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Financial Intermediation Services Indirectly Measured (FISIM): The role of reference rate

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Abstract. Adoption of SNA2008 for measurement of financial sector's output has brought about several conceptual issues and practical challenges. The proposed reference rate approach plays a vital role in computation and the choice of which affects the FISIM, and thereby financial sector's output. Depending on the reference rate, it can take a value as low as interest spread times the quantum of loans or as high as interest spread times the quantum of deposits. As there is no consensus on the reference rate, much of the debate among national accountants community over the measurement of FISIM has been confined to the appropriate choice of reference rate. In this context, this paper presents the issues and challenges of implementing the FISIM methodology of SNA2008 with respect to the commercial banking sector in India.

Keywords: SNA2008, financial services, FISIM, reference rate, national accounts, India

JEL classification: E01, G21, G29

1. Introduction

The concept of Financial Intermediation Services Indirectly Measured (FISIM) is implicitly used in the System of National Accounts (SNA) since a long time. It is well known that among various service sector industries, the financial intermediaries sector is one, in which output is difficult to measure. In fact, this is true for many types of services, where output is not measured directly, and real values have to be imputed using indirect methods. In this regard, measurement of financial sector's output, particularly as a production unit and in the context of national accounts, has been debated for a long time. Conceptually two approaches, viz., the national accounts approach and the production function approach dominate, though they are somewhat different [23]. The national accounts approach does not count for the provision of finance to borrowers in itself as an output of the financial sector, which is in sharp contrast to the production function approach, which is primarily based on the theory of firms.

Following the spirit of the national accounts approach, interest received simply cannot be treated as output. Thus, in order to obtain some output measure, a convention was adopted that the interest rate spread in value terms between loan and deposit rates could be used in national accounts as the output, so long as it was interpreted as something but not as interest. Interest in national accounts is basically a transfer or a receipt of property income involving owners of financial claims and others. Interest is not considered as a payment for a productive service and hence, it cannot be treated as an output. "The concept of production used in the SNA requires some economic activity, or process, to take place involving labour and capital assets in which inputs are transformed into outputs and in which factor incomes are generated. Lending is not an economic activity of this kind" [17]. Therefore by definition, the provision of finance is not an output in the SNA. By the same reasoning, deposits do not themselves provide 'productive' inputs in the SNA view,

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again contrary to the treatment of financial inputs in production function studies.

In the parlance of SNA1993, the output of the intermediation services provided by financial corporations, including banks, is measured using the concept of FISIM,[1] which is distinctly different from earlier measures of output of financial corporations. However, in the perspective of present-day coverage and spread of the financial sector, the focus in SNA1993 appeared somewhat narrow and confined to intermediation activity alone rather than encompassing the entire gamut of financial services including corporations lending from their own funds. In terms of institutional coverage also, activities of some of the financial intermediaries like mutual funds were not explicitly covered. Therefore, SNA2008 brought out certain changes in measurement of FISIM. Particularly, it emphasised the asset boundary and introduced the reference rate approach to FISIM. SNA2008 broadly follows the user cost of money approach for estimating the output of the financial services. According to this theory, the user cost of holding a financial asset is the yield that would have been earned on the funds if they had been invested in a risk free bond.

The FISIM methodology in SNA2008, though touched upon in SNA1993, is a conceptual one. It has a unique and theoretically sound basis for measurement of financial sector output based on reference rate approach. But its implementation is not straightforward in the absence of a unique definition of a reference rate. This has led to an enormous debate among national accountants and researchers across the globe on how and to what extent the shift to FISIM in SNA2008 would impact the financial sector output.

There have been many developments and significant structural changes in the working of financial corporations over the past decade or so, including widening of the nature of services provided, changes in the composition/importance of different portfolios (and hence sources of income), new channels and institutions for providing financial services, and increase in intra-sectoral transactions. In recognition of these developments and the consequent need for bringing about improvements in capturing the financial sector's contribution to GDP, several issues pertaining to measurement of output of financial services, non-life insurance services, output of central banks, valuation of non-performing loans, retained earnings of mutual funds, insurance companies, and pension funds, etc., have been included in the process of revision of SNA1993 and have been included in SNA2008. A major change in this regard has been the explicit adoption of the FISIM methodology in the output estimation of the financial sector.

An attempt is being made in this paper to flag the issues and challenges of implementing the FISIM methodology as proposed in SNA2008. The issue is pertinent to all countries implementing SNA2008. However, we confine ourselves to exploring the issues in the context of India. The methodological framework adopted for estimating the financial sector output in the National Accounts Statistics (NAS) of India, broadly followed the general guidelines prescribed in SNA1993 [7]. By and large, the approach had been followed in the 1999–00 series, as well as the series of NAS with base 2004–05. The reference rate approach, in line with SNA2008 recommendations, has been incorporated in the revised series of NAS with base 2011–12 by considering the average of deposit and lending rates as the reference rate [10].

The rest of the paper is organised as follows: a snapshot of the conceptual issues on the role of financial corporations as well as the basic FISIM principles, which have been highlighted in the SNA2008, are provided in Section 2. A comparison of old FISIM vis-à-vis the new FISIM is also presented in this section. Theoretical underpinnings of choosing a reference rate is illustrated in Section 3. In this section, we analytically compare the FISIM under possible scenarios of the reference rate. Experimentally, adoption of FISIM has been examined by many countries and various implementation issues have come up, particularly regarding the choice of reference rate. A brief on these issues is also presented in this Section along with a proposal for reference rate in the Indian context. Finally, we conclude in Section 4 with a few remarks on the way forward.

2. SNA revisions

2.1. The role of financial corporations

Over two decades ago, SNA1993 defined financial corporations as "...all resident corporations or quasi-corporations principally engaged in financial intermediation or in auxiliary financial activities which are closely related to financial intermediation". Subsequently, several task forces have examined the na-

[1] Reference may be made to Begg et al. [5] for estimates of FISIM as per SNA1993 for France and the U.K.

ture of activities of financial corporations.[2] Financial corporations are primarily engaged in a productive activity by channelling funds from lenders to borrowers. They incur liabilities on their own account to acquire financial assets, by engaging themselves in the financial markets. They incur liabilities not only by taking deposits but also by issuing bills, bonds or other securities. They obtain financial assets by making advances or loans to others and also by purchasing bills, bonds and other securities. Therefore, financial corporations provide a kind of service to both borrowers and lenders and these services represent the output of financial intermediation termed as FISIM.

A financial corporation does not merely intermediate between lenders and borrowers in a mechanical way, it deals with many problems that arise from asymmetric information and places itself at risk by incurring liabilities on its own. This informational asymmetry gives rise to the capital markets, debt instruments and other characteristics of the services provided by the financial corporations. Further, a financial corporation bundles the products to meet the requirement of the borrower. The activities of risk taking and repackaging of the products were labelled in SNA2008 as risk management and liquidity transformation, respectively. Thus, financial corporations in SNA2008 were defined as those which are engaged in financial services, which are produced as a result of risk management, liquidity transformation and auxiliary financial activities.

Thus, intermediation alone does not capture the full range of services provided by financial corporations. A number of other services, including monitoring services, convenience services, liquidity provision services, risk assumption services, financial information services, underwriting services and inventory, trading and market making services, are also provided by a financial corporation. SNA2008 emphasised that the definition of a financial corporation should be based on the nature of financial services instead of its activity and should include risk management and liquidity transformation along with financial intermediation. This basic change in the definition of financial corporation has brought explicit focus on the role of risk in financial intermediation activities. This has important implications for the way in which the financial sector's output is measured in SNA2008.

[2]For example, Schreyer and Stauffer [22] prepared a paper titled "Measuring the production of financial intermediaries" for the OECD Task Force on Financial Services.

2.2. *FISIM – SNA2008 principles*

Financial intermediation is the traditional way of providing financial services. A financial institution accepts deposits from units, who wish to receive interest on funds and lends them to other units, which have insufficient funds to meet their requirements. The financial institution, thus provides a mechanism to allow the second unit to borrow from the first unit. Each of the two parties in the transaction pays a fee to the financial institution for the service provided. The financial institution accepts a higher rate of interest from the borrower and offers a lower rate of interest to the depositor. The difference between accepted rate from the borrower and offered rate to the depositor, becomes the combined fees implicitly charged by the financial institution to the depositor and borrower. The concept of a 'reference' rate of interest emerged from this basic idea. That is, both the lender and the borrower could hypothetically perform the transaction at the reference rate, had there been no intermediary between them.

However, it is seldom the case that the amount of funds lent by a financial institution exactly matches the amount deposited with them. Some loans may be financed by the financial institution's own funds and not from borrowed funds, and some money may have been deposited but not yet loaned. Yet, the borrower pays the same rate of interest and receives the same services irrespective of funds provided by own funds or intermediated funds. Similarly, the depositor of funds receives the same rate of interest regardless of whether those funds are lent to another customer or kept idle with the financial institution. Therefore, an indirect service charge is to be imputed in respect of all loans and deposits offered by a financial institution irrespective of the source of the funds.

The reference rate applies to both; interest received on loans and interest paid on deposits so that the amount of interest recorded as such in the SNA is calculated as the reference rate times the level of loan or deposit in question. The difference between these amounts and the amounts actually paid to the financial institution are recorded as service charges paid by the borrower or depositor to the financial institution. In SNA parlance, the amounts based on the reference rate are recorded as interest and are described as 'SNA interest', and the amounts actually paid to or by financial institution are described as 'bank interest'. Therefore, the implicit service charge is the bank interest on loans less the SNA interest on the same loans plus the SNA interest on deposits less the bank interest on the

same deposits. The service charge payable is by or to the unit in receipt of the loan or owning the deposit, as appropriate.

Conventionally, the indirect charges are applied in respect of loans and deposits, and only when those loans and deposits are provided by or deposited with financial institutions. The type of transactions that should be included in FISIM calculations are dealt in a paper by Statistics New Zealand [1]. Exclusion of interest on securities from the scope of FISIM is a convention within the international measurement standards. The rationale for treating securities differently relates to services delivered specifically to holders of loans and deposits. For example, banking service providers guarantee deposit values and are obliged to settle their deposit liabilities on demand. As advocated by Aotearoa [1], the situation is not the same for the owner of a security issued by a banking service provider. To quote Aotearoa [1] "In issuing securities, banking service providers have a liability over a set term for a set interest rate. Should the owner of the security wish to recoup the value of the security prior to the end of the set term, there is an option to on-sell the security to a third party." Therefore, the current market price of the security need not be equal to the original value, and this valuation risk is carried by the security owner. These features differentiate the key services delivered to deposit holders and security owners. Similarly, income earned on inter-bank lending is excluded from the purview of FISIM calculation.

The financial institutions considered for FISIM calculation need not offer both deposit taking facilitates as well as making loans. Some financial institutions, such as financial subsidiaries of retailers, make loans without accepting deposits. Therefore, a money lender, who has sufficiently detailed accounts, should be treated as an actual or quasi-corporation as he extends loans but need not accept deposits. Indeed, money lenders usually charge high rate of interest, and hence their interest exceeds the SNA interest by a significant amount. Further, the financial institution need not necessarily be resident, nor does it require its clients to be resident. Therefore, imports and exports of the financial services are possible and should also be considered for FISIM calculation.

Again banks offer fixed interest loans. But, as the reference rate changes, the level of SNA interest and the service charge will vary. Further, when an enterprise acquires a fixed asset under the terms of financial lease, a loan is imputed between the lessor and the lessee. In such a situation, regular payments under the lease are treated as payments of interest and repayment of capital. Suppose, if the lessor is a financial institution, then the interest payable under the terms of a financial lease corresponds to bank interest and should be separated into SNA interest and financial service charge, as for any other loan. Even when a loan is described as non-performing, interest and the associated service charge continue to be recorded in the SNA.

2.3. How is FISIM calculated in practice?

In SNA1993, FISIM is calculated as the difference between property income receivable and total interest payable of the financial institution. However, SNA2008 suggests that the interest rate should be adjusted with respect to reference rate. More precisely, FISIM should be calculated based on the formula: $(R_l - R_r) \times L + (R_r - R_d) \times D$, where R_r is a risk free reference rate that has no service element in it and it reflects the maturity structure of the financial assets, and R_l, L and R_d, D are respectively, the loan interest rate, size of the loan, deposit interest rate and size of the deposit of financial institution.

After rearranging the above formula, one can get:

$$\begin{aligned} FISIM_{new} &= (R_r - R_d) \times D + (R_l - R_r) \times L \\ &= R_r \times D - R_d \times D + R_l \times L - R_r \times L \\ &= (R_l \times L - R_d \times D) + R_r \times (D - L) \\ &> (R_l \times L - R_d \times D), \text{as in general, } D > L \\ &\text{and } R_r \text{ is positive} \\ &= FISIM_{old} \end{aligned}$$

As can be seen, the proposed formula for FISIM should roughly raise the size of FISIM by $(D - L) \times R_r$, as compared to the FISIM derived from the existing method. In other words, the new method is expected to correct the underestimation of FISIM to a large extent. Further, it can be observed that when the quantum of loans equals the quantum of deposits, FISIM does not depend on the reference rate and is equal to the old FISIM. But, loans and deposits won't be the same in general.

3. Reference rate

3.1. Theoretical underpinnings

The reference rate approach was adopted from the theory of user cost of money, which determines

whether a financial product is an input or an output on the basis of its net contribution to its revenue. If the financial return on an asset is higher than the opportunity cost of the funds or, alternatively, if the financial cost of a liability is lower than the opportunity cost, it is considered as output; otherwise, input [16].

The theoretical justification for the reference rate approach is simple. It is the opportunity cost of funds for both the financial institution and its customer. Taking a customer's point of view, first consider a borrower who has the option of repaying a loan with an interest rate of R_l but who chooses instead to invest in a security that pays the reference rate R_r. This borrower is implicitly choosing to pay a spread of $R_l - R_r$ for the financial services associated with the loan. Now consider a depositor who could have invested in the reference rate security but instead earns the lower deposit rate of R_d and is choosing to forego income $R_r - R_d$ in exchange for depositor services.

These interest rate margins compared with the reference rate above can be interpreted as service charges from the financial institution's point of view. For the financial institution to be indifferent at the margin between lending and investing in the reference rate security, the cost of providing services to loan customers must be $R_l - R_r$. Similarly, to be indifferent at the margin between lending and investing in the reference rate security, the cost of providing services to deposit customers must be $R_r - R_d$. A detailed theoretical justification of the reference rate approach can be found in Fixler et al. [13].

It is clear that reference rate plays an important role in FISIM calculation. Some of its desirable regularity properties are as follows: it should be (i) risk neutral or default free, (ii) familiar to the consumers of the banking and financial services, (iii) linked to market related behavioural rates impacting baking business, (iv) not-skewed towards loan rates or deposit rates, (v) amenable to validation against actual observables emanating from banks' balance sheets and other reporting system, (vi) easily computable for linking over time (regarding price relatives, revision exercises, etc.). Also among other desirable coherence features, reference rate is perceived to be a single rate.

3.2. How does the choice of reference rate affect FISIM?

Ideally, the reference rate to be used in the calculation of FISIM is a rate between interest rate on deposits and loans. However, the level of loans and deposits, in general, are not equal. Reference rate can be visualised as either close to the deposit rate or close to the lending rate or in between the deposit and lending rate. Accordingly, possible scenarios are assumed for the reference rate and a brief analysis of $FISIM_{new}$ under each reference rate is presented below:

Case 1: Assuming reference rate is equal to deposit rate, i.e., $R_r = R_d$ then,

$$\begin{aligned} FISIM_{new} &= (R_d - R_d) \times D + (R_l - R_d) \times L \\ &= (R_l - R_d) \times L \\ &= \textit{Expression (interest spread between loans and deposits)} \times \textit{quantum of loans} \end{aligned}$$

Thus, in this case, $FISIM_{new}$ depends only on quantum of loans and bank's interest spread. As the quantum of loans grow, their output contribution to GDP increases.

Case 2: Assuming reference rate is equal to lending rate, i.e., $R_r = R_l$ then,

$$\begin{aligned} FISIM_{new} &= (R_l - R_d) \times D + (R_l - R_l) \times L \\ &= (R_l - R_d) \times D \\ &= (\textit{interest spread between loans and deposits}) \\ &\times \textit{quantum of deposits} \end{aligned}$$

Thus, $FISIM_{new}$ here depends only on quantum of deposits and bank's interest spread. As the quantum of deposits grow, their output contribution to GDP goes up.

Case 3: Assuming reference rate is the average of deposit and lending rate,

i.e., $R_r = \frac{1}{2}(R_l + R_d)$ then,

$$\begin{aligned} FISIM_{new} &= (R_r - R_d) \times D + (R_l - R_r) \times L \\ &= \left(\frac{1}{2}R_l - \frac{1}{2}R_d\right) \times D + \left(\frac{1}{2}R_l - \frac{1}{2}R_d\right) \times L \\ &= \left(\frac{1}{2}R_l - \frac{1}{2}R_d\right) \times (D + L) \\ &= \frac{1}{2}(\textit{interest spread between loans and deposits}) \times \textit{business} \end{aligned}$$

Thus, for this case, $FISIM_{new}$ depends on both the volume of banking activity as well as bank's interest spread. As the overall business of the banking system grows, its output contribution in GDP also increases.

Case 4: Assuming reference rate is closer to the average deposit rate,

i.e., $R_r = R_d + c$ *where* $0 < c < \frac{1}{2}(R_l - R_d)$ *then*,

$$\begin{aligned}
\textit{FISIM}_{new} &= c \times D + (R_l - R_d - c) \times L \\
&= c \times (D - L) + (R_l - R_d) \times L \\
&< \frac{1}{2}(R_l - R_d) \times (D - L) + (R_l - R_d) \times L \\
&= \frac{1}{2}(R_l - R_d) \times (D + L) \\
\textit{FISIM}_{new} &= c \times (D - L) + (R_l - R_d) \times L \\
&> (R_l - R_d) \times L \text{ since } c > 0 \text{ and } D - L > 0
\end{aligned}$$

Therefore, in this case, $(R_l - R_d) \times L < \textit{FISIM}_{new} < \frac{1}{2}(R_l - R_d) \times (D + L)$.

Case 5: Assuming reference rate is closer to the average lending rate,

i.e., $R_r = R_l - c$ where $0 < c < \frac{1}{2}(R_l - R_d)$ then,

$$\begin{aligned}
\textit{FISIM}_{new} &= (R_l - c - R_d) \times D + c \times L \\
&= (R_l - R_d) \times D - c \times (D - L) \\
&> (R_l - R_d) \times D - \frac{1}{2}(R_l - R_d) \times (D - L) \\
&= \frac{1}{2}(R_l - R_d) \times (D + L) \\
\textit{FISIM}_{new} &= (R_l - R_d) \times D - c \times (D - L) \\
&< (R_l - R_d) \times D \text{ since } c > 0 \text{ and } D - L > 0
\end{aligned}$$

Therefore, in this case, $\frac{1}{2}(R_l - R_d) \times (D + L) < \textit{FISIM}_{new} < (R_l - R_d) \times D$.

Thus, depending on the reference rate FISIM may take a value of $(R_l - R_d) \times L$ or $(R_l - R_d) \times D$ or $\frac{1}{2}(R_l - R_d) \times (D + L)$ or between these values. Therefore, selecting a proper reference rate is important for the National Accounts.

One can think of a reference rate to be (a) the interbank overnight borrowing rate; or (b) a government bond (default risk free) rate matched to the maturity of the asset/liability with which the service flow is associated. However, as financial institutions back their deposit liabilities with government securities, preference may be given to the second alternative, particularly, to those institutions which are only taking and servicing deposits [14]. Further, this rate could split the borrower service margin on asset side and depositor service margin on the liability side. The difference between loan rate charged/interest paid on the deposit and the matched government bond rate could be regarded as borrower/depositor service margin. Moreover, the difference between the average reference rates obtained from assets and liabilities would provide to the institutions the ability to match the maturity-structure of its asset and liability portfolio.

3.3. Cross country experience

Use of reference rate has produced results that are not considered plausible by users of the data. Initial experiment in Australia suggests that it produced extremely high growth in the output of financial services which was not supported by industry intelligence or financial intermediary activity and profits. In Europe, the ECB has reported "distortions of the FISIM computation" and "implausible results" [11].

The exposition given in the previous section suggests that the level of current price FISIM is quite sensitive to the choice of the reference rate. Particularly, if the chosen reference rate is exogenous, estimated FISIM could differ significantly across the choices. Early papers from the Bank of Belgium[3] and Eurostat[4] examined a set of different methodologies for determining reference rates. The Belgium paper concluded that weighted government bond rates by different maturities was most sensible. The paper from Eurostat reported the experiences of 12 countries that used six different ways of computing the reference rate. Though estimated FISIM varied across countries, there was a preference for using the interbank rate as the reference rate. However, it was observed that bank's output at any point of time would be affected by the reference rate and would tend to display some volatility.

For practical reasons, Australia used the midpoint of deposit and lending rate as the reference rate [11]. This was also preferred by New Zealand [1]. This helped smoothen out the allocation of output to user sectors and also reduced the likelihood of negative FISIM. In general, using the midpoint as reference rate gives less volatile results than using an exogenous reference rate. However, as Davies [11] pointed out that there could be disadvantages; "for example, when the securitisation of home loans increased significantly, the application of a reference rate calculated as the midpoint between

[3] 'FISIM: examination of results of experimental calculations, Belgium: First results for the period 1995–98' available at http://www.unece.org/fileadmin/DAM/stats/documents/ces/ac.68/2000/8.e.pdf.

[4] 'Results of Implementing the FISIM Calculations by Member States' available at http://www.oecd.org/std/na/15065919.pdf.

the rates for deposits and loans to loans financed by securities issued by securitisers produced results which were difficult to interpret". Also the mid-point of interest rates as reference rate has theoretical limitations, as alluded to earlier. As a result, Australia is also experimenting with using the yields on securities issued by securitisers into the calculation of the reference rate.

Statistics Canada experimented with a variety of reference rates for calculating the Service Producer Price Index [3]. Banking activities were classified into six homogeneous product lines: demand and notice deposits, term deposits, personal loans for non-business purposes, other non-mortgage loans, residential mortgages, and non-residential mortgages. As reference rate, the short-term banker's acceptance rates, T-Bills rates, Bank of Canada target rate, Guaranteed Investment Certificates (GIC) rates with different maturities, government bond rates with different maturities, and LIBOR (London Inter-bank Offered Rate) were used. In addition, Statistics Canada tried some reference rates derived from banks' financial statements, namely effective rates on banks' risk-free securities holdings and effective rates on banks' subordinated debt. It also considered using lagged reference rates, moving averages of the reference rates, and a combination of the two, and evaluated these against their impact on prices and real output. But a final choice could not be made. In fact, with respect to output measures, Canada preferred using the mid-point rate to allocate FISIM between loans and deposits, though they are now considering the adoption of multiple reference rates.

For UK, the Office for National Statistics (ONS) preferred using the London Inter-bank Offered Rate (LIBOR) [6]. Hagino and Sonoda [15] argued in the case of Japan that the reference rate should be based on the interest on claims among other depository corporations such as money market rates and recommended using multiple reference rates for the lending side. For Thailand, Supaarmorakul [24] showed that the level of FISIM is parameter dependent and different choice of the interest rate, reference rate and deflators produces divergent FISIM. He, however, preferred the FISIM value to be estimated using the market interest rate as it reflected best the output of financial corporations in the Thai economy.

The choice of reference rate can also create bizarre problems like negative FISIM. An example of this is subsidised loans, and also where the actual interest rate on loans is fixed for several years at a lower rate than the reference rate. The problem of negative FISIM and volatility in reference rate was recognized early and a methodology was suggested to avoid this problem in the joint OECD/ESCAP meeting on national accounts in 1998. In addition inter-bank lending rates can be volatile at times. Thus the methodology of using the mid-point between average deposit rate and average borrowing rate is considered practical. However, one major drawback in using the mid-rate is that it does not adequately reflect the current economic conditions and corresponding movements in interest rates [24].

3.4. Indian context

The Indian financial sector comprises banks, financial institutions (mostly consisting of Government regulated financial corporations, such as, EXIM Bank, NABARD, NHB, SIDBI, etc.) and non-bank financial companies (NBFCs). The composition of economic activities in India has changed distinctly during the last four decades, with increased emphasis on services sector, including financial services. Banks, being the major player, account for more than 80 per cent of loans and deposits in the country. NBFCs are companies registered under the provisions of Companies Act and are regulated by the Ministry of Corporate Affairs. However, deposit taking NBFCs are under the purview of Reserve Bank of India (RBI). Financial corporations are established to cater to particular segment of the economy and are generally non-market producers. For empirical illustration, we have estimated FISIM for the commercial banking sector in India.

3.4.1. Empirical illustration of FISIM

For illustration purpose, we have used four different variants of rates as reference rates: average call money interest rate, average repo rate, average government securities (G-sec) yield, and average of deposits and lending rate. The use of several reference rates and their implications on banking service prices in India were studied earlier by Barman and Samanta [2]. Data on these rates are presented in Table 1. In terms of behaviour, average repo rate and average of deposits and lending rate look similar. However, across years, variation of these four rates was not uniform. For example, in 2007–08, average call money rate declined from the previous year, while all other rates increased.

In order to compare how estimated FISIM varies with different choices of reference rates, we estimated it using the aggregate data of all commercial banks in India during 2003–04 to 2014–15 (Table 2). FISIM is

Table 1
Variants of reference rates (per cent): 2003–04 to 2014–15 (Per cent)

Year	Deposit rate	Lending rate	Reference rate			
			Average call money rate	Average repo rate	Average G-sec rate	Average of deposits and lending rate
2003–04	4.93	8.11	4.62	6.92	4.95	6.52
2004–05	4.20	7.07	4.65	6.00	5.81	5.64
2005–06	4.15	7.20	5.60	6.19	6.56	5.67
2006–07	4.44	7.89	7.22	7.10	7.42	6.17
2007–08	5.41	8.93	6.07	7.75	7.72	7.17
2008–09	5.67	9.58	7.26	7.42	7.42	7.62
2009–10	5.09	8.63	3.29	4.77	6.43	6.86
2010–11	4.62	8.33	5.89	5.96	7.40	6.47
2011–12	5.88	9.62	8.22	8.06	8.36	7.75
2012–13	6.14	9.62	8.09	7.92	8.03	7.88
2013–14	5.98	9.35	8.28	7.58	8.47	7.66
2014–15	6.04	9.35	7.97	7.92	8.22	7.70

Source: Database on Indian Economy, RBI.

Table 2
Deposits and loans of all scheduled commercial banks: 2003–04 to 2014–15 (Rs. Million)

Year	Deposits	Loans and advances	Interest paid on deposits	Interest earned on loans
2003–04	15755270	8636300	776050	700500
2004–05	18375594	11508363	772547	814083
2005–06	21646817	15168114	897420	1091900
2006–07	26969365	19812363	1198630	1562498
2007–08	33200616	24769360	1795589	2211713
2008–09	40632011	29999239	2301886	2874278
2009–10	47469196	34967200	2418332	3018245
2010–11	56158743	42974875	2595303	3577819
2011–12	64535485	50735592	3792334	4881064
2012–13	74296772	58797733	4561055	5659117
2013–14	85331730	67352132	5102378	6296974
2014–15	94351005	73881788	5701349	6907983

Source: Statistical Tables Relating to Banks in India, RBI.

estimated under each reference rate and is given in Table 3.

Data in Table 1 shows that FISIM from the deposit side can be negative for some years if average call rate or repo rate is used as reference rate. In that sense, both the G-sec yield rate and average of the deposit and lending rate provide somewhat better estimates. But one thing is clear – FISIM in SNA2008 is critically reference rate dependent. Different reference rates can produce dimensionally wide FISIM estimates. However, choice of mid-point as reference rate has practical advantages – most notable is that differences between actual and reference rates are less volatile and endogenous. This also has the benefit of greater transparency. Further, it is easy to communicate being more closely connected to the value of loans and deposits held by banking service providers. But one needs to be careful about the choice of reference rate from its theoretical consideration, rather than just choosing it from the viewpoint of ease of implementation. In that sense, possibly the yield of G-sec as reference rate has more relevance particularly on account of its risk-free nature.

In the above example, one can get a clear sense on how a particular reference rate influences the output of banking sector, a segment of financial corporation, whose services are produced as a result of risk management and liquidity transformation that are identified by loans and deposits. The issue becomes far more complicated for other financial corporations like insurance, mutual funds, non-bank finance companies, etc. Definition of their output itself is tricky and there is very little consensus in the literature. Also the reference rate, that is suitable for banks, might not find theoretical grounds for other financial corporations simply because of the different nature of their financial intermediation activities. However, the true spirit of SNA2008 demands that FISIM be estimated for all the segments of financial corporations, including money lenders. Besides the reference rate issue, implementa-

Table 3
Estimated FISIM under various reference rates: 2003–04 to 2014–15 (Rs. Million)

Year	$FISIM_{new}$ under different reference rates			
	Average call money rate	Average repo rate	Average G-sec rate	Average of deposit and lending rate
2003–04	253346	417083	276839	388492
2004–05	360862	453569	440522	428780
2005–06	557287	595511	619482	561964
2006–07	880604	872016	894918	805130
2007–08	927901	1069546	1067017	1020541
2008–09	1344332	1361344	1361344	1382948
2009–10	1011229	1196258	1403791	1457936
2010–11	1759045	1768274	1958122	1835956
2011–12	2223082	2201002	2242401	2158011
2012–13	2351935	2325587	2342636	2319673
2013–14	2683307	2557450	2717468	2572624
2014–15	2838030	2827796	2889203	2782021

tion of FISIM in SNA2008 faces the hurdle of data limitations also.

4. Concluding remarks

Financial intermediaries charge higher rate of interest to borrowers than they would otherwise pay, if they could procure funds without going through a financial intermediary. They pay a lower rate of interest to lenders than such lenders would otherwise receive if they could invest their funds without going through a financial intermediary. Therefore, services in both types of transactions are not charged explicitly, but are included in the FISIM.

SNA2008 recommends estimation of FISIM using the concept of reference rate. The reference rate represents the pure cost of the borrowed funds – that is, the rate from which the risk premium has been eliminated to the greatest extent possible and which does not include any intermediation services. Theoretically, this is a sound approach based on user cost method. But estimation of FISIM has practical limitations mainly for its reliance on the reference rate, which is not unique.

Much of the debate in the national accountants community over measurement of FISIM has since been confined to the appropriate choice of reference rate. There is no easy solution. Moreover, the reference rate plays an important role in the output measurement of financial services and their contribution to overall GDP. Further, various country experiences could not provide consensus on the choice of a particular reference rate. An empirical illustration based on four different reference rates presented here shows how the choice of reference rate could influence the FISIM for commercial banks in India.

Financial intermediaries are a group of institutions. But SNA2008 proposes a single reference rate. However, the production technologies and risk taking behaviour across financial institutions are different. Not every financial institution prices its products based on one benchmark rate. So a unique reference rate may not serve the purpose of FISIM calculation for all other financial institutions. The FISIM approach of SNA2008 has thrown more questions than answers and opened up new vistas of research for output measurement of financial services.

Disclaimer

The views expressed in this paper are personal and do not necessarily reflect the views of the organisations to which they are affiliated.

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