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Abstract

This paper empirically tests whether the inclusion of monetary aggregates in inflation forecasting models helps their forecasting ability or not. We have estimated the P-star model with Divisia M2, Divisia M3, simple sum M2, and simple sum M3 along with Phillips curve and ARIMA specifications to forecast inflation for India from April 1994 to December 2016. We find that inflation forecasting ability of both Divisia monetary aggregate and the simple sum monetary aggregates are similar. Though Divisia fits better than simple sum from 1993-2013, the information contained in Divisia does not explain the behaviour of inflation post-2013.

Keywords: *Divisia, Simple Sum, Monetary Aggregates, Phillips Curve, Inflation forecasting, P star model*

JEL Codes: *E31, E37, E47, E52, E58*

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INTRODUCTION

In this paper, we are reconsidering the relevance of Divisia Monetary Aggregates (DMA) against Simple Sum Monetary Aggregates (SSMA) for monetary policy and inflation forecasting. The paper tries to answer two questions. First, whether monetary aggregates contain any useful information for forecasting inflation or not. Second, if it does, then does it make sense to ignore SSMA completely given that there exists a large pool of evidence in the economics literature that favours DMA over SSMA. Though many authors have already researched this topic, this paper contributes to the literature in two ways. First, it tests the relevance of monetary aggregates in the period post the rupee crisis (2013) in India. Second, even though DMA fits the data better than the SSMA, we could not find enough evidence which supports DMA over SSMA for inflation forecasting. We have not tried to explore the reasons behind it, but corresponding research can take up this issue in more detail.

The quantity theory of money is so far, the most robust theory which connects money and inflation. In the 1970s, most of the central banks used to have monetary aggregates as their main intermediate target or instrument because there was a smooth transmission mechanism from money supply to inflation. However, as the financial innovations accelerated in the late 80s and new financial products started performing functions of money, the relationship between monetary aggregates and inflation began to fade out. New financial assets commenced providing monetary services to the consumers who were outside the direct control of the central bank. Friedman and Kuttner (1992) and Estrella and Mishkin (1996) have shown the increase in instability in money demand function. At that time, the quest for a new instrument began which could provide a better transmission than monetary aggregates. The interest rate rule proposed by Taylor (1993) caught the eyes of central bankers at that time. The central banks around the world started shifting from using monetary aggregates to interest rates as an instrument as proposed by New Keynesians in the new inflation-targeting framework advocated by Svensson (1997).

Central bankers started changing interest rates (policy rates) with the motive of achieving stable inflation in an economy.

The instability in the Taylor rule during the Great Recession of 2007 became a significant cause of concern among the policymakers, Zampese (2017). The zero lower bound adopted by many developed nations opened the arena for further discussion on better macroeconomic structures. A new argument emerged that monetary aggregates have some relevant information inside them, and the policymaker can make a better-informed decision by exploiting the relationship, Nelson (2002). Barnett (2012) himself said that "focusing solely on interest rates, while ignoring monetary aggregates, ignores the product produced by the central bank."

LITERATURE REVIEW

Many central banks still use SSMA for policy analysis. The aggregation technique assumes that all the monetary assets considered in the calculation are perfect substitutes of money and thus provide the same amount of liquidity to the consumer. Thus, SSMA is not an ideal way of modelling people's preferences. In real life, this does not make much sense as each consumer treats different monetary asset differently. Thus, the arithmetic sum of assets leads to aggregation bias. The problem exaggerates when one goes into the higher degree of aggregation, for example, M2 or M3. At higher aggregation levels, less liquid components are allotted weights equivalent of currency. Theoretically, the weights should be provided based on the amount of liquidity service provided by the monetary asset. Economists have tried several ways to estimate "moneyness" of different monetary assets in the past so that each monetary asset can get suitable weights.

Friedman and Meiselman (1963) proposed dual criteria of correlation as the method for constructing appropriate monetary aggregates. They defined money as the aggregate, which has the highest correlation with income.

Chetty (1969) used micro-foundations to calculate the weights of different assets. He estimated CES utility function subject to two-period budget constraint. They used elasticity of substitutions for each asset with respect to money to create weights for each monetary asset. The problem with this approach was that consumer behaviour changes over a period, and therefore the weights would also change.

Friedman and Schwartz (1970) extended the argument of Friedman and Meiselman (1963) by identifying aggregates which has a stable relationship with the number of variables namely wealth, income, rate of interest or relative change in prices. The criticism of this study is that there can be many aggregations which can satisfy such criteria.

Koot (1975) derived weights using factor analysis, and he considered the first factor as money and the second factor as near money. The main drawback behind his methodology was the lack of theoretical backing in his estimation.

A coherent theoretical background and sound methodology were provided by Barnett (1978,1980) who used index number theory for monetary aggregation with user cost pricing, which we have used in this paper to represent weighted monetary aggregates. We have covered the details in the next subsection.

Rotenberg, Driscoll, and Poterba (1991) derived currency equivalent aggregates (a special case of DMA). The CE aggregates assume linear aggregator function rather than non-linear. It captures the stock of money that measures the discounted monetary services provided by an aggregate.

Divisia Formulation

Barnett expressed the Divisia index as the degree of change of the weighted sum of the degrees of change of the individual component assets. He defined the user cost to assign weights to the growth rate of each monetary asset which is part of the monetary aggregate. Formally, the user cost of monetary asset i in time t is expressed as

$$p_{i,t} = \frac{R_t - r_i}{(\,1 + R_t)}$$

Where R_t is the rate of interest on the benchmark asset (which does not provide any liquidity services and hence believed to have the highest rate of return), and r_i is the return on concerned monetary asset. The user cost is the opportunity cost of using the liquid assets relative to the least liquid one as a person is giving up upon higher interest rate that he/she could have earned in case, they have chosen the least liquid asset—more the liquidity of the asset, lesser the interest rate and thus higher the opportunity cost.

The actual weight of asset *i* is calculated as

$$weight_{i,t} = \frac{p_{i,t}M_{i,t}}{(\sum p_{i,t}M_{i,t})}$$

Thus, the weight applied to each asset is its share of total expenditure on transaction services calculated using the user cost which is the price paid by the person for using the service (liquidity) of the monetary asset. The Divisia index of money is then given by

$$IogD_t - IogD_{t-1} \; = \sum n_{i,t}\;(Iog\;M_{i,t} - Iog\;M_{i,t-1}\,)$$

Where,

D_t is the Divisia measure at time t.

$M_{i,t}$ is the holding of monetary asset i at time t.

$n_{i,t} = 1/2(weight_{i,t} + weight_{i,t-1})$

As this is a discrete-time approximation, the actual weights are the simple two-period moving averages of the expenditure shares. We can obtain the level of Divisia money by arbitrarily assigning a base value of 100 (or any other) in any one period and calculating percentage growth rates after that. This property of the index implies that the aggregate will grow at the same rate as its components and that the weights will sum to unity.

The monetary aggregator should reflect the utility which agent derives from the monetary assets. The SSMA assumes that the agent derives equal utilities from each asset. The DMA assign weights to different assets based on the share of expenditure allotted to the concerned asset. A person who derives higher utility from a monetary asset will allot a higher share of expenditure to the asset. DMA has a more robust theoretical framework than SSMA and therefore, contains more information.

DIVISIA MONETARY AGGREGATES FOR INDIA

Calculation of DMA for India

We have constructed DMA (M2 and M3) using the monthly data from April 1994 to December 2016, which composed of 273 data points for India. We have provided the selected interest rates for each monetary aggregate in the appendix. We have collected the data from *The Handbook of Statistics of Indian Economy* and other publications of Reserve Bank of India.

The selection of benchmark asset is an essential part of estimating the DMA. If the rate of interest on benchmark asset turns out to be less than any monetary asset, then that weight will become negative. In order to deal with this problem, we have followed Barnett and Spindt (1982) recommendation and have chosen the maximum of the interest rate among the set of several benchmark assets considered and added a constant of 0.1 to it. We have used the yield on long-term government securities, prime lending rate of the State Bank of India (SBI) and the rate of interest on some of the broadest monetary assets as the set of benchmark assets.

Figure 2.1 and Figure 2.2 shows the trajectories between M2 and Divisia M2 (DM2) and between M3 and Divisia M3 (DM3), respectively. In both cases, SSMA is higher than DMA. It is directly followed from the definitions as DMA gives lower weight to less liquid assets as compared to SSMA. The gap increased at a faster pace post-2007-2008 because of an increase in financial innovation and technology or increase in new monetary assets with varying degree of liquidity. The sharp downward movement in November 2016 is due to the demonetization shock.

Figure 2.1: Divisia M2 VS simple sum M2

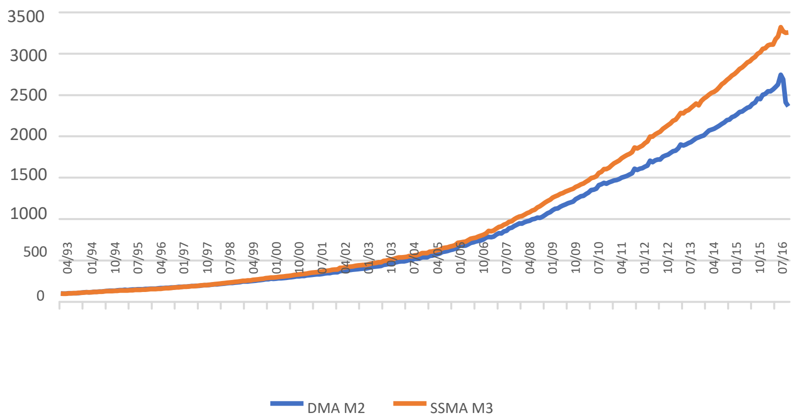
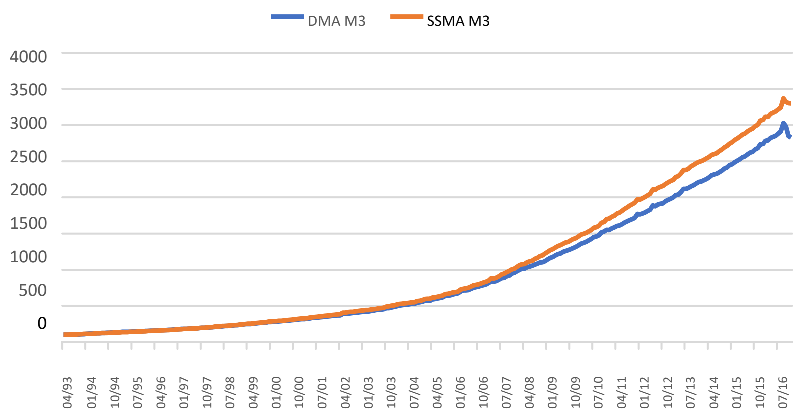


Figure 2.2: Divisia M3 VS simple sum M3



Correlation between Inflation rate and Growth Rate of Monetary Aggregates

We have calculated the correlations between the monetary aggregate growth rate (DMA and SSMA) and inflation rate with varying lags (contemporaneous, three months, six months, nine months and twelve months). We have used the formulae $\frac{m_t - m_{t-12}}{m_{t-12}} * 100$ to calculate yearly growth rate in monetary aggregate and the formulae $\frac{p_t - p_{t-12}}{p_{t-12}} * 100$ to calculate yearly inflation rate where we have considered the Wholesale Price Index (WPI) as the price level. Table 1 contains the results.

The DMA has a higher correlation with the inflation rate than the SSMA at contemporaneous, three lags and six lags. The difference in correlations seems to converge for the ninth and the twelfth-month lag. The correlation results, in this case, suggest that inflation responds faster and at a higher rate to DMA than SSMA.

Table 1: Correlation Between Growth in Monetary Aggregates (X) And Inflation (π)

	X_t and π_t	X_{t-3} and π_t	X_{t-6} and π_t	X_{t-9} and π_t	X_{t-12} and π_t
M2	0.269	0.340	0.398	0.426	0.423
DIVISIA M2	0.378	0.489	0.517	0.462	0.395
M3	0.356	0.452	0.509	0.519	0.491
DIVISIA M3	0.409	0.514	0.550	0.514	0.454

INFLATION FORECASTING MODELS

Several studies have already taken place for India, which claims the superiority of DMA over SSMA. Ramachandran (2010) had shown that DMA does better than their SSMA counterparts as a leading indicator of inflation. Paul and Ramachandran (2013) also recommended CE aggregates for policy perspective. Though, none of the studies has analyzed the behaviour of DMA post the Rupee crisis (2013). We will take up this task in this section and will estimate several inflation targeting models with DMA and SSMA to observe their performance.

P-Star Model

Hallman (1991) first proposed the model, and he used the quantity theory of money in which he attributed the short-run fluctuations to inflation from its trend to the determinants of the long-run equilibrium price. He theorized that the original aggregate price would adjust according to its divergence from the equilibrium price. In other words, the model predicts whether the actual price will rise, fall or remain unchanged depending upon whether it is below above or at its equilibrium price, respectively. The paper gives the following specification.

$$\pi_t = \varphi(v_{t-1} - v^*_{t-1}) - \gamma(y_{t-1} - y^*_{t-1}) + \pi_{t-1}$$

Where,

$(v_{t-1} - v_{t-1}^{*})$ is the velocity gap
$(y_{t-1} - y_{t-1}^{*})$ is the output gap

The above specification requires the calculation of long-run equilibrium output and velocity.

Svensson (2000) gave another equation for the P-star model as

$$\pi_t = (M_{t-1} - M_{t-1}^{*}) + \beta\pi_{t-1}$$

Where,

M_{t-1} is the real money calculated as $m_{t-1} - p_{t-1}$. m_{t-1} is the nominal money stock, and p_{t-1} is the nominal price level

We will use Svensson's representation of the P-star model in our study, and we will estimate it using simple sum M2, simple sum M3, Divisia M2 and, Divisia M3.

Phillips Curve

The most celebrated relationship of Phillips curve was introduced by Phillips (1958), which postulated that there exists a tradeoff between inflation and unemployment. However, the episodes of high unemployment and high inflation posed a question on the long-run relationship. Phelps (1967) and Friedman (1968) argued that the relationship between inflation and unemployment only exists in the short run. This critique brought into the picture the role of expectations (adaptive and rational) which gave birth to expectation-augmented Phillips Curve. Gordon (1977, 1982) extended the model by incorporating supply shocks and called it as a triangle model. The empirical version of triangle Phillips curve model is given by

$$\pi_t = \alpha\pi_{t-1} + \gamma(u_t - u_n) + \delta Z_t$$

Where,

π_t is the inflation rate at time t
u_t is the unemployment rate at time t
u_n is the natural rate of unemployment
Z_t is the vector of supply shocks

Post the triangle model, Calvo (1983) and Gali and Gertler (1999) proposed the New Keynesian Phillips curve. Many researchers have validated its relationship in several developed countries, but there was a mixed response as far as developing nations are concerned. For this reason, we will use the triangle Phillips curve model in our study.

ESTIMATION RESULTS

We have defined two models above namely P-star model and the triangle Phillips curve (we will call it Phillips curve for the rest of the paper). We have estimated six equations consisting of one Phillips curve , Four P-star model with SSMA and DMA for M2 and M3 each and lastly an ARIMA model. We estimated the models considering the period from May 1994 to December 2013 for the Phillips curve and July 1993 to December 2013 for P-star model due to data limitations. We have taken international non-fuel commodity (NFC) inflation and crude oil (CO) inflation as our supply shocks in the triangle Phillips curve model. We have used Ordinary Least Square technique for estimation. The econometric equations used for estimation is provided below.

P-star Model --------- $\pi_t = \beta\pi_{t-1} + \alpha(M_{t-3} - M^*_{t-3}) + \gamma NFC_t + \delta CO_t + \varepsilon_t$

Phillips Curve -------- $\pi_t = \beta\pi_{t-1} + \alpha(y_{t-1} - y^*_{t-1}) + \gamma NFC_{t-1} + \delta CO_t + \epsilon_t$

Where $(y_{t-1} - y^*)$ is the last year deviation of real output from its potential output calculated using the Index of Industrial Production (IIP) as the monthly frequency is required. We have used HP filter to calculate the real money gap and the output gap. Models 1 - 4 are P-star model with real money gap calculated using Divisia M2, Divisia M3, simple sum M2 and simple sum M3 respectively. Model 5 is the Phillips curve. Table 2 contains the regression results.

Table 2: Estimated Coefficients of Inflation Models

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Constant	0.375**	0.376**	0.36**	0.37**	0.29**
π_{t-1}	0.218*	0.216**	0.246**	0.228**	0.35**
NFC_t	6.98*	7.488*	8.26*	8.27*	10.89*
CO_t	-0.024	-0.45	-0.46	-0.738	1.13
$(M_{t-3} - M_{t-3}^*)$	0.3786**	0.4147**	0.3593**	0.4008**	
$(y_t - y_t^*)$					-0.0255 **
Adj R^2	0.2906	0.2995	0.2859	0.2970	0.228

** means significant at 1 percent level and * means significant at 5 percent level

The results show that the effect of the real money gap on inflation is significant in the P-star models (model 1,2,3 and 4). The effect of the real output gap is also significant for the Phillips curve. Models with the real money gap calculated using DMA has a higher coefficient than their SSMA counterparts. P star model has a better fit as compared to the Phillips curve.

The coefficients of international non-fuel inflation and inflation persistence are significant for all the models. The coefficient for crude oil inflation is insignificant for all the models. The adjusted R^2 for all the models, except the Phillips curve, is very much similar but models with DMA slightly dominate SSMA in terms of fitting the data. We will use this as the motivation to test whether the forecasts from DMA are also better than their SSMA counterparts.

Forecasting Performance of Inflation Models

Given that India has adopted the inflation targeting framework, it is crucial from a policy perspective to have the best inflation forecasting model. Therefore, we have tested these inflation forecasting models to see which one of them performs the best. We have included an ARIMA specification as our Model 6. Mean square errors of four, six and eight quarters ahead forecasts are calculated. We have used the Diebold-Mariano test to see whether the difference in Mean Square Error (MSE) is significant or not.

Table 3 shows the MSE of the forecasts at different horizons. The P-star models do better than Phillips curve and ARIMA model in terms of MSE for four, six and eight quarters ahead forecast. Further, the MSE for Model 1 (Divisia M2) and Model 2 (Divisia M3) is less than Model 3 (Simple sum M2) and Model 4 (Simple sum M3) at eight quarters ahead forecast. However, model 3 and model 4 do better than model 1 and 2 at four quarters ahead forecast. We got mixed results for six months ahead forecast.

Further, we check the significance of the difference of MSE using the Diebold-Mariano test. We have considered Divisia M3 (Model 2), simple sum M3 (Model 4) and Phillips Curve model (Model 5) in Table 4 and Divisia M2 (Model 1), simple sum M2 (Model 3) and Phillips Curve model (Model 5) in Table.

Table 3: MSE of Forecasting Models at Different Horizons

	MSE (8 Quarters)	MSE (6 Quarters)	MSE (4 Quarters)
Model 1	0.435	0.380	0.423
Model 2	0.441	0.362	0.400
Model 3	0.448	0.364	0.395
Model 4	0.453	0.368	0.410
Model 5	0.474	0.525	0.578
Model 6	0.889	0.885	0.901

Source: Author's calculation

Table 4: Forecasting Ability of P-Star Model with Divisia M3, Simple Sum M3, And Phillips Curve Using Diebold Mariano Test

	Mod 2 VS Mod 5	Mod 4 VS Mod 5	Mod 2 VS Mod 4
4 Quarters	0.03	0.04	0.34
6 Quarters	0.02	0.02	0.46
8 Quarters	0.67	0.79	0.104

Source: P-values of Diebold-Mariano tests are presents above. The null hypothesis is that the two models considered have the same forecasting accuracy.

Table 5: Forecasting Ability Of P-Star Model with Divisia M2, Simple Sum M2 And Phillips Curve Using Diebold Mariano Test

	Mod 1 VS Mod 5	Mod 3 VS Mod 5	Mod 1 VS Mod 3
4 Quarters	0.055	0.057	0.23
6 Quarters	0.02	0.03	0.33
8 Quarters	0.56	0.75	0.47

Source: P-values of Diebold-Mariano tests are presents above. The null hypothesis is that the two models considered have the same forecasting accuracy.

The forecasting ability of the P-star models calculated using SSMA (Model 3 and 4) and DMA (model 1 and 2) are significantly better than forecasting ability of Phillips curve at short horizons of four and six quarters. Nevertheless, the difference of MSE between the P-star model with DMA and the P-star model with SSMA is not statistically significant. Therefore, from the estimation of several forecasting models, we concluded that the P-star model with SSMA is at par with the P-star model with DMA in terms of forecasting inflation. Though models with monetary aggregates are superior to other models, it is difficult to proclaim a winner among the ones containing monetary aggregates.

EXPLORING THE RESULTS POST RUPEE CRISIS

Given the micro-foundations of DMA and the vast pool of literature on its credibility, the above results confirm the superiority of DMA over SSMA in terms of fitting the data, but we could not find enough evidence in favour of DMA when it comes to inflation forecasting. Table 6 summarizes all the relevant studies done in the past for India on weighted monetary aggregates. The results in each paper stated that weighted monetary aggregates (Divisia or currency equivalent) dominate SSMA in terms of fitting the data and stability of the demand function though, no study has considered the period post-2013. Thus, to test and explore information content in monetary aggregates post-2013, we have run the ordinary least squares on the model where we have included both the real money gap calculated using DMA and SSMA. The next subsection contains the details

Table 6: Past Studies on Weighted Monetary Aggregates

Research Paper	Aggregates	Period	Results
Acharya and Kamaiah (1998)	Currency Equivalent Aggregate	1985-1996	CEA > SSMA
Jha and Longjam (1999)	Divisia Monetary Aggregates	1970-1998	DMA > SSMA
Acharya and Kamaiah (2001)	Divisia Monetary Aggregates	1970-1996	DMA > SSMA
Acharya and Gopalswamy (2005)	Currency Equivalent Aggregate	1999-2005	CEA > SSMA
Ramachandran (2010)	Divisia Monetary Aggregates	1993-2008	DMA > SSMA
Paul and Ramachandran (2011)	Currency Equivalent Aggregate	1993-2009	CEA > SSMA
Paul and Ramachandran (2013)	Currency Equivalent Aggregate	1993-2009	CEA > SSMA
Barnett, Bhadury and Ghosh (2015)	Divisia Monetary Aggregates	2000-2008	DMA > SSMA
Paul, Rathar and Ramchandran (2015)	Currency Equivalent Aggregate	1993-2012	CEA > SSMA

Source: CEA=Currency Equivalent Aggregates DMA=Divisia Monetary Aggregates SSMA =Simple Sum Aggregates

Regression with Both DMA and SSMA

In this subsection, we will try to answer two things with a simple exercise first, whether DMA fit the data better post-2013. Second, whether this superior information in Divisia is sustained after accounting for SSMA. To answer them, we have run an OLS regression on the P star model containing real money gap calculated using both DMA and SSMA in a single equation for different periods. We have estimated two such equations with M2 and M3 for each period. If the coefficient of the real money gap calculated using DMA comes out to be significant, then one can infer that it has some extra information not contained in SSMA. Table 7 contains the results. We have provided the equation considered for estimation below.

$$\pi_t = \beta_0 + \beta_1 \pi_{t-1} + \beta_2 (dM_{t-3} - dM^*_{t-3}) + \beta_3 (M_{t-3} - M^*_{t-3}) + \beta_4 S_{t-1} + \varepsilon_t$$

$(dM_{t-3} - dM^*_{t-3})$ is the real money gap calculated using DMA

$(M_{t-3} - M^*_{t-3})$ is the real money gap calculated using SSMA

Table 7: **OLS Regression Result Using Both Simple Sum and Divisia M3**

	1994-2016	1994-2013	1994-2010	2000-2016	2000-2010
Real money gap using DM3 & M3	β2 = Insig β3 = Insig	β2 = 0.097** β3 = Insig	β2 = 0.094* β3 = Insig	β2 = Insig β3 = Insig	β2 = 0.139** β3 = -0.082*
Real money gap using DM2 & M2	β2 = Insig β3 = Insig	β2 =0.052** β3 = Insig	β2 = Insig β3 = Insig	β2 =0.0367* β3 = Insig	β2 =0.075*** β3 = Insig

Source: Insig=Insignificant, * means significant at 10 percent, ** means significant at 5 percent, *** means significant at 1 percent

The coefficients for the real money gap calculated using DMA (DM2 and DM3) are significant in all the periods apart from those where the period 2013-2016 is included (1994-2016 for both DM2 and DM3 and 2000-2016 for DM3). Whereas the real money gap calculated using SSMA is coming out to be insignificant in all except M3 for 2000-2010. The results are consistent with previous studies suggesting that DMA captures better information than SSMA. However, the ability of this extra information to explain the behaviour of inflation post-2013 is much weaker. Thus, it is not wrong to conclude that DMA is at least as robust as SSMA for explaining inflation (fitting the data) and equally robust as SSMA for inflation forecasting considering all the time frame in the study.

Therefore, if the policymaker uses monetary aggregates, then DMA is a more reliable option.

DMA, though a better aggregation technique than SSMA, still have many drawbacks due to which it is not able to capture the correct liquidity level of different monetary assets at specific periods. With the advancement in the financial system and the emergence of new financial assets, the actual information content of DMA is reducing, and the problem has exacerbated in the more recent time as supported by the results of this paper. The choice of benchmark asset from the pool of available non-liquid assets also plays an essential role in calculating DMA. Different benchmark asset can lead to different aggregation and hence different results. DMA, though a step forward towards precision, is still unable to remove all the uncertainty from the market which distorts the money demand function. There remains a room for improvement in the aggregation technique, which can capture the liquidity characteristic of a monetary aggregate more correctly. Therefore, in the times where the money demand is highly unstable, DMA also fails to provide consistent results even though DMA is relatively stable in other periods where SSMA show instability.

CONCLUSION

We test the forecasting ability of various inflation forecasting models for India. As India has adopted inflation targeting in 2016, the central bank must have the best forecasting model while making any decision on repo rates. The forecasts attained from P-star models were more accurate than other models and coefficients for the real money gap calculated using DMA slightly dominated their SSMA counterpart. However, as far as the inflation forecasting is concerned, the results were inconclusive. The forecasts of SSMA forecasts were more accurate than DMA at shorter horizons (4 quarters), and forecasts of DMA were more accurate at longer horizons (8 quarters).

Moreover, DMA fits better than SSMA from 1993-2013; the results after 2013 do not favour any one aggregation technique over the other. Therefore, the information contained in DMA does not explain the behaviour of inflation post-2013. So, relying on DMA is a better way forward, but relying solely on DMA might pose a problem in some periods. Exploring this issue can be a topic of research for the future.

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APPENDIX A

Measures of Monetary Aggregates Used in the Study

Monetary Aggregates	Monetary Components
M1	Currency with Public + Demand Deposits + Other Deposits with RBI
M2	M1 + Time Liability Proportion of the savings deposits with banks + Term Deposits with contractual maturity of up to and including one year in bank
M3	M2 + All deposits with the Post Office savings bank (Excluding National Saving Certificates)

Monetary Components and Their Corresponding Interest Rate Proxy

Monetary Components	Interest Rates
Currency with Public	Zero
Demand Deposits + Other Deposits with RBI	Zero
Term Deposits with contractual maturity of up to and including one year in bank	Interest rate on one-year term deposit of SBI
Term Deposits with contractual maturity of over one year	Maximum interest rate of term deposits with the contractual maturity of over one year of SBI
All deposits with the Post Office savings bank (Excluding National Saving Certificates)	Interest rate on postal time deposit

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