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Session on Banking and Credit

Mini presentation on

An introduction to FISIM – Concepts and Measurement difficulties

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1 Introduction

1.1 Background and Purpose

The 24th meeting of the Voorburg Group in 2009 in Oslo, Norway, re-introduced the measurement of Banking Services to the Group, having being earlier discussed in 1993 and 1999. Delegates from Norway, Mexico, United States and Canada delivered mini-presentations on turnover measurement, while the United Kingdom, United States and Canada delivered mini-presentations on service producer price index measurement.

At the conclusion of the session, the session leader, Louis Marc Ducharme from Statistics Canada, concluded that the Group as a whole were not prepared to make recommendations for a sector paper on Banking Services, indicating two areas for further development.

First, the mini-presentations delivered to the Group highlighted a range of technical difficulties being experienced by the national statistical agencies measuring Banking Services. These would need to be explicitly addressed in 2010 at the 25th meeting of the Voorburg Group. Second, the discussion highlighted that the Group, as a whole, would benefit from an overview of the difficulties of measurement of banking services, in particular the System of National Accounts (SNA) concept of Financial Intermediation Services Indirectly Measured (FISIM), and issues surrounding its measurement (particularly with respect to price index measurement). This paper[1] is intended to be an introduction to the measurement of banking services and financial intermediation, attempting to express the SNA concepts in terms more familiar to price index practitioners and survey statisticians.

2 Concepts in the System of National Accounts that arise infrequently in price and turnover measurement

2.1 Introduction

The compilation of the national accounts requires use of concepts and accounting rules that are similar, but not identical, to those applied in business. The 2008 SNA itself sets out and defines a complete set of definitions for stocks, flows and accounting rules. Some of these concepts are very familiar to businesses, and familiar to services producer price index (SPPI) practitioners and turnover survey statisticians alike. Other concepts, such as imputation for non-monetary transactions, and partitioning of transactions, arise infrequently, although they play a key role in the SNA. In order to better understand the measurement of Banking and Credit Services, this section introduces some of the less familiar but more important SNA concepts.

2.2 Imputing values – estimating the unobservable

The 2008 System of National Accounts (2008 SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity in accordance with strict accounting conventions based on economic principles. The framework of the SNA provides accounts that are:
   a. comprehensive, in that all designated activities and the consequences for all agents in an economy are covered;

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[1] This paper focuses on FISIM, but acknowledges that some financial services attract direct fees, and that the mix between direct and indirect charges varies over time and between institutions and sectors. Given that fees and charges are more familiar to producers of SPPI's and Turnover statistics, the paper focuses solely on FISIM.

b. consistent, because identical values are used to establish the consequences of a single action on all parties concerned using the same accounting rules;

c. integrated, in that all the consequences of a single action by one agent are necessarily reflected in the resulting accounts, including the impact on measurement of wealth captured in balance sheets.

In defining a ***comprehensive*** set of accounts, the SNA defines a boundary that includes both monetary and non-monetary transactions[2]. Whereas goods and services sold in monetary transactions are frequently readily observable, either individually or in aggregate, the case for non-monetary transactions is not so straightforward:

> When goods and services produced within the economy are sold in monetary transactions, their values are automatically included in the accounts of the SNA. Many goods or services are not actually sold but are nevertheless supplied to other units: for example, they may be bartered for other goods or services or provided free as transfers in kind. Such goods and services must be included in the accounts even though their values have to be estimated. The goods or services involved are produced by activities that are no different from those used to produce goods or services for sale. Moreover, the transactions in which the goods and services are supplied to other units are also proper transactions even though the producers do not receive money in exchange. It is misleading to describe such output as "imputed". For example, the services of financial intermediaries which are measured indirectly in the SNA do actually take place; but their values have to be measured indirectly. It is the value, not the transaction that is "imputed". (2008 SNA 1.36)

Thus under the SNA, the non-monetary services of financial intermediaries (to be defined shortly) are considered to actually occur, but their value needs to be imputed.

2.3 Partitioning transactions – breaking up and reassigning the observable

In defining a ***consistent*** set of accounts, the SNA introduces a concept called *partitioning transactions*[3]. This begins with a single transaction between two parties, and records the transaction as two or more differently classified transactions. This is important to the measurement of Banking and Credit services, because the SNA applies this concept to financial services and interest.

Regarding partitioning and financial services, the 2008 SNA notes

> Another example is the treatment of certain financial services. For example, the SNA prescribes partitioning interest payable by financial intermediaries on deposits and payable to financial intermediaries on loans into two components. One component represents interest as defined in the SNA while the remainder represents the purchase of financial intermediation services for which the intermediaries do not charge explicitly. The purpose of the partitioning is to make the service item explicit. In consequence, intermediate and final consumption of particular industries and institutional sectors as well as gross domestic product are affected. However, the saving of all the units concerned, including the financial intermediaries themselves, is not affected. (2008 SNA 3.67)

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[2] A monetary transaction is one in which one institutional unit makes a payment (receives a payment) or incurs a liability (receives an asset) stated in units of currency (2008 SNA 3.55). Non-monetary transactions are transactions that are not initially stated in units of currency (2008 SNA 3.75)

[3] 2008 SNA 3.66

Thus partitioning is used, for Banking and Credit, to make the service item explicit[4].

The twin concepts of imputation for non-monetary transaction, and portioning of interest, are fundamental to the understanding of measurement of Banking and Credit services in the SNA.

3   Financial Intermediation in the 2008 System of National Accounts

3.1   Banking and Credit - what are financial intermediaries?

The 2008 System of National Accounts (2008 SNA) defines *financial intermediaries* as "…institutional units that incur liabilities on their own account for the purpose of acquiring financial assets by engaging in financial transactions on the market (2008 SNA 4.101)". Of particular interest within this group are those institutional units that take deposits, namely:

> 4.105 Deposit-taking corporations except the central bank have financial intermediation as their principal activity. To this end, they have liabilities in the form of deposits or financial instruments (such as short-term certificates of deposit) that are close substitutes for deposits. The liabilities of deposit-taking corporations are typically included in measures of money broadly defined.
> 4.106 In general, the following financial intermediaries are classified in this subsector:
> a. Commercial banks, "universal" banks, "all-purpose" banks;
> b. Savings banks (including trustee savings banks and savings and loan associations);
> c. Post office giro institutions, post banks, giro banks;
> d. Rural credit banks, agricultural credit banks;
> e. Cooperative credit banks, credit unions; and
> f. Specialized banks or other financial corporations if they take deposits or issue close substitutes for deposits. (2008 SNA 4.105-106)

This group of institutional units aligns with those activities discussed at the Banking and Credit session at the 24th meeting of the Voorburg Group[5]. The definition of financial intermediaries, however, ultimately depends upon the definition of financial intermediation itself.

3.2   What is Financial Intermediation?

The 2008 SNA defines *financial intermediation* in paragraphs 6.163 – 6.169, which are included as an Annex to this paper (Annex A). A plain English description of the key concepts is better conveyed by the following example[6]:

> There is a notional reference rate of interest at which lending and borrowing can take place directly between a lender and a borrower, satisfactory to both parties. So consider if I want to borrow 100 euros and I am prepared to pay back 110 euros after one year.

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[4] Partitioning is also used in the SNA when considering wholesale and retail trade (being discussed elsewhere at the 25th meeting of the Voorburg Group). For example, see 2008 SNA 3.68

[5] http://www4.statcan.ca/english/voorburg/index.asp?script=display_results&title=Year%20and%20Location&value=41, 22

[6] *What is FISIM?* developed by Robin Lynch of the World Bank, and published on the United Nations Statistical Division website as part of the regular "SNA News and Notes" series. The style, language and terminology from that November 1998 paper form the basis of this example, almost in its entirety, although slight changes have been made to make the material more contemporary. Any errors introduced in doing so are purely the responsibility of the current author. (http://unstats.un.org/unsd/nationalaccount/sna/sna8-en.asp#txt2)

If I could find the right person at the right time, it's quite possible that they would accept this as good business, and lend me 100 euros in exchange for the 110 in a year's time. However, as we all know, finding a counterpart who would be interested at the same time in the same deal over the same time period isn't easy, so we go to a bank to help us. They bundle together various lending offers, and match them against the array of borrowers so that they effectively provide a market for borrowing and lending. If in order to make a living out of such transactions, it turned out the bank had to charge 5 euros, then they could choose to directly charge 5 euros for the introduction and facilities to make the transaction. They may choose to do this by directly levying a charge of 3 euros to the lender, and 2 euros to the depositor. On the other hand, if the bank does it through the interest rates, then in the example above, I could be asked to pay back 113 euros at the end of the year, but the lender might receive only 108 euros. The net interest receipts of the bank are equal to 13 less 8 = 5 euros. If we accept that the reference rate of interest for this kind of small borrowing and lending is 10%, then we can see that I have paid 3 euros, and the lender 2 euros.

This example utilises the concepts introduced earlier. First, the financial intermediation service in this example involves non-monetary transaction, in which case the value requires imputation. In practice, the bank does not levy one or even two service charges, but charges the borrower 13% interest and pays the lender 8% interest. Second, this involves partitioning of two interest payments. The 13 euros interest charged to the borrower, called "bank interest" in the SNA, is partitioned into two components, 3 euros service fee, and 10 euros "SNA interest". For the lender, the SNA considers the 10 euros "SNA interest" partitioned into 8 euros "bank interest" actually paid to the lender, and 2 euros service charge retained by the bank. For this financial intermediation service the bank receives a fee of 5 euros (3 from the borrower and 2 from the lender). The SNA calls this combined service charge *Financial Intermediation Services Indirectly Measured* (FISIM)

TABLE 1 - PARTITIONING OF IMPUTED VALUE, SNA INTEREST

	Borrower	Depositor/Lender
SNA Interest (based on reference rate)	-10	10
Bank Interest	13	-8
Service charge	*3*	*2*

TABLE 1 describes this partitioning and imputation from the perspective of the bank (and so interest *paid* by the bank is *negative*).

4 Measurement difficulties with Banking Services

4.1 Consumption of banking services – who pays?

In producing an **integrated** set of accounts, the SNA is concerned not only with the measurement of bank output (effectively, net interest receipts as illustrated above), but also with how banking services are consumed. Thus the SNA is also concerned with the intermediate consumption expenditure of banking services in the production accounts of industries, the consumption of banking services by households, and the export of banking services across national borders (both of which should appear as components of final demand). More succinctly[7],

> In order to estimate the correct level of GDP, it is necessary to make the allocation of the service payments across industries and consumers with confidence. For each transaction where there is a loading of interest payments to cover the costs of the financial services provider, we would like to know who the borrower is, who the lender is, what the lending

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[7] Lynch, R *What is FISIM?*, ibid

instrument is, and what is the appropriate reference rate for the transaction. In practical terms, we cannot know this detail and must settle for more aggregate measures.

Thus, calculation of FISIM would ideally require determination of a separate reference rate for each transaction, and the identification (at least to sector) of borrowers and lenders. Neither is achievable in practice, and the necessary compromises in measurement give rise to a set of problems.

4.2 Choice of reference rate[8]

In the simple example above, the reference rate is defined as the interest rate that the borrower and lender would agree on if they could "find the right person at the right time". The 2008 SNA notes that the reference rate should be between the interest rates paid on deposits, and those charged on loans; but a simple average or mid-point between these two rates is inappropriate, since such a measure does not allow for different levels of deposits and loans. In any event, the reference rate "should contain no service element and reflect the risk and maturity structure of deposits and loans."[9].

4.2.1 Reference rates for SPPI's used in practice

The 24th meeting of the Voorburg Group saw several suggestions as part of the session on Banking and Credit SPPI's:

> *US Bureau of Labor Statistics* (BLS). According to Bathgate, D and Swick, R (2009), for production of SPPI the BLS calculate a reference rate each quarter using Federal Deposit Insurance Corporation (FDIC) Call Report data provided by the Federal Reserve Board. The specific data elements used are the quarterly interest income and the quarterly average balance for U.S. Treasury securities and U.S. government agency obligations (excluding mortgage-backed securities). This data is reported at an aggregate level for all banks filing Call Reports. The reference rate is always lagged by one quarter, which is the period of time necessary for banks to adjust to changes in their investment portfolios.

> *Statistics Canada* have experimented with a wide variety of reference rates as part of the development of their SPPI's. In Barzyk, F, Eatock, A and Xie, M (2009), development work focussed on six product lines identified from available accounting data: demand and notice deposits, term deposits, personal loans for non-business purposes, other non-mortgage loans, residential mortgages, and non-residential mortgages. Reference rates considered included short-term bankers' acceptance rates, T-Bills rates, Bank of Canada target rate, GIC rates with different maturities, government bond rates with different maturities, and LIBOR (London Inter-bank Offered Rate). Subsequently[10], Statistics Canada also tried some reference rates derived from banks' financial statements, namely effective rates of banks' risk-free securities holdings and effective rates on banks' subordinated debt. In collaboration with SNA's exploration of new methodology to calculate individual FISIM (further disaggregated by sector), experimentation continued with SNA reference rates as well, e.g., short-term and long-term corporate bond (with different ratings) rates. This experimental work also considered using lagged reference rates, moving averages of the reference rates, and a combination of the two, evaluated against the impact on prices and real output.

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[8] Choice of reference rate is being addressed in a dedicated paper presented to the 25th Voorburg Group
[9] 2008 SNA 6.166
[10] Correspondence between André Loranger and the author, September 2010.

With respect to output measures (as opposed to SPPIs), the Canadian SNA has been using mid-point rate to allocate FISIM between loans and deposits, though they are now considering the adoption of multiple reference rates.

UK Office for National Statistics use the LIBOR (London Inter-bank Offered Rate) (Berger, M and Pegler, K (2009)).

4.3 Negative prices[11]

Regardless of the approach taken, the use of any derived reference rate may mean that the particular service charge (or the price of a service charge) can, from time to time, result in a negative estimate of FISIM. This raises two important areas for future consideration.

4.3.1 Can a FISIM price truly be negative?

Negative prices in most economic circumstances don't usually arise, and so observation of a negative price under these circumstance is an artefact of the measurement instrument. This may be because of the choice of an inappropriate reference rate, or through the application of an aggregate measure to a detailed component (or vice versa).

Yet there are three circumstances when the gap between observed market rates and some central rate can truly be negative. First, as the central bank of an economy has a role in setting market interest rates, situations may arise where the central bank is paying above market rates in situations where the external value of the currency is under pressure. This apparent negative value may also occur when the central bank acts as a development bank offering loans at below market rates to priority industries. In these unusual situations, the SNA recommends[12] that the flows calculated by the difference between the reference rate and the actual rate set by the central bank be set as taxes or subsidies (as appropriate). Such apparent values do not belong in FISIM, and thus not in the SPPI.

Second, a more common situation arises at an individual product level for a given provider, where it is possible that the service charge received is actually negative. As the service is a margin service, this circumstance arises when the interest rate charged is less that the equivalent reference rate; in this case such a product is identical to a "loss leader" in retail sales. Yet when considering SPPI's, as the basis is an output price index, these items are actually input costs (like advertising and marketing), and do not belong in the SPPI.

Third, when large and sudden changes are observed in money market rates, the use of a single reference rate can yield negative FISIM. For example, when considering products such as fixed rate term deposits, the UK observed that the drop in the cash rate by the Bank of England in 2008 resulted in products that were paying substantially more than the reference rate – implying that the service charge was negative.

Thus it is possible to actually observe a negative value in a conceptual sense, at least for an individual product.

4.3.2 Negative estimates (as opposed to negative prices)

Negative prices may be observed as a consequence of compromises in the measurement of FISIM SPPI's; that is, they are not real world phenomena as indicated above, but arise because of choice of inappropriate reference rate, or inappropriate aggregation structure.

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[11] Negative prices are being addressed in a dedicated paper presented to the 25th Voorburg Group
[12] 2008 SNA 7.122

The treatment of the observed (but erroneous) negative prices is not clear. Because of the very basis of FISIM (deviation from a central reference rate), exclusion of the negative prices can lead to slight bias in the estimates elsewhere. However, they cannot be included in index calculations that incorporate geometric means. They further cause problems in most existing price index systems with regards to validation; and they also are unsuitable for outlier detection systems that apply the calculation of logarithms.

Consequently, practice across international agencies varies; the BLS exclude them, for example, whereas the UK ONS includes them but sets the price to zero.

5   Future developments – FISIM and Risk[13]

Current discussion among national accountants focuses, among other things, on whether the risk premium itself is payment for services or not and, if not, whether it should be deleted from the loan rate in applying FISIM. As FISIM is described in this paper, the risk premium is implicitly part of the service charge, resulting from an assessment on the part of the bank as to the risk of default of the borrower; the alternative point of view is that mitigation of risk is not a financial intermediation service in itself, and thus should be excluded from the FISIM calculation.

However, banking service output price and volume considerations may suggest that there is no need to exclude risk premia from FISIM, even if not payment for service by themselves, because the risk premium can be viewed as part of the price of the service but not part of the volume. Another argument is that the risk premium pays for risk mitigation activities undertaken by holders of loans, and thus is a payment for service and should be part of FISIM; the risk mitigation services thus involve an internal default insurance operation, or purchased insurance (so, they actually already appear elsewhere as part of intermediate consumption on behalf of the bank).[14]

The Inter-Secretariat Working Group on National Accounts (ISWGNA) is planning to convene a Task Force in this fall (2010) to address the FISIM questions touched on in this section, among others, as part of the 2008 SNA research agenda.

6   Summary

This paper has described the SNA as a set of complete, consistent and integrated accounts. It has introduced the concepts of imputing values for unobserved but real transactions, and partitioning of individual transactions into two or more transactions classified differently.

FISIM has been described as an indirectly measured service, which partitions the gap between borrow and lend interest rates according to some "reference rate". In application the measurement of FISIM must be done at an aggregate level, leading to problems of choice of reference rate and the possibility of negative prices. These issues will be discussed in more depth at the 25th meeting of the Voorburg Group.

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[13] This section is compiled from a presentation made by Kim Zieschang of the IMF, as presented to the UNECE-ILO joint meeting on CPI's, Geneva 10-12 May 2010 (http://unece.org/stats/documents/ece/ces/ge.22/2010/zip.15.e.ppt)
[14] For examples with details of the opposing view points see Davies, M (2009) and Colangelo, A and Mink, R (2009)

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Annex A – The 2008 SNA definition of Financial Intermediation

Financial services provided in association with interest charges on loans and deposits

6.163 One traditional way in which financial services are provided is by means of financial intermediation. This is understood to refer to the process whereby a financial institution such as a bank accepts deposits from units wishing to receive interest on funds for which the unit has no immediate use and lends them to other units whose funds are insufficient to meet their needs. The bank thus provides a mechanism to allow the first unit to lend to the second.   Each of the two parties pays a fee to the bank for the service provided, the unit lending funds by accepting a rate of interest lower than that paid by the borrower, the difference being the combined fees implicitly charged by the bank to the depositor and to the borrower. From this basic idea the concept emerges of a "reference" rate of interest. The difference between the rate paid to banks by borrowers and the reference rate plus the difference between the reference rate and the rate actually paid to depositors represent charges for financial intermediation services indirectly measured (FISIM).

6.164 However, it is seldom the case that the amount of funds lent by a financial institution exactly matches the amount deposited with them. Some money may have been deposited but not yet loaned; some loans may be financed by the bank's own funds and not from borrowed funds. However, the depositor of funds receives the same amount of interest and service whether or not his funds are then lent by the bank to another customer, and the borrower pays the same rate of interest and receives the same service whether his funds are provided by intermediated funds or the bank's own funds. For this reason 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 paid on loans and interest paid on deposits so that the amounts of interest recorded as such in the SNA are 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. For clarity the amounts based on the reference rate recorded in the SNA as interest are described as "SNA interest" and the total amounts actually paid to or by the financial institution are described as "bank interest". The implicit service charge is thus the sum of 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 is payable by or to the unit in receipt of the loan or owning the deposit as appropriate.

6.165 By convention within the SNA, these indirect charges in respect of interest apply only to loans and deposits and only when those loans and deposits are provided by, or deposited with, financial institutions. The financial institutions in question need not be resident; nor need the clients of the financial institution be resident. Thus imports and exports of this type of financial service are possible. Nor need the financial institution necessarily offer deposit taking facilities as well as making loans. The financial subsidiaries of retailers are examples of financial institutions that make loans without accepting deposits. A money lender who has sufficiently detailed accounts to be treated as an actual or quasi-corporation may receive this sort of charge; indeed since money lenders usually charge especially high rates of interest, their service charges may exceed the SNA interest payments by significant amounts.

6.166 The reference rate to be used in the calculation of SNA interest is a rate between bank interest rates on deposits and loans. However, because there is no necessary equality between the level of loans and deposits, it cannot be calculated as a simple average of the rates on loans or deposits. The reference rate should contain no service element and reflect the risk and maturity structure of

deposits and loans. The rate prevailing for inter-bank borrowing and lending may be a suitable choice as a reference rate. However, different reference rates may be needed for each currency in which loans and deposits are denominated, especially when a non-resident financial institution is involved. For banks within the same economy, there is often little if any service provided in association with banks lending to and borrowing from other banks.

6.167 Banks may offer loans that they describe as being fixed interest loans. This is to be interpreted as a situation where the level of bank interest is fixed but as the reference rate changes, the level of SNA interest and the service charge will vary.

6.168 When an enterprise acquires a fixed asset under the terms of a financial lease, a loan is imputed between the lessor and the lessee. Regular payments under the lease are treated as being payments of interest and repayment of capital. When the lessor is a financial institution, 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.