211,345,626	34,976	1,655
May-19	231,379,578	42,236	1,825
Jun-19	199,531,493	31,708	1,589
Jul-19	227,410,021	37,478	1,648
Aug-19	204,216,839	35,512	1,739
Sep-19	212,361,529	35,433	1,669
Oct-19	227,243,822	37,688	1,658
Nov-19	230,422,358	37,827	1,642
Dec-19	227,422,938	40,648	1,787
Jan-20	230,091,053	42,101	1,830
Feb-20	226,109,447	41,335	1,828
Mar-20	235,858,514	39,785	1,687
Apr-20	217,564,950	29,029	1,334
May-20	281,763,062	47,376	1,681
Jun-20	256,097,767	44,831	1,751
Jul-20	310,570,637	63,000	2,029
Aug-20	269,697,875	41,404	1,535

Table 5: Transaction data for Bangladesh Electronic Fund Transfer Network (BEFTN) (Dec 2018 – July 2020)

Month	No of Transactions	Amount (in BDT crore)	Average transaction amount (BDT actual)
Dec-18	1,645,629	12,949	78,684
Jan-19	2,404,297	17,188	71,487
Feb-19	1,700,946	14,273	83,913
Mar-19	1,801,337	14,738	81,814
Apr-19	1,865,987	14,528	77,855
May-19	2,267,543	18,166	80,112
Jun-19	1,624,991	12,667	77,952
Jul-19	2,088,270	16,179	77,475
Aug-19	1,579,861	12,476	78,968
Sep-19	1,849,304	14,279	77,211
Oct-19	2,008,127	15,755	78,455
Nov-19	4,137,465	15,484	37,425
Dec-19	3,205,167	16,503	51,488
Jan-20	3,318,575	17,432	52,528
Feb-20	2,527,007	16,756	66,308
Mar-20	2,243,832	15,749	70,189
Apr-20	1,606,820	28,417	176,853
May-20	2,591,370	40,081	154,671
Jun-20	3,533,557	23,809	67,379
Jul-20	5,013,442	27,175	54,204
Aug-20	2,968,678	21,644	72,907

-

Table 6: Transaction data for Real Time Gross Settlement (RTGS) (Dec 2018 – July 2020)

Month	No of Transactions	Amount (in BDT crore)	Average transaction amount (BDT actual)
Dec-18	98,791	96,629	9,781,185
Jan-19	129,030	113,707	8,812,447
Feb-19	106,139	83,547	7,871,442
Mar-19	124,870	89,526	7,169,560
Apr-19	137,571	90,285	6,562,800
May-19	157,358	124,293	7,898,715
Jun-19	122,226	98,403	8,050,898
Jul-19	166,285	126,285	7,594,497
Aug-19	140,180	99,753	7,116,086
Sep-19	177,395	130,777	7,372,057
Oct-19	195,768	144,709	7,391,841
Nov-19	185,341	135,905	7,332,716
Dec-19	205,916	113,402	5,507,173
Jan-20	227,542	135,478	5,953,956
Feb-20	225,350	118,087	5,240,155
Mar-20	222,202	97,298	4,378,812
Apr-20	-	-	-
May-20	5,017	2,174	4,333,267
Jun-20	172,184	149,363	8,674,642
Jul-20	231,407	176,182	7,613,517
Aug-20	209,218	170,839	8,165,618

Table 7: Transaction data for Card based transactions (Dec 2018 – July 2020)

Month	No of Transactions	Amount (in BDT crore)	Average transaction amount (BDT actual)
Dec-18	18,992,571	13,784	7,258
Jan-19	20,341,933	14,679	7,216
Feb-19	18,247,560	13,750	7,535
Mar-19	20,183,142	14,590	7,229
Apr-19	20,815,609	14,891	7,154
May-19	24,053,166	18,223	7,576
Jun-19	19,773,920	14,058	7,109
Jul-19	21,648,030	15,437	7,131
Aug-19	22,238,333	16,446	7,395
Sep-19	21,152,643	14,543	6,875
Oct-19	22,131,375	15,662	7,077
Nov-19	21,883,563	15,224	6,957
Dec-19	23,225,149	16,866	7,262
Jan-20	23,103,802	17,021	7,367
Feb-20	22,124,445	16,330	7,381
Mar-20	21,732,286	16,569	7,624
Apr-20	11,801,879	8,988	7,615
May-20	16,063,112	12,728	7,924
Jun-20	16,777,884	13,657	8,140
Jul-20	23,569,738	19,691	8,354
Aug-20	19,532,765	14,961	7,659

Table 8: Money supply statistics (Dec 2018 – July 2020)

Month	1. Currency Outside banks	2. Deposits of FIs with Bangladesh Bank (except DMBs)	3. Demand Deposits with DMBs*	4. Time Deposits with DMBs*	5. Money Supply (M1) (1+2+3)	6. Money Supply (M2) (4+5)
Dec-18	1,446,791	7,006	1,100,763	8,999,047	2,554,560	11,553,607
Jan-19	1,446,817	7,366	1,061,918	9,029,477	2,516,101	11,545,578
Feb-19	1,459,630	6,730	1,057,379	9,081,989	2,523,739	11,605,728
Mar-19	1,446,465	7,267	1,063,397	9,168,665	2,517,129	11,685,794
Apr-19	1,447,590	7,037	1,078,678	9,176,131	2,533,305	11,709,436
May-19	1,646,043	7,162	1,081,036	9,317,335	2,734,241	12,051,576
Jun-19	1,542,870	7,885	1,182,179	9,463,181	2,732,934	12,196,115
Jul-19	1,578,311	7,167	1,144,300	9,565,945	2,729,778	12,295,723
Aug-19	1,579,077	7,329	1,121,792	9,810,611	2,708,198	12,518,809
Sep-19	1,390,781	7,143	1,049,495	8,810,831	2,447,419	11,258,250
Oct-19	1,548,277	7,251	1,132,520	9,930,064	2,688,048	12,618,112
Nov-19	1,552,536	7,355	1,139,327	10,055,552	2,699,218	12,754,770
Dec-19	1,565,830	8,725	1,184,829	10,184,967	2,759,384	12,944,351
Jan-20	1,589,176	7,467	1,132,317	10,246,539	2,728,960	12,975,499
Feb-20	1,618,205	7,795	1,147,337	10,291,630	2,773,337	13,064,967
Mar-20	1,733,476	9,038	1,168,780	10,195,369	2,911,294	13,106,663
Apr-20	1,776,215	8,977	1,185,016	10,290,447	2,970,208	13,260,655
May-20	1,937,507	7,848	1,222,369	10,348,586	3,167,724	13,516,310
Jun-20	1,921,145	6,210	1,355,283	10,454,712	3,282,638	13,737,350
Jul-20	2,109,838	5,013	1,283,890	10,650,042	3,398,741	14,048,783
Aug-20	1,939,896	5,106	1,345,274	10,863,847	3,290,276	14,154,123

Table 9: Gross Domestic Product (GDP) of Bangladesh at Current Prices, 2016-17 to 2019-20 (in million BDT)

Year	GDP (in million BDT)
2015-16	17,328,637
2016-17	19,758,154
2017-18	22,504,793
2018-19	25,424,826
2019-20	27,963,782

Table 10: Calculation for velocity of money supply (M1). (FY 2016 to FY 2020)

Month	Nominal GDP	Money supply (M1)	Velocity of money supply (M1)	Code (1 if observation is greater than run, 0 if lower than mean)	Counting runs
Jul-16	19,758,154	1,969,396	10.03	1	1
Aug-16	19,758,154	1,983,635	9.96	1	1
Sep-16	19,758,154	2,013,884	9.81	1	1
Oct-16	19,758,154	1,977,282	9.99	1	1
Nov-16	19,758,154	1,974,514	10.01	1	1
Dec-16	19,758,154	2,044,463	9.66	0	2
Jan-17	19,758,154	1,987,947	9.94	1	3
Feb-17	19,758,154	2,007,113	9.84	1	3
Mar-17	19,758,154	2,026,087	9.75	0	4
Apr-17	19,758,154	2,042,960	9.67	0	4
May-17	19,758,154	2,090,118	9.45	0	4

Month	Nominal GDP	Money supply (M1)	Velocity of money supply (M1)	Code	Counting runs
Jun-17	19,758,154	2,400,785	8.23	0	4
Jul-17	22,504,793	2,259,034	9.96	1	5
Aug-17	22,504,793	2,434,033	9.25	0	6
Sep-17	22,504,793	2,313,234	9.73	0	6
Oct-17	22,504,793	2,267,445	9.93	1	7
Nov-17	22,504,793	2,270,919	9.91	1	7
Dec-17	22,504,793	2,337,897	9.63	0	8
Jan-18	22,504,793	2,264,421	9.94	1	9
Feb-18	22,504,793	2,265,458	9.93	1	9
Mar-18	22,504,793	2,252,721	9.99	1	9
Apr-18	22,504,793	2,271,548	9.91	1	9
May-18	22,504,793	2,338,592	9.62	0	10
Jun-18	22,504,793	2,548,937	8.83	0	10
Jul-18	25,424,826	2,454,041	10.36	1	11
Aug-18	25,424,826	2,571,566	9.89	1	11
Sep-18	25,424,826	2,763,218	9.20	0	12
Oct-18	25,424,826	2,708,198	9.39	0	12
Nov-18	25,424,826	2,441,739	10.41	1	13
Dec-18	25,424,826	2,554,560	9.95	1	13
Jan-19	25,424,826	2,516,101	10.10	1	13
Feb-19	25,424,826	2,523,739	10.07	1	13
Mar-19	25,424,826	2,517,129	10.10	1	13

Month	Nominal GDP	Money supply (M1)	Velocity of money supply (M1)	Binary	Counting runs
Apr-19	25,424,826	2,533,305	10.04	1	13
May-19	25,424,826	2,734,241	9.30	0	14
Jun-19	25,424,826	2,732,934	9.30	0	14
Jul-19	27,963,782	2,729,778	10.24	1	15
Aug-19	27,963,782	2,708,198	10.33	1	15
Sep-19	27,963,782	2,447,419	11.43	1	15
Oct-19	27,963,782	2,688,048	10.40	1	15
Nov-19	27,963,782	2,699,218	10.36	1	15
Dec-19	27,963,782	2,759,384	10.13	1	15
Jan-20	27,963,782	2,728,960	10.25	1	15
Feb-20	27,963,782	2,773,337	10.08	1	15
Mar-20	27,963,782	2,911,294	9.61	0	16
Apr-20	27,963,782	2,970,208	9.41	0	16
May-20	27,963,782	3,167,724	8.83	0	16
Jun-20	27,963,782	3,282,638	8.52	0	16