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Risk in FISIM

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Contents

SUMMARY

This first note lays out the two main views on the methodology for Financial Intermediation Services Indirectly Measured (FISIM). The first posits a single-risk free reference rate, while the second posits a constellation of reference rates, one for deposits and one for each individual loan asset instrument on a financial institution's balance sheet matched to reference security rates. The first approach considers FISIM to include all loan risk remuneration, while the second considers FISIM to entirely exclude it. The note proposes for discussion a third, cost of funds approach that focuses on three accounting facts in recording the accounts of an enterprise: the value of output must equal the full cost of production, the cost of funds is the average full cost of its liability portfolio (including an institutional risk premium), and the return on equity capital is residually determined. The cost of funds approach produces two reference rates, one for deposits and one for financial assets, which are not necessarily equal and account for the risk remuneration to funders of a financial enterprise. In particular, it produces an asset reference rate sufficiently far below the average return on assets that FISIM is large enough to cover the full cost of production. The cost of funds approach to FISIM appears to be computationally tractable.

I. PRELIMINARIES

1. Financial Intermediation Services Indirectly Measured (FISIM) in the *System of National Accounts 2008* (2008 SNA) focuses on two financial instruments of financial corporations (2008 SNA institutional sector code S12) in determining the output of financial services: deposit liabilities (sum of 2008 SNA financial instrument codes AF22 and AF29) and loan assets (2008 SNA financial instrument code AF4).[1] Deposit FISIM is intended to measure the services depositors receive in-kind, in lieu of monetary interest, and is calculated as

$$s_D = \left(rr - r_D\right) D \qquad (1)$$

where *rr* is called the *reference rate*. In this case, *rr* can be interpreted as $\hat{r}_D$, the rate depositors would be paid with no included services. r_D is the monetary rate they actually accept along with the financial services associated with their deposits, *D*. Loan FISIM is intended to measure the margin the issuing institution charges over its cost of funds to cover services to borrowers and is calculated as

$$s_L = \left(r_L - rr\right) L \qquad (2)$$

where, r_L is the loan rate and *L* is loan assets. In this case, the reference rate *rr* can be interpreted as the loan issuing institution's cost of funds.

[1] This note, initially focuses on *indirectly* measured service charges (FISIM), abstracting from the financial services carrying *directly* measured service charges and recognized as such in the 2008 SNA as 'Financial services provided in return for explicit charges' (¶ 6.161- 6.169). The 2008 SNA also recognizes 'Financial services associated with the acquisition and disposal of financial assets and liabilities in financial markets' (¶ 6.170-6.174), and 'Financial services associated with insurance and pension schemes' (¶ 6.175-6.206). In the final section, the note reintroduces these directly measured and other charges. Regarding in particular 'Financial services provided in return for explicit charges', there will be a variety of practices observed among financial institutions and across countries in the extent to which the full service charge can be directly and indirectly measured for the financial service products associated with deposits and loans.

II. VIEWS OF RISK AND THE REFERENCE RATE

2. The returns on financial instruments include premia to compensate their holders for assuming various forms of risk—principally default risk (counterparty does not honor the terms of the underlying contract) and market risk (the value of the instrument varies from time to time), and liquidity risk (inability to transact the instrument). Thus, for any given instrument *i* its return r_i decomposes as

$$r_i = \rho + \psi_i \qquad (3)$$

where ρ is the rate earned on a riskless instrument and ψ_i is the risk premium of instrument *i*.[2] Both deposits and loans carry risk premia, though depositors generally take their premia in-kind in the form of deposit insurance.

3. If deposits were the only source of funds for a loan-issuing institution, $\hat{r}_D = rr$ is the cost of funds. Since the deposit risk premium ψ_D will depend, among other things,[3] on the riskiness of the loan portfolio, the "full" deposit rate $\hat{r}_D = \rho + \psi_D$ would be aptly described by the 2008 SNA's language concerning the reference rate:

> The reference rate should contain no service element and reflect the risk … structure of deposits and loans. (2008 SNA, ¶ 6.166).[4]

4. To illustrate the issues, we will defer adding in relevant complications for the time being, such as how to determine the reference rate when deposits are not the only source of funding for loans, or for loan FISIM when deposits are not a funding source at all, as in the case of finance companies (in 2008 SNA institutional sector S125 – Other financial intermediaries, except insurance corporations and pension funds). For the same reason, we also will defer for the time being considering how the presence of other financial assets besides loans affect the 2008 SNA's FISIM calculations. We will return to these additional features of the financial services business later.

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[2] This note deals only with risk in an abstract sense and does not deal with maturity. Thus we do not specify a maturity for the riskless instrument here.

[3] Such as the acuity with which the institution assesses and prices borrower counterparty risk in issuing and monitoring loans, and the alacrity with which it manages, through its reserves, its own counterparty risk to depositors given the risks in the loan portfolio.

[4] The full quotation is "The reference rate should contain no service element and reflect the risk *and maturity* structure of deposits and loans" (italics added). Maturity and liquidity transformation are the subjects of a separate note prepared for this meeting.

5. There are two views concerning how the reference rate *rr*, and thus deposit and loan FISIM, should reflect the risk premia of financial assets. Both might find some support in paragraph 6.166 of the 2008 SNA.

6. The first view effectively argues that ψ_D is small, near zero, because institutions are well regulated and the insurance they provide depositors costs little over and above the riskless rate. Paragraph 6.166 contains the following sentence supporting this view:

> The rate prevailing for inter-bank borrowing and lending may be a suitable choice as a reference rate.[5]

This low-risk view on the reference rate essentially underlies most current national accounts implementations of FISIM. It produces consequential results, since a low reference rate allocates more FISIM to loans and less to deposits than a high reference rate. It can affect the distribution of FISIM between intermediate and final consumption when deposits and loans have differing relative sizes in the portfolios of corporations, general government, households, NPISHs, and the rest of the world.

7. A question that arises with this approach to the reference rate is: how valid is the assumption that the in-kind insurance depositors receive is provided at very low cost by the issuing institution?[6] Wouldn't this implicit premium vary with the composition of loans in the institution's asset portfolio?

8. The second view argues that there cannot be one reference rate. In this view, depositors get a low risk financial product from institutions, whose reference rate $rr = \hat{r}_D$ should be comparable to rates on low risk financial instruments available on the market, regardless of the institutional risk of the issuer of the deposit. In this, proponents of this view are similar to the proponents of the first view above. However, they also argue that the services provided borrowers should exclude all specific risk premia in the loan rates charged to borrowers because, they further posit, risk bearing is not production, and thus the premia compensating for risk bearing are not part of nominal financial services output. Thus there is an assumption under position 2 that a loan issuing financial institution has no particular

[5] Although this sentence also could be interpreted as supporting the idea that the effective maturity of deposits, because they are callable immediately (transferrable deposits) or with a relatively short wait, is very short. However, the ISWGNA FISIM task force also heard a view from the US at its March 3-4, 2011 meeting that the effective maturity of deposits actually is quite long.

[6] In fact, until recently, actual deposit insurance rates charged to banks by public deposit insurance corporations have been quite low. Recent increases in the deposit insurance premium probably reflect a systemic risk surcharge that was not recognized in earlier pricing policy for these insurance funds.

advantage over rating agencies and the bond[7] market in providing credit, other than originating the loan instrument and servicing repayment of the debt. There is no specific language in the 2008 SNA supporting this view, though a liberal reading of the citation

> The reference rate should contain no service element and reflect the risk … structure of deposits and loans

might be taken as support, in the absence of other language in the 2008 SNA's Chapter 6 equating interest flows at "the" reference rate with "SNA interest" which strongly suggests a single reference rate, at least within a given financial institution. In sum, *for deposits*, the approach to FISIM of the second view on the reference rate is similar to the currently implemented approach, but considers the reference rate(s) *for loans* to be much higher and thus loan FISIM to be substantially less than the current approach. The implications of this view are consequential, roughly halving the FISIM estimate of the nominal value of indirectly measured financial services output for certain advanced economies.

9. *Questions arise with the second view. Financial institutions facilitate lending transactions when borrowers do not qualify for bond financing or would find it too expensive, so eliminating all specific risk remuneration by eliminating bond risk premia from loan rates, if feasible at all, would appear to take out too much from loan interest and give the institution credit for too little. As for deposits, a qualitatively similar question to the one asked of adherents to the first view on the reference rate above applies: why, if the implied cost of funds is as high as registered in the market for borrowers' bonds, are depositors paid, and willing to accept, such low compensation? Finally, proponents of the second view have not really considered the accounting coherence implications of their proposed FISIM methodology. For example, is FISIM determined this way large enough to produce positive operating surplus, at least on the average?*

10. This note frames the issue of accounting for risk remuneration in the SNA's FISIM methodology by deriving the reference rate(s) on deposits and loans from the liability side of the institutional balance sheet, following the flow of funds from deposits and other institutional funding instruments to loans and other borrower instruments. It offers the possibility of integrating insights from both of the above points of view. On the liability side, the case for recording nominal service output is when a funder of the institution accepts less monetary interest in return for services in-kind. The full compensation—including in-kind services—of a funder with this arrangement should be comparable to a funder compensated entirely in monetary interest. Deposits are the important instance of this on the liability side (and the only instance recognized by the 2008 SNA). On the asset side, services are covered in the margin between the rate earned on asset instruments and the institutional cost of funds

[7] "bond" is used interchangeably with "debt security" in this note.

(loans are the only instance of this recognized by the 2008 SNA), including in that funding mix the full cost of deposits if deposits are present. Here, the institutional cost of funds is the same regardless of instrument on the asset side of the ledger—money is fungible. We argue that matching deposits with other types of funding arrangements for the institution, such as bond finance, to obtain the full cost of deposits is a more valid "market comparison" than the approach under view 2, where the "market comparison" is between bond instruments "competing" with the loans banks provide on the other side of the ledger, in the sense that the liability side comparison is not as fraught with unaccounted for differences in the risk profiles of the instruments compared.[8] We also suggest that the liabilities-to-assets flow better characterizes the financial production process as the aggregation of funds to supply credit.

III. THE FULL COST OF DEPOSITS

A. Estimating the full cost of deposits—introducing debt securities into the model

11. How can national accounts compilers determine the full cost of deposits $\hat{r}_D$? The two available options are to

- Find an equivalent financial instrument to deposit funding that takes account of the institutional risk of the issuing institution but provides none of the services associated with deposits; i.e., by using rates on bank bonds otherwise similar (e.g., in effective maturity) to deposits[9]—to do this, we are introducing a new funding source, bond finance (2008 SNA debt securities—AF3), on the liability side of the balance sheet as compared with our initial simple deposit-loan model;
- Build $\hat{r}_D$ up from its components based on $\hat{r}_D = \rho + \psi_D$, in particular, by estimating the insurance equivalent of the deposit risk premium ψ_D.

[8] Notably, both deposit and bond finance on the liability side of a given institution's balance sheet face the same institutional risk and would include similar risk premia, other tings equal.

[9] Notice that this a similar tactic for determining the full cost of deposits on the liability side of the institution's balance sheet to that employed by 'position 2' advocates for loans on the asset side. While there are issues with applying this stratagem on the asset side for the reasons noted earlier in this note, it is justified on the liability side because on the liability side, the comparison is across funders of the *same* financial institution and facing the *same* institutional risk. On the asset side, the comparison is less tight, between market funders of borrower needs and financial institution funders of borrower needs. These two types of funders face different information asymmetries, with financial institutions having the advantage in knowing the borrower and thus, among other things, being able to develop a more accurate estimate of counterparty (default) risk.

12. The first option is straightforward in principle, but might be complicated by a lack, or relatively small amount, of bond financing on the liability side of financial institutions' balance sheets, making it difficult to match bond characteristics with deposit characteristics (such as effective maturity) within the same institution or sector.[10]

13. The second option would estimate ψ_D as a composite of market swap premia charged for insurance against defined asset portfolio risks, such as loan default.[11]

B. Is the cost of funds equal to the full cost of deposits—are there two reference rates?

14. One difference between views 1 and 2 is that view 1 assumes a single reference rate while view 2 assumes as many reference rates as there are individual instruments on the balance sheet. A third alternative, the cost of funds approach, strikes a middle ground, suggesting there are two reference rates, one for deposits and one for loans.

15. In our first approach to estimating the full cost of deposits, we introduced bond finance as a new liability on the institution's balance sheet. By implication, the cost of funds for making loans is the portfolio-weighted average of the cost of debt security liabilities and the full cost of deposits. While depositors and purchasers of bank bonds face the similar institutional risk premia, the average cost of funds (from all funding sources) will differ from the full cost of deposits (from only the deposit funding source) if bond finance, for example, has different maturity characteristics than deposit finance and thus different returns on this score.[12] By implication, there would be two reference rates—one for deposit FISIM and one

[10] Note, however, that there may be data from rating agencies or other sources in some economies on the spreads between bank corporate bond rates and "safe" government bond rates by maturity and agency rating. These data appear to be available from Reuters for the United States, for example (www.bondsonline.com).

[11] All methods have their potential drawbacks—this approach is no different. Swap premia include a counterparty risk premium specific to the bilateral contracting nature of swap markets that could overstate the risk premium under certain circumstances. A good example is in late 2008 when counterparty risk premia exploded in the US credit default swap market in the wake of AIG's failure. This point was made by the US representative attending the European FISIM task force (p. 17 in Eurostat, Report of the European Task Force on Financial Intermediation Services Indirectly Measured (FISIM) of 2010-2011, 42nd Meeting of the Committee on Monetary, Financial, and Balance of Payments Statistics, CMFB 2011/06/A.6.1, June 30, 2011). In 'normal times', however, swap premia appear to be good indicators of the insurance costs against default and interest rate risk in an institution's loan portfolio. Any method using a 'donor price' will fail when the market determining the 'donor price' breaks down.

[12] The two forms of funding also present a differential form of risk to their holders, since debt security holders are subordinate to deposit holders in the event of bankruptcy. The discussion here abstracts from that difference.

for loan FISIM—but they would differ for another reason than, and normally not by as much as, posited by the 'position 2' advocates. [13]

C. The role of expected loan losses—to the extent that they impact funders, they should be in the asset reference rate, so should not be subtracted from the loan rate

16. Advocates of 'view 2' argue that expected loan loss rates should be subtracted from the loan rate (or, equivalently added to the loan reference rate).[14] Under the synthesis in this note, if the reference rate for loans is the cost of funds, expected loan losses already should be accounted for in the institutional risk premium built into the cost of funds, to the extent that these losses impact the institution's funders. Loan FISIM is the difference between the loan rate and the reference rate (cost of funds). Thus, subtracting the rate of expected loan losses from the loan rate would double-correct for these losses and underestimate loan FISIM under the cost of funds approach.

IV. THE ROLE OF EQUITY CAPITAL—OWNERS AS RESIDUAL CLAIMANTS

17. So far we have sorted out how the deposit and loan reference rate(s) should be determined for a deposit-taking corporation (2008 SNA sector codes S121+S122) with no owners' capital, but this is clearly unrealistic. All financial institutions operate with equity funding. Owners are residual claimants, so receive the difference between FISIM output (assuming, for simplicity, no other service charge income) and the cost of producing those services, including: intermediate consumption of goods and services (2008 SNA P2), compensation of employees (2008 SNA D1), taxes on production (2008 SNA D29), and the implicit rent on nonfinancial assets. The value of owners' stake in the financial enterprise is "capital," generally understood to be the sum of SNA equity (AF51) and SNA net worth (B90). Owners' capital earns a residual claimant return after all the other costs are paid. The return on equity is, in effect, a free parameter that allows the average cost of funds to be set at a level so that FISIM output covers the cost of production, including funders' risk premia.

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[13] In the first meeting of the ISWGNA FISIM task force March 3-4, 2011, some of the discussion centered around the possibility that the effective average residual maturity of deposits is as long as for other forms of bank funding, suggesting a potentially small difference between the deposit reference rate (full cost of deposits) and the loan reference rate (institutional average cost of funds, including the full cost of deposits). This is to say that the cost of deposit finance may not be that different from other forms of non-equity finance on the liability side of the balance sheet and thus a single reference rate might be a reasonable approximation to reality.

[14] The first meeting of the ISWGNA FISIM task force during March 3-4, 2011 discussed a procedure used by the US Bureau of Economic Analysis to improve its estimate of the *actual* loan rate from its data sources by eliminating interest accrued on charged off loans from the numerator *and the value of charged off loans from the denominator* of the ratio of interest receivable on loans and the value of loans outstanding. That calculation does *not* constitute a downward adjustment of the loan rate by the rate of loan charge offs.

V. A GENERAL FRAMEWORK FOR FISIM

18. The residual claimant feature of owners' financial participation in an enterprise leads to a tractable approach to calculation of the asset reference rate *rr*, provided the full costs of liabilities are known or can be estimated. Because financial institutions transform funds into financial products, funders play two roles: as suppliers of funds for transformation and as bearers of risk. Owners bear additional risk as residual claimants. It is generally assumed that owners, as residual claimants, demand a higher risk premium than lenders to the institution (its bondholders and depositors), and that the effective maturity of owners' investment is at least as long as that of depositors and bondholders. Under these assumptions, bringing in equity will tend to further raise the average cost of funds beyond the average cost of deposit and bond finance. This would widen the difference between the deposit reference rate (full cost of deposits) and the loan reference rate and reduce the FISIM generated on loans while leaving deposit FISIM unaffected. However, accounting coherence requires that the cost of owners' capital cannot be so high, given the FISIM earned on deposits, as to routinely produce an average cost of funds leaving an insufficient margin on loans (loan FISIM) to cover the nonfinancial and financial costs of production, including the (expected) risk premia of the institution's lenders and owners.[15]

19. We can use two evident facts about the accounting constraints faced by a financial enterprise to determine the loan (actually all asset) reference rate, given knowledge of the reference rates of liabilities (full costs of funds by type):

- The (value of) output must cover the full cost of production, including the full cost of deposits, bond finance, and the return on owners' equity,

- The asset (including loan) reference rate is the institution's average cost of funds *including the cost of equity finance.*

20. To state this algebraically, we first define the notation in Table 1, which uses variable names derived from the 2008 SNA coding system where possible.[16] Following our earlier convention, we denote interest rates or rates of return by *r* with subscripts corresponding to the associated liability/asset variable, and *rr* as the institutional cost of funds and the asset reference rate.

[15] We insert 'expected' parenthetically because owners' nominal returns will be noisy, unlike those of creditors, which are fixed by contract.

[16] 2008 SNA, Annex 1.

Table 1. Notation

Concept	**Flow**	**Liability**	**Asset**
Output (total, in current prices)	*P*1		
Directly priced output prices (*m* vector)	*P*		
Directly priced output quantities (*m* vector)	*Y*		
Intermediate consumption	*P*2[17]		
Compensation of employees	*D*1		
Other taxes on production	*D*29		
Consumption of fixed capital	*P*51*c*[18]		
Nonfinancial assets			*AN*
Financial instruments (*k* vector)[19]		*AFL*[20]	*AFA*[21]
Deposits		*AF*2*DL*[22]	*AF*2*DA*[23]
Debt securities		*AF*3*L*	*AF*3*A*
Loans		*AF*4*L*	*AF*4*A*
Equity capital		*AF*5*CL*[24]	*AF*51*A*[25]

[17] Including indirectly measured intermediate financial services such as FISIM provided by other institutional units.

[18] The 2008 SNA convention on this variable is that it carries a negative sign (¶A1.17). Thus, to *add* depreciation as a component of cost, it will have to be *subtracted*.

[19] For simplicity, we limit the range of financial instruments here to deposits, debt securities, loans, and equity. The analysis straightforwardly extends to including the other SNA financial instruments on the balance sheet: insurance, pension, and standardized guarantee schemes; financial derivatives and employee stock options; and other accounts receivable/payable.

[20] $AFL = AF2L + AF3L + AFCL$.

[21] $AFA = AF2A + AF3A + AF51$.

[22] In the 2008 SNA, deposits as a whole do not have a code but are the sum of transferrable deposits (*AF*22) and other deposits (*AF*29). Thus we append the Currency and deposits code *AF*2 with the letter '*D*' for 'deposits' and the letters '*L*' for liabilities or '*A*' for assets to represent the aggregates $AF2DL = AF22L + AF29L$ and $AF2DA = AF22A + AF29A$. We are not for the moment considering the case of the central bank. Were we to do so, we also would bring in currency (*AF*21) as well as monetary gold and SDRs (*AF*1).

[23] Ibid.

[24] We define equity capital as equity (2008 SNA *AF*51) plus net worth (2008 SNA *B*90).

[25] *B*90 is by definition only a liability. Ibid.

21. With these preliminaries, first define the 'receipts equals expenditures' identity

$$p'y + r'_{AFA} AFA \equiv P2 + D1 + D29 - P51c + r'_{AFL} AFL \qquad (4)$$

with the reminder that the 2008 SNA negative sign convention on depreciation $P51c$ means that subtracting $P51c$ *adds* depreciation to other production costs. In words, equation (4) says that directly measured output plus interest income on financial assets equals intermediate consumption, plus compensation of employees, plus taxes on production, plus depreciation on produced nonfinancial assets, plus interest and other financial expense on liabilities, including the residually determined return to owners.

22. We can then identify within equation (4) margins between financial asset returns and the institutional cost of funds, and between the full cost of liabilities and the monetary amounts received by lenders to and owners of the institution as

$$\begin{aligned} p'y + \left(r_{AFA} - rr \cdot \iota\right)' AFA + rr\left(\iota' AFA\right) = {} & P2 + D1 + D29 - P51c \\ & - \left(\hat{r}'_{AFL} - r_{AFL}\right)' AFL + \hat{r}'_{AFL} AFL \end{aligned} \qquad (5)$$

where ι is a vector of ones, and recalling that AFL includes owners' capital. We then collect the financial margin terms on the left side and the cost of funds terms on the right side to obtain

$$\begin{aligned} p'y + \left(\hat{r}_{AFL} - r_{AFL}\right)' AFL + \left(r_{AFA} - rr \cdot \iota\right)' AFA = {} & P2 + D1 + D29 - P51c \\ & + \left(\hat{r}'_{AFL} AFL - rr \cdot \left(\iota' AFA\right)\right) \\ & \text{or} \\ P1 = {} & P2 + D1 + D29 - P51c \\ & + \left(\hat{r}'_{AFL} AFL - rr\left(\iota' AFA\right)\right) \end{aligned} \qquad (6)$$

In words, output $P1$—comprising directly measured output $p'y$, plus financial liability FISIM, plus financial asset FISIM—equals total cost—comprising intermediate consumption $P2$, plus compensation of employees $D1$, plus other taxes on production $D29$, plus depreciation of produced nonfinancial assets $-P51c$, plus the net cost of finance, including of owners' capital. We thus have identified in equation (6) what "output equals input" implies on the cost side given the basic SNA FISIM principle for measuring financial services.

23. We now employ our second precept, that the asset reference rate rr is the average (full) cost of funds, in which case

$$\hat{r}'_{AFL} AFL = rr\left(\iota' AFL\right) \quad (7)$$

Using equation (7), we rewrite equation (6) as

$$p'y + \left(\hat{r}_{AFL} - r_{AFL}\right)' AFL + \left(r_{AFA} - rr \cdot \iota\right)' AFA = P2 + D1 + D29 + \left[rr \cdot \left(\iota' AFL - \iota' AFA\right) - P51c\right] \quad (8)$$

A few of the implications of equation (8) are that

- Most of the elements of the vector $\left(\hat{r}_{AFL} - r_{AFL}\right)$ may well be zero, meaning that in-kind services are not provided in return for lower monetary interest paid on most liabilities; in particular, these terms for bond finance, *AF3L*, and owners' capital, *AFCL*, would be zero in most cases.[26]

  If of the liability margins are zero except for deposit liabilities, *AF2DL*, then equation (9) reduces to the 2008 SNA case where, among liabilities, only deposits are associated with FISIM. We note that the treatment of indirectly measured financial services on *liabilities* here is very much the same as the approach taken by view 2 on financial *assets*. However, we think it is a more accurate depiction of how a financial enterprise works to apply this procedure to liabilities rather than assets: banks aggregate funds to produce financial services, rather than aggregating financial assets to raise finance.

- The 2008 SNA considers FISIM out of scope for all financial assets except loans; the 2008 SNA case would hold in equation (8) if the sum of margins on *non-loan* financial assets were zero in the FISIM expression for asset services, $\left(r_{AFA} - rr \cdot \iota\right)' AFA$.

  For some of these non-loan assets, such as deposit (*AF2DA*) and debt security (*AF3A*) assets, these margins might be or could become negative.[27] We suggest these assets are, at least in part, acting as reserves in the bank's internal insurance operation on behalf of depositors, and consequently are primarily associated with inputs rather than

[26] Though, as anywhere else in the national accounts, exceptions can be imagined—owners might take some of their share of the profits as financial services in return for a lower monetary portion of their share of the residually determined return on owners' capital, for example.

[27] The deposits and debt securities on the asset side of the ledger tend to be liquid and low-risk. Their yields thus may not be high enough to offset the cost of funds/asset reference rate which includes funders' risk premia, at least on the average.

output—this is an area for further examination in the FISIM context, as there is potential to over or under estimate FISIM output if the margins on non-loan financial assets are non-trivially negative or positive. It implies widening the asset scope of financial asset FISIM calculations beyond loans. It appears necessary to include these negative offsets from low yielding financial assets to properly account for these insurance or insurance-like operations.[28]

- The term $\left[rr \cdot \left(\iota' AFL - \iota' AFA\right) - P51c\right]$ is the *implicit rental cost of nonfinancial assets*; this becomes clearer by observing that, because *AFL* as defined here includes net worth, $\iota' AFL - \iota' AFA = AN$ where *AN* is nonfinancial assets, and the expression then reads $\left[rr \cdot AN - P51c\right]$ or 'return foregone on financial capital invested in nonfinancial assets plus depreciation on produced nonfinancial assets', i.e., the 'user cost of nonfinancial capital'.

24. From equation (8) we can solve for the asset reference rate *rr* as:

$$rr = \frac{p'y + \left(\hat{r}_{AFL} - r_{AFL}\right)' AFL + r'_{AFA} AFA - \left(P2 + D1 + D29 - P51c\right)}{\iota' AFL} \qquad (9)$$

In words, given knowledge of indirectly measured services on liabilities, the asset reference rate or cost of funds *rr* that generates a FISIM output exactly covering the full cost of production (including the cost of equity capital) is directly measured output, plus FISIM on liabilities, plus financial asset interest, less the sum of intermediate consumption, compensation of employees, taxes on production, and depreciation, all divided by total liabilities. A few of the implications of equation (9) are that

- The higher the level of directly measured services *p'y* (fee income for banks), the higher the reference rate and the lower the asset (including loan) FISIM, an expected tradeoff between directly measured fee income and indirectly measured financial services;

[28] Thus, while it is suggested above that expected loan losses should not be subtracted from loan interest income in a cost of funds approach to FISIM, the effective cost of holding low-yielding reserve assets might have to be subtracted from deposit and loan FISIM to reflect these insurance-like operations, which would have a similar effect. Low-yielding financial assets also may be held as precautionary and transactions balances to support routine service operations. Note also that financial derivatives and other accounts receivable/payable, not considered here for simplicity, may earn positive margins over the cost of funds, reducing or more than offsetting the negative impact of reserve assets.

- The higher the liability (including deposit) FISIM, the higher the reference rate and the lower the asset (including loan) FISIM;

- The higher the interest received on financial assets $r'_{AFA}AFA$, the higher the asset reference rate, but also the higher the asset (including loan) FISIM.

  For a unit increase in $r'_{AFA}AFA$, *rr* increases by $1/\iota' AFL$ and, from the equation (9) expression for *rr*, $rr\left(\iota' AFA\right)$ increases by $0 \le \iota' AFA/\iota' AFL \le 1$; hence financial asset FISIM increases by $0 \le 1 - \iota' AFA/\iota' AFL \le 1$.

- If output other than from financial assets, $p'y + \left(\hat{r}_{AFL} - r_{AFL}\right)' AFL$, minus the cost sum $P2 + D1 + D29 - P51c$ is zero, then the financial asset reference rate *rr* is the average rate of return on assets, and asset FISIM is identically zero

  This harks back to a treatment of FISIM similar to that of the 1953 SNA, which recognized no credit services and allocated the full net interest margin to deposit services; **however, it is a nonviable case**, since from equation (8) output then falls short of the total cost of production by $rr \cdot \left(\iota' AFL - \iota' AFA\right)$, which, as highlighted in the above discussion of that equation, is a significant component of the imputed rental/rent for nonfinancial assets.

- If the enterprise is entirely funded by liabilities whose full cost is paid in monetary interest, then the term $\left(\hat{r}_{AFL} - r_{AFL}\right)' AFL$ is identically zero (i.e., no FISIM on the liability side, including deposits); an example of this would be an entirely equity financed financial corporation that earns fee income and makes loans.[29]

- It is technically possible for equation (9) to return a negative value, though this appears nonsensical given the expected configuration of the variables from which it is calculated; a negative numerator in this expression suggests some part of output is subsidized (with the subsidy erroneously excluded) and/or there is some other form of measurement failure; the denominator would always be positive.

25. *The free parameter underlying the approach to the reference rate in equation* (9) *is the rate of return on equity capital, one of the liability costs making up the average cost of*

[29] Another example would be a stylized "Nordic bank" paying depositors only in monetary interest and directly charging for all deposit services.

funds and thus the reference rate for financial assets.[30] *This is because the return on owners' capital is residually determined, unlike all of the other funding costs whose liability-portfolio-weighted average comprises rr. Once rr is determined, equation* (7) *can be solved for the return on equity capital. It is entirely possible for the return on equity capital to solve as a negative value even when rr is positive. This is not surprising, as owners are residual claimants, though the return on equity should be positive on the average.*

26. *The import of equation* (9) *is that despite its incorporation of the risk premia of funders of the institution, rr cannot be too high—in particular, too close to the average return on assets—or output cannot cover the cost of production.*

27. *It should be emphasized that although the language and context of this note relate to an individual financial institution, they apply equally to the financial corporations sector and its subsectors. The average cost of funds for an institution scales up through averaging to the average cost of funds for financial corporations, and the same FISIM calculations apply for the sector as for the units making it up.*

28. *Having said that the context and language here pertain to financial corporations, this approach to the cost of funds and services from financial assets could be applied to any enterprise having a portfolio of nonfinancial and financial assets. The 2008 SNA, of course, does not recognize service production from financial assets unless the unit is classified as a financial corporation, but the preponderance of FISIM services will be delivered by financial corporations in most countries.*

29. *Equation* (9) *presents no real problem of computation for any country capable of constructing an ordinary production account and having adequate information on asset and liability interest flows. The particular challenge is in getting an estimate of the full cost of those liabilities for which holders are paid partly in monetary interest and partly in kind. As discussed, the scope of the 2008 SNA limits this exercise to deposits, and, in any case, other liabilities may well entail little or no in-kind compensation to lenders/owners in lieu of monetary interest.*

30. *What is the sense of the ISWGNA FISIM task force regarding evaluation of a FISIM methodology determining deposit FISIM using a matched security or constructive approach and determining loan FISIM using equation (9)?*

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[30] Again, relating this to 2008 SNA concepts, owners' capital is equity (*AF*51, ¶A1.26) plus net worth (*B*90, ¶A1.33).