

INCORPORATING RETAIL DIGITAL TRANSACTIONS INTO MONEY SUPPLY MEASUREMENT

Issue No. 30, FY22

Date: 27 July 2021

India currently compiles four monetary aggregates on the basis of the balance sheet of the banking sector in conformity with the norms of progressive liquidity: M0 (monetary base), M1 (narrow money), M2 and M3 (broad money), which are used in monetary policy making decisions. **As per the definition, M0 is the monetary base and its components can never change.** M3 (broad money), is defined as the total stock of money (paper notes, coins and demand deposits of bank) in circulation which is held by the public and this measurement needs to change in line with emerging trends.

In the post demonetization period, the digital money (pre-paid instruments) has got a push and reached Rs 21,509 crore in May'21. Simultaneously, there has been a massive surge in UPI payments and it has touched Rs 41 lakh crore in FY21. During Apr-June, FY22, the amount of UPI transactions has touched Rs 15.32 lakh crore, with 7.9 lakh transactions.

Empirical literature suggests that in China during 1990 to 2010 there is robust evidence that electronic money had a negative impact on M0 but a positive impact on M3. Given the significant surge in retail digital transactions in India, it is imperative that measures of monetary aggregates like M3 by RBI incorporate such digital transactions going forward otherwise it might distort the understanding of movements in derived ratios like money multiplier that are important to contemplate impact of monetary aggregates on prices and output.

For example, our empirical analysis for the post-demonetization period to understand the impact of retail digital transactions (RDT) on M0, M3 and money multiplier (MM) suggests that increase in digital transactions has had a negative impact on M0 and money multiplier even though their value is larger than earlier, and a positive impact on M3. Our estimate of MM is also much higher than existing MM, though it shows the same trend. We thus clearly believe that such an increase in digital transactions has played a critical role in the declining trend in money multiplier, even though the overall measure of M3 has been expanded. In particular, there has been a substitution from currency and much of it has gravitated towards digital mode of payments. The increased use of digital money/pre-paid instruments (especially m-wallets) has changed the composition of both reserve money as well as monetary base and has further impacted central bank's control of money supply.

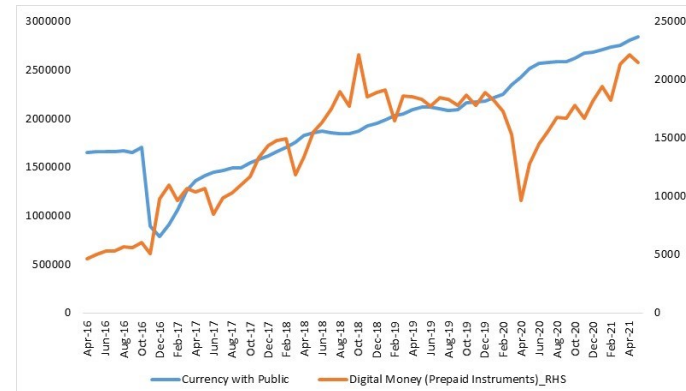
Interestingly, the use of digital currency by RBI will not impact M3 as central bank liability will be swapped with digital currency assuming there is 1-1 conversion. If the currency is issued on decentralised blockchain, outside the fiat system it is purely supply of high powered money that drives money supply of crypto. As, $M3 = H0 + \text{bank credit}$, unless crypto creates credit and is fungible for fiat, M3 will not be impacted in theory.

In the coming policy, we expect RBI to hold the rates. However, the RBI forward guidance should clearly lay down the contours of current inflation trajectory by flagging the dangers of fuel prices on which Government has a control and clearly elucidate that inflation is unlikely to make a downward movement until and unless the fuel prices are rationalized! The RBI has done its bit, its over to Government now.

MONEY SUPPLY IN INDIA

- ◆ In view of the ongoing changes in the Indian economy and developments in monetary sector, RBI has set up working groups periodically to review and refine the monetary aggregates.
- ◆ Three working groups have been set up so far, viz., the First Working Group on Money Supply (FWG) (1961), the Second Working Group (SWG) (1977) and the "Working Group on Money Supply: Analytics and Methodology of Compilation" (WGMS) (Chairman: Dr. Y.V. Reddy) (1998).

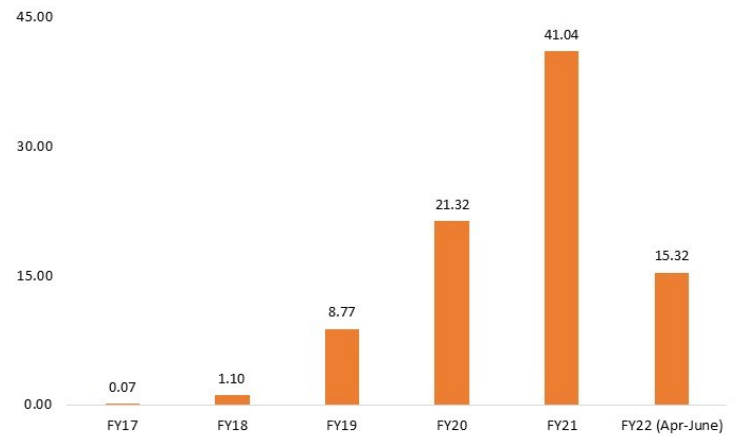
Movement of Currency with Public vs Digital Money (PPI) in Rs Crore



Source: SBI Research

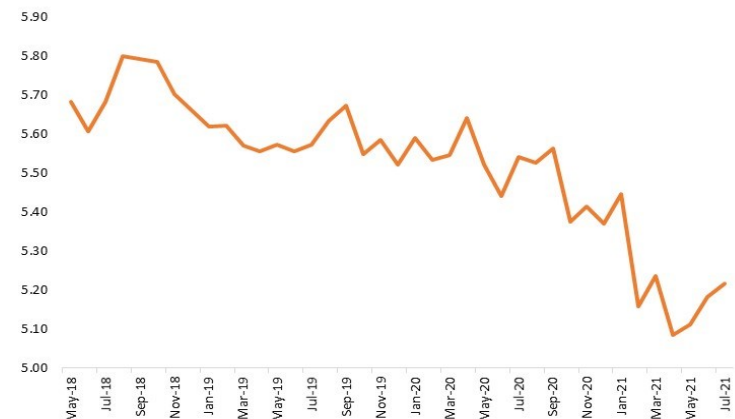
- ◆ With the recommendation of the first working group on Money Supply (1961) and subsequent recommendations by the Y V Reddy Committee (1998), India compiles four monetary aggregates on the basis of the balance sheet of the banking sector in conformity with the norms of progressive liquidity: M0 (monetary base), M1 (narrow money), M2 and M3 (broad money), which are used in monetary policy making decisions. As per the definition, M0 is the monetary base and its components never change. This is the money created by the central bank. M3 (broad money), is defined as the total stock of money (paper notes, coins and demand deposits of bank) in circulation which is held by the public at any particular point of time.
- ◆ In the post demonetization period, the digital money (pre-paid instruments) has got a push and has been increasing with some variations, but touched the low in Apr'20, with the COVID-19 led lockdown. However, it has been increasing and reached Rs 21,509 crore in May'21.
- ◆ The slow pace of 'Digital Money' may be due to the rise in UPI payments, which captured the market very quickly. Since its inception UPI, every month transactions has been increasing and has touched Rs 41 lakh crore in FY21. During Apr-June, FY22, the amount of UPI transactions has touched Rs 15.32 lakh crore, with 7.9 lakh transactions.
- ◆ Interestingly, if we look the monthly trend of money multiplier, it was showing a declining trend post demonetization (there has been a marginal increase recently). If we look the yearly number, the money multiplier stood at 5.4 in 2020-21, which is marginally below its decennial average (2011-20) of 5.5. However, adjusted for the reverse repo - analytically more meaningful and akin to banks' deposits with the central bank - money multiplier turned out to be much lower at 4.7 in 2020-21, explaining the slowdown in money creation under subdued credit demand conditions. As a result, a substantial expansion in RM (adjusted for the first-round effects of CRR changes) did not translate into a commensurate increase in M3.
- ◆ We however believe that the increase in digital transactions played a critical role in the decline in money multiplier, even though the overall measure of broad money has been expanded. In particular, there has been a substitution from currency and much of it has gravitated towards digital mode of payments. The increased use of digital money/pre-paid instruments (especially m-wallets) has changed the composition of both reserve money as well as monetary base and has further impacted central bank's control of money supply.

UPI Transactions (Rs lakh crore)



Source: SBI Research

Money Multiplier Trend



Source: SBI Research

- ◆ In a RBI Working Group on 'Electronic Money' in 2002 has raised the issue of e-money and highlighted its challenges, which may place in future both on the balance sheet of the central bank as also on the transmission mechanism of monetary policy are appropriately met.

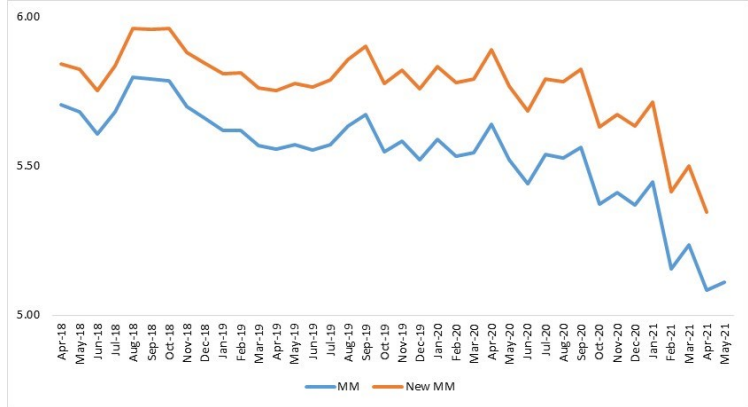
E-MONEY AND THEIR IMPACT ON MONETARY AGGREGATES

- ◆ China's central bank — People's Bank of China (PBOC) — has recently rolls out its own e-currency (digital yuan), on a pilot basis. This may play a role in making domestic and international payments faster and cheaper for both large-scale and consumer transactions. The PBOC had been working on its digital yuan programme since 2014, shortly after bitcoin gained attention in the country.
- ◆ Cryptocurrencies such as bitcoin have foreshadowed a potential digital future for money, though they exist outside the traditional global financial system and aren't legal tender like cash issued by governments. However, the e-currency is legal tender and owned by central bank.
- ◆ China has positioned its DC/EP product as a substitute for M0, which is basically the amount of physical money in the economy at a given time.

- ◆ In the case of India, RBI is already contemplating the launch of digital currency. Meanwhile, the increasing usage of pre-paid instruments (PPIs, also a part of e-money) has the potential to impact the measure of monetary aggregates.
- ◆ For example, if a consumer prefers to use e-money (or PPI in the case of India) vis-à-vis currency, then for a given stock of currency, the money multiplier would go up which would in turn increase the aggregate money supply in the economy more than what would have been the case without e-money. It is expected that e-money might be used mainly for small value transactions and thus, could be used to substitute central bank notes and coins at least partially. In India, the per transaction average value of PPI is only Rs 465.
- ◆ We have envisaged to see the impact of PPI transactions (the total value of 47 crore monthly transaction in Jun'21 was Rs 22,147 crore) on monetary aggregates (i.e. on M3) and subsequently on money multiplier. By taking into consideration the digital money (PPI transactions), we have arrived a new M3 and also a new money multiplier (NMM). Though, the trend of MM and NMM indicate the same but the difference between them is increasing, which is mainly due to the popularity of the digital transactions.
- ◆ Empirical literature suggests that in China during 1990 to 2010 there is robust evidence that electronic money had a negative impact on M0 but a positive impact on M3. In addition, the central bank's abilities to control money supply can be affected by the wide application of electronic money.
- ◆ In a similar vein we carried out an empirical analysis for the post-demonetization period to understand the impact of digital transactions (RDT) on M0, M3 and money multiplier (MM) and results suggest that increase in digital transactions has a negative impact on M0 and money multiplier. This is quite consistent with the theory as people prefer to hold less cash in hand as they do more and more digital transactions. However, at the same time if the deposits with bank goes up there is positive relationship between M3 and digital transactions.

Disclaimer: The Ecwrap is not a priced publication of the Bank. The opinion expressed is of Research Team and not necessarily reflect those of the Bank or its subsidiaries. The contents can be reproduced with proper acknowledgement. The write-up on Economic & Financial Developments is based on information & data procured from various sources and no responsibility is accepted for the accuracy of facts and figures. The Bank or the Research Team assumes no liability if any person or entity relies on views, opinion or facts & figures finding in Ecwrap.

Money Multiplier: Actual vs Calculated



Source: SBI Research

Regression Results

Dependent Variable	Independent Variable: Digital Transactions	P-Value
M3	0.0125	0.0369
M0	-0.1000	0.0000
MM	-0.0015	0.0000

Source: SBI Research MM: Money Multiplier Period: Apr'16 to May'21

HOW CONDUCT OF MONETARY POLICY WILL CHANGE?

- ◆ According to the RBI's working group report on Electronic Money (Chairman: Zarir Cama, July 2002), the e-money could have profound impact on compilation of monetary statistics and money supply unless regulated prudently. Since e-money is close substitute of central bank money, this should be explicitly accounted for in monetary statistics. If e-money is allowed to be issued only by banks, then currency would be substituted with demand/time liabilities through e-money. In that eventually, issuance of e-money would be money stock neutral and no change would be required in the definition of money stock. However, if e-money is issued by entities other than depository institutions (i.e., banks), the money creating sector as embedded in compilation of monetary statistics would need to be broadened. Otherwise, it would reduce information content of monetary aggregates as monetary statistics without coverage of e-money may not fully represent the transaction balances in economy.

Contact Details:

Dr. Soumya Kanti Ghosh
 Group Chief Economic Adviser
 State Bank of India, Corporate Centre
 M C Road, Nariman Point, Mumbai - 400021
 Email: soumya.ghosh@sbi.co.in
 gcea.erd@sbi.co.in
 Phone: 022-22742440
 : kantisoumya