

Weighted monetary aggregates for South Africa: Are they useful?

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Outline

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Overview

- SA monetary aggregates (i.e. M1, M2, etc) are calculated by summing the total values of a set of the monetary assets with a set of unity assigned to each. i.e. simple-sum aggregation procedure.
- By assigning equal weights to all components, the simple sum-aggregation therefore, treats different assets with varying degrees of liquidity as perfect substitutes.
- According to microeconomic demand theory, if indeed these assets were perfect substitutes, rational economic agents would choose to hold only one asset class unless all assets have the same user cost.

Overview (cont...)

- However, there is sufficient evidence on differences in user costs and on imperfect substitution between components of monetary aggregates
- Thus the substitutability assumption implicit in the simple-sum aggregation procedure is without sound economic foundation.
- E.g. it has been pointed out that when components are not perfectly substitutable and they differ in terms of their transaction properties, they may have substantially different effects on economic activity.

Overview (cont...)

- For any monetary aggregate to be economically meaningful, it must allow for less than perfect substitution between assets with weights that vary over time according to economic conditions.
- A method of aggregation that is consistent with rigorous microeconomic and aggregation-theoretic foundations was suggested by Barnett (1980).
- These aggregates are called the Divisia aggregates or in some cases Monetary Services Indices.

Literature review

- Problems associated with the simple-sum monetary aggregation was detected as early as 1970s by Friedman and Swartz who suggested applying some form of weighting in the components of the monetary aggregates.
- Significant contribution came from the work of Barnett in 1980 who provided a theoretically consistent method for such weighting and advocated the use of the Divisia Index.
- Since then, Barnett method was followed to construct the Divisia Index for different countries (eg. United Kingdom, Canada, Japan, United States, Switzerland).

Literature review (cont...)

- Numerous studies have analysed the relative usefulness of the Divisia index by comparing its leading indicator properties with that of simple-sum and their relative stability and found a strong evidence of stable broad money demand relationships using this aggregate in the US and the UK.
- Some studies have found some weaknesses in Divisia index. For instance, it was found that the application of the Divisia index number methodology to the missing M2 episode of the early 1990s in the UK was problematic.
- Some evidence indicated that despite the theoretical advantages of Divisia aggregates, they have not been shown clearly superior to summation aggregates.

Literature review (cont...)

- Other than the Divisia indices, there are other monetary aggregation approaches that have been used in the literature. There is a currency-equivalent (CE) index proposed by Driscoll et al (1991).
- Another approach for constructing monetary aggregates was suggested by Feldstein and Stock (1996), which involves determining the weights for the monetary component assets empirically (Drake and Fleissig, 2006).

Description of the Divisia Index

- This paper follows amongst others Barnett (1980), Fisher, et al. (1993) and Hancock (2005) approach in constructing the Divisia monetary index for South Africa.

$$\ln DI_t - \ln DI_{t-1} = \sum_{i=1}^n w_{it}^* (\ln M_{it} - \ln M_{it-1})$$

The weights

- w_{it}^* is calculated as follows:

$$w_{it}^* = \frac{1}{2} (w_{it} + w_{it-1})$$

- Where w_{it} is:

$$w_{it} = \frac{M_{i,t} (U_{it}^c)}{\sum_{k=1}^n M_{k,t} (U_{it-1}^c)}$$

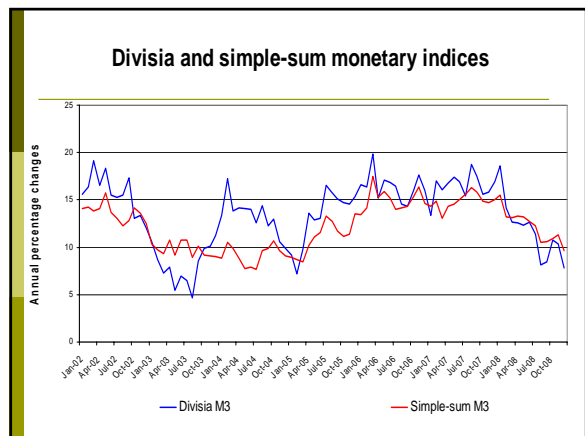
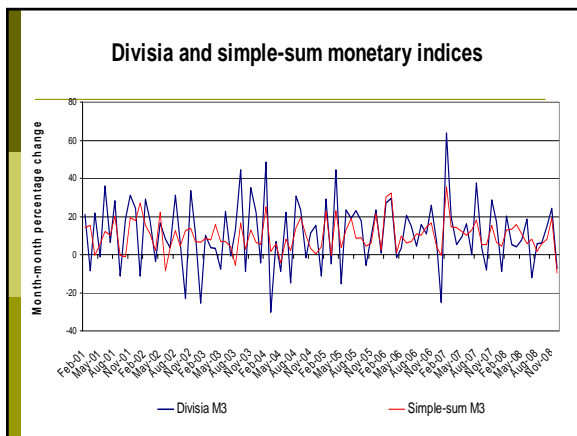
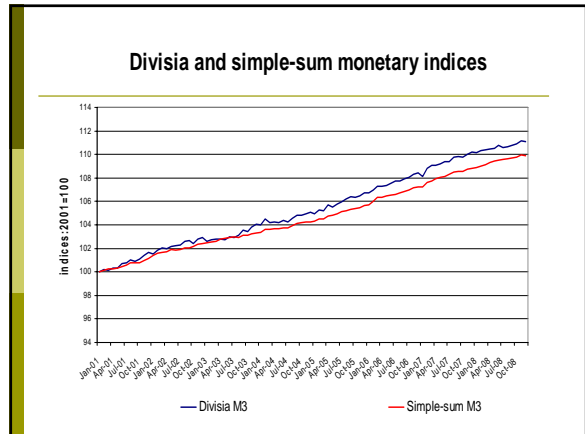
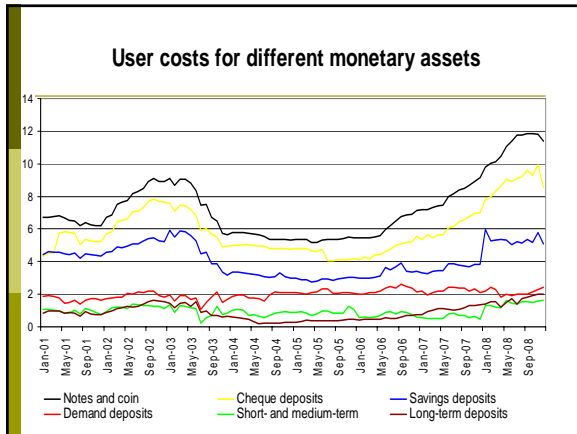
User costs

- It is designed to capture the opportunity cost of holding monetary assets
- User cost is determined as in Barnett:

$$U_{it}^c = P_t * \frac{R_t - r_{it}}{1 + R_t}$$

Data

- Monthly seasonally unadjusted data from Jan 2001 to Dec 2008.
- Consumer price index for metropolitan areas.
- Long-term government bond yield as a benchmark interest rate.
- Components of M3
 - Notes and coin
 - Cheque and transmission deposits
 - Savings deposits
 - Demand deposits
 - Short- and medium-term deposits
 - Long-term deposits
- Corresponding interest rates



Indicator properties

- ▣ Preliminary evaluation of the relative usefulness of the Divisia M3 index compared to that of the simple-sum M3,
- ▣ by assessing their relative out-of-sample predictive ability as the indicator variables for South African consumer prices, using the simple bivariate indicator models of Stock and Watson (2003) and Clark and McCracken (2001).

Indicator properties (cont..)

- ▣ The results indicated that, between 2001–2008, for a one and six months forecast horizons, both simple-sum and Divisia indices do not have statistically significant predictive power for consumer inflation at 5 per cent significance levels.
- ▣ Thus on the basis of the Divisia's predictive content for inflation, using a bivariate model, we find no evidence that the Divisia is more useful as a leading indicator for inflation compared to the simple-sum aggregate.

Conclusion

- The paper followed the approach used by Barnett (1980) to derive a properly weighted monetary aggregates and assesses their relative usefulness.
- We found that the level of computed index does seem to follow the same trend as the simple-sum aggregate however, the rates of growth show some striking differences.
- We found that the Divisia index shows remarkable volatility compared to its simple-sum counterpart.

Conclusion (cont...)

- Using a bivariate indicator model of Stock and Watson (2003), we found that both the simple-sum and the Divisia aggregate indices have no statistically significant predictive content for consumer prices in South Africa.
- The disappointing results can be attributable to a variety of reasons:
- First, the results are still preliminary and are still subject to further checks and tests;

Conclusion (cont...)

- Second, the data used is not seasonally adjusted which might explain the volatility exhibited by the growth rates of these indices;
- Third, monthly data seem to be volatile and further attempts need to be made to use quarterly data to see if different results could be obtained;
- Fourth, the usefulness of the monetary aggregates are done using just one test, i.e using inflation indicator model. It could be the case that it is a leading indicator of some other non-consumer price variables e.g. GDP growth, employment growth, and so forth.