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Deconstructing FISIM: Should Financial Risk Affect GDP?

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I. INTRODUCTION

The System of National Accounts (SNA) is the international statistical standard that underpins closely watched macroeconomic indicators such as gross domestic product (GDP). Financial services measurement has become topical in recent years, and the SNA's methodology for calculating the output of the financial services industry is receiving closer scrutiny, not least because of the recent financial crisis. The treatment of financial risk within this methodology has become an important issue under discussion in the national accounting community and among users of these data. The SNA's approach depends critically on how a "reference rate" of interest is determined, as this affects the estimate of the current value of total output of the services of banks and other financial intermediation institutions. It also affects the distribution of those services between depositors and borrowers, and their distribution across economic sectors. An issue has arisen whether the reference rate for loans should include risk premia and, by implication, whether the measure of the current value of credit services output should exclude all or part of these premia.

More than fifteen years ago, the 1993 version of the SNA introduced the concept of financial intermediation services indirectly measured (FISIM) as the preferred approach to measuring the value of indirectly charged financial services production. Put simply, FISIM for an asset class such as loans is the interest earned on the asset class less the income foregone at a reference rate of interest for the asset class. FISIM for a liability class such as deposits is the income that would be earned at a reference rate of interest on the funds acquired less the interest cost of those funds. FISIM is broadly consistent with the Barnett (1978)-Donovan (1978) user cost of money theory of financial services production and consumption, as foreshadowed by Diewert (1974). Because the 1993 SNA allows for nonzero value added and final consumption of indirectly measured financial services, FISIM affects GDP for countries compiling national accounts under the 1993 SNA.[1] The predecessor standard, the 1968 SNA, allowed for indirectly measured financial services production but, by convention, allocated all of this production to intermediate consumption; thus indirectly measured financial services made no contribution to GDP. The newest, 2008 version of the SNA not only recommends but requires the use of FISIM for loans and deposits, allocated to both intermediate and final consumption, and thus affecting GDP.

An important issue in implementing FISIM on which full consensus has not been reached is how the reference rate should be determined. The 1993 SNA suggested the reference rate be a very short duration, essentially riskless rate, like the interbank rate. The 2008 SNA (paragraph 6.166) continues to say the interbank rate "may be suitable," but also says "The

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[1] Countries are allowed by the 1993 SNA to opt out of allocating part of FISIM to final consumption, however, so not all 1993 SNA countries may, in fact, follow the first-best methodology (1993 SNA, paragraph 6.129.).

reference rate should … reflect the risk and maturity structure of deposits and loans." The 2008 SNA thus identifies two subsidiary considerations in determining the reference rate, the degree to which it should reflect the level of risk of the institution's portfolio of assets and liabilities, and the degree to which it should reflect the residual maturities of the asset as well as liability classes to which it is applied. The SNA's language (including other text in the same chapter), implies that there is a single reference rate applied to all types of deposits and loans, but that this rate should reflect the overall risk and maturity of deposits and loans in some average sense.

As a counterpoint, Wang, Basu, and Fernald (2004) and Basu, Inklaar, and Wang (2008), among others, argue for a constellation of reference rates fully reflecting the risk and maturity premia of each asset class. Since the reference rate is subtracted from the loan rate in calculating indirectly measured credit services, this effectively eliminates risk and maturity remuneration from FISIM.

In this paper, we observe that banks' indirectly measured financial services comprise not only payment processing and loan origination activities, but also activities mitigating insolvency risk to depositors, loan default risk, and the risk of losses arising from interest income failing to cover interest expense because of different maturity profiles between assets and liabilities. Risk that institutions cannot mitigate, either through borrower screening, loan monitoring, and provisioning, or through buying insurance in the form of deposit insurance as well as credit default and interest rate swaps, is borne by the owners and unsecured creditors. In effect, the risk bearing of owners and creditors, whether the risk arises from the institution's own financial product portfolio, or from agreements to bear risk transferred from other institutions through financial derivatives, is a primary service that must be compensated to secure capital for the enterprise. Owners' and creditors' risk premia are built into operating surplus. Owners require a return that includes a premium for risking their capital in the enterprise and creditors receive risk premia in the interest rates on unsecured deposits of, bonds issued by, and loans owed by financial enterprises. Without covering these premia through proceeds from the sale of financial services, including indirectly measured financial services, financial institutions could not secure the financial capital they need to operate.

Examining US data, we find that the sum of estimated deposit, term, and credit default risk insurance services are the preponderance of FISIM, strongly suggesting that the greater part of loan risk premia are covering either risk mitigation or risk bearing costs. As we have argued above, risk mitigation is inextricably linked to the risk management activities to which the firm devotes intermediate inputs as well as labor, capital and financial resources. Accordingly the risk premia are not merely transfers from borrowers to financial institutions. We think this raises some difficult questions for the advocates of removing risk remuneration from FISIM.

Although we find little evidence for purging risk premia from FISIM, we do find that the SNA's valuation of loans at contract value on the balance sheet is inappropriate for the calculation of financial services output.[2] Recording loans at contract (book) value is one of the exceptions the 2008 SNA makes to the market valuation principle for financial assets.[3] We propose instead that FISIM in current prices be calculated incorporating the market or fair value of loans even though loans on the SNA balance sheets are at book value. This approach would be compatible with existing 2008 SNA guidance on calculation of FISIM, without requiring a substantive revision of the current national accounting standard.

Financial institutions manage risk internally through provisioning (self insurance), or via financial derivative contracts (risk transfer), principally interest rate and credit default swaps. The growth in the use of financial derivatives reflects the substantial outsourcing of term risk management since at the 1980s[4] and default risk management since the 1990s.[5]

The 2008 SNA recognizes the fees charged to set up derivative contracts as payment for services, which are recorded as output from the producers and as intermediate consumption to the users of these services. However, possible service charge components built into the net settlement payments between parties over the duration of these contracts are recognized in the 2008 SNA (paragraph 11.114) but are treated along with transactions in financial derivatives because of the difficulty in distinguishing the service element. Our purpose here is not to challenge the 2008 treatment of financial services associated with financial derivatives, but to use information on the risk premia in derivative contracts to estimate the market value of the risk management services financial institutions are producing for themselves. To produce these estimates, we treat these risk management services as non-life insurance produced for own use.

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[2] We do not challenge in this paper the SNA's recording of loans at contract value on the balance sheet, even though we argue that FISIM should be based on market value. The two can coexist within the same system. On the 2008 SNA balance sheet, revaluations of loans appear in the form of discounts or premia to contract value when realized through, e.g., change of ownership.

[3] The exception is made regarding balance sheet positions in loans because loans are considered not to be marketable (even if transactions in loans are recognized), and because there is interest in tracking the contractual liability of the owing unit, and to ensure symmetric recording among economic agents. The financial account deals with transactions in loans at market value by recording a realized holding gain/loss for the seller and a realized holding loss/gain to the buyer. The loan is transferred at contract value from the balance sheet of the selling to the buying unit. There are no unrealized gains/losses recorded on loans. The SNA also records positions in deposits and in other accounts receivable/payable in nominal terms.

[4] Ludwig (1993), Chapter 2, History of the Swap Market.

[5] US banks were using these instruments as early as 1996. See US Office of Comptroller of the Currency (1996).

We also want to emphasize that our focus here is on the current price output of indirectly measured financial services output in the national accounts, not the price and volume decomposition of that output. Recently Haldane, Brennan, and Madouros (2010), among others, have questioned the contribution of financial services to GDP growth. This is certainly a legitimate question. In answering it, there are two components of the contribution of the financial services industry to GDP growth to assess: the industry's share in GDP and growth in volume of output. While we can think of refinements, we think the share of financial services in GDP is broadly properly measured by existing guidelines in the SNA, including for FISIM, and that it has indeed grown in recent years. We think the real issue is whether there has been anywhere near as significant an increase in the volume of output of financial services, and, directly related, whether there has been substantial price inflation in indirectly measured financial services in particular. Regarding the role of risk in this inquiry, there is an important distinction to be made between the impact of rising risk on the transaction value of output and the price and volume decomposition of that output. Risk bearing and risk mitigation services must be paid for, and rising risk remuneration clearly must increase the *value* of financial services output. For a consumer of financial services, any uninsured risk in a transaction reduces the quality of the services received and, by implication, raises the *price*. Thus, increases in the risk borne by consumers of financial services subtract from the growth in the *output* of those services.

Finally, our main focus in this paper is on risk premia and risk management services. Although risk is a factor when considering deposits on the liability side of the register, for example, through deposit insurance premia and in managing the interest/term risk of variable rate deposits, its principal impact on bank operations is in loans on the assets side. We discuss insurable risk for deposits, but our later empirical analysis focuses on loans. We plan to extend the empirical analysis to include a fuller treatment of deposits at a later stage.

II. ACCOUNTING FOR INDIRECTLY MEASURED FINANCIAL SERVICES IN THE USER COST FRAMEWORK

A. Basics of the framework

The user cost framework values the bundle of financial services that attach to the financial products provided by banks. As noted in the introduction, Donovan (1978) and Barnett (1978) applied the user cost of capital concept to valuing the services provided by financial assets, as foreshadowed by Diewert (1974). In this approach, the user cost of money is defined for a financial asset as

$$\pi_i^t = h_i^t - \rho^t$$

and for a financial liability as

$$\pi_i^t = \rho^t - h_i^t$$

where

π_i^t = the rate of user cost service value per nominal unit of asset or liability i

h_i^t = the rate of holding revenue per nominal unit asset i or the rate of holding cost per nominal unit of liability i

ρ^t = the opportunity cost rate of money, what the SNA calls the reference rate.

For loans, h is the loan rate receivable by a financial institution, and for deposits, h is the deposit rate payable by a financial institution.

Hancock (1985) applied the Barnett-Donovan user cost of money approach to modeling the production of financial services from banks, effectively laying a microeconomic foundation for the *1993 SNA* treatment of financial services production. In the same vein as Hancock's financial firm model (see also Fixler and Zieschang [1991]), the *2008 SNA* values the indirectly measured credit and depositor services output of financial institutions as

$$Y^t = \sum_i \pi_i^t L_i^t + \sum_j \pi_j^t D_j^t = \sum_i \left(h_i^t - \rho^t \right) L_i^t + \sum_j \left(\rho^t - h_j^t \right) D_j^t$$

$$= \left(\sum_i h_i^t L_i^t - \sum_j h_j^t D_j^t \right) - \rho^t \left(\sum_i L_i^t - \sum_j D_j^t \right)$$

where, at time t, L_i^t is the value of loans of class i and D_j^t is the value of deposits of class j. Thus, credit and depositor service output in the national accounts is interest on loans less interest on deposits, less the cost of financial capital tied up in loans less deposits.[6]

   In the user cost formulation above the prices of the financial services contain a risk premium, as evidenced by the difference between the relevant interest rate and a benchmark rate that is taken to be a risk-free rate. The existence of this premium indicates that risk bearing is inextricably linked to the production of financial services. For example, credit services whose provision is necessarily includes a default risk are incurred along with the risk

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[6] See the appendix for the algebra that equates the user cost with net interest plus dividends plus rent *if* the scope of the calculation is the entire balance sheet.

bearing the bank incurs. It is for this reason that banks consume resources to manage risk. A few excerpts from the Bank of America 10-K filing to the Securities and Exchange Commission in December 2008 illustrates the point.

> Our management governance structure enables us to manage all major aspects of our business through our planning and review process that includes strategic, financial, associate, customer and risk planning. We derive much of our revenue from managing risk from customer transactions for profit. In addition to qualitative factors, we utilize quantitative measures to optimize risk and reward trade offs in order to achieve growth targets and financial objectives while reducing the variability of earnings and minimizing unexpected losses.

> Market risk is the risk that values of assets and liabilities or revenues will be adversely affected by changes in market conditions such as market movements. This risk is inherent in the financial instruments associated with our operations and/or activities including loans, deposits, securities, short-term borrowings, long term debt, trading account assets and liabilities, and derivatives. Market-sensitive assets and liabilities are generated through loans and deposits associated with our traditional banking business, customer and proprietary trading operations, ALM process, credit risk mitigation activities and mortgage banking activities.

> We have established and continually enhance control processes and use various methods to align risk-taking and risk management throughout our organization. These control processes and methods are designed around "three lines of defense": lines of business, enterprise functions and Corporate Audit. The lines of business are the first line of defense and are responsible for identifying, quantifying, mitigating and monitoring all risks within their lines of business, while certain enterprise-wide risks are managed centrally. For example, except for trading-related business activities, interest rate risk associated with our business activities is managed centrally as part of our ALM activities.

> For example, for Risk Management, a senior risk executive is assigned to each of the lines of business and is responsible for the oversight of all the risks associated with that line of business. Enterprise-level risk executives have responsibility to develop and implement polices and practices to assess and manage enterprise-wide credit, market and operational risks.

The above user costs were formulated as though all of the interest rates involved in the calculation are known. Future interest rate values are uncertain and thus confront deposit taking and loan making institutions with the risk that plans made on the basis of rates today may not be consistent with actual rates tomorrow. Barnett and Wu (2005) derive an exact expression for the user cost of money perceived by a risk averse household when confronted by monetary assets with stochastic interest returns. Under a structural assumption consistent

with the capital asset pricing model (CAPM), they show that the user cost of a risky asset follows the following formula:

$$\pi_i^{t}* = \pi_i^{t} + \beta_i^{t}\left(\Pi_i^{t}* - \Pi_i^{t}\right)$$

where

$\pi_i^{t}* = $ the risk adjusted user cost of asset i

$\pi_i^{t} = $ the certainty user cost of asset i

$\Pi_i^{t}* = $ the risk adjusted user cost of the wealth portfolio

$\Pi_i^{t} = $ the certainty user cost of the wealth portfolio

β_i^{t} is the coefficient of correlation between the gross return on asset i and the return on the overall wealth portfolio (that is, asset i's "beta").

The "beta" of a given risky asset is the coefficient of correlation of the asset's gross return with the gross return of the entire asset portfolio. When the risky asset's gross return is positively correlated with the gross return on the full portfolio, given that the user cost of the full portfolio is positive, the risk adjusted asset user cost of the risky intermediation asset exceeds its certainty value. Risky assets with negative portfolio correlations will have risk-adjusted user cost rates below their certainty user cost rates.

Basu, Fernald, and Wang (2004) focused on the SNA's credit services or loan FISIM to examine whether official statistics correctly account for risk in measuring the credit (loan) services output of banks. They argue that the systematic risk premia banks receive on loan assets should be removed from their return in calculating indirectly measured bank output. In the same vein, Basu, Inklaar, and Wang (2008) establish reference rates for each type of loan by attempting to match loan assets with security assets by maturity and systematic risk.[7] They take the difference between loan rates and these matched reference rates as the value of financial services, effectively eliminating risk premia from credit FISIM and suggesting a much lower share of banking in GDP than currently measured in official statistics.

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[7] See Wang, Basu, Fernald, and Wang (2004), and Basu, Inklaar, and Wang (2008). Their specific methodology was to match commercial and industrial loans with commercial paper assets by maturity, under the assumption that the systematic risk profile of the commercial paper of a given company matches its risk profile as a borrower from a financial institution. The rates on commercial paper are assumed not to cover any intermediation services, while the rates on loans must cover banks' intermediation costs. Under the former assumption particularly, the difference between loan rates and commercial paper rates is taken to be the value of intermediation services. By definition, it excludes remuneration for risk and maturity. A limitation of this methodology was that commercial paper is, by definition, limited to 270 days duration, but, in principle, the methodology could be extended to longer maturities by using corporate bond data.

We argue that at a conceptual level this approach denies the costs loan making institutions incur in acquiring private information about potential borrowers. However, even if we grant these authors' conceptual approach, their implementation of it exaggerates its implied downward impact on FISIM. Their empirical approach relies on information symmetry between banks (e.g., in making commercial loans) and other credit providers (e.g., buyers of the commercial paper of business borrowers) that is unlikely to hold. Banks have an advantage in knowledge of the characteristics of individual borrowers and their credit risk compared with financial market credit providers. The latter thus will charge a higher premium to cover their greater perceived risk than will banks. Hence, a bank reference rate based on credit market risk premia will be too high and produce a FISIM that is too low, even if we were to agree that risk premia be excised from FISIM (which we do not).

The implication of the Basu, et al approach is apparent in the following table of US data which considers the impact of removing the imputations of credit and deposit services from Gross Operating Surplus which contains the above expression for output Y.

Table 1. Impact of Credit and Borrower Services on Gross Operating Surplus

	2001	2002	2003	2004	2005	2006	2007	2008
Gross operating surplus (billions)	367.6	385.6	402.3	395.0	447.5	479.9	465.6	546.6
Imputed Depositor Services	203.0	213.4	197.1	215.7	206.8	190.3	243.3	290.3
Imputed Borrower Services	99.2	103.7	129.1	135.8	164.1	200.3	184.1	154.3
Gross operating surplus, less imputed services	65.4	68.5	76.1	43.5	76.6	89.3	38.2	102.0

Gross operating surplus is from the finance and insurance industry entry of the Components of Value Added by Industry table. (revised 5/25/10)
http://www.bea.gov/industry/gpotables/gpo_action.cfm?anon=511546&table_id=25697&format_type=0
Imputed depositor and borrower services are from NIPA table 7.12, Imputations in the National Income and Product Accounts (revised 9/3/09).
http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=289&Freq=Year&FirstYear=2007&LastYear=2008

Though the subtraction of the entire indirectly measured service charge is extreme, it is clear that reductions in the credit and deposit services will significantly reduce gross operating surplus and value added.

In the following sections, to derive an implicit value of risk management services that must be covered in value added and operating surplus, we characterize these services as non-life insurance; that is, financial corporations can undertake forms of self-insurance using purchased inputs or, at a cost, engage in transactions that cede the risk they have incurred. In effect, we deconstruct FISIM into term risk, default risk, and other account services components as well as an estimate for the "net non-life insurance" component of FISIM. We find that the estimated value of insurance service production against the specified risks explains almost all of the market insurance premia. By implication and consistent with the above, eliminating risk premia entirely would throw out the implicit value of the risk management activities in financial institutions. Our analysis thus suggests caution in accepting the large downward adjustments to official estimates of value added from indirectly measured financial services that are inherent in the approach of Basu, Inklaar, and Wang (2008).

B. A "narrow bank" approach to deconstructing FISIM

In deconstructing FISIM on deposits and loans, we first apply a "narrow bank" approach to determining the reference rate for the deposit taking institutions, and then apply the general principle to the SNA's categories of loan making institutions. In so doing, we end up slightly at variance with the SNA standard, in that we effectively consider reference rates that are institution-specific, while the SNA presumes a reference rate that is the same both across institutions and asset types. However, like the SNA, at least within institution, our reference rate is not asset specific. The narrow bank story told below thus produces a calculation rule for FISIM that follows the SNA prescription reasonably closely.

Deposit-taking financial corporations

Like any deposit-taking bank, a narrow bank takes deposits and services depositors, covering the cost of these services by the income earned on the deposited funds. A narrow bank, however, does not produce credit services.

We consider first a simple narrow bank in which depositors put their money together into a scheme that buys risk free securities and receives interest. It thus assumes no risk on the asset side of its portfolio, investing deposited funds in liquid, risk free securities matched in maturity to the expected maturity profile of its deposits. The value of the services of the simple narrow bank to depositors is the opportunity cost of funds invested in the risk free securities less the interest paid depositors. The opportunity cost of depositors' funds is identically their earnings on the risk-free portfolio of securities. By implication, the reference rate is thus the deposit maturity-weighted average risk free security rate. Depositors are paid

all interest less the cost of operating the scheme. FISIM is the difference between the opportunity cost of invested funds and the amount paid out to depositors, which equals the cost of operating the scheme. The value of credit services is, by definition, identically zero since there are no loans.

Now consider a narrow bank that employs the capital of its owners, who may be distinct from depositors, to generate interest income on risk free securities. In this case, the owners' opportunity cost of funds is the risk free rate appropriate to the owners' time horizon for participating in the business. The opportunity cost of the owners' equity thus would be the interest rate on a risk free security whose maturity matches the owners' expected duration of participation in the enterprise. The reference rate thus is the deposit and equity maturity-weighted average risk-free security rate. We expect owners' participation durations to be longer on the average than those of depositors. When long duration securities yield more than short duration securities (the usual upward sloping term structure of interest rates), the reference rate for a narrow bank with owners' capital thus will be higher than for the simple narrow bank.

We now move out of the narrow bank case to consider deposit-taking corporations that also make loans. This covers a broad spectrum of banking institutions. The SNA recognizes two types of deposit-taking financial corporations:

- The central bank

- Deposit-taking corporations

The SNA identifies a third category of institutions that also provide depositor services:

- Money market funds (MMFs).

We can view any deposit-taking institution as containing within it a narrow bank, an establishment specialized in depositor services only. Indeed, both the central bank (usually) and MMFs are essentially narrow banks.[8] We can find the value of credit services on loans as the difference between interest earnings on loans and the reference rate derived from a

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[8] Central banks usually carry government securities on the asset side of their balance sheets and commercial bank deposits, currency, and equity on the liability side. In the extraordinary circumstances of the recent financial crisis, the asset side has included a riskier portfolio of assets such as commercial paper and asset-backed securities. This extension in the scope of central bank assets is expected to be unwound as the crisis is brought under control. Money market funds closely follow the same pattern as the "normal" central bank, carrying short term, liquid, low-risk, usually government-issued securities on the asset side and deposits (unit share accounts) on the liability side.

narrow bank with owners' capital. The narrow bank approach to the reference rate thus applies to all deposit-taking institutions.

Loan-making financial corporations other than deposit-taking financial corporations

This group of institutions comprises the SNA institutional subsectors

- Other financial intermediaries, except insurance corporations and pension funds

- Captive financial institutions and money lenders

As a rule, these institutions rely on debt and equity liabilities as a source of funds with which they make loans.[9] They thus take our narrow bank with owners' equity to the polar case where deposits are zero.

Although there are no deposits on the liability side of their balance sheets, determining the reference rate for these institutions follows the same general principle as with a narrow bank with owners' capital. The reference rate would be determined the same as for the equity component of the narrow bank's liabilities, as the owners' duration-weighted average interest rate on risk-free securities. This certainty rate of return would leave owners indifferent between shares in these financial institutions and a portfolio of government securities whose maturity profile matches their time horizons. Assuming owners have a longer time horizon than depositors, and the term structure of interest rates is upward sloping, the reference rate for these non-depository loan-making institutions will be higher (or at least as high) as that for institutions that both make loans and take deposits.

The value of credit services provided to borrowers (credit FISIM) will be the difference between interest earned on loans and the reference rate of the narrow bank with owners' capital.[10]

C. FISIM in the aggregate

If we were to add up deposit FISIM output values across depository corporations, the result would be the difference between aggregate interest at the industry reference rate (the liability

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[9] In fact, all financial institutions may obtain funds not only from equity, but also from loans, securities issues, and other financial instruments.

[10] As noted in the Introduction, risk bearing is among the primary factor services the owners provide to any enterprise, including financial corporations. The difference between owners' and creditors' return on invested capital and their risk-free opportunity cost of money remunerates them for this primary service.

maturity-weighted risk free interest rate for all depository corporations[11]) and the interest paid to depositors. The aggregate reference rate thus reflects the maturity structure of deposits (among other liabilities), like the SNA. Unlike the SNA, however, it also reflects the structure of the owners' time horizons, but does not reflect the maturity structure of loans. In addition, unlike the 2008 SNA, there also is no reflection of the average structure of risk premia in the reference rate.[12] Adding up loan FISIM output values across loan-making corporations, the result would be the difference between loan interest and risk-free interest reflecting the maturity structure of the liability side of the balance sheet.

III. RISK PREMIA AND INSURANCE

Our approach to determining the SNA reference rate seems to rationalize 2008 SNA guidance on financial services output rather well, at least insofar as it incorporates the term structure of deposits. Clearly, however, the owners of a bank take on at least two kinds of risk when they make loans: the loans generally have a longer maturity on average than non-equity (deposit) loanable funds, and the loans carry a risk of default. The first is term risk, and the second default risk.

Basu, Inklaar, and Wang (2008) argue that all risk-premia should be excised from FISIM calculations because they are income a financial institution receives for which it has not provided a service quid pro quo. We examine this proposition by first asking whether at least part of the risk premia pay for risk management services, or insurance.

Following, for example, Reece (1992), the price of an insurance policy can be expressed

$$p = \alpha - \delta + \rho\beta + (r - \rho\beta)b$$

where

p = price per nominal unit of insurance in force
α = premium rate per nominal unit of insurance in force
δ = expected loss per nominal unit of insurance in force
β = rate of additions to technical reserves per nominal unit of insurance in force

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[11] This would cover all liabilities from all SNA instruments, notably, deposits, loans owed. We take risk free rates for loan liabilities because the FISIM on loans owed is counted as intermediate consumption of the debtor institution and thus must be reflected in the value of output. It would be eliminated from output were we to set the reference rate for equity as the rates on the loans themselves.

[12] Except to the extent that the benchmark (lowest risk) securities determining the reference rate carry some minimal level of risk, in which case the reference rate will reflect the structure of risk premia for benchmark securities.

ρ = reference rate
r = rate of return on policy loans
b = policy loans per nominal unit of insurance in force

The SNA calculates the value of non-life insurance services according to the formula

Insurance services = insurance premiums earned + premium supplements – expected claims.[13]

Insurance premiums need little explanation. Premium supplements are the investment income earned on the insurance technical reserves accumulated to pay claims when insured events occur. Ordinarily, if insurance is purchased from another unit, we see it as an output of the producer and service charges payable for it in the expense (intermediate consumption) lines of the income statements of the using units. However, when these service charges are embedded in the net settlement flows of financial derivatives, the SNA considers it a transaction in financial assets (financial derivatives). It nevertheless is consistent with the SNA to observe that these service charges must be covered by output even if they only show up as a component of operating surplus and value added.

The SNA treats the non-service, non-output part of the premium,

Expected claims – premium supplements,

as a current transfer from the insured unit to the insurer, and, by implication, not part of the value of output of the insurer, which the SNA terms "net non-life insurance.".

When a financial corporation self insures, the internal costs of running the insurance operation appear in part as intermediate consumption and compensation of employees, with the remainder appearing in the corporation's own operating surplus. Under the 2008 SNA, the owners of the insured financial corporation effectively capture the "net non-life insurance" themselves.

Thus, all of the premium costs of the production of insurance for own use, including "net non-life insurance," must be covered by FISIM. To illustrate, using the equation for credit insurance services, the loan rate –reference rate equals the insurance service value + net non

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[13] The 1993 SNA followed the Reece (1992) approach very closely for all insurance, including subtraction of net increase in insurance reserves. The 2008 SNA follows this formula for life insurance, but deviates from it for non-life insurance by not subtracting net increase in reserves. The would hold under the assumption that there is no need to accumulate reserves from period to period to cover, e.g., relatively rare, catastrophic events, that are actuarily imperfectly anticipated, and that net reserves accumulation is essentially zero; that is, that additions to reserves less claims fluctuates closely around zero.

life insurance, plus indirectly measured administration and origination fees. By implication, the "net non-life insurance" effectively appears in the purchasing institution's value added and operating surplus, whether it purchases the insurance (via a financial derivative contract) or produces those services itself. The system thus assigns to deposit-taking and loan-making corporations the "net non-life insurance," even when the insurance service is supplied by another unit.

IV. DECONSTRUCTING FISIM ON DEPOSITS

A. Account services

These services comprise check clearing and other account services to depositors. We argue they are not the only services FISIM covers.

B. Insurance (risk management) services

Deposit risk premium

The contract between deposit-taking institutions and their depositors is that depositors' accounts are safe and payable in full within the provisions of the contract, either on demand or at the end of a specified period (or if earlier, on demand subject to an early withdrawal penalty). As banking is not entirely without risk in meeting the requirements of this contractual agreement with depositors, depository institutions undertake internal risk mitigation or purchase insurance against the possibility funds will not be available to meet depositors' withdrawal demands. The insurer maintains a technical reserve to meet depositors' claims in the event of an insolvency event. The insurer charges deposit-taking institutions a premium figured as a percentage of deposits for this insurance.

Deposit insurance services

Deposit insurance services are calculated according to the non-life formula as premiums (generally stated in terms of a rate in basis points per currency unit of insured deposits), plus investment income (premium supplements) on the technical reserves (also known as the insurance fund), less expected losses (expected payouts to depositors as a result of bank failures). As this insurance service is within a recognized class of output in the SNA, deposit FISIM clearly must cover it.

Deposit net non-life insurance

The net non-life insurance component of the deposit insurance premium is the quantity 'expected payouts to depositors', plus investment income on the insurance fund (premium supplements). If the net non-life insurance premium is not covered by deposit FISIM,

operating surplus will not include the risk premia investors require to employ their capital in the depository institution versus other investment opportunities.

Recent experience on deposit insurance and deposit risk bearing charges

In the United States deposit taking institutions are required to provide insurance from the Federal Deposit Insurance Corporation (FDIC), a public corporation, on deposits up to a specified amount, currently $250,000 per account.[14] The Deposit Insurance Fund (DIF) is the insurance technical reserve of the FDIC. As of early 2009 it was expected to be about 1.25 percent of insured deposits. The deposit insurance premium varies depending on the assessed riskiness of the insured depository institution, ranging from 5 basis points per dollar of insured deposits for low risk (category I) institutions to 43 basis points for high risk (category IV) institutions. On January 1, 2009, FDIC raised assessments to 12 basis points for category I institutions to 50 basis points for category IV. On April 1, 2009, it again revised its assessment methodology to include credits for unsecured debt and surcharges for secured liabilities and brokered deposits. The minimum assessment became 7-24 basis points for category 1 institutions up to 43-77.5 basis points for category IV institutions. After credits, the average insurance premium rate during 2008 was 3.8 basis points per dollar (.038 percent) of insured deposits, but, as noted, will have risen since then.[15] These rate increases have followed rising assessments of the expected losses from bank failures. As losses have been dynamic in recent months while reserves are accumulating more slowly, and thus investment income on reserves slowly increasing, the risk bearing charge as a fraction of FDIC's premium has probably been increasing since late 2007 or early 2008. This notwithstanding, deposit insurance services remain small relative to the spread between the "narrow bank" reference rate and the rate paid on deposits. For example, the recently historically high roughly 10 basis point (a tenth of a point of interest) average deposit insurance premium as a percentage of total (insured and uninsured deposits) compares with deposit interest paid as a percentage of total deposits ranging from .89 percent in the first quarter of 2001 to .21 percent in the first quarter of 2010.[16]

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[14] In addition to deposit insurance there is the possibility that reserve requirements now play some role in providing liquidity insurance. Such a role was envisioned when they were initially imposed but for the post-war period they have instead served as an instrument of money policy. However, the recent change in policy that provides for the payment of interest on such reserves may increase the liquidity insurance dimension.

[15] FDIC, Memorandum from Arthur J. Merton, Director of Insurance and Research to the Board of Directors: Assessment Rates for 2008, March 13, 2008. The memo is available from the FDIC website at http://www.fdic.gov/deposit/insurance/assessments/assessment_rates_2008.pdf. A description of FDIC's risk classification of financial institutions is available on its website at http://www.fdic.gov/deposit/insurance/risk/rrps_ovr.html.

[16] In addition to the solvency risk covered (in part) by deposit insurance, variable rate deposits generate term risk. We do not deal with this deposit-side aspect of term risk here. However, we would estimate the insurance

(continued)

V. DECONSTRUCTING FISIM ON LOANS

A. Account services

These services comprise payment processing and credit rating, among other services to borrowers. We argue they are not the only services FISIM covers.

B. Insurance (risk management) services

Loan risk premium

Term or interest rate risk premium

Loan making financial institutions lend in long maturities and borrow in short maturities. The average portfolio term risk premium is the cost of taking this relatively long position on the asset side.

Institutions can manage differences in the maturity structures of their asset and liability portfolios using interest rate swaps. These are derivative contracts that swap a variable short term rate—generally a London Interbank Offer Rate (LIBOR) plus a premium—with a rate fixed for the duration of the swap contract. Swaps are created between two parties without an up-front charge to either; that is, they are created "at the money," meaning that the present value of the fixed interest stream is equal to the present value of the variable interest stream. The premium over the variable component of the swap is the degree of freedom in this calculation. It is set to equalize the present value of the fixed and variable income streams at the initiation of the swap. This premium, amortized over the period of the swap, would be the period to period cost of carrying the interest risk insurance provided by the contract. Once the contract is in place, of course, it can go "in the money" and assume positive market value, or "out of the money" and assume negative market value, depending on investor views about the future development of the term structure of interest rates.[17]

Term or interest rate risk insurance services

In the case of swaps, the principal risk is counterparty risk: the event that one counterparty does not make good on his obligations under the contract. Historically, counterparty risk on

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value of mitigation activities against this risk in the same way as we do for loans below, using information on interest rate swap premia.

[17] Many interest rate swaps also include explicit service charges by guarantors of one or both counterparties, which would be part of the overall interest risk insurance charge built into the swap arrangement..

interest rate swaps has been very low, so we assume counterparty risk is essentially nil.[18] As a result, there also are no appreciable technical reserves held against counterparty default events. The implication is that the interest rate risk insurance service charge on swaps is simply the amortized premium over the variable component of the swap. In general, we expect that the longer the agreed duration of the swap contract, the higher the premium, following the normal upward slope of the maturity profile of interest rates. Hence, the difference between the risk free interest cost of the maturity profile of the institution's liabilities (deposits) and the maturity weighted risk free interest income potential of the institutions assets (loans) can be seen as covering the cost of term risk insurance services.

Term or interest rate "net non-life insurance"

Because the insurance service charge uses the entire premium, the "net non-life insurance" on interest rate swaps is nil.

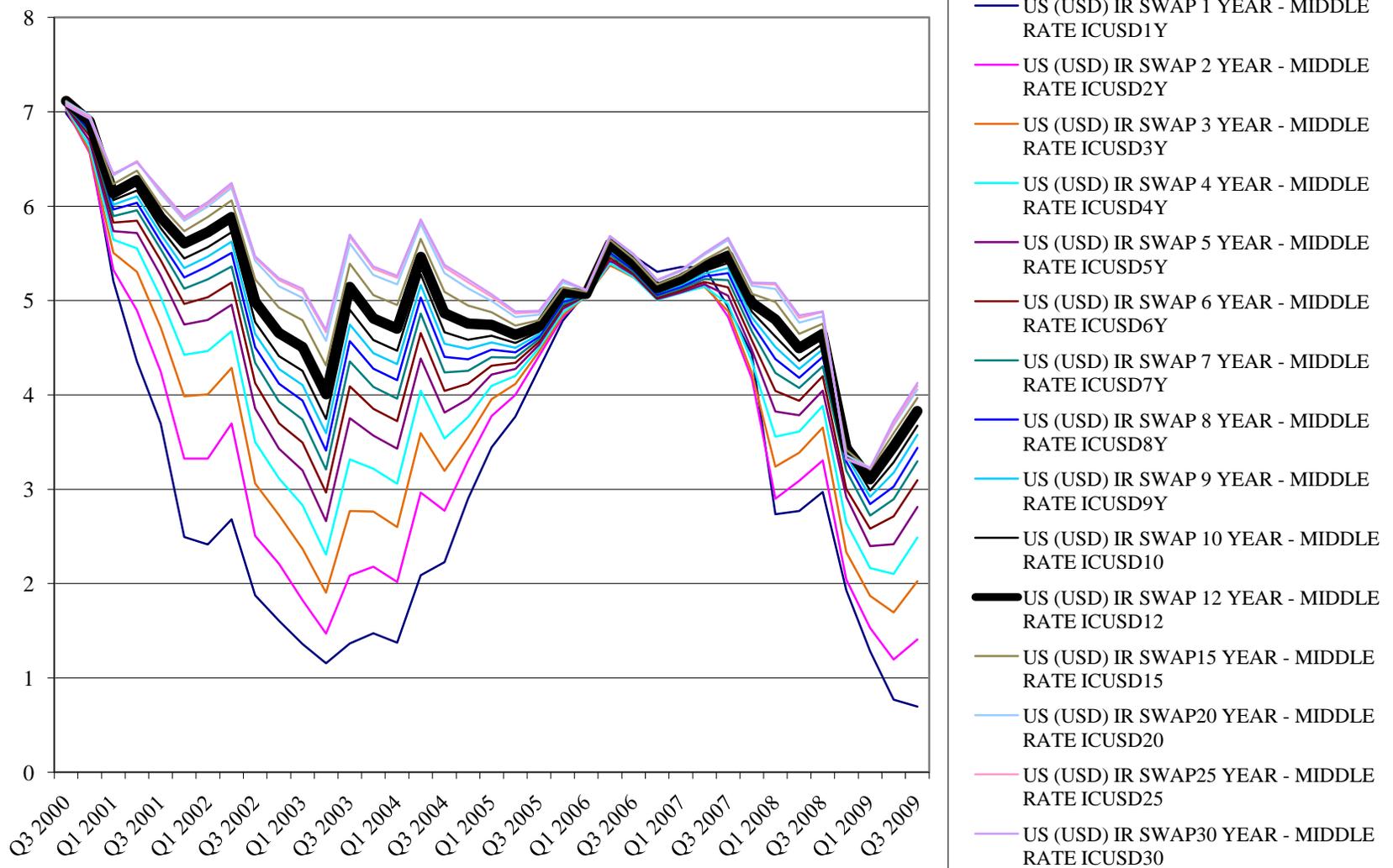*Recent experience on term risk insurance (interest rate swaps)*

Figure 1 shows the recent history of interest rate swap prices. Interest rate swap premiums (defined as the difference between the rates on the fixed and variable components of the swap) have broadly declined from 7 percent in 2000 to less than 4 percent in 2009. The chart shows that short term swaps generally lie below long term swaps, but that during periods of monetary tightening, amortized premiums on short term swaps rise to meet premiums on long term swaps as the term structure of rates flattens. Data from the US regulatory authorities puts loan residual maturity at around 12 years, so we chose the 12 year interest rate swap premium as the cost of term risk insurance.[19]

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[18] We note below, however, that the same is not true of counterparty risk in the credit default swap market. There has been increasing pressure from policy makers in the wake of the 2008-2009 financial crisis to push derivative activity onto central counterparties, and the Basel Committee for Banking Supervision is proposing to strengthen bank capital requirements for counterparty risk exposures arising from derivatives, repos, and securities financing activities.

[19] FDIC, Call Reports. . Our implicit assumption is that short maturities predominate on the the liability side of the balance sheet. To the extent that we underestimate maturities on the liability side, we will overstate the value of interest or term risk insurance that must be covered by loan rates on the asset side. Swaps also may be used to control the interest risk of variable rate deposits on the liability side of the balance sheet. Our focus here is on loans, so we pass over this additional term insurance component that aggregate FISIM must cover.

Figure 1. US Interest Rate Swap Premiums

Legend:
- US (USD) IR SWAP 1 YEAR - MIDDLE RATE ICUSD1Y
- US (USD) IR SWAP 2 YEAR - MIDDLE RATE ICUSD2Y
- US (USD) IR SWAP 3 YEAR - MIDDLE RATE ICUSD3Y
- US (USD) IR SWAP 4 YEAR - MIDDLE RATE ICUSD4Y
- US (USD) IR SWAP 5 YEAR - MIDDLE RATE ICUSD5Y
- US (USD) IR SWAP 6 YEAR - MIDDLE RATE ICUSD6Y
- US (USD) IR SWAP 7 YEAR - MIDDLE RATE ICUSD7Y
- US (USD) IR SWAP 8 YEAR - MIDDLE RATE ICUSD8Y
- US (USD) IR SWAP 9 YEAR - MIDDLE RATE ICUSD9Y
- US (USD) IR SWAP 10 YEAR - MIDDLE RATE ICUSD10
- US (USD) IR SWAP 12 YEAR - MIDDLE RATE ICUSD12
- US (USD) IR SWAP15 YEAR - MIDDLE RATE ICUSD15
- US (USD) IR SWAP20 YEAR - MIDDLE RATE ICUSD20
- US (USD) IR SWAP25 YEAR - MIDDLE RATE ICUSD25
- US (USD) IR SWAP30 YEAR - MIDDLE RATE ICUSD30

Default risk premium

The default risk premium on a loan is equivalent to an insurance premium on a contract that reimburses the loan making institution for losses in repayment of principal (default risk). There are, in fact, such contracts, called credit default swaps (CDSs), that institutions can purchase or negotiate on the financial markets. The contract pays off if a loss-making "credit event" occurs in an amount equal to the difference between the contract principal of the loan and the amount the institution recovers from the borrower. The so-called CDS "spread" is the one period premium rate on the insured amount that must be paid to insure the beneficiary of the CDS against a default event.

Default risk insurance services

Again, the value of the insurance service is the premium, plus the premium supplement (the rate of investment income earned on the technical reserves that the issuer of the default insurance holds against actual losses from insured credit events), less the expected loss.

Default "net non-life insurance"

As before, the remainder of the premium, given by the difference between the insurer's expected losses from default and its investment income on technical reserves for CDS contracts, is "net non-life insurance."

Recent experience on the value default risk insurance and "net non-life insurance"

To provide an indication of the value of the premium component for default insurance service output, Figure 2 shows the recent history of the default insurance premium measured as quarterly average CDS spreads from 2004, when the data begin in earnest, until the second quarter of 2009.[20] Looking at the underlying daily CDS data, spreads began around 1.5 percent in 2003, fell to about 0.9 percent in the middle quarters of 2004, rose into the 1.5 percent range during 2005-2007, then began an accelerating rise in late 2007, peaking at 100.25 percent in March of 2009, before retreating to the mid 20s by August 2009. A potentially serious caveat to interpreting these default insurance service estimates from late 2007 forward is that CDS premia rose in large measure based on investors' belief that loan default probabilities had increased by a large enough amount (e.g., with a focus on sub-prime mortgages) that claims on CDS contracts would climb to levels too great to be honored by their issuers. It thus reflects a perceived increase in the counterparty risk idiosyncratic to CDS instruments as much as, or possibly much more than, the increase in loan default risk by

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[20] Source: MarkIt, www.markit.com.

Figure 2. Default Insurance Premium (CDS) and Default insurance Service Charge
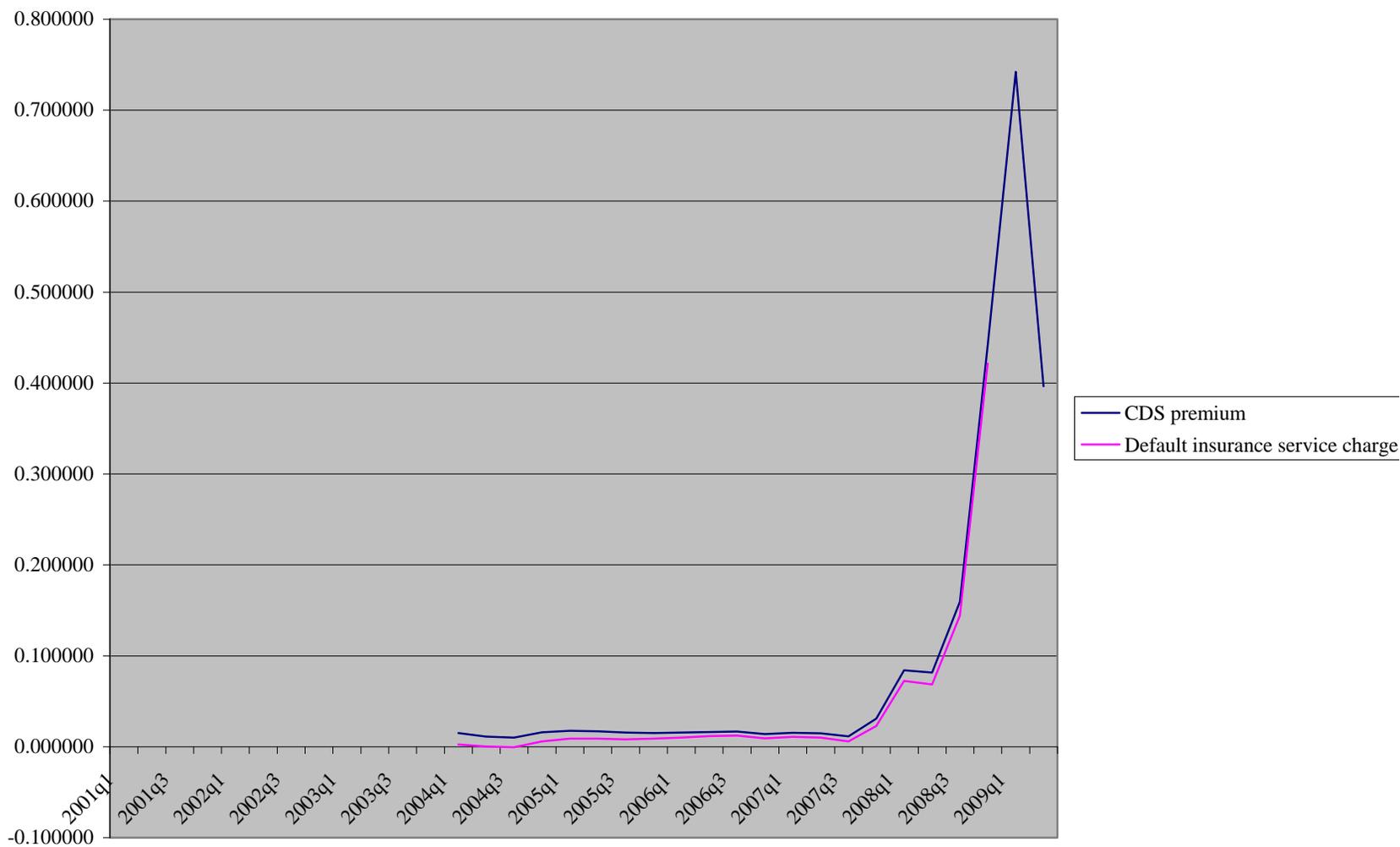
Data sources: MarkIt, www.MarkIt.com, CDS premia; Federal Deposit Insurance Corporation, provisions on loan losses, loans, regulatory reserves; US Department of the Treasury, government bond rates.

itself. Hence, there likely was a divergence between the cost of market default insurance and the value of own production of loan default risk management services by the issuing default (CDS) premium rates seen in as the CDS market began to stabilize in 2009, the premium is almost entirely the default insurance service charge, with "net non-life insurance" constituting a very small part of the premium.

C. How Do Risk Management Services Compare with Loan interest?

We argue that it is critical to use a current reference rate and the current market or fair value of loans in calculating loan FISIM, regardless of the 2008 SNA prescription that loans appear on the balance sheet at contract value. Were loans at contact value used to compile FISIM, the reference rate in any given period for a loan portfolio would have to be a weighted average of market reference rates prevailing at the various loan origination dates in the loan portfolio. Aside from being data intensive and complex, this approach does not reflect current returns and valuations that should drive the value of services generated in the current period. Hence, we write credit FISIM as

Loan interest receivable – (the reference rate × the market/fair value of loans).

To estimate the market value of the loan portfolio, for mortgages we obtained rates on mortgage backed securities by maturity, for commercial and industrial loans rates on commercial paper,[21] and for rates on consumer loans credit card rates.[22] We estimated the market value of mortgages, commercial and industrial, and consumer loans, adjusting the book values of these loan assets using these market interest rates and the average book returns on the same assets. We estimate the market loan rate as a maturity weighted average of rates on mortgage backed securities for loans secured by real estate and as the average rate on consumer credit for loans not backed by real estate, where the weights are at estimated market values of these loan classes.[23]

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[21] In the US, commercial paper has an original maturity of no more than 270 days, so using this an estimator understates the market rate on loans and overstates the estimated market value of loans, a significant fraction of which will have a longer residual maturity and higher yield than securities of 9 months or less.

[22] Rates on credit cards overstate the average market rate on consumer loans and understate the market value of these loans. In addition to unsecured credit card debt, much of the remaining non-mortgage consumer credit is secured by durable goods and carries lower interest rates.

[23] Ideally, we would like to factor in market rates earned on commercial loans, but these data were not readily available for this analysis.

Having estimated the default risk and term risk components of the insurance activities of US banks, in Table 2 we examine how the total of these two components compares with the average market loan rate. The sum of these two components was greater than or largely covered the difference between the contract interest rate on loans and the interbank rate throughout the period, strongly suggesting that FISIM calculated as recommended in the 1993 SNA and sanctioned by the 2008 SNA does not understate the nominal value of credit services output.

Table 2. Components of Loan FISIM

	Average estimated market rate on loans	Average contract interest rate on loans	Diff. in loan rates	Total of default insurance and term insurance	Interbank (Federal Funds) rate	Total of interbank term insurance, and default insurance rates	Market loan rate less interbank, term and default	Average Contract rate less interbank, term and default
2004q1	0.08558	0.06238	0.02320	0.05392	0.01003	0.06395	0.02163	-0.00157
2004q2	0.08996	0.05878	0.03118	0.04832	0.01010	0.05842	0.03154	0.00036
2004q3	0.09376	0.05611	0.03765	0.04638	0.01433	0.06071	0.03305	-0.00460
2004q4	0.09475	0.05599	0.03875	0.06031	0.01950	0.07981	0.01494	-0.02382
2005q1	0.09740	0.06408	0.03332	0.05740	0.02470	0.08210	0.01530	-0.01802
2005q2	0.10082	0.06337	0.03745	0.05644	0.02943	0.08588	0.01495	-0.02251
2005q3	0.10110	0.06398	0.03712	0.05554	0.03460	0.09014	0.01095	-0.02617
2005q4	0.10208	0.06352	0.03856	0.05516	0.03980	0.09496	0.00712	-0.03144
2006q1	0.10230	0.07363	0.02866	0.05710	0.04457	0.10167	0.00063	-0.02804
2006q2	0.10560	0.07309	0.03250	0.06254	0.04907	0.11161	-0.00601	-0.03851
2006q3	0.10570	0.07398	0.03171	0.06285	0.05247	0.11532	-0.00962	-0.04133
2006q4	0.10406	0.07228	0.03179	0.06517	0.05247	0.11764	-0.01357	-0.04536
2007q1	0.10258	0.07905	0.02353	0.06470	0.05257	0.11726	-0.01468	-0.03821
2007q2	0.10222	0.07748	0.02475	0.06131	0.05250	0.11381	-0.01159	-0.03633
2007q3	0.10663	0.07534	0.03130	0.05805	0.05073	0.10879	-0.00215	-0.03345
2007q4	0.10047	0.07240	0.02807	0.07636	0.04497	0.12133	-0.02086	-0.04894
2008q1	0.09546	0.07269	0.02276	0.12706	0.03177	0.15882	-0.06337	-0.08613
2008q2	0.09613	0.06901	0.02711	0.11806	0.02087	0.13893	-0.04280	-0.06991
2008q3	0.09657	0.06444	0.03212	0.19208	0.01940	0.21148	-0.11491	-0.14704
2008q4	0.09435	0.05997	0.03438	0.46637	0.00507	0.47144	-0.37709	-0.41147

One can see from the Table 1 that there is a 2-4% difference between market loan rates and average contract rates. [24] The last two columns illustrate that the difference is especially important until 2006 because of the difference in sign between the risk management adjusted user cost, which can be taken as the loan rate less the sum of the reference rate, the default premium and the term premium. The negative sign indicates that the cost of purchasing insurance to manage risk exceeded the user cost of money on loans (loan FISIM). This would induce banks to increase their self-insurance and/or to ration credit to higher quality borrowers. The latter is indicated by the reported accumulation of reserves by banks and the reduced demand for loans by corporations—as evidenced by their accumulation of cash. Figure 3 illustrates the trend of the rates.
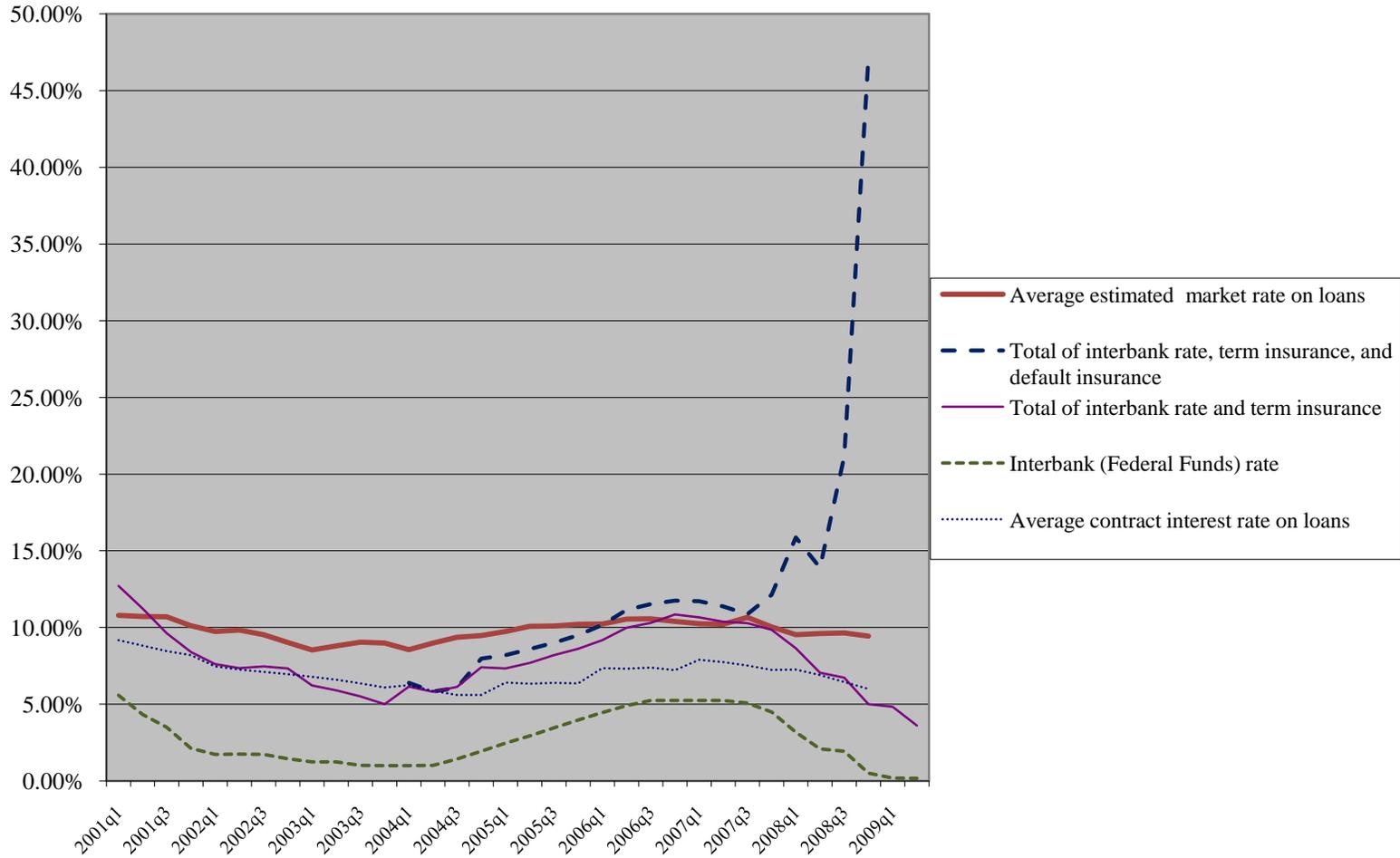
The residual of the loan rate and the risk services components of output covers the reference rate or cost of money and the value of additional services besides risk management. Comparing the sum of these service components with the loan rate provides an estimate of the value of credit services (gross) output as the sum of at least two of its components: term/interest rate and default risk insurance. Term insurance is a significant fraction of the market loan rate throughout the period, and, the crisis period beginning in the last quarter of 2007 notwithstanding, the interbank rate plus term and default insurance services on US bank loan portfolios has been at least half of estimated market loan interest.

Comparing the estimated market loan rate with the sum of the interbank rate and the insurance premiums for term and default risk tells an interesting story before and during the financial crisis period. We see that banks were operating with a comfortable margin to cover account servicing costs during 2002-2005, but the margin narrowed beginning with Fed tightening in the third quarter of 2004. By the first quarter of 2006, narrowing of the margin slowed. The Fed halted the rise in the interbank rate in the third quarter of 2006 at a level equating our estimated market loan rate with the sum of the term premium plus the Federal Funds rate in the third quarter, despite a slowly growing insurance premium on default risk. Circumstances were on the mend by the third quarter of 2007, when the sum of the cost of money and risk insurance, including default risk, fell back to about the level of the estimated market loan rate. However, by the fourth quarter of 2007, market assessments of default risk began a steady upward climb as the dimensions of the sub-prime mortgage problem became evident, to levels far in excess of market returns on loans. As noted, however, this was

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[24] The 2008 SNA, as earlier versions of the SNA, books loans at contract rather than market value. All other financial assets are booked at market value.

Figure 3. Estimated Market Values of the Interest and Risk Insurance Components of the Loan Rate

Legend:
- Average estimated market rate on loans
- Total of interbank rate, term insurance, and default insurance
- Total of interbank rate and term insurance
- Interbank (Federal Funds) rate
- Average contract interest rate on loans

*Data sources: Federal Deposit Insurance Corporation, loan interest earned by, and book value of loans of US banks; Freddie Mac Primary Mortgage Survey, rates on mortgage loans, Federal Reserve Board, rates on Federal Funds, mortgages, credit card debt (consumer credit), and commercial paper; MarkIt, credit default swap amortized premia; DataStream, interest rate swap amortized premia.

precipitated by a counterparty risk crisis in the CDS market as much as by concerns about a rising portfolio of nonperforming mortgages.[25]

VI.   ACTIVE ISSUES IN THE 2008 SNA TREATMENT OF FINANCIAL SERVICES PRODUCTION

The 2008 SNA, like the 1993 SNA, values loans at contract rather than market value on the financial balance sheet. The 2008 SNA's recognizes implicit service flows on financial derivatives, but there could be clarification on this. [26]

The 2008 SNA directs national accountants to record loan contracts at their nominal or contract values rather than market values, presuming them to be non-marketable.[27] Should a loan become marketable, it is usually reclassified as a security and marked to market, but other circumstances may result in transactions in loans without considering them having become securities. The SNA also prescribes memoranda items to the loans entry showing the value of nonperforming loans at both contract and market or fair value.

We argue that calculation of FISIM requires valuation of loans at market or fair value, independently of their presence on the SNA balance sheet at contract value. If loans are valued at contract value for calculation of FISIM, each loan in a bank's book must have its own reference rate, that prevailing on the loan origination date. Aside from complicating

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[25] Though the explosion of perceived counterparty risk was a direct consequence of an increase in the perceived probability of default on mortgages, particularly from "sub-prime" borrowers.

[26] There are other issues that could be taken up in the 2008 SNA Research Agenda (2008 SNA, Annex 4). Although the scope of assets whose interest flows are eligible for FISIM treatment is not explicitly mentioned in paragraph A4.33, this issue might be taken up under "The Calculation of FISIM." The 1993 SNA calculated the output of financial services as the property income of financial corporations: net interest, plus dividends, plus rent. This was equivalent, in effect, to measuring FISIM output as the user cost or rental value of the entire financial and nonfinancial balance sheet of financial corporations. The 2008 SNA also allocates output to using sectors based on the user cost value of services from financial assets, but restricts the scope of these service yielding assets to deposits and loans. In particular, the 2008 SNA eliminates securities from this calculation, unlike its 1993 predecessor. The 2008 SNA is consistent in valuing total indirectly measured financial service output as the sum of these user cost valued services to sectors from deposits and loans only, while the 1993 SNA "allocated" its aggregate output estimate based on a FISIM calculation excluding "own funds" (essentially equity plus net worth), generating an inconsistency. Though the 2008 SNA now is internally consistent between the value of output and the total of its uses, it comes at the cost of excluding the value of financial services production from other parts of the balance sheet. We note that this would not necessarily increase FISIM output for every institution. Besides scope, the Research Agenda also provides for revisiting the exclusion of holding gains and losses from the value of estimated service flows (paragraph A4.23), among other topics.

[27] 2008 SNA, paragraph 13.62.

calculation of the reference rate and FISIM by orders of magnitude, this does not give a current estimate of FISIM, but a distributed lag of FISIM components as long as a decade or more. Market valuation of loans for FISIM calculation can be done as a clarification of the 2008 SNA text on FISIM without materially changing loan valuation, though recommending a memorandum item for market value of loans on the balance sheet would be desirable.

To assess the importance of risk management in the indirectly measured output of financial corporations, we have argued here that premia on swap contracts can be used to value the risk management services institutions produce for their own use. We find that these risk management services tend to dominate FISIM, particularly in economic downturns. However, our use of derivative premia need not imply any restatement of the 2008 SNA treatment of financial services associated with derivative contracts.[28]

VII. CONCLUDING REMARKS

This paper takes a step toward examining the value of risk management services underlying the production of financial intermediation services indirectly measured (FISIM) in the national accounts. We find that two major classes of risk management activity—term risk and default risk insurance—could account for a significant share of the value of the loan FISIM produced by US banks. Our approach to these underlying insurance services that the value of output must cover is based on market information from the financial derivatives that financial institutions use to manage risk. Our results counsel caution in using methods to estimate FISIM on loans as the difference between market loan interest rates and rates on securities matched to those loans by maturity and risk. These methods depend critically on finding an asset whose return contains no remuneration for the service outputs financial institutions are producing, particularly for risk management operations. Unless that assumption is true, they are likely to throw out the components of FISIM that remunerate the term and default insurance services inherent in risk management, and seriously underestimate the current price value of indirectly measured financial services output. We suggest that a more promising approach to analyzing the contribution of the indirectly measured output of financial corporations to aggregate total output and net output (GDP) would be in their contribution to volume and price change within the currently defined aggregate rather than,

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[28] The 2008 SNA considers guarantees produced through financial derivatives, e.g., of loans against default through credit default swaps, as well as so-called "one-off" guarantees , not to generate insurance transactions between counterparties because these contracts do not involve a sufficient element of risk pooling. The SNA does, however, consider the (explicit) fees for setting up financial derivative contracts to be (non-insurance) financial service transactions. Our approach—considering derivative instruments as part of the technology of producing risk management services for own use—is compatible with the existing SNA language. On the other hand, the 2008 SNA does consider "standardized" guarantees to involve sufficient risk pooling activity to be insurance, whose service output is measured using the non-life formula. See 2008 SNA, Chapter 17.

in effect, netting risk remuneration from the price of financial services and current price total and net output.

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