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FISIM Accounting
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Abstract

In the System of National Accounts (SNA), the output of financial intermediation services is the sum of directly and indirectly measured components. This paper considers the second, “financial intermediation services indirectly measured” (FISIM) component, analyzing FISIM in a series of rearrangements of a cash flow identity facing any enterprise with financial instruments on its balance sheet. Our framework encompasses essentially all versions of the SNA, the *user cost of money* approach to financial services pioneered by Diewert (1974), Barnett (1978, 1980), Donovan (1978), and Hancock (1985), and recent analyses by Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012). The paper argues that the SNA’s “reference rate of interest” for calculating FISIM output is the Modigliani-Miller (1958) cost of capital, that SNA FISIM then comprises three computable components—account servicing, asset management, and risk intermediation—and that allocating FISIM to institutional sectors and thus to its intermediate and final uses should follow a “funders pay the spread” principle similar in spirit to the 1953 version of the SNA. The paper characterizes the differing views on the SNA’s inclusion of maturity and risk premia in FISIM as taking different approaches to the treatment of FISIM’s risk intermediation component.

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ABBREVIATIONS

APR	Annual Percentage Rate
<i>1953 SNA</i>	<i>A System of National Accounts and Tables</i>
<i>1968 SNA</i>	<i>A System of National Accounts</i>
<i>1993 SNA</i>	<i>System of National Accounts 1993</i>
<i>2008 SNA</i>	<i>System of National Accounts 2008</i>
FDIC	Federal Deposit Insurance Corporation
FISIM	Financial Intermediation Services Indirectly Measured
ISWGNA	Inter-Secretariat Working Group on National Accounts
MMF	Money Market Funds
SNA	System of National Accounts

I. INTRODUCTION

1. In the System of National Accounts (SNA), the international national accounting standard, the output of financial intermediation services produced by banks and other financial institutions is the sum of directly and indirectly measured components. This paper considers various approaches to the second, “financial intermediation services indirectly measured” (FISIM) component, whose calculation rests on a “reference rate of interest.” How the reference rate should be determined has been a topic of discussion among national accountants since the reference rate terminology was first introduced with the 1993 version of the SNA (*1993 SNA*). It affects not only the total current price (nominal) output of financial services, but also the contribution of financial services to current price value added and gross domestic product (GDP). The *1993 SNA* provides general principles for determining the reference rate, and the latest, *2008 SNA* provides additional context. However, practitioners still need more specific guidance to coherently and consistently implement the standards internationally, and the international consortium responsible for the SNA has formed a task force to clarify what the *2008 SNA* language intends in more concrete terms.²

2. What is FISIM? The SNA says that, for each type of financial asset on which it recognizes indirectly measured service output, FISIM is the difference between the rate of return on the asset and the reference rate of interest, multiplied by the asset amount on account. The SNA says that for each type of financial liability on which it recognizes indirectly measured service output, FISIM is the difference between the reference rate of interest and the rate of return on the liability, multiplied by the liability amount on account. As we will see here, the drafters of the various historical versions of the SNA have emphasized some key ideas over the years: that FISIM is a function of the spread between interest received and interest paid; that the deposit liabilities and loan assets of financial institutions are important sources of FISIM output, but “own funds” are not; and that FISIM output is associated with the asset and liability instruments on the balance sheet through a “reference rate of interest.”

A. A consequential debate

3. Two broad camps have formed on how national accountants should think about and compile FISIM. The first camp has focused on how the single SNA reference rate should be determined in practice to produce “reasonable” results that are consistently nonnegative for in-scope instruments that are expected to be associated with outputs, such as the deposit liabilities and loan assets of banks. The second camp has argued that using a single reference

² The Inter-Secretariat Working Group on National Accounts (ISWGNA) comprises Eurostat, IMF, OECD, UN, and the World Bank. The ISWGNA’s FISIM task force was commissioned in late 2010 and first met in March 2011.

rate inherently allows maturity and risk premia to enter FISIM calculations that do not belong, in its members view, in the production account. They promote a revision of the standards that would use instrument-specific reference rates set as the returns on maturity and risk-matched debt securities to purge maturity and risk premia from FISIM. The difference between the two camps is consequential, particularly for countries with large financial sectors. The “multiple rate” camp’s estimates of FISIM are a little more than half the official estimates based on single reference rate approaches. This paper is an attempt to clarify the issues of the debate on FISIM within a coherent accounting framework that encompasses both the historical SNA and its current critics.

4. Since the SNA applies the FISIM methodology not only to banks but also to loan-making financial institutions other than banks, we focus broadly on the “financial intermediation” subsectors of the SNA’s “financial corporations” sector, the latter being one of the five main sectors comprising an economy in the national accounts. Having set this context, we first consider below various approaches to FISIM accounting based on the language of the current, *2008 SNA*, as well as the language of the earlier, *1953*, *1968*, and *1993 SNA*. We then show FISIM in a straightforward series of rearrangements of the cash flow identity facing an enterprise with financial instruments on both the asset and liability sides of its balance sheet. Although our focus here is on financial enterprises, specifically banks, *the framework actually applies to any enterprise*, financial or nonfinancial. Broadly speaking, a financial institution is a specific instance of this framework where financial assets comprise a large percentage of total assets or, in the case of banks, where the liabilities funding its operations include deposits.

5. Our framework encompasses not only the SNA, but also the *user cost of money* approach to measuring financial services pioneered by Diewert (1974), Barnett (1978, 1980), Donovan (1978), and Hancock (1985), and most recently employed in the FISIM context by Diewert, Fixler, and Zieschang (2012). It also can articulate within a national accounting context the position of the critics of the SNA approach. Basu, Colangelo, Fernald, Inklaar, and Wang (hereafter, Wang, et al) in various papers³ have raised the concern that the treatment of risk remuneration is problematic in the SNA’s FISIM, either because compensation for risk bearing should not be in the value of production a priori,⁴ or because the SNA is inconsistent in its treatment of risk remuneration between the financial and nonfinancial sectors of the economy.⁵ To address their concern about the SNA’s risk and maturity accounting, Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012)

³ Basu, Fernald, and Wang (2009), Basu, Inklaar, and Wang (2011), and Colangelo and Inklaar (2012), among others.

⁴ Wang, Basu, and Fernald (2004).

⁵ Colangelo and Inklaar (2012).

devise a method to eliminate risk and maturity premia from FISIM by matching financial instruments on bank balance sheets with debt securities having similar maturity and risk. Thus, rather than FISIM based on the SNA's single reference rate, their approach to FISIM involves potentially many reference rates, empirically produces much smaller FISIM margins on financial instruments, and thus smaller FISIM output, value added, and operating surplus for financial corporations.⁶ We show that their approach calculates what we identify here as the "account servicing" component of SNA FISIM.

6. We then identify two additional components of SNA FISIM—"asset management" on the asset side of the ledger and "risk intermediation" on the liability side. In the process we clarify the issue of determining the overall reference rate by arguing that it is the enterprise's cost of funds, straightforwardly calculated as the average rate of return paid to holders of its liabilities, including equity liabilities. In addition to the already mentioned account servicing, we would expect to see asset management service production, particularly for financial corporations whose asset portfolios contain a large share of financial assets. In our view this component of FISIM must be present to capture, for example, the nominal output of "no load" investment funds.

7. It is the risk intermediation component of SNA FISIM that we suggest is key to understanding the risk accounting issue that is the focus of the Wang, et al critique of the SNA. In the FISIM algebra developed in Section III below, we identify the risk intermediation component of SNA FISIM as the difference between the average cost of funds (including equity) on the liability side of the balance sheet and the cost of debt financing (including deposits as well as debt securities and loans) within that funding portfolio. This difference will be positive in the expectation (if not necessarily positive at any given point in time) with the probability that it becomes negative presumptively declining as leverage (the share of debt financing) increases (at least up to a point).⁷

⁶ Because the intermediate consumption of nonfinancial enterprises also would be reduced, their value added increases under this approach and thus partly offsets the reduction in financial corporation output and value added. The combination of the two produces a muted decline in GDP.

⁷ Faugere and Van Erbach (2006) characterize what we call "risk intermediation" as "portfolio insurance:"

Debt holders by choosing to hold debt instead of equity settle to earn a lower long-term return (than equity holders), because they choose to fully insure against the loss of their principal in the short run. Thus, in equilibrium, agents will be indifferent between holding debt or equity, because insuring one's principal is costly. Debt holders are in effect "paying" a portfolio insurance premium to stockholders, and thus end up with a return equal to the risk-free rate on average. (p. 560).

Their context is the combined purchase of equity and a European put option (the right to sell at a strike price—the face value of the bond—which can be exercised only at the end date of the put) to insure against downside risk. Unlike the context of Faugere and Van Erbach, we are not characterizing enterprise debt as "risk free," since there is still non-negligible bankruptcy risk which could impinge on the amount debt holders (buyers of

8. In essence, the value of the risk intermediation output of an enterprise is the return the holders of non-equity claims against the enterprise forego to eliminate nominal capital and income risk on their stakes in the enterprise. From the cost of funds definition of the reference rate, risk intermediation is identically equal to the premium that equity holders earn over the cost of funds to bear the risk ceded by non-equity claimants on the enterprise. By implication, there is no risk intermediation if the enterprise is entirely equity financed, but risk intermediation is present for any partly debt financed enterprise, whether nonfinancial or financial. Here we encounter a consistency issue under existing SNA FISIM accounting: the SNA includes risk intermediation in the nominal output of enterprises classified as financial corporations, but rules it out in accounting for the output of enterprises classified in other sectors.

9. Because SNA FISIM includes risk intermediation in the output of financial corporations, operating surplus includes the equity premium. Thus reflecting this premium, SNA FISIM effectively includes equity liabilities in capital inputs along with nonfinancial assets, but only for financial corporations and not for nonfinancial enterprises. We suggest that risk intermediation is the component of SNA FISIM that is of concern to Wang, et al, while observing that they have adopted a methodology that, by focusing exclusively on account servicing, eliminates not only risk intermediation but also indirectly measured asset management services that should remain in FISIM regardless of the treatment of risk intermediation.

10. Colangelo and Inklaar (2012) recommend and implement the Basu, Inklaar, and Wang (2011) account servicing-only approach to FISIM. However, they conjecture an alternative risk accounting approach to that of the SNA that would compute total output including risk intermediation, but also recognize production of risk bearing services by households that is then sold to enterprises, where it would be recorded as intermediate consumption. This would increase the value added of households and reduce the value added of, inter alia, financial corporations. We consider a comprehensive risk accounting approach in the last section that would recognize a supply of primary risk bearing services from the owners of equity capital instruments to the enterprises issuing those instruments, as well as consumption by those same agents of risk intermediation on the debt assets in their portfolios. This setup would look essentially the same as the SNA for financial corporations, but also would recognize risk intermediation output and risk bearing primary input for partly debt financed nonfinancial enterprises not now included in the accounts. Our approach is more in the vein of the standard national accounts treatment of primary services, including financial risk bearing. For example, labor also is a primary service, and the SNA

the put) would recover in the event. Finally, it remains to be seen whether their insurance transaction is *directly* between the debt holders and equity holders of a given enterprise, or between equity holders and the enterprise and debt holders and the enterprise, with the enterprise *intermediating*. The SNA's de facto position, based on the current treatment of FISIM is that the enterprise intermediates between its debt and equity—risk averse and risk tolerant—investors.

conventionally books compensation of employees with the enterprises that employ them. Following the Colangelo and Inklaar conjecture, however, a satellite account could be developed in which labor services are shown as the result of a household production process using, say, human capital and household time inputs. The Colangelo and Inklaar proposed treatment of the financial risk bearing primary service would be along the same lines, except any institutional unit in any sector may own the equity instruments through which financial risk bearing services are sold, so such an account would not be focused exclusively on households, as their narrative implies.

B. The SNA “Neighborhood” for FISIM

11. The 2008 SNA divides the world economy into two (1-digit) sectors—the Total economy of an economic territory and the Rest of the world. It further divides the first, Total economy sector into five (2-digit) principal institutional sectors as follows:

S1 Total economy

S11 Nonfinancial corporations

S12 Financial corporations

S121 Central bank

S122 Deposit taking corporations other than the central bank

S123 Money market funds (MMFs)

S124 Non-MMF investment funds

S125 Other financial intermediaries, except insurance corporations and pension funds

S126 Financial auxiliaries

S127 Captive financial institutions and moneylenders

S128 Insurance corporations

S129 Pension funds

S13 General government

S14 Households

S15 Nonprofit institutions serving households

S2 Rest of the world

We also show above the 2008 SNA subsector (3-digit) detail under financial corporations, with shading to indicate where FISIM is applied in the 2008 SNA, and, since the shaded subsectors comprise “financial intermediaries,” the scope of application of FISIM in the 1993 SNA as well. Bold indicates the principal focus of recent papers on the subject of indirectly measured financial services: 2008 SNA subsector S122, Deposit taking corporations other than the central bank, hereafter referenced simply as banks. Analytically, banks are the most “feature rich” of the financial intermediaries group—other financial intermediaries are essentially specializations of S122. We also highlight with a border the two investment fund subsectors, S123 and S124. Although the 2008 SNA text does not explicitly consider these two subsectors in connection with FISIM, we suggest that the “no load” service pricing schemes of many mutual funds that involve deducting “expense ratios” (what we will call

below “asset management” FISIM) from raw fund returns are equivalent to FISIM-type service charges. Finally, in monetary statistics, Money market funds S123 are grouped with the Central bank S121 and Deposit taking corporations S122 in a sector called Monetary financial institutions or corporations, so they are viewed functionally as banks.

12. Banks, while the principal source of FISIM, are not the only institutions in the financial corporations sector, nor the only institutions producing FISIM. However, they are a—and perhaps the—major source of FISIM in the national accounts of most countries. Before turning to an analysis of financial intermediaries as instances of a general enterprise having financial as well as nonfinancial instruments on both sides of its balance sheet, to place this discussion in its historical context, we consider the implications of various approaches to FISIM as explicitly—or in earlier years implicitly—stated in the language of successive versions of the international national accounting standard: the *1953*, *1968*, *1993*, and *2008 SNA*.

II. THE EVOLUTION OF FISIM

A. The *1953 SNA*

13. The *1953 SNA* described a measurement approach dealing with the basic financial services problem that explicit service charges do not cover cost, and that there is effectively an indirect service charge covered by the difference between interest received and interest paid:

In those cases where output is not sold at a clearly recognizable market price a problem of evaluation arises. Apart from the cases mentioned in chapter II, this is particularly so as regards banks and similar financial intermediaries which maintain themselves principally by virtue of the margin between interest rates on deposits and loans and which, therefore, would show a negligible or even negative contribution to domestic product if this were evaluated on the basis of the treatment adopted for other enterprises. The contribution of banks, etc., to gross domestic product is here evaluated as the sum of compensation of employees, profits, net rent and provisions for the consumption of fixed capital by imputing to depositors a service charge equal to the excess of investment income accruing to these institutions over deposit interest accruing to their depositors and by imputing at the same time a corresponding amount as interest to depositors. Thus these imputations do not change the income of banks or of other enterprises but they result in a change in the industrial classification of domestic product (from other enterprises to banks) in so far as the imputation is made in respect of business deposits, and an increase in the domestic product to the extent that the imputation is made in respect of the deposits of households, etc. (*1953 SNA*, p. 32)

Fixler and Zieschang (1991) observed that the *1953 SNA* treatment of FISIM implicitly assumed a reference rate applying to deposit liability and all financial asset instruments equal

to the average return on financial assets of financial institutions. By implication, FISIM is identically zero on total non-deposit financial assets. In addition, the text above also excludes application of FISIM to non-deposit liabilities.

B. The 1968 SNA

14. The *1968 SNA* took essentially the same view of aggregate FISIM as the *1953 SNA*:

6.32. Charges for services account for a small proportion of the income of commercial and saving banks, saving and loan associations, and similar financial institutions. The activities of these institutions are largely financed by the excess of the property income they receive over the property income they pay out. The property income involved consists essentially of interest. If the transactions of banks and similar financial institutions were treated like the transactions of other industries, their operating surplus, and perhaps their value added, would therefore be negative.

6.33. This anomaly may be avoided by imputing a service charge in addition to the charges actually paid. The imputed service charge should, in principle, be equated to the excess of the property income received by banks and similar intermediaries on loans and other investments made from the deposits they hold, over the interest they pay out on these deposits. The property income they receive as a result of investing their own funds should not be taken into account in calculating the imputed service charge. In practice, it will generally be necessary to include all the property income received in the calculation. (*1968 SNA*, p. 97)

The first instance of the term “own funds” was in 1968. It appears, based on context, to refer to non-deposit liabilities, as in the *1953 SNA*, but opens up the possibility that FISIM might apply to other kinds of liabilities besides deposits. However, the *1968 SNA* took a step back in allocating aggregate FISIM between intermediate and final uses, setting FISIM intermediate consumption equal to FISIM output, and thus setting FISIM final consumption equal to zero:

6.35. Because it is not feasible to allocate the imputed service charge among the various industries, the charge is to be treated as the intermediate consumption of a nominal industry. ... The nominal unit is to be classified as a financial institution in the case of the income and outlay accounts of the system... (*1968 SNA*, p. 97)

By implication, FISIM had no impact on GDP. This was done for practical reasons: lack of data. Indeed, the *1953 SNA* commented that the allocation by deposits it proposed was not feasible at the time due to data limitations:

The main problem in applying this rule is of a statistical character and arises from the fact that statistics on the distribution of bank deposits, which would be a convenient criterion for allocating the imputations, are only seldom available. (*1953 SNA*, p. 32)

15. 1968 SNA total FISIM was calculated essentially the same as described in 1953, though the term “own funds” could suggest broader application of FISIM than just deposits, to, say, non-equity liabilities. National accountants in many countries now have data on bank loan asset and deposit liability positions by institutional sector, and, indeed, the next version of the SNA reintroduced the allocation of FISIM by intermediate and final uses into the national accounts.

C. The 1993 SNA

16. The predominant national accounting standard in use at this writing is the *1993 SNA*.⁸ In the *1993 SNA*, total indirectly measured financial service output is taken to be the net property income earned by banks—comprising interest received less interest paid, plus dividends, plus rent, less income on banks’ “own funds.” The *1993 SNA* language does not foreclose exclusion of debt securities and loans from “own funds” and thus inclusion in FISIM calculations.⁹ We therefore narrowly interpret “own funds” here as equity capital, so we consequently see the *1993 SNA* excluding bank profits from its total FISIM aggregate. It then allocated this total via a user cost principle, on the basis of the difference between a single reference rate of interest and the monetary interest paid on liabilities (other than own funds), and the difference between the monetary interest rate earned on financial assets and the same single reference rate of interest.

17. The *1993 SNA* described its user-cost of money-type allocation of total FISIM to using sectors and the associated “reference rate of interest” as follows:

6.127. When the output is allocated among different users, one possible way of proceeding is to base the allocation on the difference between the actual rates of interest payable and receivable and a “reference” rate of interest. When the requisite information is available, estimates of the following may be calculated and used to allocate the total output:

⁸ The process of implementing the *2008 SNA* is underway in many countries but will not be completed until 2014-2015 in most.

⁹ *1993 SNA* paragraph 6.125 defines aggregate FISIM as

The total value of FISIM is measured in the System as the total property income receivable by financial intermediaries minus their total interest payable, excluding the value of any property income receivable from the investment of their own funds, as such income does not arise from financial intermediation. ...

The *1993 SNA* nowhere defines the scope of “own funds.” The term clearly applies to equity liabilities. It arguably does not apply to loan, debt security, and deposit liabilities. The sample calculation in Annex III of the *1993 SNA* assumes that no interest but all other forms of property income on financial instruments are payable on “own funds (Annex III, paragraph 2). We therefore equate “own funds” with equity liabilities here.

(a) For those to whom the intermediaries lend funds, both resident and non-resident, the difference between the interest actually charged on loans, etc. and the amount that would be paid if a reference rate were used.

(b) For those from whom the intermediaries borrow funds, both resident and non-resident, the difference between the interest they would receive if a reference rate were used and the interest they actually receive.

6.128. The reference rate to be used represents the pure cost of borrowing funds - that is, a rate from which the risk premium has been eliminated to the greatest extent possible and which does not include any intermediation services. The type of rate chosen as the reference rate may differ from country to country but the inter-bank lending rate would be a suitable choice when available; alternatively, the central bank lending rate could be used.

The *1993 SNA* was the first instance of the “financial intermediation services indirectly measured” as well as the associated “reference rate of interest” terminology, but, as we have seen, not the first instance of FISIM.

D. The 2008 SNA

18. The *2008 SNA* altered the *1993 SNA* by limiting FISIM only to the deposits and loans originated by financial corporations, and by suggesting that the reference rate “reflect the risk and maturity structure of deposits and loans,” without foreclosing use of the interbank rate as reference rate. Thus, compared with the *1993 SNA*, the scope of the financial balance sheet to which FISIM applies has narrowed, and the reference rate has edged up in view of the incorporation of the institutional risk premium and longer maturities into its calculation, at least in principle:

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.

III. FISIM ACCOUNTING

A. Basic identities in a general enterprise accounting framework

The cash flow identity

19. To understand the various approaches to calculating FISIM, it is helpful to begin with the accounting identities for enterprises holding financial assets and liabilities. As noted, financial corporations are a special case of this class, possessing a large fraction of financial assets in their asset portfolios or using deposit funding. We first define notation in Table 1, which uses variable names derived from the 2008 SNA coding system where possible to reinforce the point that the concepts used here come for the most part directly from the prevailing national accounting standards.¹⁰ Throughout, we denote interest and equity return rates with the letter r subscripted with the financial asset or liability variable with which it is associated. Referencing Table 1, first define the “receipts equals expenses” identity

$$p'y + r'_{AFA} AFA \equiv \overline{P2} + D1 + D29 - P51c + r'_{AFL} AFL \quad (1)$$

noting that AFL is the entire vector of liabilities, including owners' equity $AF5CL$, that r_{AFL} thus includes the residually determined return on equity liabilities, and that the 2008 SNA negative sign convention on consumption of fixed capital (CFC, a.k.a. depreciation) $P51c$ means that subtracting $P51c$ adds CFC to other production costs. In words, equation (1) says that directly measured output $p'y$ plus interest income on financial assets $r'_{AFA} AFA$, equals directly measured intermediate consumption $\overline{P2}$, plus compensation of employees $D1$, plus taxes on production $D29$, plus consumption of produced nonfinancial assets $-P51c$, plus interest and other financial expense on liabilities $r'_{AFL} AFL$, the latter including the residually determined return to owners. Finally, observe for future reference that the return on equity capital $AF5CL$ is defined by a rearrangement of equation (1) as

$$r_{AF5CL} AF5CL \equiv p'y + r'_{AFA} AFA - \overline{P2} - D1 - D29 + P51c - r'_{AFL} AFL \quad (2)$$

where, by implication, we define the rate of return on equity as

$$r_{AF5CL} \equiv \frac{p'y + r'_{AFA} AFA - \overline{P2} - D1 - D29 + P51c - r'_{AFL} AFL}{AF5CL} \quad (3)$$

¹⁰ 2008 SNA, Annex 1.

Table 1. Notation

Concept	Flow	Liability	Asset
Output (total, in current prices)	$P1$		
Directly priced output prices (m vector)	p		
Directly priced output quantities (m vector)	y		
Intermediate consumption	$\overline{P2}^{11}$		
Compensation of employees	$D1$		
Other taxes on production	$D29^{12}$		
Consumption of fixed capital	$-P51c^{13}$		
Nonfinancial assets			AN
Financial instruments ¹⁴		AFL^{15}	AFA^{16}
Non-equity instruments		$\overline{AFL}^{17}$	$\overline{AFA}^{18}$
Deposits ¹⁹		$AF2DL$	$AF2DA$
Debt securities		$AF3L$	$AF3A$
Loans		$AF4L$	$AF4A$
Equity capital		$AF5CL^{20}$	$AF51A^{21}$

¹¹ The 2008 SNA code for intermediate consumption is $P2$ —the overbar notation denotes $P2$ excluding the FISIM services provided by other FISIM producers.

¹² Other than Taxes on products, D21.

¹³ The 2008 SNA convention is that this variable carries a negative sign (paragraph A1.17). Thus, to add depreciation as a component of cost, it will have to be subtracted.

¹⁴ 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.

¹⁵ AFL denotes the vector $[AF2DL, AF3L, AF4L, AF5CL]'$ whose elements are defined in the subsequent lines of the table.

¹⁶ AFA will designate the vector $[AF2A, AF3A, AF4A, AF51A]'$. We are not considering here the case of the central bank. Were we to do so, we also would bring in $AF1$ —monetary gold and Special Drawing Rights (SDRs). We also ignore currency— $AF21$ —here.

¹⁷ $\overline{AFL}$ denotes the vector $[AF2DL, AF3L, AF4L]'$. By implication, $AFL = [\overline{AFL}, AF5CL]'$.

¹⁸ $\overline{AFA}$ denotes the vector $[AF2DA, AF3A, AF4A]'$. By implication, $AFA = [\overline{AFA}, AF51A]'$.

¹⁹ In the 2008 SNA, deposits comprise transferrable deposits ($AF22$) and other deposits ($AF29$). Currency and deposits $AF2$ is appended with the letter 'D' for 'deposits' and 'L' for liabilities or 'A' for assets, so $AF2DL = AF22L + AF29L$ and $AF2DA = AF22A + AF29A$.

²⁰ We define equity capital as equity (2008 SNA $AF51$) plus net worth (2008 SNA $B90$).

²¹ Our definition of equity capital carries over to equity interests in other enterprises, including their net worth.

and where the “bar” notation for AFL refers to the vector of liability instruments *other than* owners’ equity.

The balance sheet identity

20. In addition to the cash flow identity of flows of income and expense, accounting for the balance sheet involves an “assets equals liabilities” identity

$$\iota' AFA + AN \equiv \iota' AFL \quad (4)$$

where the notation $\iota'x = \sum_i x_i$ with ι a vector of ones commensurate with the dimension of vector x . Owners’ equity is the balancing item of the balance sheet. The SNA decomposes it into Equity and investment fund shares ($AF5$) and Net worth, with Net worth residually determined.²²

B. What is SNA FISIM?

21. We consider SNA FISIM not to be a monolithic concept, but to comprise three main components: account servicing on both asset and liability financial instruments, asset management on assets, and on liabilities what we will call “risk intermediation.” The interpretation and treatment of the latter, third component of FISIM can differ depending on how you view indirectly measured financial services, a subject to which we will turn later.

Account servicing

22. In this section, we are focusing on account servicing—those services provided on individual account numbers or financial instruments. For deposit liabilities this would include indirectly charged check clearing, statement processing, fraud surveillance, and so on, and for loan assets it would include indirectly charged credit assessment and loan initiation services as well as payment processing, contract monitoring, and handling delinquencies.

Multiple reference rates

23. We measure account servicing as the difference between the return on a balance sheet financial instrument and the rate of return on a reference instrument with the same maturity

²² The 2008 SNA recognizes several types of nonfinancial assets whose market values are difficult to determine. Among produced assets ($AN1$), certain Intellectual property products ($AN117$), and a large part of nonproduced assets ($AN2$)—Natural resources ($AN21$), Contracts, leases, and licenses ($AN22$), and Purchases less sales of goodwill and marketing assets ($AN23$)—are examples of difficult to value items. An alternative approach to direct valuation of these items, where possible, is to value equity shares at market and determine the value of nonfinancial assets residually as the difference between total liabilities and financial assets.

and risk profile but on which no account servicing is provided. Measurement of account servicing thus in principle implies a large constellation of instrument specific reference interest rates (we will elaborate more precisely on where these reference rates can come from when we impose an additional assumption below). To derive account servicing FISIM from the cash flow identity (1), we subtract the total instrument specific reference interest cost of financial assets from both sides and add the total instrument specific reference interest cost of financial liabilities to both sides. The approach to FISIM of Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012) would be accommodated by this rearrangement of equation (1). In so doing, we can then identify the value of account servicing margins between individual financial asset returns and their “(account) service-free,” interest returns (identified with caret notation), and between the “(account) service-free,” interest cost of liabilities (identified with caret notation) and the monetary amounts received by lenders to and owners of the institution as

$$\begin{aligned} & p'y + (\hat{r}_{AFL} - r_{AFL})' AFL + (r_{AFA} - \hat{r}_{AFA})' AFA \\ & \equiv \overline{P2} + D1 + D29 - P51c + (\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA) \end{aligned} \quad (5)$$

where $\hat{r}_{AFL} \equiv [\hat{r}_{AF2DL}, \hat{r}_{AF3L}, \hat{r}_{AF4L}, \hat{r}_{AF5CL}]$, $\hat{r}_{AFA} \equiv [\hat{r}_{AF2DA}, \hat{r}_{AF3A}, \hat{r}_{AF4A}, \hat{r}_{AF51A}]$,

$AFL \equiv [AF2DL, AF3L, AF4L, AF5CL]$, $AFA \equiv [AF2DA, AF3A, AF4A, AF51A]$, as per Table 1.²³

24. In words, directly measured output, $p'y$, plus total financial margins relative to reference rates on financial instruments, is equal to directly measured cost, comprising directly measured intermediate consumption $\overline{P2}$, plus compensation of employees $D1$, plus other taxes on production $D29$, plus consumption of produced nonfinancial assets, $-P51c$, plus a residual financial cost expression $(\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA)$. To interpret this last expression, note that

$$\begin{aligned} (\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA) &= \left(\frac{\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA}{t' AFL - t' AFA} \right) (t' AFL - t' AFA) \\ &= \left(\frac{\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA}{AN} \right) \cdot AN \end{aligned} \quad (6)$$

where

²³ Equation (5) is equivalent to Diewert, Fixler, and Zieschang equation (45).

$$AN \equiv \iota' AFL - \iota' AFA \quad (7)$$

follows from the balance sheet identity (4) that total assets are identically equal to total liabilities.²⁴ Equation (6) thus interprets the financial residual as the internal rate of return on capital.²⁵ *However, there are other, perhaps more compelling ways to write this.* We will consider another formulation of the same identity below that widens the definition of capital inputs beyond the nonfinancial assets AN shown as the factor in equation (6). The residual determination of instrument specific reference interest received on nonfinancial assets in equation (6) is equivalent to saying that total instrument specific reference interest received on assets (including nonfinancial assets) is identically equal to total instrument specific reference interest distributed to funders on liabilities, as can be verified by the identity

$$\hat{r}'_{AFA} AFA + \left(\frac{\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA}{AN} \right) AN \equiv \hat{r}'_{AFL} AFL \quad (8)$$

The “no (account servicing) FISIM on own funds” assumption for output

25. The SNA’s traditional exclusion of “own funds” from account servicing FISIM is imposed by assuming the reference rate on equity equals the observed rate of return on equity, $\hat{r}_{AF5CL} = r_{AF5CL}$, and there thus is no indirectly measured account servicing produced on equity instruments within the term $(\hat{r}_{AFL} - r_{AFL})' AFL$ in equation (5). Admittedly, this is a narrow interpretation of this traditional restriction, as we will shortly consider other components of FISIM for which this restriction will not be imposed. However, it also is reasonable to assert that there is little or no account servicing on equity instruments. The account servicing margin on the FISIM term for equity liabilities $AF5CL$ is thus zero,

$$(\hat{r}_{AF5CL} - r_{AF5CL})' AF5CL = 0, \quad (9)$$

and, as well, we can replace the reference rate on equity liabilities with the observed rate of return within the expression for the internal return to nonfinancial assets (and thus primary services) in equation (5) as

$$(\hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA) = (r_{AF5CL} AF5CL + \hat{r}'_{AFL} \overline{AFL} - \hat{r}'_{AFA} AFA). \quad (10)$$

²⁴ Equation (6) is equivalent to Diewert, Fixler, and Zieschang equation (44).

²⁵ Where “capital” in this context means SNA’s Nonfinancial assets AN rather than our Equity capital ($AF5CL$) liabilities.

Equations (9) and (10) thus constitute the implications of “no FISIM on own funds,” $\hat{r}_{AF5CL} = r_{AF5CL}$, and we can now write equation (5) as

$$\begin{aligned} & p'y + (\hat{r}_{AFL} - r_{AFL})' \overline{AFL} + (r_{AFA} - \hat{r}_{AFA})' AFA \\ & \equiv \overline{P2} + D1 + D29 \\ & -P51c + \left(r_{AF5CL} AF5CL + \hat{r}_{AFL}' \overline{AFL} - \hat{r}_{AFA}' AFA \right). \end{aligned} \quad (11)$$

The “no account servicing FISIM on debt securities” assumption

26. To calculate account servicing from equation (5), Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012) assume that there is no account servicing on debt securities as well as equity, since the service free interest return on balance sheet instruments is determined by rates on matched debt securities. By implication, the reference rates on debt securities are equal to their observed rates of return. They then determine the reference rates for deposits and loans as the return on debt securities matched in maturity and specific risk to these non-security/non-equity asset and liability instruments on the balance sheet. Thus, deposit and loan asset and liability account servicing is, in principle, calculable from observable reference rates determined from matched securities, under the assumption that account servicing on securities is negligible.

Limitation of account servicing to deposits and loans

27. The combination of the above two assumptions implies there is no account servicing on any instruments *except* deposits and loans, and that

$$\begin{aligned} \hat{r}_{AF3A} &= r_{AF3A} \\ \hat{r}_{AF3L} &= r_{AF3L} \\ \hat{r}_{AF51A} &= r_{AF51A} \\ \hat{r}_{AF5CL} &= r_{AF5CL}. \end{aligned} \quad (12)$$

Thus, equation (11) reduces to²⁶

²⁶ This equation is essentially equation (46) in Diewert, Fixler, and Zieschang (2012).

$$\begin{aligned}
& p'y \\
& + (\hat{r}_{AF2DL} - r_{AF2DL})' AF2DL + (\hat{r}_{AF4L} - r_{AF4L})' AF4L \\
& + (r_{AF2DA} - \hat{r}_{AF2DA})' AF2DA + (r_{AF4A} - \hat{r}_{AF4A})' AF4A \\
& \equiv \overline{P2} + D1 + D29 \\
& - P51c \\
& + [(\hat{r}_{AF2DL} AF2DL + r_{AF3L} AF3L + \hat{r}_{AF4L} AF4L + r_{AF5CL} AF5CL) \\
& - (\hat{r}_{AF2DA} AF2DA + r_{AF3A} AF3A + \hat{r}_{AF4A} AF4A + r_{AF51A} AF51A)].
\end{aligned} \tag{13}$$

To summarize, we have characterized in this section on the account servicing component of FISIM the traditional SNA assumption since 1953 that “own funds” are not associated with output of FISIM, and the 2008 SNA restriction of (here, account servicing) FISIM to deposits and loans. To foreshadow the following sections, however, we will find that the latter 2008 SNA restriction of FISIM to deposits and loans logically cannot apply to the other components of SNA FISIM, one of which is a portfolio level rather than instrument level service. We also will find that, while the assumption that “own funds” do not generate FISIM output can be maintained, “own funds” can nevertheless play a role in the allocation of that output to using sectors, particularly for financial corporations.

The cost of funds

28. As explained in the previous section, since 1993 the SNA has based indirectly measured financial intermediation services on a reference rate of interest²⁷, but has been less than definitive about how the reference rate might be selected or determined. We propose that the overall reference rate should be definitively and straightforwardly the cost of funds to the enterprise—

$$\bar{r} \equiv \frac{\hat{r}'_{AFL} AFL}{i' AFL} \tag{14}$$

²⁷ Where, as noted in Section II, the 2008 SNA broadens this to allow individual reference rates by currency of denomination.

—which is the average cost of liabilities at instrument specific reference rates.²⁸ As such, the cost of funds $\bar{r}$ is the same as the Modigliani and Miller (1958) cost of capital.²⁹ Using the cost of funds as the enterprise reference rate will allow us to shed light on other key components of financial services in FISIM besides account servicing.

29. Computing $\bar{r}$ requires us to know the individual liability account reference rates $\hat{r}_{AFL}$. Referencing the Basu, Colangelo, Inklaar, and Wang approach to liability account servicing in the previous section, the cost of funds for each individual non-equity liability is a risk and maturity matched debt security interest rate. We recall here that the specific reference rate of each of the debt security liabilities on the enterprise balance sheet is their observed return (no indirectly charged account servicing), and the instrument specific reference rate for equity liabilities is their observed return (no indirectly charged account servicing), but that the instrument specific reference rate for loan liabilities will be a maturity- and specific risk-matched debt security rate,³⁰ as will be the reference rate for deposit liabilities.

30. The return (14) thus effectively shows what the funding portfolio would cost were it converted entirely into debt securities and equity. Imposing our assumptions on instrument specific opportunity cost rates (12) that exclude account servicing FISIM from debt security and equity instruments, equation (14) can be rewritten

$$\bar{r} \equiv \frac{\hat{r}_{AF2DL} AF2DL + r_{AF3L} AF3L + \hat{r}_{AF4L} AF4L + r_{AF5CL} AF5CL}{l' AFL} \quad (15)$$

So after the above exercise of determining the value of account services, if we can successfully match debt securities to the characteristics of the deposits and loans on the

²⁸ This is equivalent to Diewert, Fixler, and Zieschang (2012) equation (46).

²⁹ Modigliani and Miller (1958) argued, in the notation of this paper, that because of arbitrage opportunities in efficient markets, $\bar{r}$ is independent of the debt-equity composition of funding (noting that ρ_k is equivalent to our $\bar{r}$ in the following quotes):

“Proposition I. ... the market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate ρ_k appropriate to its class. ... That is, the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class.” Modigliani and Miller (1958, pp. 268-269).

“Proposition II. ... the expected yield of a share of stock is equal to the appropriate capitalization rate ρ_k for a pure equity stream in the class, plus a premium related to financial risk equal to the debt-to-equity ratio times the spread between ρ_k and [the interest rate] r .” Modigliani and Miller (1958, p. 271).

³⁰ However, we will later reconsider this way of determining the reference rates for individual loans.

enterprise balance sheet, we know all of the account servicing reference rates $\hat{r}_{AFL}$, and thus the overall cost of funds $\bar{r}$. In what follows, we assume this to be the case.

Asset management output/financial capital primary service input

The investment fund within the enterprise

31. Let us now go beyond the value of account servicing and consider services associated with managing the asset portfolio. These typically involve investment research and calculation of portfolio weightings optimized to fund managers' risk-return tolerances, as well as the transactions necessary to maintain a particular portfolio mix as relative asset values evolve. Abstracting from the account servicing flows computed above and valuing returns on all financial instruments other than equity at equivalent debt security rates, we effectively reduce our enterprise to a leveraged investment fund, with debt security and equity funding on the liability side, and debt securities, equity, and nonfinancial assets on the asset side.

32. When the financial asset portfolio is yielding more than the cost of funds, we will characterize the value of *asset management service output* below as the difference between the investment return on the asset portfolio at instrument specific reference rates and the cost of funds. Asset management is the service provided by investment funds and charged for in so-called expense ratios deducted from financial asset portfolio returns.

33. When the financial asset portfolio is yielding less than the cost of funds, we will characterize the value of the *primary service input from financial assets* as the difference between the cost of funds and the investment return on the asset portfolio. Financial asset primary services are capital service inputs yielded from the financial asset portfolios owned, for example, by enterprises whose principal, and directly measured, output is a good or nonfinancial service, or by a household or general government final consumer. These low-yielding financial asset portfolios generally perform a liquidity management function to the institutional unit owning them, supporting production of goods or nonfinancial services either for sale or for own use. In this regard, however, we note that the primary, capital service attributed to low-yielding financial asset portfolios are offset to a greater or lesser extent by the risk intermediation and asset management services supplied by the *issuers* of those financial instruments, for whom they are liabilities. These latter services appear as intermediate consumption. We will see that the capital service attributable to the financial asset portfolio ultimately is a function of the difference between the cost of funds of the unit owning the asset and the cost of funds of the unit issuing the asset, multiplied by the value of the financial asset portfolio.

Asset/liquidity management services

34. As noted earlier, financial asset management services will be the difference between the income at security equivalent returns (instrument specific reference rates) on the asset portfolio and the cost of funds $\bar{r}$ (since investable funds are fungible). So asset management services (the investment return on assets less the cost of funds) are

$$\hat{r}'_{AFA} AFA - \bar{r} \cdot (\iota' AFA) = (\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA \quad (16)$$

Under our assumptions limiting account servicing to deposits and loans, equation (16) can be rewritten using equation (12) as

$$\begin{aligned} (\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA &= (\hat{r}_{AF2DA} - \bar{r} \cdot \iota)' AF2DA + (\hat{r}_{AF3A} - \bar{r} \cdot \iota)' AF3A \\ &\quad + (\hat{r}_{AF4A} - \bar{r} \cdot \iota)' AF4A + (\hat{r}_{AF51A} - \bar{r} \cdot \iota)' AF51A. \end{aligned} \quad (17)$$

35. Note that we are working with the accounting identities of a general enterprise. Alluding to the introductory remarks of this section, specializing this to a financial enterprise characterized by a significant share of financial assets in its portfolio, it will be rare to observe a negative value for asset management services (16). However, for a nonfinancial enterprise whose portfolio of financial assets is relatively small and concentrated in liquid assets such as deposits, (16) may be negative and represent “liquidity management” inputs. We note that part of these liquidity management service inputs are in the form of asset management and risk intermediation services purchased from the issuers of the underlying financial instruments, which are by definition intermediate consumption. Only that part of liquidity management over and above these purchased services is a capital service produced for own use in the classical user cost sense, and only this user cost appears in the operating surplus of the enterprise holding these instruments as assets. We will consider this explicitly below after first discussing the allocation of FISIM to uses.

36. Finally, we can show that asset/liquidity management services are inherent in the multiple reference rate expression in equation (5). To show this, we first show that the “internal return to nonfinancial assets” of equation (6) can be rewritten as the sum of the cost of funds times nonfinancial assets plus the user cost of financial assets:

$$\begin{aligned} \hat{r}'_{AFL} AFL - \hat{r}'_{AFA} AFA &= \hat{r}'_{AFL} AFL + (\bar{r} \cdot \iota' AFA - \bar{r} \cdot \iota' AFA) - \hat{r}'_{AFA} AFA \\ &= (\hat{r}'_{AFL} AFL - \bar{r} \cdot \iota' AFA) + (\bar{r} \cdot \iota' AFA - \hat{r}'_{AFA} AFA) \\ &= \bar{r} (\iota' AFL - \bar{r} \cdot \iota' AFA) + (\bar{r} \cdot \iota' AFA - \hat{r}'_{AFA} AFA) \\ &= \bar{r} \cdot AN + (\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \end{aligned} \quad (18)$$

37. From equation (18), if the user cost of financial assets $(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA > 0$ then financial assets comprise part of primary services and are a capital input, along with nonfinancial assets AN . We might characterize financial assets as playing a “working capital” or “cash management” role, and would be characterized by an enterprise financial asset portfolio weighted toward assets that are of shorter maturity and/or of lower risk than would be indicated by the enterprise’s average cost of funds. This is likely to be characteristic of most nonfinancial enterprises.

38. On the other hand, if $(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA < 0$, financial assets are playing an output role. We therefore add $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA = -(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA > 0$ to both sides of equation (5) to obtain the following output = cost expression:

$$\begin{aligned} & p'y + (\hat{r}_{AFL} - r_{AFL})' AFL + (r_{AFA} - \hat{r}_{AFA})' AFA + (\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA \\ &= p'y + (\hat{r}_{AFL} - r_{AFL})' AFL + (r_{AFA} - \bar{r} \cdot \iota)' AFA \\ &\equiv \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN \end{aligned} \quad (19)$$

Equation (19) is characteristic of investment funds, whose “expense ratio” service charge covers the output term $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA$ added to both sides of equation (5) to obtain equation (19). Equation (19) is also characteristic of financial corporations more generally, as most provide asset and account management services that are implicitly priced. Notably, unlike the “nonfinancial enterprise” case above, in this “financial corporation” case the financial asset portfolio is absent from the capital services component of cost.

39. To summarize our characterization of FISIM output thus far, we have covered “account servicing” and “asset management output/cash management input.” We can combine these findings from equations (18) and (19) with a notational device as follows:

$$\begin{aligned} & p'y + (\hat{r}_{AFL} - r_{AFL})' AFL + (r_{AFA} - \hat{r}_{AFA})' AFA + \left[(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA \right]_+ \\ &\equiv \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + \left[(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \right]_+ \end{aligned} \quad (20)$$

where we presume that $(\hat{r}_{AFL} - r_{AFL})' AFL \geq 0$ and $(r_{AFA} - \hat{r}_{AFA})' AFA \geq 0$ and define the subscript “+” notation as censoring the quantity in brackets so that it is equal to the expression in brackets if the quantity is positive, and zero otherwise. By implication, if $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA > 0$ and appears on the left, output side, then $(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA < 0$ and does not appear on the right, cost side, and vice versa.

Risk intermediation

40. Debt funders of enterprises (depositors, debt security holders, and lenders) have contracts that insure their stakes in the enterprise against nominal capital risk—their investment is returned, either in full at the end of the term of the contract if total assets exceed non-equity liabilities, or in proportion to their claim on total assets otherwise. Their income flows also are insured against nominal fluctuations—they receive interest at a contract rate on their principal, with the option of forcing liquidation of enterprise assets to meet that obligation if the value of enterprise assets declines or interest arrears accumulate sufficiently.

41. The premiums debt holders pay to cede the above principal and income risks to equity holders are the differences between the overall cost of funds at $\bar{r}$, to which they are entitled as funders of the enterprise, and the security equivalent rates of pure interest they respectively receive at reference rates $\hat{r}_{AFL}$. We can therefore write “risk intermediation” as:

$$\begin{aligned} & \left(\bar{r} \cdot t - \hat{r}_{AFL} \right)' \overline{AFL} \\ & = -(\bar{r} - r_{AF5CL}) AF5CL = (r_{AF5CL} - \bar{r}) AF5CL. \end{aligned} \tag{21}$$

42. From here forward, we will make an expository assumption concerning equation (21):

EXPOSITORY ASSUMPTION: The average cost of capital $\bar{r}$ lies above the security equivalent interest paid on every debt liability instrument (deposits, debt securities, and loans).

Thus, all of the terms in the inner product on the left hand side of equation (21) will be assumed positive. In such a case it must be that the return on equity must lie above the average cost of capital. This configuration will be typical of highly leveraged financial corporations with a rather high return on equity relative to the cost of debt finance. It need not hold in general, particularly for less leveraged enterprises, in the sense that some non-equity liability instruments could have yields above the average cost of capital.³¹ With this expositional proviso, the last line of equation (21) shows that risk intermediation is equivalent to the premium earned by equity holders, because $\bar{r}$ is the average return on

³¹ This assumption is for expository ease only, but also highlights a nuance in what we mean in this paper by “leverage premium.” Since leverage is defined as the ratio of debt to equity, equation (21) implies that while the leverage premium on equity will be one of the negative terms, it need not be the only negative term, as it is possible for a given debt security or loan liability to have a high enough interest rate to generate a negative FISIM margin. Empirically, this does not seem to be so for banks, whose highly leveraged financing mix coincides with a large leverage premium on equity.

liabilities at reference rates, and the instrument specific reference rate for equity is its observed return. Thus the average “deviation” of liability account-specific matched security rates from the cost of funds $\bar{r}$ is identically zero—

$$\left(\bar{r} \cdot \iota - \hat{r}_{AFL}\right)' \overline{AFL} + \left(\bar{r} - \hat{r}_{AF5CL}\right) AF5CL \equiv 0 \text{—from which the last line of (21) follows.}$$

43. If the expository assumption does not hold, all of the results shown below continue to hold, but the solitary FISIM margin on equity— $\left(\bar{r} - \hat{r}_{AF5CL}\right) AF5CL = \left(\bar{r} - r_{AF5CL}\right) AF5CL$ —which will almost always be negative, is replaced everywhere it appears by the sum of negative FISIM margins on liabilities using the same notational device as in equation (20):

$$\left(\bar{r} - \hat{r}_{AFL}\right)'_{-} AFL \tag{22}$$

where for

$$x = \begin{bmatrix} x_1 \\ \vdots \\ x_n \end{bmatrix}$$

then

$$x_{-} = \begin{bmatrix} x_{1-} \\ \vdots \\ x_{n-} \end{bmatrix}$$

where

$$x_{i-} = \begin{cases} 0 & \text{if } x_i \geq 0 \\ x & \text{if } x_i < 0. \end{cases}$$

44. Similarly, the term $\left(\bar{r} \cdot \iota - \hat{r}_{AFL}\right)' \overline{AFL}$ is replaced everywhere it appears by the sum of positive FISIM margins on liabilities, say,

$$\left(\bar{r} - \hat{r}_{AFL}\right)'_{+} AFL \tag{23}$$

where

$$x_{+} = \begin{bmatrix} x_{1+} \\ \vdots \\ x_{n+} \end{bmatrix}$$

with

$$x_{i+} = \begin{cases} 0 & \text{if } x_i < 0 \\ x & \text{if } x_i \geq 0. \end{cases}$$

45. From the notation introduced in equations (22)-(23), it should be evident that our assumption will simplify the exposition going forward—by allowing us to avoid this notation—with essentially no impact on generality.³² The simplification the expositional assumption affords also allows us to expose the key feature of “risk intermediation”—reallocation of risk from institutional units that would hold debt in the enterprise to institutional units that would hold equity.

46. We have described above a risk allocation motivation consistent with the SNA’s recognition of “risk intermediation” as output of the institutions issuing the debt. However, foreshadowing the discussion of “risk intermediation” below, it sits at the fulcrum of the debate about whether these services should be included in output at all, or if included, should not be included with the output of the issuer of a debt instrument, for whom it is a liability, but with the output of the holder, for whom it is an asset. Before taking this up, we complete our discussion of the implications of the existing SNA approach to FISIM, including its treatment of “risk intermediation.”

The total SNA FISIM aggregate

47. We can now characterize a “total SNA output aggregate” as the sum of account services (5), asset management services (16), and risk intermediation (21):

$$\begin{aligned}
 P1 &\equiv p'y && \text{[direct charges]} \\
 &+ (\hat{r}_{AFL} - r_{AFL})' AFL + (\hat{r}_{AFA} - r_{AFA})' AFA && \text{[account servicing]} \\
 &+ \left[(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA \right]_+ && \text{[asset management]} \\
 &+ (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} && \text{[risk intermediation]}
 \end{aligned} \tag{24}$$

If the expression $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA$ in equation (24) is positive and represents asset management, then that equation reduces to

³² It is worth noting here that the “own funds” language in the 1953 (implicit), 1968, and 1993 versions fits well with the idea of this section of the paper that “own funds” are those costing more than the funding portfolio average.

$$\begin{aligned}
P1 &= p'y && \text{[direct charges]} \\
&+ (\hat{r}_{AFL} - r_{AFL})' AFL + (\hat{r}_{AFA} - r_{AFA})' AFA && \text{[account servicing]} \\
&+ (\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA && \text{[asset management]} \\
&+ (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} && \text{[risk intermediation]} \\
&= (\bar{r} \cdot \iota - \hat{r}_{AFL} + \hat{r}_{AFL} - r_{AFL})' AFL + (\hat{r}_{AFA} - \bar{r} \cdot \iota + r_{AFA} - \hat{r}_{AFA})' AFA \\
&= (\bar{r} \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - \bar{r} \cdot \iota)' AFA.
\end{aligned} \tag{25}$$

Thus, equation (25) shows that the output of our financial corporations archetype includes a positive asset management services term as well as account servicing and risk intermediation.

48. On the other hand, if the expression $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA$ in equation (24) is negative and represents cash management inputs, then it disappears from output as in

$$\begin{aligned}
P1 &= p'y && \text{[direct charges]} \\
&+ (\hat{r}_{AFL} - r_{AFL})' AFL + (\hat{r}_{AFA} - r_{AFA})' AFA && \text{[account servicing]} \\
&+ (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} && \text{[risk intermediation]} \\
&= (\bar{r} \cdot \iota - \hat{r}_{AFL} + \hat{r}_{AFL} - r_{AFL})' AFL + (\hat{r}_{AFA} - r_{AFA})' AFA \\
&= (\bar{r} \cdot \iota - r_{AFL})' \overline{AFL} + (\hat{r}_{AFA} - r_{AFA})' AFA.
\end{aligned} \tag{26}$$

Equation (26), is our nonfinancial corporations archetype, in the context that these corporations do not issue deposit liabilities and thus will have no deposit account servicing and minimal or zero loan account servicing. Thus the account servicing shown in equation (26) will usually be negligible, leaving risk intermediation as the sole component of FISIM for nonfinancial enterprises. Risk intermediation will be larger the more leveraged the enterprise, but will almost always be a significantly less important component of output than direct charges $p'y$ compared with financial corporations.

49. Regarding the reference rates used to calculate equation (24), recall that the overall reference rate for financial and nonfinancial assets as well as non-equity liabilities is $\bar{r}$, the cost of funds, while the instrument specific reference rate for equity is equal to r_{AF5CL} , its observed rate of return. Finally, observe that the last line of equation (25) strongly resembles current SNA standards for the indirectly measured output of financial corporations, while

equation (26) shows that the output of nonfinancial corporations contains nonzero risk intermediation, reflecting the degree of leverage in enterprise financing.³³

50. The implications of SNA FISIM shown in equation (24) for the cost side can be derived by adding asset management services $(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA$ and risk intermediation $(\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL}$ to both sides of equation (24):

$$\begin{aligned}
 & p'y + (\hat{r}_{AFL} - r_{AFL})' \overline{AFL} + (r_{AFA} - \hat{r}_{AFA})' AFA + \left[(\hat{r}_{AFA} - \bar{r} \cdot \iota)' AFA \right]_+ \\
 & + (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} \\
 & \equiv \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + \left[(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \right]_+ \\
 & + (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} \\
 & = \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + \left[(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \right]_+ \\
 & + (r_{AF5CL} - \bar{r}) AF5CL.
 \end{aligned} \tag{27}$$

where the last line of equation (27) follows from equation (21).

51. Combining equations (25) and (27) produces the “classic” 1993 SNA result for archetypical financial corporations on the output side while showing its implications on the cost side:

$$\begin{aligned}
 & p'y + (\bar{r} \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - \bar{r} \cdot \iota)' AFA \\
 & = \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL.
 \end{aligned} \tag{28}$$

Thus, the value of comprehensive FISIM on the left hand side covers the cost of nonfinancial assets at the overall cost of funds reference rate $\bar{r}$, plus the equity premium $(r_{AF5CL} - \bar{r}) AF5CL$ on the right hand side.³⁴ Again recall that from the definition of the

³³ Keeping in mind that, *de facto*, the SNA has heretofore not recognized risk intermediation (or any other FISIM) output for nonfinancial enterprises—only financial corporations.

³⁴ Equation (28) is equivalent to equation (17) in Diewert, Fixler and Zieschang (2012), provided

average cost of funds $\bar{r}$ in equation (14), equation (21) shows that risk intermediation in nominal output equals the equity premium.

52. Combining equations (26) and (27) shows what exactly analogous treatment of archetypical nonfinancial enterprises implies for the output and input sides:

$$\begin{aligned}
 P1 &= p'y && \text{[direct charges]} \\
 &+ (\hat{r}_{AFL} - r_{AFL})' \overline{AFL} + (\hat{r}_{AFA} - r_{AFA})' AFA && \text{[account servicing]} \\
 &+ (\bar{r} \cdot \iota - \hat{r}_{AFL})' \overline{AFL} && \text{[risk intermediation]} \\
 &= (\bar{r} \cdot \iota - \hat{r}_{AFL} + \hat{r}_{AFL} - r_{AFL})' \overline{AFL} + (\hat{r}_{AFA} - r_{AFA})' AFA \\
 &= (\bar{r} \cdot \iota - r_{AFL})' \overline{AFL} + (\hat{r}_{AFA} - r_{AFA})' AFA \\
 &= \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN \\
 &+ (\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \\
 &+ (r_{AF5CL} - \bar{r}) AF5CL.
 \end{aligned} \tag{29}$$

-
- We add together the terms on the left hand side of our equation (21) which eliminates the instrument specific reference rates for the various assets and liabilities, (which in turn combines account servicing with the asset management and other liability services terms into combined effects of these two sets of terms);
 - We assume Diewert, Fixler, and Zieschang's (2012) pure profits π are 0 which pins down the equity rate of return for the bank;
 - We choose the bank's reference rate ρ_B to be $\bar{r}$ (the average cost of capital over all sources of funding) and
 - We take all of the financial service flows on the right hand side of Diewert, Fixler, and Zieschang (2012) equation (17) (with the exception of the household equity premium margin term $(R_{HB} - \rho_B)V_{HB}^0$ which corresponds to $(r_{AF5CL} - \bar{r})AF5CL$), change their signs and put them in the production account, leaving only the Diewert, Fixler, and Zieschang term $w_B x_B + (1 + \rho_B)P_{KB}^0 K_B^1 - P_{KB}^1 K_B^1 + (R_{HB} - \rho_B)V_{HB}^0$ which is the sum of labor payments, the user cost of capital (using the reference interest rate ρ_B) and the equity margin over the average cost of capital, $(R_{HB} - \rho_B)V_{HB}^0$.

Equation (29) shows no asset management output but does show “cash management/working capital” input.³⁵

53. A key takeaway from the equity premium term $(r_{AF5CL} - \bar{r})AF5CL$ on the right hand, cost side of equation (28) is that the SNA’s treatment of FISIM for financial corporations since at least 1993, and arguably, since 1953, has implicitly recognized financial capital (SNA equity liabilities and SNA net worth) as a productive input for partly debt financed *financial* enterprises. A key takeaway from the “cash management/working capital” term $\left[(\bar{r} \cdot \iota - \hat{r}_{AFA})' AFA \right]_+$ on the cost side in equation (27) is that the SNA has always implicitly recognized financial working capital services in the operating surplus of *nonfinancial* enterprises.³⁶ An implication of this is that we can rewrite rate of the return to capital in equation (6) in terms of “productive capital” comprising not only nonfinancial assets *AN*, but also as financial assets *AFA* and equity capital liabilities *AF5CL*.

C. Who pays for FISIM?

54. Do counterparties to the enterprise’s loan assets and deposit liabilities pay the FISIM on those instruments, and does the enterprise pay another provider for the FISIM on loan liabilities and deposit assets? Further, notwithstanding the exclusion of “own funds” from output, are equity holders always compensated entirely in property income and not services? The *1993* and *2008 SNA* say yes to both questions. Here, we pose the question whether all of these asset-related service charge components are actually paid by the enterprise’s funders. We come to a different answer than the *1993* and *2008 SNA*, resembling instead the *1953*

³⁵ While it is tempting at this stage to label this financial asset input as entirely a primary service, we will find, when we consider the allocation of FISIM output to its intermediate and final uses below, that this is not the case.

³⁶ We should qualify this by saying this is true for the SNA’s treatment of “market” nonfinancial enterprises. For these enterprises, operating surplus is computed as the residual of output less intermediate consumption, compensation of employees, and taxes on production (but not products). Equation (27) shows that this residual calculation of operating surplus must include the user cost of financial assets when they earn less than the cost of funds. However, The SNA has yet to recognize the opportunity cost of financial capital in the operating surplus of “nonmarket” enterprises, whose output is not sold at what the SNA has called since 1993 “economically significant prices” that, by national accounting convention, generally cover at least half the cost of producing it. Output for nonmarket enterprises thus is compiled as a sum of costs, which, in principle, should include the user cost of capital, but for the SNA’s exclusion of the opportunity cost of funds invested when the enterprise is nonmarket. Equation (27) also allows us to see that the SNA has never consistently treated the risk intermediation component of FISIM across sectors, excluding it from the output of nonfinancial enterprises while including it in the output of financial corporations. Nevertheless, this might still “work” empirically to the extent that leverage—and thus risk intermediation—is relatively low and/or debt is concentrated at long maturities among nonfinancial enterprises as compared with financial enterprises. We will address the latter consistency point later.

SNA. In so doing, in the case when asset management appears as an output (rather than appearing as financial capital services as a primary input), we determine a reference rate for *allocating* FISIM output at that is distinct from the cost of funds with which we calculate the level of FISIM output.

Deposit account servicing

55. From equation (5), deposit *liabilities* are associated with the account servicing output $(\hat{r}_{AF2DL} - r_{AF2DL}) AF2DL \geq 0$, the margin between their security equivalent return and the amount of interest paid to depositors. Depositors effectively see this difference because they accept less than the security equivalent return on their funds invested in deposits in return for account servicing. Thus Depositors pay deposit account servicing FISIM.

56. The same is true of deposit *assets* from the point of view of the enterprise holding the deposit asset vis a vis its counterparty, another (financial) enterprise. From equation (5), deposit assets are associated with the account servicing payment $(r_{AF2DA} - \hat{r}_{AF2DA}) AF2DA \leq 0$, the margin between the amount of interest received on deposit assets and their security equivalent return. Thus account servicing on deposit assets is paid by the (nonfinancial or financial) enterprise as an intermediate consumption purchased from another (financial) enterprise. As this is not part of output, we will return to this when discussing intermediate consumption below.

Loan account servicing and asset management: Funders pay the spread

Loan account servicing

57. From equation (5), loan *assets* are associated with the account servicing output $(r_{AF4A} - \hat{r}_{AF4A}) AF4A$, the margin between their security equivalent return and the amount of interest received from borrowers. While an argument can be made that, under certain circumstances, borrowers pay some of the account servicing on loans, empirical results from Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012) show that loan account servicing is a rather small part of total FISIM. Taking another view of the borrower's options, the borrower would not have taken out the loan if he had had a better opportunity, including issuing a debt security matched in maturity to the loan. Thus, from the credit *purchaser's* perspective, all of the interest paid on the loan is just interest, without a service component. On the other hand, funders can effectively see this charge, and effectively pay it by agreeing to accept less than the full amount of loan interest the enterprise receives. Under this view, funders pay account servicing on the loan rather than the borrower.³⁷ As a

³⁷ The commenters on this paper found the notion that borrowers, the counterparties to loan assets, do not pay account servicing FISIM to be difficult to accept, though most agreed that funders do indeed pay the portfolio-level asset management component of FISIM. It is worth emphasizing here that borrowers are still paying the

practical, accounting matter, this makes the loan specific reference rate equal to the observed loan rate, with the understanding that the *producer* of asset management services and loan account servicing can, perhaps to analyze its own production process, decompose the margin of loan interest over the cost of funds into an account servicing component and a contribution to portfolio level asset management, but not the *borrower*.

58. From equation (5), loan *liabilities* are associated with the account servicing payment $(\hat{r}_{AF4L} - r_{AF4L})AF4L$, the margin between the security equivalent return on the enterprise's loan and the (larger) amount of interest paid by the enterprise to its lender. Again, the borrowing enterprise generally will not be able to issue a debt security in lieu of the loan and does not see this margin distinctly from interest in general. It is seen instead by the enterprise's lender, and thus is paid by the lender, not the enterprise, which views account servicing on loans as interest and thus part of its cost of funds. From the borrower's point of view, the effect of this is again to make the loan specific reference rate $\hat{r}_{AF4L}$ simply the loan rate r_{AF4L} .

Asset management and the spread

59. The "spread" is generally understood to be the difference between the income on financial assets and the cost of the funds invested in those assets. The income on financial assets is simply $r'_{AFA}AFA$. From equation (14), the total cost of funds is $\hat{r}'_{AFL}AFL$, but to obtain the cost of funds invested in financial assets we would have to subtract from this the cost of funds invested in *nonfinancial* assets, which is simply the overall cost of funds as a rate of return applied to nonfinancial assets. We can thus define the spread as

lending enterprise the full amount of loan interest, they just do not see any of it as a service charge—it is all interest to them. The service charge is still in the loan rate, of course, but the argument is that *funders* are the agents that can see this service charge and effectively pay it (otherwise, they would get the full amount of loan interest paid by the borrower rather than the interest net of account servicing as well as asset management services). Granted, there are instances where lenders may actually try to get borrowers to cover part of the loan servicing cost explicitly. Some lenders, for example, offer mortgagees with monthly amortization schedules the option of biweekly amortization schemes with automatic draft payment in return for a one time, explicit fee. The benefit to the borrower is a more rapid amortization of the loan and lower total interest payments over the life of the contract. Were the annual percentage interest rates on loans with biweekly repayment schemes higher than the interest rates on loans with monthly payment schemes, other things equal, we would have evidence of an implicit, FISIM account servicing fee visible to and paid by the borrower. Light might be shed on this with a detailed data set of loan contracts (which is not that easy to obtain unless the analyst is employed by a lending institution) and a hedonic regression model. This said, however, it appears we are talking about very small amounts relative to total FISIM.

$$\begin{aligned}
S &\equiv r'_{AFA} AFA - \left(\hat{r}'_{AFL} AFL - \frac{\hat{r}'_{AFL} AFL}{t'_{AFL}} \cdot AN \right) \\
&= r'_{AFA} AFA - (\hat{r}'_{AFL} AFL - \bar{r} \cdot AN) \\
&= r'_{AFA} AFA - \bar{r} \cdot (t'_{AFL} - AN) \\
&= r'_{AFA} AFA - \bar{r} \cdot t'_{AFA} \\
&= (r_{AFA} - \bar{r} \cdot t)' AFA.
\end{aligned} \tag{30}$$

60. We know from equation (24) that $(r_{AFA} - \bar{r} \cdot t)' AFA$ is the sum of account servicing on financial assets and asset management services, thus the spread S is the sum of these two FISIM components. Regarding the spread, note that, while for the typical financial corporation the spread S will be positive, it need not be positive for enterprises such as manufacturers that predominantly use financial assets such as deposits with very low interest returns. Note that the spread does not include “risk intermediation.”

Risk intermediation

61. Risk intermediation in equation (27) is given by the quantity $(\bar{r} \cdot t - \hat{r}_{AFL})' \overline{AFL}$. Risk intermediation is paid by funders according to their positions in each of the three non-equity types of liabilities. Funders are able (or should be able) to see the difference between the average cost of funds and the security-equivalent interest they receive. In view of our assumption that the security equivalent returns on debt securities are just their observed returns, and our deeming the loan account servicing to be paid entirely by funders, the only security equivalent interest rate we need to determine in calculating risk intermediation is the security equivalent return on deposit liabilities $\hat{r}_{AF2DL}$.

Allocating FISIM output to users

62. We conclude that, other than account servicing FISIM on deposit assets and liabilities, the allocation of FISIM to using sectors—and by inference to intermediate uses (by enterprises) and final uses (by households, general government, and rest of the world)—thus should be in proportion to sector holdings of deposits, sector holdings of debt securities, sector holdings of loans, and sector holdings of equity claims on the enterprises in question. Under this “funders pay the spread” view, holders of the enterprise’s liability instruments pay for the entire amount of FISIM output, other than account servicing on deposit assets (which are considered intermediate consumption by the enterprise).

63. To draw out the implications of the foregoing for allocating output to using sectors and determining intermediate consumption and value added, we first note that under “funders pay the spread” the specific reference rate for loan liabilities is just the loan rate, so there are

no *de facto* account servicing intermediate inputs on loan liabilities.³⁸ By implication, we have

$$\hat{r}_{AF4L} = r_{AF4L} \quad (31)$$

so that the cost of funds in equation (15) now reads

$$\bar{r} \equiv \frac{\hat{r}_{AF2DL} AF2DL + r_{AF3L} AF3L + r_{AF4L} AF4L + r_{AF5CL} AF5CL}{t' AFL} \quad (32)$$

Requiring us now to find only a security equivalent rate of return for deposits $\hat{r}_{AF2DL}$ to determine the cost of funds $\bar{r}$.

64. Further define ψ as the value of asset management and account servicing FISIM over total liabilities:³⁹

$$\psi \equiv \frac{(r_{AFA} - \bar{r} \cdot t)' AFA}{t' AFL} = \frac{S}{t' AFL} \quad (33)$$

where the expression

$$\frac{(\hat{r}_{AFA} - \bar{r} \cdot t)' AFA}{t' AFL} = \frac{S}{t' AFL}$$

in equation (33) follows from the definition of the spread S in equation (30). Thus ψ is the spread as a percentage of total liabilities = total assets.

65. We are now in a position to posit the following:

³⁸ Note that, from the loan supply side, it is entirely possible for the provider of credit services to see and evaluate the difference between loan interest rates and alternative debt security investments

³⁹ Note that in this paper we assume that nonfinancial assets do not generate income directly in the form of monetary rents. If they do generate such monetary returns, these also would be included in the numerator of equation (33) in calculating the asset management component of FISIM.

PROPOSITION: If the spread is positive the SNA reference rate for *allocation* of FISIM to users rr should be the cost of funds plus the spread as a percentage of total liabilities, and should be the cost of funds otherwise:

$$rr \equiv \begin{cases} \bar{r} + \psi & \text{if } \psi > 0 \\ \bar{r} & \text{otherwise} \end{cases} \quad (34)$$

where $\psi = \frac{\hat{r}'_{AFL} AFL + S}{t' AFL} = \left(\frac{S}{AFA} \right) \frac{t' AFA}{t' AFL}$ is the spread as a proportion of total liabilities.

The reference rate rr thus will be higher than the cost of funds $\bar{r}$ if $\psi > 0$, implying that financial assets as a whole generate a portfolio level asset management output. On the other hand, if $\psi < 0$ financial assets as a whole are associated with an asset management input and have no effect on rr .⁴⁰ Further, the uses reference rate rr will converge on the cost of funds (i.e., the output reference rate) $\bar{r}$ as the share of financial assets in total assets

$$\frac{t' AFA}{t' AFL} = \frac{t' AFA}{t' AFA + AN}$$

converges to zero. Thus, for corporations with holdings of long maturity, risky assets, the reference rate will lie above the cost of funds (the spread is positive) and financial assets are associated with asset management service output. For investment funds, for example, with financial asset shares near 1, and 100 percent equity funding, ψ becomes the so-called “expense ratio.” For enterprises with holdings of short, safe financial assets with yields below their costs of funds, financial assets are associated with inputs of risk intermediation and asset management services purchased from another enterprise, plus the difference between their total capital service production and these purchased intermediate consumptions—this difference being the capital service produced for own use from these financial assets by their owners. Thus, when the spread is negative, services from financial assets are divided between intermediate consumption (deposit assets) and primary, capital services (other financial assets).

66. When $\psi > 0$, we can then rewrite output from equation (24) in terms of its allocation to the instruments held by the owners of claims on the enterprise as

⁴⁰ We will consider below how much of this input is purchased from the issuers of these asset instruments and how much is generated as a capital service for own use by the owner of these instruments.

$$\begin{aligned}
& p'y + (\bar{r} \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - \bar{r} \cdot \iota)' AFA \\
&= p'y + ((rr + (\bar{r} - rr)) \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - (rr + (\bar{r} - rr)) \cdot \iota)' AFA \\
&= p'y + (rr \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - rr \cdot \iota)' AFA + (\bar{r} - rr) \cdot (\iota' \overline{AFL} - \iota' AFA) \\
&= p'y + (rr \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - rr \cdot \iota)' AFA + (rr - \bar{r}) \cdot (\iota' AFA - \iota' \overline{AFL} - (\iota' AFA - \iota' AFA)) \\
&= p'y + (rr \cdot \iota - r_{AFL})' \overline{AFL} + (r_{AFA} - rr \cdot \iota)' AFA + (rr - \bar{r}) \cdot (AF5CL - AN) \\
&= p'y + (rr \cdot \iota - r_{AFL})' \overline{AFL} + (rr - \bar{r}) \cdot AF5CL \text{ when } rr = \frac{r_{AFA}' AFA + \bar{r} \cdot AN}{\iota' AFA} = \psi + \bar{r} \\
&= p'y + (rr \cdot \iota - r_{AFL})' \overline{AFL} + \psi \cdot AF5CL \\
&= \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL.
\end{aligned}
\tag{35}$$

where we end equation (35) on the last line with the same cost expression as in equation (24). Notice first that this is essentially a transformation of variables on the output side of the output = cost identity and does not affect total FISIM, just the financial instruments with which its *uses* (as opposed to *sources*) are associated. Note also from the expression on the left hand side of the last “=” in equation (35) that the effect of introducing the uses reference rate rr is to make the *allocation* of FISIM output determined by non-equity liability positions $\overline{AFL}$ and equity capital $AF5CL$, while *eliminating* financial assets as an allocation argument. Equation (35) clearly specializes to the investment fund case of 100 percent equity capital funding and an “expense ratio”-type service charge rate of ψ on equity invested.

67. The bottom line from equation (35) is that if the logical bearers of FISIM charges associated with financial assets are an enterprise’s *funders* rather than its *borrowers*, the result—when there is a positive spread over the cost of funds for financial assets—is the reintroduction of equity as one of the drivers of the *allocation* of FISIM to uses, notwithstanding the lack of equity account servicing FISIM *output* under the “no FISIM on own funds” assumption.

68. This approach allocates FISIM to its using sectors according to those sectors’ claims on the enterprise in the form of the four types of instruments—deposits, debt securities, loans, and equity—on the liability side of its balance sheet. It allows us to have a uniform treatment of all types of financial intermediaries, including those 100 percent financed with equity, such as unleveraged “no-load” investment funds, whose FISIM-type “expense ratio” service

charges are levied on their equity investors.⁴¹ *By pro-rating asset management FISIM to liability holders, it recalls the 1953 SNA's allocation of the entire net property income of financial institutions to those institutions' liability holders.*⁴² Because it combines the 1993 SNA's explicit user cost characterization of FISIM output with the 1953 SNA's "funders pay" view of the allocation of FISIM to using sectors, we might call this a *1953/1993 synthesis* of views on FISIM.

69. For completeness, consider as well the output = total cost equation (29) for archetypical nonfinancial enterprises. There, since there is no positive spread, the output allocation reference rate rr (where rr sets the implicit user cost price at which indirectly measured services are sold to funders), is just the cost of funds $\bar{r}$ and equation (29) continues to hold for allocation of (risk intermediation, if any) output to using sectors.

D. Intermediate consumption and operating surplus

70. For archetypical *financial corporations*, we can show intermediate consumption in equation (35) by adding to and subtracting from the cost side the purchases of FISIM from elsewhere, say, sector 0— $\left(rr^0 \cdot \iota - r_{\overline{AFA}}\right)' \overline{AFA} + \left(rr^0 - r_{AF51A}\right)'_{+} AF51A$. This not surprisingly reduces operating surplus by the amount of intermediate consumption of FISIM. This produces the expression

$$\begin{aligned}
 \text{Output} \equiv P1 &= p'y + \left(rr \cdot \iota - r_{\overline{AFL}}\right)' \overline{AFL} + \psi \cdot AF5CL \\
 &\equiv \text{Total cost} \\
 &= \overline{P2} \quad \quad \quad [\text{Directly measured intermediate consumption}] \\
 &\quad + \left(rr^0 \cdot \iota - r_{\overline{AFA}}\right)' \overline{AFA} \quad \quad [\text{Indirectly measured intermediate consumption}] \\
 &\quad + \left(rr^0 - r_{AF51A}\right)'_{+} AF51A \quad [\text{Indirectly measured intermediate consumption}] \quad (36) \\
 &\quad + D1 + D29 - P51c \\
 &\quad + \left[\bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL\right. \\
 &\quad \left. - \left(rr^0 \cdot \iota - r_{\overline{AFA}}\right)' \overline{AFA} - \left(rr^0 \cdot \iota - r_{AF51A}\right)'_{+} AF51A\right]. \quad [\text{Gross operating surplus}]
 \end{aligned}$$

⁴¹ Note that this would imply a clarification of the 2008 SNA treatment of investment funds, whose output is described only in terms of the difference between the buying and selling prices of their shares. The treatment here would add these funds' "expense ratios" to their 2008 SNA outputs.

⁴² Without the 1953 SNA's limiting the scope of liability holders to depositors.

Equation (36) may need a little explaining. The first indirectly measured intermediate consumption item, $(rr^0 \cdot \iota - r_{\overline{AFA}})' \overline{AFA}$, can be viewed from the sector 0, counterparty side as $(rr^0 \cdot \iota - r_{\overline{AFA}})' \overline{AFL}^0$. The latter expression is the FISIM output associated with the debt issued by sector 0. It will essentially always be nonnegative, and we simply add it to intermediate consumption and subtract it from operating surplus. The second indirectly measured intermediate consumption item, $(rr^0 - r_{AF51A})_+ AF51A$, is viewed from the sector 0, counterparty side as FISIM output of sector 0 and its positivity implies that $rr^0 > r_{AF51A}$, so that holders of equity issued by sector 0 receive (and pay for) FISIM. If $rr^0 < r_{AF51A}$, it is viewed from the sector 0, counterparty side as primary input, so that holders in the present sector of equity issued by sector 0 provide primary, risk bearing services to sector 0. In this later case, it does not appear in the intermediate consumption of the present sector, but does appear in the operating surplus of sector 0 as a primary service.

71. For archetypical *nonfinancial enterprises*, the spread is negative—

$(r_{\overline{AFA}} - \bar{r} \cdot \iota)' \overline{AFA} < 0$. In this case, we subtract it from both sides of equation (35), financial assets are associated with *inputs* of capital (primary) services, and the output = cost equation now appears

$$\begin{aligned}
P1 &= p'y + (\bar{r} \cdot \iota - r_{\overline{AFL}})' \overline{AFL} \\
&= \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL - (r_{\overline{AFA}} - \bar{r} \cdot \iota)' \overline{AFA} \\
&= \overline{P2} + D1 + D29 - P51c + \bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL + (\bar{r} \cdot \iota - r_{\overline{AFA}})' \overline{AFA} \\
&= \overline{P2} + (rr^0 \cdot \iota - r_{\overline{AFA}})' \overline{AFA} + D1 + D29 - P51c + \bar{r} \cdot AN \\
&\quad + (r_{AF5CL} - \bar{r}) AF5CL + (\bar{r} - rr^0)' \overline{AFA} + (\bar{r} - r_{AF51A}) AF51A \\
&= \overline{P2} \quad \text{[Directly measured intermediate consumption]} \quad (37) \\
&\quad + (rr^0 \cdot \iota - r_{\overline{AFA}})' \overline{AFA} \quad \text{[Indirectly measured intermediate consumption]} \\
&\quad + (rr^0 - r_{AF51A})_+ AF51A \quad \text{[Indirectly measured intermediate consumption]} \\
&\quad + D1 + D29 - P51c \\
&\quad + \bar{r} \cdot AN + (r_{AF5CL} - \bar{r}) AF5CL + \left[(\bar{r} - rr^0)' \overline{AFA} - (rr^0 - r_{AF51A})_+ AF51A \right] \\
&\quad \text{[Gross operating surplus].}
\end{aligned}$$

where $\overline{AFA}$ is the vector of debt instrument assets.

72. From equation (37), when the spread is negative, output again depends on liability positions only, and the reference rate for allocating output from the present sector to the funding sector 0 is simply the cost of funds $rr = \bar{r}$ of the present sector. From the counterparty, intermediate service providing perspective, within the indirectly measured intermediate consumption terms, $\overline{AFA} \equiv \overline{AFL}^0$ and $AF51A \equiv AF5CL^0$. In effect, the negative spread on financial assets (a.k.a., the user cost of financial assets as generators of primary input services)— $(\bar{r} \cdot \iota - r_{AFA})' AFA = -(r_{AFA} - \bar{r} \cdot \iota)' AFA > 0$ —splits into two components: intermediate purchases of FISIM on financial asset instruments issued from elsewhere as liabilities— $(rr^0 \cdot \iota - r_{AFA})' \overline{AFA} + (rr^0 - r_{AF51A})'_+ AF51A$ —and capital services produced for own use—

$$\begin{aligned} & (\bar{r} - rr^0)' \iota AFA - (rr^0 - r_{AF51A})'_+ AF51A \\ &= \left[(\bar{r} \cdot \iota - r_{AFA})' AFA \right] - \left[(rr^0 \cdot \iota - r_{AFA})' \overline{AFA} + (rr^0 - r_{AF51A})'_+ AF51A \right]. \end{aligned} \quad (38)$$

This will reduce the operating surplus of archetypically nonfinancial enterprises with negative asset spreads compared with a case not accounting for intermediate consumption of FISIM. Thus, for nonfinancial enterprises the effect of FISIM intermediate consumption is to offset to a greater or lesser degree their notional user cost of financial assets as primary inputs, classifying much of that flow as purchased from the risk intermediating issuers of debt and equity liability instruments rather than originating as a primary service within the enterprise itself. In this nonfinancial enterprise case, financial assets are associated not only with intermediate consumption but also with capital primary service input.

73. In summary, we note the following regarding the impact of “funders pay the spread” on the intermediate and final consumption of other sectors. For the enterprise’s liability holders, those in the (nonfinancial and financial) corporations⁴³ sector will show their FISIM purchases as intermediate consumption. Households and general government will show FISIM on their holdings of enterprise liabilities as private and public final consumption, respectively. FISIM on nonresidents’ holdings of enterprise liability instruments will be shown as exports.

E. Does SNA FISIM only apply to financial enterprises?

74. So far, all of the accounting above has involved straightforward algebra and, if applied to *every* enterprise in the economy, should yield consistent and interpretable results.

⁴³ Including the quasi-corporations controlled by households and general government.

However, since 1953, the SNA has excluded recording FISIM from any enterprise that is not a financial corporation. Is this a meaningful restriction? The 2008 SNA says the following of financial corporations:

4.98 Financial corporations consist of all resident corporations that are principally engaged in providing financial services, including insurance and pension funding services, to other institutional units. ...

The production of financial services is the result of financial intermediation, financial risk management, liquidity transformation or auxiliary financial activities. Because the provision of financial services is typically subject to strict regulation, it is usually the case that units providing financial services do not produce other goods and services and financial services are not provided as secondary production.

4.99 One form of financial innovation has seen a substantial growth in activity of a kind traditionally carried out by, or through, financial corporations but that may also be done directly by non-financial enterprises themselves. For example, there is a tendency in some countries for producers or retailers of goods to provide consumer credit directly to their customers. Another example is the tendency for non-financial enterprises in some countries to raise funds themselves by selling their own obligations directly on the money or capital markets. However, the enterprise as a whole must continue to be classified as nonfinancial provided that:

- a. A non-financial enterprise does not create a new institutional unit, such as a subsidiary corporation, to carry out the financial activity; and
- b. The financial activity remains secondary to the principal activity of the enterprise.

And further

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.

So the SNA applies FISIM only to the financial intermediation activities of corporations whose principal activity is financial services of some kind, among these services being financial intermediation.

75. What does our general accounting framework say about distinguishing between corporations that are and are not “principally engaged in providing financial services?” In practice, enterprises are classified into activities by the plurality of their nominal, current price output. Thus, if an enterprise’s output, including FISIM, has the highest share of financial services in, for example, ISIC, Revision 4 activity 64 – Financial service activities, except insurance and pension funding,⁴⁴ then it would be considered a financial enterprise.⁴⁵ All of our analysis to this point would apply to setting up the accounts for this enterprise, following the SNA’s rules.

76. But what about nonfinancial enterprises (all the rest)? For these entities, FISIM output is disallowed in the SNA. Hence *all* of the FISIM margin terms on the left hand side of equation (35) are subtracted from both sides for nonfinancial enterprises, *including the positive margins, if any*. Although this treatment is not really consistent, it might not be quantitatively important if the aggregate positive FISIM term in the left hand side of equations (35) (for leveraged and unleveraged nonfinancial enterprises) is negligible relative to explicitly charged output $p'y$.⁴⁶

77. Is risk intermediation FISIM small for nonfinancial enterprises relative to their directly charged output? As with financial enterprises, by the “no FISIM on own funds” assumption that the reference rate for equity is equal to its observed return, equity liability

⁴⁴ This activity comprises the following

641 - Monetary intermediation

642 - Activities of holding companies

643 - Trusts, funds and similar financial entities

649 - Other financial service activities, except insurance and pension funding activities.

⁴⁵ From the 2008 SNA language the secondary financial intermediation service production and the associated FISIM from enterprises classified in

65 – Insurance, reinsurance and pension funding, except compulsory social security

66 – Activities auxiliary to financial service and insurance activities

also would be counted in output, because they also are financial corporations (ISIC Chapter K). See the International Standard Industrial Classification of All Economic Activities, Rev.4 at <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>.

⁴⁶ Note that deposit liabilities are insignificant for all sectors except deposit taking corporations (S121 Central bank and S122 Other deposit taking corporations). Consequently, unlike deposit taking corporations, their reference rate calculations, as conceived in this paper, involve no unknown account-specific deposit services.

FISIM will be identically zero. The FISIM margins for debt (debt securities and loans) will be positive because the allocation reference rate rr will usually exceed the rate paid on debt, and debt is likely to be an important component of liabilities for some sectors, in the neighborhood of 40 percent in the US “corporate nonfinancial business” sector, compared with about 90 percent for “corporate financial business.”⁴⁷ As we observed earlier in the section on the reference rate, the equity holders of a leveraged nonfinancial enterprise are supplying a risk bearing service to the enterprise’s debt holders, by analogy to the SNA’s treatment of financial enterprises. So there is the potential for non-negligible FISIM associated with the debt financing of nonfinancial enterprises within all of the SNA institutional sectors besides the financial corporations sector. However, to the extent that leverage is not too high, and the residual maturity of the debt of nonfinancial enterprises is long, the market rate paid to an enterprise’s lenders will be, in normal, upward sloping yield curve situations, closer to the expected value of equity holders’ profit, and risk intermediation relatively small for nonfinancial enterprises. This is ultimately an empirical question.⁴⁸

78. At the end of the day, there are two consistent ways of treating risk intermediation: delete it from financial sector output, or retain it in financial sector output but also include it in the output of the nonfinancial sectors. The potential of the existing SNA treatment of FISIM for skewing our view of the economy thus lies in omitting FISIM’s small part of the typically large share of value added originating in the nonfinancial sectors. FISIM has a significant share of the output of financial corporations, largely though not exclusively as a result of the concentration of deposit liabilities in the financial sector and high levels of leverage. It is reasonable to expect that eliminating risk intermediation from FISIM will have a bigger downward proportional impact on financial corporations’ share in aggregate value added than the upward proportional impact of including FISIM in the output of nonfinancial enterprises on their share in value added.

F. The fulcrum of the debate: Risk intermediation and the equity premium

Comprehensive risk accounting

79. The Introduction noted the consequential debate on the treatment of maturity and risk premia in FISIM, with some analysts arguing that it has no place in FISIM. There appears to be no disagreement that the account servicing component of FISIM should continue to be

⁴⁷ See the US integrated macroeconomic accounts at www.bea.gov, with the caveat that the equity share for US financial business is significantly understated by book value accounting of nonfinancial assets in much of the source data for the US financial business sector.

⁴⁸ An additional complication to the conjecture on the relatively small size of risk intermediation for nonfinancial as compared with financial enterprises is the SNA’s valuation of loans, which like deposits and other accounts receivable/payable, are valued at historical cost, contrasting with all other financial instruments, for which the SNA prescribes market valuation.

counted as financial output, and we argue here that there should be little doubt that, when the spread is positive, the asset management component of FISIM should remain in FISIM. Thus, we characterize this debate as really about the treatment of what we have termed here the “risk intermediation” component of FISIM. Framing the debate this way, Wang, et al can be viewed as saying either

- that risk intermediation is not production, because risk bearing is not a productive service, or
- taking the more nuanced position of Colangelo and Inklaar (2012), that risk bearing is, perhaps, a primary service, but the SNA has never explicitly recognized it as such, and, until more comprehensive risk accounting is incorporated into the SNA, compensation for risk bearing should be excised from the production account; and that taking risk and maturity remuneration out of FISIM is a less radical change to the SNA than incorporating comprehensive risk accounting would be.⁴⁹

80. The first of these two views on risk intermediation does not square with the fact that equity funders of leveraged enterprises generally get a premium over the cost of funds compared with debt funders, so financial risk bearing is a service of demonstrable market value. However, the second view provides food for thought. The SNA has included risk intermediation in the output of financial corporations for over 60 years, and elimination of risk intermediation from FISIM has a rather large impact on the nominal level and share in GDP of financial services output. Granted, it is hard to agree with the Colangelo and Inklaar assertion that eliminating financial risk bearing (measured by the equity premium) from the SNA production account would be a less radical change to the system than leaving it in (and possibly extending measurement of risk intermediation to nonfinancial enterprises).

⁴⁹ Colangelo and Inklaar (2012, pp. 143-44) note the following

Our proposed methodology [to include in FISIM only what is termed in the present paper “account servicing”] would be a conceptual improvement, because it strengthens the internal consistency of the System of National Accounts (SNA). By excluding the compensation for risk-bearing from bank output, the financing mix of a firm (bonds versus bank loans) would no longer affect firm value added and bank output would no longer change if the bank decides to securitize and sell loans rather than keep those loans on the balance sheet. This represents a modest adjustment to the SNA, but it is certainly not the only possible adjustment to improve consistency.... Households could be credited with risk-bearing output from holding bonds and equity and the output of insurance firms could be set equal to gross premiums, rather than premiums minus expected losses, to reflect riskbearing output. This would require an expansion of the set of inputs recognized under SNA: not only labor, fixed capital, and intermediate inputs (i.e. the output of other industries) would provide income, but also financial capital. In turn, the value from risky activities, such as investing in new ventures, would shift from where it is created to where the income from it ends up. We do not argue that such an alternative system would be conceptually better or worse, merely that it would require a much more drastic adjustment to the current system than our proposed adaptation to the measurement of bank output.

However, Colangelo and Inklaar also sketch a conjecture that accounting for financial risk bearing should look through to the ultimate bearers of financial risk, and they suggest that households are the ultimate bearers of financial risk.

81. This paper shows that the SNA contains a coherent risk accounting system, oriented, as Colangelo and Inklaar (2012) put it, toward accounting for financial risk according to “where [the income from financial risk bearing⁵⁰] is created” in leveraged enterprises rather than “where the income from it ends up” in the sectors owning the equity of leveraged enterprises. Colangelo and Inklaar are most interested in seeing a presentation of the data showing “where the income from it ends up.” We suggest that this would be feasible from the current core SNA framework (extended, perhaps, to include the risk intermediation originating from nonfinancial enterprises as well as financial) by showing for each sector the breakdown of its equity liabilities (including net worth) by counterparty sector. The equity risk premium could then be allocated by these equity shares to show each counterparty sector’s contribution of financial risk bearing services to the sector of interest. This would not result in households as the sole financial risk bearing sector, as Colangelo and Inklaar suggest—all sectors are likely to participate in a given sector’s equity capital in some degree, but it would show the destination sector of the income represented by a given sector’s total equity risk premium.⁵¹

82. Since leverage risk-bearing by equity holders is a financial service, were this service to be shown as produced by equity holding sectors rather than as risk intermediation through debt issuing enterprises, the output and value added of the financial services sector as a whole be about the same, but the sector would now show diminished importance of financial services output from financial corporations and greater importance of output from other sectors including the rest of the world. Because the allocation of financial services to using sectors would follow the holdings, by sector of holder, of the liabilities of enterprises, under the funder pays principle proposed in this paper, total financial services output would not only be about the same, but would be allocated about the same across *using* sectors.

⁵⁰ This is, as we show in this paper, equivalent to the equity risk premium over the cost of funds (the latter a.k.a. the Modigliani-Miller cost of capital).

⁵¹ Note that were the accounts presented with inter-enterprise holdings consolidated out (for resident enterprises), households probably would become prominent originators of risk bearing, as Colangelo and Inklaar suggest, as well as general government and the rest of the world. On the other hand, post crisis, analysts have pointed to the lack of inter-enterprise financial positions as a key data gap in understanding financial interconnectedness and the channels through which leverage risk is propagated. This would argue against dispensing with the SNA’s gross accounting of inter-enterprise positions and the associated flows. We suggest here that inter-enterprise financial positions remain associated with the production account because the income flows from them represent payment for services—others might argue that they be considered what the SNA calls “other flows” such as revaluations or “other changes in the volume of assets,” or that they be treated just as “distributive” or “allocative” flows not associated with production.

Risk intermediation and capital services from financial assets

83. The monetary aggregation literature beginning with Barnett (1978, 1980) has consistently analyzed services from financial instruments from the point of view of the *holders* of these instruments rather than their *issuers*. These instruments are *assets* to their holders, and can be viewed as yielding services through time whose values are measured by their user costs to the holders. These services are measured the same way as they would be from a nonfinancial capital asset, in terms of the cost of holding the asset for one period.⁵² Thus, the one period capital service yielded to the holder of an asset, financial or nonfinancial, evaluated ex post⁵³, is

$$\begin{aligned} \text{Capital services} = & \quad [\text{Opportunity cost rate on funds invested} \\ & + \text{Depreciation rate} \\ & - \text{Income rate paid on the asset by the issuer, if any}] \\ & \times \text{End of period value of the asset.} \end{aligned}$$

Depreciation is understood in this equation to encompass change in the market value of the asset by the end of the period, comprising the change in value due to change in the market price of an asset with given characteristics as well as change in the characteristics of the asset. Change in asset characteristics could arise, for example, from deterioration through use that is not offset by maintenance, or from enhancement as a result of capital improvements. For financial assets, the degree of uncertainty about future income flows would be an example of a price determining asset characteristic that could change over time.

84. The negative component of this formula labeled “Income paid on the asset” usually comprises interest, dividends, or rent receivable on the asset. It also includes, for equity instruments, enterprise profit. This income is not always monetary, however, and in the present financial instruments/financial services context, partly comprises indirectly measured financial services, or FISIM provided from the enterprise issuing the financial asset that is *purchased* by the holder of the asset. This purchase is undertaken by the instrument holder accepting less than the property income, determined by the FISIM allocation reference rate *rr* applied to the value of the instrument he holds, to which he would otherwise be entitled. Equation (38) expresses this precisely, because it shows purchased FISIM—comprising purchased risk intermediation and asset account servicing, as well as asset management in the event the supplier of FISIM is earning a positive spread on financial assets—offsetting the value of capital services produced for own use from financial assets in determining the user cost of financial assets within operating surplus. As noted above, account servicing and asset

⁵² OECD’s *Measuring Capital* (2009) is the definitive statistical reference on the subject.

⁵³ Diewert, Fixler, and Zieschang (2012) derive both the ex ante and ex post user cost formulas.

management are (or should be) noncontroversial components of the indirectly measured services component of “Income paid on the asset as services in lieu of payment.” Risk intermediation is the more controversial component. What is left over is the “user cost,” the value of capital services the owner of the asset effectively produces from it for own use. If the opportunity cost rate on funds invested for the holder of the asset is higher than the depreciation rate less the income earned on the asset, the holder is generating capital services for own use on the asset equal to the, therefore positive, “user cost.” Otherwise, the holder is providing primary, financial capital services to the issuer of the instrument.⁵⁴

85. Note that there is no “arbitrage inconsistency” introduced by the SNA’s de facto treatment of capital services from financial assets. If a financial asset is owned directly by an institutional unit, then that unit manages diversification of its overall wealth, which then includes that asset for production of asset management services for own consumption. If the asset is owned by an investment fund, whose shares are then owned by the aforementioned institutional unit, then the unit gets the financial income on the asset less the investment fund’s asset management fee, while the investment fund gets the asset management fee. The sum of the two still exhausts the interest paid out on the asset. However, the first institutional unit now owns a different asset—shares in an investment fund—rather than the original financial instrument, and is getting asset management services (e.g., diversification and access to assets sold only in large denominations) in return for accepting less than the interest on the original asset.⁵⁵ If the unit is offered participation in the investment fund with a debt

⁵⁴ For an enterprise with a negative spread on financial assets, observing negative values for the user cost of financial asset inputs after accounting for the purchased FISIM associated with financial assets is possible but likely to be the exception rather than the rule. A unit holding individual asset issues itself rather than a managed portfolio of such assets from another supplier is unlikely to persistently buy an asset management service from that another enterprise, if the supplier’s FISIM allocation (and charging) reference rate rr^0 is higher than the purchasing unit’s own cost of funds $\bar{r}$. This is a type of “make or buy” decision. See equation (38).

⁵⁵ Wang, Basu, and Fernald (2009) raised this consistency issue by reference to “a bank that does nothing.” If, in the text example, the investment fund intermediary actually does nothing, then the characteristics of the equity stake in the investment fund that the institutional unit owns are identical with those of the security on the asset side of the investment fund’s balance sheet. By implication, the equity in the fund should have the same price as the security on the asset side of its balance sheet, because it is the same asset. However, if the investment fund has managed to extract a fee, this pricing equality will not hold between the security it holds and the equity it issues. If no asset management service is delivered no one will pay an asset management fee, of course, unless there is asymmetric information, and the unit will just own the original security directly. If the investment fund offers debt securities as a form of participation in addition to equity, then it also intermediates transformation of the risk bearing services of its equity holders into risk mitigation for its debt security holders. In the first case, the service may well involve making available participation in debt security instruments on the asset side, such as commercial paper and treasury bonds, that otherwise cannot be obtained in the small amounts that would be attractive to many investors. Over and above this, as noted above, a fund may offer debt security (or deposit) participation to investors in addition to equity. The point here is that “the bank that does nothing” does not seem a particularly compelling case to consider, particularly in moving away from equity financing to debt security financing on the liability side. If we were to consider it, it should be set up as a fund carrying debt

rather than equity instrument, the unit also is getting risk mitigation provided by risk tolerant equity holders in the fund as well, at the price of receiving a return that is lower than the average cost of funds to the investment fund.

86. If the institutional unit in question is a household, however, we can appeal to the above characterization of capital services from financial assets to highlight a consequence of the SNA's *production boundary*, that the financial service output of households producing asset management services for own use are excluded by convention, along with all other services produced for own use by households, *except* the services of owned dwellings.⁵⁶ This means that the FISIM purchased from financial enterprises is counted, while the same FISIM produced by households for own use is not. We suggest this is the true source of concern for Wang, Basu, and Fernald (2009) regarding consistency of treatment of financial services in the SNA. Were households' production of capital services for own use from their *direct* holdings of individual financial instruments included within the SNA's production boundary, the "value chain" from households through financial enterprises to the individual financial assets held by those enterprises would show the same total value as when households are able to hold those assets directly.

87. From equations (21) and (24)-(28), the SNA treatment of what we call risk intermediation

$$\left(\bar{r} \cdot \iota - \hat{r}_{AFL} \right)' \overline{AFL} = \left(r_{AF5CL} - \bar{r} \right) AF5CL$$

views a leveraged enterprise as mediating the assumption of risk by its equity holders from its debt holders in return for a fee given by the equity premium. The SNA assigns the nominal value of this service to the mediating enterprise, if the enterprise is a financial corporation. The presumptive reasoning is that the debt instruments are secured by the issuing enterprise's assets and are serviced from the operating profits of the same issuing enterprise. Risk intermediation $\left(\bar{r} \cdot \iota - \hat{r}_{AFL} \right)' \overline{AFL}$ thus appears on the output side of the enterprise's output = cost equation in the form of FISIM-type margins between the cost of capital and the security equivalent value of the institution's debt liabilities. The equity premium over the cost of capital $\left(r_{AF5CL} - \bar{r} \right) AF5CL$ appears as the equivalent expense component on the cost side within the remuneration to capital assets (a.k.a., operating surplus).

security assets and financing them with equity liabilities only. And, in any case, "the bank that does nothing" does not demonstrate an inherent flaw in the SNA's risk accounting.

⁵⁶ See 1993 SNA paragraphs 1.22 and 6.14-6.36, and 2008 SNA paragraphs 6.28-6.31

88. As we noted earlier, there is a consistency problem with the SNA's treatment of "risk intermediation." While equations (21) and (24)-(28) also apply to leveraged nonfinancial enterprises, the SNA does not include the equivalent risk intermediation flow in their output. From a consistency point of view, this could be dealt with by including these services in their output as well, with the note that this would increase their nominal output above what they receive in monetary income from sale of their nonfinancial output. In the typical economy, nonfinancial enterprises as a group are much less leveraged than financial enterprises are as a group. So compared with financial corporations, risk intermediation would be a significantly smaller part of the total output of nonfinancial enterprises compared with financial corporations. On the other hand, in most economies nonfinancial output is very large relative to financial output, so a small percentage increase in nonfinancial output attributed to risk intermediation is not necessarily a small number in absolute (as opposed to percentage) terms compared with financial corporation FISIM. Its importance in the economy as a whole would thus need to be assessed empirically. However, from a growth and productivity measurement perspective, the impact of recognizing risk intermediation for leveraged nonfinancial enterprises is still likely to be rather small, because it would have only a small upward impact on their nominal share in value added, with this share increment related to a relatively small weight for risk intermediation in their output indexes.

89. Enterprises purchase risk bearing services from holders of equity claims in the form of a premium over the cost of funds comparable to those enterprises' risk intermediation outputs. Equity holders thus are suppliers of a financial risk bearing input—a primary service—to enterprises. As with the owners of debt claims against enterprises and thus the consumers of risk intermediation, the owners of equity claims/providers of risk bearing can be from any institutional sector of the economy. Thus, the "raw material" of risk intermediation is the risk bearing provided by holders of equity claims across the economy, to which debt financed enterprises may add other inputs comprising part of their intermediate consumption (including risk intermediation), labor, and nonfinancial asset services, in order to produce risk intermediation output.

90. An additional feature of SNA risk accounting is that all institutional sectors both supply risk bearing primary services to enterprises, and consume the risk intermediation output of leveraged enterprises, depending on the composition of sector financial portfolios. Sectors can tune their risk exposures through their relative debt and equity positions. Tracing this through the economy, and allocating FISIM to using sectors following the "funder pays" rule, requires balance sheet information by institutional sector, broken down by counterparty sector. These are referred to as "from whom-to whom" financial position data. These data are available in varying degrees in the sectoral financial position and flow accounts of several

advanced economies, and will be increasingly available from G-20 countries over the next five to ten years.⁵⁷

91. In a very real sense, the risk accounting just described is a key dimension of assessing the degree of financial interdependence and systemic vulnerability that has been the focus of policy analysts in the wake of the 2008 financial crisis, and is a key feature of the linkage between the financial and real sectors of the economy. We also would highlight the connection between equation (28) and the monetary aggregation literature. From Barnett's (1978) work and the large literature it spawned, we know that this risk bearing-risk intermediation link is essentially the same nexus through which we would assess the amount of liquidity (money) in the economy. This said, the question remains whether this has any role in the production account as the SNA's current treatment suggests, or whether it impacts the production account only in a the binary sense that enterprises are liquidated when leverage gets too high or becomes negative, but otherwise has no effect on enterprise operations. In the latter view, enterprise operations are affected only by the average cost of funds, but not by the composition of funding.

92. To summarize this section, the SNA effectively says that the controversial FISIM component, risk intermediation, is received by the owners of debt claims *from the issuing (financial) enterprises*. This effectively reduces the value of capital services the owners of these debt claims produce on their own account from these instruments, and assigns that value to the risk intermediating enterprise. To supply these services to its debt holders the enterprise purchases risk bearing services from its equity holders in return for an equity premium over its average cost of funds. What we could call "extended SNA risk accounting" would add the risk intermediation output of *nonfinancial* enterprises to the risk intermediation the SNA already recognizes from financial corporations, and would allocate that total risk intermediation output to uses via a "funder pays" principle, independently according to sector holdings of each of the four type of funding instrument.

93. As a final note on the SNA approach to risk accounting in the production account, the SNA does effectively view financial corporations as operating, in respect of their marketing of equity holders' risk bearing services to debt holders, a *transformation* rather than *intermediary* production process. Risk bearing is treated in the same way as other *primary inputs* such as labor. Enterprises pay a service charge to equity holders, and then pass that cost through to the value of the service provided to debt holders. Thus households and other institutional units provide risk bearing primary services, and, while financial corporations effectively stand between risk bearers and other institutional units desiring to mitigate risk, the accounting effectively includes the "cost of goods sold" (risk bearing) in the "risk mitigation" service output. By contrast, an intermediary approach, such as described by

⁵⁷ See, e.g., <http://www.imf.org/external/np/seminars/eng/2011/sta/index.htm> for information on the G-20 Data Gaps Initiative regarding sectoral national accounts data, including "from whom-to whom" financial positions and flows. See also Shrestha, Mink, and Fassler (2012).

Colangelo and Inklaar (2012), would subtract the risk bearing primary service value from the value added of the risk mitigation service output of the debt issuing enterprise. To do this risk bearing would have to be seen, not as a primary input to financial corporations, but as an intermediate input purchased from some other enterprise. This splits the hair pretty finely as to how we understand the nature of a capital primary service, as nonlabor primary services, while directly associated with the capital assets the enterprise owns, normally are associated ultimately with the owners of the enterprise.

94. Although they consider the possibility of risk accounting in the production account, Colangelo and Inklaar (2012) suggest placing a household production process between the household's supply of risk bearing and the using financial (or other) enterprise. By analogy, were we to do this with labor primary services, while we would measure output the same, we would not count labor compensation in primary inputs, but as the intermediate consumption of a "help supply" enterprise operated by the household providing the labor. Value added now appearing as compensation of employees of enterprises would appear instead as the output of a household enterprise that is then sold to corporations as help supply services. In that case, the accounts would show no labor primary input in the corporations sector—only intermediate consumption of non-household enterprises provided by household sector "help supply" enterprises. In the case of risk bearing, household sector "insurance" enterprises would use household net worth as insurance reserves along with household nonfinancial assets to sell risk mitigation services to enterprises in proportion to their equity holdings in those enterprises, which, in turn, would show it as intermediate consumption rather than primary services. Such an extended accounting framework also would need to recognize, in principle, the production of capital services (principally asset management) for own consumption of households holding undiversified financial assets. The quantitative importance of this latter item would need to be empirically assessed before recommending its inclusion in the core national accounts, relaxing the current production boundary to include not only shelter services produced for own use but also financial services produced for own use.

Productivity and risk accounting

95. Productivity accounting focuses on weighting output and input volume series together to form a summary index of relative change in the ratio of output to input. The weights are a function of shares of products in nominal output and the shares of inputs in nominal cost, as well as some measure of the elasticity of scale. Risk accounting, if considered integral with production activity, thus affects the weights of the volume components in aggregate productivity measures and de facto includes positions in financial instruments as both output and input arguments in productivity measures. That financial instruments are included as outputs is evident from the left hand side of equation (28) and that equity capital liabilities are included among inputs is evident from the right hand side of the same equation. Risk accounting is clearly responsible for the risk intermediation term—but not the account servicing and asset management terms—in the outputs on the left hand side of equation (28),

and is solely responsible for the equity capital liability term on the right hand side, which reflects traditional SNA FISIM accounting applied to financial (but not nonfinancial) enterprises. The principal quantitative impact of the risk intermediation component of FISIM is to significantly increase the importance of debt liabilities in determining output, and introduce equity capital as an input in addition to nonfinancial capital assets. From a productivity point of view, much of the impact of risk intermediation ultimately rides on the volume indicators for the services associated with the debt and equity funding of enterprises.

96. To calculate meaningful productivity statistics, equation (28) thus confronts us with determining exactly what “volume” or “quantity” means for financial instrument positions. Barnett’s approach, since the inception of the Divisia monetary aggregation literature with his 1978 *Economics Letters* paper, has been to deflate financial positions with a price index, and this recommendation surfaces as well in the price and volume chapter of the 1993 (Chapter 16) and 2008 (Chapter 15) versions of the SNA. This, of course, begs the question what kind of price index? This question has generally been answered in the literature dealing with the household demand for money in terms of the price index of goods and services yielding household welfare now and in the future. In general, the principle has been that the positions in various instruments would be measured in the units of the goods, services, or nonfinancial assets they could be expected to finance. Beyond deflation, Fixler and Zieschang (1992) provide a second mechanism through which volume “indicator” or “service quality” statistics can be used, if available, to determine the volumes of services associated with various financial instruments. In principle, the Fixler and Zieschang (1992) approach does not appear to conflict with using *both* deflation and service indicators to determine the output and input volumes associated with financial positions in an enterprise production function.

Presenting “risk accounting” within “production accounting”

97. Though risk bearing appears to be a legitimate primary service flow, should “risk accounting” be distinct from “engineering accounting,” and how should the production accounts be presented? A clear implication of equations (21) and (24)-(28) is that, provided we can calculate the cost of funds, which we suggest in this paper should not be that difficult to do, risk intermediation output and the associated risk bearing primary services can be distinguished in the data from other forms of production activity. It appears possible, then, to separately determine “engineering” production flows, which are based on 100 percent equity financing of the enterprise and thus would exclude risk intermediation on the output side and the equity premium on the input side of financial service production. An enhanced production account thus could show output of FISIM, as the SNA would measure were it using a cost of funds reference rate, with an “of which” for risk intermediation. The same

account could show intermediate consumption of FISIM, with an “of which” for risk intermediation.⁵⁸

G. Scaling up: What should national accountants do?

98. First, we will summarize the findings of this paper for computation of the FISIM output of a given enterprise and the allocation of that output to its uses among the sectors of the economy to which it is sold. Then we consider the implications of scaling these findings up to the SNA institutional sectors and total economy, finding that aggregation poses an additional wrinkle that could cause macroeconomic aggregate statistics on uses of FISIM output by sector not to be a simple scaling up of the individual enterprise case. This wrinkle speaks to the issue raised in Diewert, Fixler, and Zieschang (2012) about equating the supplies and uses of FISIM by sector if each sector’s average cost of funds differs. It is, however, the same type of issue routinely faced in compiling supply and use tables for the economy when there is heterogeneity in the average product prices across industrial or activity sectors resulting from variations in detailed product mix of the purchases of a given class of product across using sectors. We then consider some practical implications for macroeconomic statisticians compiling national accounts.

99. Our findings for individual enterprises, despite the occasional complexity of the identities we have visited in this examination of FISIM, summarize with appealing simplicity.

- **There is a single reference rate determining FISIM output for each institutional unit in the economy that is given by the cost of funds to that unit, which is the average return $\bar{r}$ that unit pays to the holders of all of its liabilities—this cost of funds is also known as the Modigliani-Miller (1958) cost of capital. $\bar{r}$ is given above in equation (32), which contains only one variable that does not come directly from the income statement and balance sheet. It is the security-equivalent return on deposit liabilities, which must be obtained by matching a market security to the maturity and risk characteristics of deposit liabilities.**
- **Based on the cost of funds output reference rate, FISIM comprises three components—account servicing output, asset management output (+)/ working capital management primary input (–), and risk intermediation output. In principle, any enterprise may generate all or any subset of the three forms of FISIM,**

⁵⁸ In the presentation of the accounts for intermediate consumption in this passage, we are assuming that all flows of FISIM are valued from the side of the supplier of FISIM. This does not mean that every unit in the economy has the same output reference rate, but by defining each sector’s reference rate as that sector’s average cost of funds, we effectively handle the cross sector balancing of purchases and sales of FISIM under differing sectoral reference rates that is noted by Diewert, Fixler, and Zieschang (2012). An implication of the approach here is that the within cell average output reference rates for cells defined by sector and counterparty sector can differ from cell to cell.

but, in general, financial enterprises will produce asset management and risk intermediation, while nonfinancial enterprises principally will produce risk intermediation, and risk intermediation is present only to the extent that enterprises are debt financed. *However, computing total FISIM output does not require knowledge of these individual FISIM components—the 1993 SNA determination of output, with the cost of funds reference rate, is sufficient.*

- **FISIM is sold to and used by the liability holders or funders of the enterprise—funders pay the spread.** *This is broadly consistent with the 1953 SNA, and is not necessarily at variance with the language of 1993 and 2008 SNA, depending on how the reference rate for allocating FISIM is set (see the next point).*
- **For each enterprise, the reference rate at which FISIM is sold— rr —is the cost of funds $\bar{r}$ plus the spread ψ if the spread is positive, and the cost of funds $\bar{r}$ otherwise.** *The introduction of a distinct reference rate for **allocating** output to uses when the spread is positive is not specifically included in the language of any version of the SNA, but is not necessarily precluded, either.* Thus, total FISIM output is allocated in proportion to the FISIM associated with each of the four types of instruments on the liability side of the balance sheet, using the allocation reference rate rr .
- **Recognition of risk intermediation is needed to account for the financial risk associated with the enterprise from which it originates, as in the present SNA treatment of financial corporations, but data on ownership of equity by economic sector would permit also showing the data by the sector receiving the income for supplying financial risk bearing primary services.** Risk intermediation thus should not be excised from enterprise accounts, but equity risk premia and risk intermediation services could be presented as “of which” items in such accounts, and additional presentations showing sector receipts of equity premium income may also have policy uses, in the spirit of the Colangelo and Inklaar (2012) conjecture by showing income by where it is generated rather than where it is used in production.

100. Scaling the above findings up to account for all enterprises producing FISIM and the nonfinancial corporations, financial corporations, general government, household, nonprofit institutions serving households, and rest of the world subsectors results in the macroeconomic accounting aggregates in standard SNA integrated macroeconomic accounts. The results of this paper provide us with a straightforward finding for compiling output, but a nuanced finding for allocating it across the using sectors.

- **There is a single reference rate determining FISIM output for each institutional sector in the economy that is given by the average cost of funds $\bar{r}$ across enterprises within that sector, which is the average return that the sector pays to**

the holders of all of its liabilities. This is the same finding we have for individual enterprises, merely scaled up to each SNA institutional sector or the total economy.

- **Based on the cost of funds output reference rate, FISIM comprises three components—account servicing output, asset management output (+)/ working capital management primary input (–), and risk intermediation output.** In principle, any sector may generate all or any subset of the three forms of FISIM, but, in general, financial corporations will produce asset management and risk intermediation, while nonfinancial corporations principally will produce risk intermediation, and then only to the degree they are debt financed. *However, computing total FISIM output does not require knowledge of these individual FISIM components—the 1993 SNA determination of output, with the cost of funds reference rate, is sufficient.* This is the same finding we have for individual enterprises, merely scaled up to each SNA institutional sector or the total economy.
- **FISIM is sold to and used by the liability holders or funders of the sector.** *This is broadly consistent with the 1953 SNA, and is not necessarily at variance with the language of 1993 and 2008 SNA, depending on how the reference rate for allocating FISIM is determined (see the next point).* This is the same for the sector and subsector aggregate as for the individual institutional unit/enterprise.
- **For each sector, the amount of FISIM purchased by a counterparty sector is determined by the sum across enterprises in the sector supplying FISIM to the counterparty sector.** This is not a simple application of the same principle for allocating the sector aggregate output to uses as for the allocation of the output of the individual enterprises within the sector to their counterparties. The average allocation reference rate rr determining the average user cost allocation of the output of a given sector to a given counterparty sector depends on the importances of individual enterprises in that sector regarding the liabilities they have to that counterparty sector. For a given sector aggregate of enterprises, we can expect these liability shares to vary across counterparty sector for each type of instrument. Consequently, the average allocation reference rate rr for a given sector's supply of FISIM to a counterparty sector can differ from counterparty sector to counterparty sector, because it weights the individual enterprise rr s within the sector depending on the counterparty sector receiving the FISIM output. *Note that, were the 1993 and 2008 SNA allocation principles applied at the enterprise level and aggregated up, they also would produce this non-isomorphic scaling issue in allocating output across sectors. Hence, this issue is not particular to the analysis of this paper, but it does not seem to have been recognized by the SNA's authors.*
- **Recognition of risk intermediation is needed to account for the financial risk associated with the enterprise from which it originates, as in the present SNA treatment of financial corporations, but data on ownership of equity by**

economic sector would permit also showing the data by the sector receiving the income for supplying financial risk bearing primary services. Risk intermediation thus should not be excised from enterprise accounts, but equity risk premia and risk intermediation services could be presented as “of which” items in such accounts, and additional presentations showing which sector receives the equity premium may also have policy uses, as in the Colangelo and Inklaar (2012) conjecture. This is the same as in our individual enterprise findings.

101. **Regarding the allocation of FISIM, the takeaway for compilers is that, as a first best approach, FISIM should be compiled at the enterprise level, allocated to the sectors that are the counterparties to the liabilities each enterprise has issued using the allocation reference rate rr of each enterprise, and then aggregated across enterprises into sectors.** Thus, we have essentially isomorphic results to for the sector to the individual enterprise case, except for the allocations of FISIM to users, and by implication to intermediate and final consumption.

102. **Compilers may not have access to income statements and balance sheets at the enterprise level, however.** In this case, a second best approach is to allocate FISIM in a given sector as if there were a single enterprise in the sector whose income statements and balance sheets are the sum of the same accounts of the individual enterprises within the sector. Here a single average allocation reference rate rr can be computed and applied to allocating FISIM to uses by counterparty sectors.⁵⁹

IV. CONCLUSION

103. This paper explores the algebra for FISIM accounting based on a straightforward cash flow identity, a framework that can represent a wide range of options for FISIM calculation. The paper shows the relationship between the reference rate(s) set for financial asset and liability instruments on an enterprise’s balance sheet, and the residually determined operating surplus. We argue that the reference rate for determining output is the average cost of funds $\bar{r}$, and that, in the absence of deposit funding, $\bar{r}$ is merely the average rate of monetary return paid to funders, including equity funders. In the presence of deposit funding, the reference rate is the average monetary return to funders, plus the value of account servicing provided to depositors. We propose that deposit account servicing be computed broadly following the methodology of Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012), which relies on the difference between a the rate of return on a security matched to deposits by maturity and risk, and the monetary interest depositors receive.

⁵⁹ The degree of error caused by this assumption is essentially an empirical question. It could work rather well as a rule of thumb.

104. This overall reference rate is key to showing that SNA FISIM comprises two additional identifiable and computable components besides account servicing: asset management and risk intermediation. The account servicing component is identified, as noted above, by the instrument specific approach to FISIM of Basu, Inklaar, and Wang (2011) and Colangelo and Inklaar (2012) applied to the entire financial balance sheet. Asset management services are the sum of margins comprising the difference between the debt security equivalent returns on assets (using the aforementioned matched security methodology) and the overall reference rate $\bar{r}$. The third, risk intermediation component of SNA FISIM is the difference between the cost of funds $\bar{r}$ and the debt security equivalent return paid on the enterprise's non-equity liabilities; that is, to its non-equity funders. The SNA's traditional exclusion of "own funds" from FISIM is present in this framework by setting the equity liability instrument-specific reference rate equal to the observed return on equity. Thus we integrate recent literature with older national accounting contributions to explain what SNA FISIM is. This tripartite characterization of output generates, in the aggregate, the algebraic FISIM output results of the 1993 SNA.

105. Moving from the output of FISIM to the uses of FISIM, we argue for a distinct "funders pay the spread" criterion for *allocating* indirect service charges that recalls the 1953 SNA. Thus, while non-equity funders pay the non-equity liabilities component of 1993 SNA FISIM, comprising liability (deposit) account servicing and risk intermediation, both non-equity funders and equity funders also pay for a pro-rata share of asset management services and asset account servicing. This allows us to precisely characterize SNA FISIM *nominal output* in terms of financial instruments *other than* equity liabilities, while showing that the *allocation of FISIM to uses* partly accrues to equity funders in high equity, low leverage contexts such as unleveraged investment funds and finance companies. Indeed, when leverage is zero and equity's share 100 percent, equity holders pay all of FISIM. Thus, the SNA FISIM paid by nonfinancial corporations, financial corporations, general government, households, and nonprofit institutions serving households is a function of their financial—including equity—claims against financial corporations and, we would argue, against leveraged nonfinancial enterprises with secondary SNA FISIM production.

106. This paper has touched on several aspects of the FISIM problem, identifying a number of moving parts to contend with in understanding the issues. The analysis here has pulled together some quite old measurement notions going back to the 1953 SNA—"own funds" are not associated with FISIM production—and the 1993 SNA—there is one reference rate (in this paper, the cost of funds) determining the output of financial asset services for an individual enterprise—and circling back to the 1953 SNA—"funders pay FISIM" under an allocation of the aforementioned output to its using sectors using a reference rate, distinct from that used to calculate output, that adds the "spread" as a fraction of total liabilities to the cost of funds. We also have clarified the treatment of the "risk intermediation" component of traditional SNA FISIM, incorporating it into a capital services treatment of financial instruments.

107. We have focused here on the characterization, computation, and allocation of SNA-type FISIM, but also note that the SNA's treatment of what we term "risk intermediation" is at the heart of recent critiques of the SNA FISIM accounting methodology. At the end of the day, the issue is whether to present the SNA production account, not just for financial corporations, but for all enterprises, with or without the value of the risk intermediation inherent in debt financing. Colangelo and Inklaar (2012) have argued that, to be consistent, leaving risk intermediation *and asset management* in FISIM requires us to account for the supply of risk bearing services from households, and that it is less radical surgery to the SNA to simply leave these two components, comprising half of FISIM, out of the production account. We would agree that consistency requires comprehensive risk accounting, but would assert that asset management must remain in FISIM, and are not so sure that articulating a comprehensive risk accounting framework within the existing system would be a more radical change to the SNA than excising risk intermediation from output altogether. As for the alternative risk accounting conjecture proposed by Colangelo and Inklaar to the extended SNA approach outlined here, it comes down to whether the presentation traces the transformation of risk bearing primary input into risk intermediation output *with* (extended SNA risk accounting) or *without* (Colangelo and Inklaar risk accounting) the enterprises issuing the associated financial instruments being treated as risk transfer intermediaries. In the absence of these extensions, the current SNA presentation with "of which" items for risk intermediation output and intermediate/final consumption flows is a better statistical goal for productivity and systemic risk analysis than eliminating risk accounting from the production account altogether. At the end of the day, the SNA's single reference rate principle for FISIM applied to a given enterprise balance sheet generates a perfectly serviceable and interpretable production account that integrates financial services—including risk bearing and risk intermediation—with nonfinancial production. Indeed, the SNA's de facto recognition of risk intermediation services lies at the heart of a presentation of accounts that tracks a key transmission channel between the financial and "real" sectors of the economy.

108. This paper has focused entirely on nominal ("current price" in SNA jargon) financial services and not on identifying the price and volume factors whose product gives the relative change in nominal FISIM. While the single reference rate determination of FISIM output and the "back to the future" allocation of FISIM only to funders—the 1953/1993 synthesis—explored here would be unlikely to reduce the share of financial services in nominal GDP, the growth of financial services output volume is a separate (if related) matter. Growth in the *share* of financial services in the GDP of countries with international financial centers is not a sufficient condition for financial intermediaries to contribute significantly to these countries' GDP *volume* growth. This is to say that, the nominal value of FISIM aside, its deflation is a distinct and remaining problem.

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