

# Measuring the Services of Commercial Banks in the National Income and Products Accounts

## Changes in Concepts and Methods in the 2013 Comprehensive Revision

By Kyle K. Hood

AS PART OF the 2013 comprehensive revision of the national income and product accounts (NIPAs) to be released in July, the Bureau of Economic Analysis (BEA) will change its methods for measuring implicitly priced services produced by commercial banks.

National economic account statisticians have long recognized that banks are compensated for some services by a portion of the interest that they charge on loans or by a reduction in the interest rates that they pay to depositors—rather than by charging explicit fees. BEA refers to these services as “financial services furnished without payment” or as “implicitly priced services.” For example, banks may provide some services—such as processing of checks, disbursing or transferring funds when and where needed, protecting deposited funds, and investment services—without charging explicit fees. To account for such services, the NIPAs include an imputation of the value of these services because they are omitted by the standard measure of output based on revenue from fees or prices, which is used for most industries. The *System of National Accounts (SNA)*, which provides widely followed international guidelines for national accounts, contains recommendations on measuring implicitly priced services of financial intermediaries, including banks, and terms these services “financial intermediation services indirectly measured,” or FISIM (*SNA 2008*, paragraph 6.163, 115).

This article details the improved methods that will enable the NIPAs to better reflect the level and composition of the implicitly priced services (hereafter implicit services) that commercial banks provide. The changes in methods for computing implicit services (1) modify the boundaries of the assets and liabilities included in the implicit services calculations, (2) introduce a new treatment of losses from borrower default, and (3) refine the computation of the reference rate to avoid spurious volatility in the measures of implicit services consumed by borrowers and depositors. The

first of these changes reflects differences between the 1993 and 2008 versions of the *SNA*. The other two changes—while still falling within the measurement framework recommended by the *2008 SNA*—address a conceptual concern relating to interest charged to cover defaults (which is not a charge for services) and a practical concern relating to potential maturity and timing mismatches between the reference rate and interest rates on assets and liabilities. In addition, this article takes a look at how the new methodology affects estimates for a specific year (2008), the effects of revisions on commercial bank interest rates, and the effects on gross domestic product estimates. The article concludes with a note on areas of future research. In addition, a box takes a look at the research background on accounting for implicit financial services.

In sum, the new methods will produce a more realistic picture of bank output, as is particularly evident in the run-up to, and aftermath of, the recent financial crisis.

### Updated Asset and Liability Boundaries

The *2008 SNA* makes more specific recommendations about the assets and liabilities included in computations of implicit services than did the *1993 SNA*. The *1993 SNA* implied that all financial assets and liabilities on banks’ balance sheets should be used in the calculation of implicit services (paragraph 6.125, 139–140). In contrast, the *2008 SNA* states that “indirect charges in respect of interest apply only to loans and deposits” (paragraph 6.164, 115–116). Furthermore, Reinsdorf (2011) argues that banks only provide implicit services in connection with assets and liabilities that involve direct contact between the bank and a customer. If, for example, a bank purchases a bond for its portfolio on the open market, the bank does not produce services that are used by the actual bond issuer.

As part of the 2013 comprehensive revision, the NIPAs will narrow the scope of the assets and liabilities for which flows of implicit services are imputed.

Although the 2008 SNA specifies that only loans and deposits are to be used to compute implicit services, securities repurchase agreements will also be included in the implicit services calculations because these arrangements usually involve contact with a customer. Commercial banks in the United States have a net liability position in repurchase agreements, so the net effect of the treatment of repurchase agreements will be to treat the funding that the commercial banking industry obtains from repurchase agreements with customers the same way that deposits are

treated. Also, commercial banks' trading assets and liabilities may be associated with direct customer contact. In such cases, only those assets and liabilities will be included in the measure of implicit services.

The exclusion of securities and bank borrowings that do not involve customer contact is expected to reduce the estimates of implicit services slightly. The effect will be small because nonloan, nondeposit financial assets and liabilities tend to have interest rates that are close to the reference rate.

### Accounting for Implicit Financial Services: Background

It has been recognized since the early days of the national accounts that commercial banks are remunerated for some services not through fee income but through interest margins on loans and deposits. Fees for these services are embedded in interest rates, which are higher for loans or lower for deposits than would be the case if the bank charged for such services directly. Yet in national income accounting, interest payments are usually treated as distributions of income to investors and lenders, not as payments for services. If these interest flows were accounted for in the usual way, then banks would be shown as contributing negatively to national income; their fee income is not large enough to cover their operating expenses. Furthermore, much of the output that banks produce would be missed. To avoid these problems, the NIPAs include an imputation for the services that are furnished by commercial banks without explicit payment. This imputation treats some of the net interest that banks receive as implicit payments for services provided to borrowers and depositors.

The 1993 SNA recognized that banks provide financial intermediation services both to borrowers and to depositors. To divide these services between those consumed by borrowers and those consumed by depositors, it introduced the "reference-rate" approach. Under this approach, the difference between the interest rate on bank assets and the reference rate is used to measure implicit services to borrowers, and the difference between the reference rate and interest rate on bank liabilities is used to measure implicit services to providers of funds to the bank. The reference rate methodology can be interpreted as an application of the theory of the user cost of money of Donovan (1978), Diewert (1974), and Barnett (1978). In this theory, the user cost of holding a financial asset is the yield that would have been earned on the funds if they had been invested instead in a "reference" asset, such as a risk-free bond.

The reference-rate approach to measuring implicit services was implemented in the NIPAs as part of the 2003 comprehensive revision (Fixler, Reinsdorf, and Smith 2003). Previously, the entire amount of banks' net interest income had been treated as a payment for implicit services to depositors. Because the proportion of bank deposits held by persons is higher than the proportion of loan balances that are due from persons (excluding residential mortgages and business loans to sole

proprietors), implementation of the reference-rate approach resulted in a lower estimate of personal consumption expenditures on implicit services. However, the estimate of implicit services used by the owner-occupied housing sector increased by enough to cause a substantial reduction in the measure of the value added of this sector.

In addition to its effect on the division of the consumption of implicit services among using sectors, adoption of the reference-rate approach also reduced the overall measure of bank output of implicit services. The reduction can be interpreted as a change in the treatment of loans that are funded with the bank's own capital, termed "own funds" in the SNA. Banks do not have to pay interest on own funds, so when banks lend their own funds, the entire amount of the interest received from the borrower is included in banks' net interest income. Yet only the part of the interest paid by the borrower that comes from the spread between the loan rate and the reference rate represents the implicit services of the bank. The part of a bank's net interest income that does not represent an implicit payment for services to either a borrower or a depositor is therefore equal to the reference rate times the amount of own funds used by the bank for lending purposes. This implies that the total amount of implicit services of the bank from all its lending and deposit-taking activities equals the net interest received by the bank less the interest expense that the bank has avoided by funding its loans with money that is borrowed at a cost equal to the reference rate of interest.

Since the original implementation of the reference-rate approach to measure implicit services of commercial banks, the methods have been improved. The most important change modified the definition of the reference rate. The original definition, implemented as part of the 2003 comprehensive revision of the NIPAs, included Treasury securities, federal agency debt, and mortgage-backed securities in the calculation of the reference rate. Although the reference rate is supposed to be a risk-free rate, interest rates on mortgage-backed securities had begun to be influenced by perceptions of risk, so mortgage-backed securities were removed from the reference-rate calculation as part of the 2005 annual revision of the NIPAs. Other more technical changes introduced at around the same time improved the stability of the quarterly estimates.

## New Treatment of Default Losses

Some of the interest that a bank charges on loans is used to cover losses of principal due to borrower default, a conceptual concern that has been discussed by Fixler, Reinsdorf, and Smith (2003); Wang (2003); Wang, Basu, and Fernald (2009); and Basu, Inklaar, and Wang (2011). Funds that are used to cover these principal losses are not available to cover costs of labor and fixed capital needed for production, so they should be out-of-scope for measuring output. Accordingly, the revised NIPA procedure for calculating the value of implicit services provided to borrowers will subtract a measure of expected credit losses due to borrower default from the actual interest that banks earn on loans.<sup>1</sup>

When a lender originates a loan, there is almost always the possibility that the borrower may not pay back the loan's principal in its entirety. To ensure that nonpayment of principal does not drain away their capital, lenders generally charge an additional interest-rate margin large enough so that on average, the interest paid by all borrowers will be sufficient to cover amounts lost to default by some borrowers (in addition to cost of funds and services). This component of the lending rate is termed the "default margin."

In user cost theory, the interest rate on loans is usually expressed as the sum of the cost of funds (a risk-free, default-free, service-free reference rate) plus a service margin ( $s$ ):

(1)

$$r^{loan} = r^{reference} + s$$

The current method in the NIPAs for computing the output of borrower services of commercial banks defines the service margin as the difference between the interest rate on loans and the reference rate; this service margin is then multiplied by total loan balances. Because  $r^{loan}$  includes a default margin and  $r^{reference}$  does not, the default margin ends up in the service margin, and thus is incorrectly included in the measure of borrower services.

Corrado, Reinsdorf, and Hood (2012) argue that in equilibrium the revenue that banks receive from implicit borrower services should be equal to the total amount needed to compensate factors of production,

1. Besides the default adjustment, Wang (2003) also removes a risk premium from the measure of implicit borrower services by including a risk premium in the particular reference rate used to calculate borrower services for each type of loan. This risk premium compensates investors for the disutility of bearing risk and is in addition to the component of loan interest needed to cover expected credit losses. The proposed adjustment to remove the risk premium from the measure of implicit services has conceptual and practical disadvantages; it differs from the default cost margin considered in this article. It is important not to conflate the concept of a default margin with that of a risk premium.

such as labor, that produce the borrower services. If the default margin is positive, it will be included in the measured service margin from equation (1) even though it is effectively earmarked to be distributed to defaulting borrowers as a replacement for the principal that they owe and is not expected to be available to pay labor and suppliers. Thus, an adjustment to exclude the default margin is needed as part of the procedure for computing the service margin.

To exclude the default margin from the measure of output, the interest rate on loans,  $r^{loan}$ , is adjusted with an estimate of the default margin. The service margin is then computed using equation (1a):

(1a)

$$r^{loan} - d = r^{reference} + s$$

Here,  $d$  is the estimate of the default margin. The default margin is estimated as a smoothed measure of loan charge-offs; charge-offs in a quarter represent the principal value that is recognized as uncollectable during that quarter. Charge-offs are reported to bank regulators in Call Reports (quarterly reports of bank condition and income). These charge-offs are aggregated and adjusted for business combinations and seasonality by the Federal Reserve Board.<sup>2</sup> Because charge-off rates can be noisy, adjusted charge-off rates (charge-offs divided by loan balances) that are smoothed using a geometrically declining weighted average are computed. (An analogous method is recommended in 2008 SNA (paragraph 6.189, 118) for nonlife insurance claims.) This is done by setting the estimated default margin of the current quarter  $Q$  equal to the estimated default margin from the preceding quarter plus 0.075 times the difference between the observed charge-off rate in the current period and the estimated default margin from the previous period.<sup>3</sup> This is shown in the following equation:

(2)

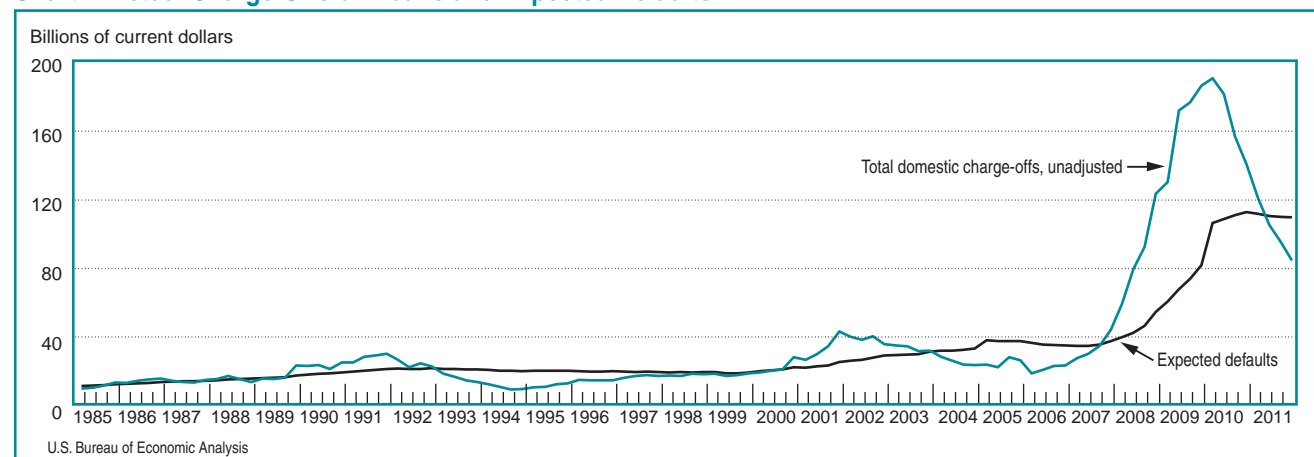
$$d_Q = d_{Q-1} + 0.075(c_Q - d_{Q-1})$$

where  $c$  denotes the charge-off rate. Separate default margins are calculated for four types of loans. For each loan type, the estimated default margin is then subtracted from the observed interest rate to arrive at an adjusted loan rate. The adjusted loan rate is then used to compute the service margin, as shown in equation (1a). Chart 1 shows the combined actual charge-offs for the four types of loans and the overall estimated default margin multiplied by loan balances.

Note that the NIPAs currently measure gross loan

2. See [www.federalreserve.gov/releases/chargeoff](http://www.federalreserve.gov/releases/chargeoff).

3. The 0.075 per quarter figure is chosen to match the average maturity and repricing dates of loans on banks' books, which is about 3 years.

**Chart 1. Actual Charge-Offs on Loans and Expected Defaults**

interest for calculating borrower FISIM using the interest income booked by banks, which excludes uncollected interest income on loans on nonaccrual status. The exclusion of uncollected interest on these doubtful loans means the interest that is contractually due but that the bank does not expect to receive is effectively removed. A separate adjustment, however, is required for losses of *principal* due to default (or charge-offs), which is the adjustment described in equation (2).

### Refined Reference-Rate Calculation

Hood (2010) and Corrado, Reinsdorf, and Hood (2012) suggest that when estimating implicit services, differences between the timing and maturity of banks' loans and deposits and the assets actually used to compute the reference rate can result in spurious fluctuations in the relative levels of borrower and depositor services. While fluctuations in the reference rate relative to loan and deposit rates will not have large effects on total implicit services (that is, the total of both borrower and depositor services), their effects on the relative levels of estimated borrower and depositor services can be substantial. This matters because borrower and depositor services are consumed by households, the business sector, and other sectors in different proportions, and only consumption by households, government, and services exported to the rest of the world are included in the expenditure-approach estimate of GDP.

Spurious fluctuations in the split between borrower and depositor services can occur if the reference rate comes from an instrument that has a different maturity from bank loans and deposits. At present in the NIPAs, the yield on Treasury and government agency bonds (excluding mortgage-backed securities), which tend to have longer maturities, is used for the reference rate. For this reason, loan and deposit rates tend to adjust more rapidly to changes in the interest-rate envi-

ronment than does the reference rate. If loan and deposit rates go up but the reference rate stays the same from one period to the next, then this situation will generate a relative increase in the estimate of borrower services; conversely, if loan and deposit rates go down but the reference rate stays constant, then this will generate a relative increase in the estimate of depositor services.

The reference rate in its current form reflects the methodology developed in 2003 (Fixler, Reinsdorf, and Smith 2003) and a change instituted in 2005 that removed mortgage-backed securities from the reference-rate calculation (Seskin, Smith, and Weadock 2005). This improvement has had the effect of reducing the volatility of the reference rate to some degree. Nevertheless, while the current reference rate has always hovered between the rates on loans and deposits, at turning points in the interest-rate environment, it tends to lag behind shifts in loan and deposit rates for one or two quarters (Corrado, Reinsdorf, and Hood 2012).

Short-run shifts in user cost prices due to swings in loan or deposit rates relative to the reference rate, such as those occurring at turning points in the interest-rate environment, may not be meaningful measures of actual price changes, because maturities of the loans and deposits may lock consumers into these instruments for many quarters. Fixed rates on loans and deposits are set with the expectation that over the life of the loan or deposit, they will have an average margin, compared with the reference rate, that covers the cost of the associated services. Hood (2010) presents some evidence that spreads on loans over the cost of funds react quite slowly to changes in the lending environment. To avoid spurious changes in user cost prices, the NIPAs will implement a spread stabilization procedure. This procedure will incorporate shifts in relative user cost prices of assets and liabilities that are implied

by changes in the relative position of the reference rate over a period of 12 quarters, reflecting the average maturity of loans on banks' balance sheets.

To ensure that the reference rate reflects the timing of changes in the interest-rate environment, the current (lagging) reference rate is averaged with a four-quarter moving average of the market yield on a 5-year Treasury bond, which leads changes in the interest-rate environment relative to loans and deposits. This average better reflects the timing of changes in the interest-rate environment and has about the same average level and variance as the currently used reference rate.

The new procedure involves the following steps: first, implicit borrower services and depositor services are computed using the standard reference-rate approach. This generates *unstabilized* borrower services (BS) and depositor services (DS). Second, the unstabilized proportion of services that are allocated to borrowers is computed as borrower services divided by the sum of unstabilized borrower and depositor services:

(3)

$$p_{unstab,Q}^{BS} = \frac{BS_{unstab,Q}}{BS_{unstab,Q} + DS_{unstab,Q}}$$

where  $Q$  represents the current quarter. Third, the stabilized proportion of services allocated to borrowers is computed as the difference between the stabilized proportion of services allocated to borrowers last quarter plus the difference between the unstabilized proportion in the current quarter and the stabilized proportion in the previous quarter, multiplied by a "stabilization factor" of 7.5 percent:

(4)

$$p_{stab,Q}^{BS} = p_{stab,Q-1}^{BS} + 0.075 \times (p_{unstab,Q}^{BS} - p_{stab,Q-1}^{BS})$$

This stabilization factor is derived from the average maturity, or repricing date, of items of banks' balance sheets, about 12 quarters. Fourth, borrower and depositor services are computed with the stabilized proportion:

(5)

$$BS_{stab,Q} = p_{stab,Q}^{BS} \times (BS_{unstab,Q} + DS_{unstab,Q})$$

and

(6)

$$DS_{stab,Q} = (1 - p_{stab,Q}^{BS}) \times (BS_{unstab,Q} + DS_{unstab,Q})$$

Finally, borrower and depositor services are assigned to sectors based on ratios that are held constant throughout the year. The sector assignment methodology is unrevised from that introduced in the 2003 comprehensive revision.

During each annual revision of the NIPAs, the stabilized proportions of borrower and depositor services can be used to derive the reference rate for the preceding year that yields the observed stabilized borrower services proportion. This is termed the "derived" reference rate. Based on the derived reference rate, output for each type of financial asset and liability can be computed separately, and sectoring ratios can be re-computed for the year.

### Effects of the New Methodology

Table 1 provides an example of the new methodology applied to commercial banks for all four quarters of 2008. Stabilization of the reference rate and adjustment of the default rate require some numbers to be carried over from one quarter to the next, so the computation is shown for several quarters. The steps shown are (1) computation and adjustment of default rates, (2) computation of the rates of interest, (3) computation of user cost rates (unstabilized), (4) computation of output (unstabilized), and (5) stabilization of output. The balance sheet and income statement have been adjusted for foreign institutions operating in the United States.<sup>4</sup> Because this methodology is applied to data starting in 1985, the reference rate stabilization is started using the 1984 borrower services proportion. The charge-off adjustment is started using the long-run average of charge-off rates.

### Effects of revisions on commercial bank interest rates

Chart 2 (page 14) shows how the overall spread between the average loan rate and the average deposit rate will be divided up after the incorporation of the default adjustment and the stabilized reference rate. The width of the light green area is the difference between the net and gross rates of return on bank assets (loans and trading account assets) and thus represents the adjustment to the interest rate for expected costs of borrower default. Although this adjustment normally falls within the range of 0.5 percent to 1 percent, it widened substantially during 2008–2011, reaching nearly half of the margin between the gross rate of interest on loans and the stabilized reference rate. (The stabilized reference rate is the light gray area

4. Because no income statement data are available for foreign institutions operating in the United States, this adjustment is done using balance sheet information only.

that separates the dark gray area from the dark green area.) This area grew larger because during this period, charge-off rates were persistently higher than historical averages. In 2012, they fell, but they are still nearer to historic highs than to long-run averages.

The methods currently used in the NIPAs show

growth of approximately 45 percent in nominal borrower services from 2007 to 2011. Yet the growth of gross lending by commercial banks was close to flat over this period because of a financial crisis that resulted in a recession and numerous bank failures. The revised methodology yields results that seem more

Table 1. Effects of New Methodology on Commercial Bank FISIM, 2008—Continues

Line		2008				
		I	II	III	IV	
		Billions of current dollars				
<b>Balance sheet <sup>1</sup></b>						
<b>Assets</b>						
	Borrower services					
1	Domestic loans, net .....	6,527.64	6,541.43	6,544.12	6,850.45	
2	Trading assets .....	876.22	797.03	753.33	668.16	
Assets netted against liabilities						
3	Federal funds sold .....	977.41	917.58	906.71	823.44	
4	Cash in the process of collection .....	174.62	170.52	153.23	153.84	
5	Interest-bearing balances at depository institutions .....	234.68	256.11	270.16	332.27	
6	Other balances at depository institutions .....	106.86	114.87	126.47	168.77	
Other assets						
7	Treasury and agency securities .....	219.47	203.61	198.85	199.72	
<b>Liabilities</b>						
8	Domestic deposits <sup>2</sup> .....	6,858.66	6,882.17	7,010.06	7,275.03	
9	Federal funds purchased .....	1,204.37	1,140.80	1,090.51	1,066.94	
<b>Income statement <sup>1</sup></b>						
<b>Income</b>						
Borrower services						
10	Loan interest .....	110.77	102.15	100.84	105.49	
11	Trading assets .....	10.60	8.99	8.26	8.04	
Netted against liabilities						
12	Federal funds sold .....	8.37	5.94	5.79	2.92	
13	Cash in the process of collection .....	0.00	0.00	0.00	0.00	
14	Interest-bearing balances .....	3.05	3.12	2.74	4.66	
15	Other balances .....	0.00	0.00	0.00	0.00	
Other income						
16	Treasury and agency securities .....	2.54	2.28	1.96	1.89	
<b>Expenses</b>						
16	Domestic deposits <sup>2</sup> .....	47.02	37.92	35.97	34.02	
17	Federal funds purchased .....	10.32	7.18	6.56	3.33	
		Formula	Percentage points or billions of current dollars			
<b>Computation of charge-off adjustments and default rates</b>						
18	Charge-offs, domestic loans <sup>3</sup> .....		14.93	19.92	23.18	30.93
19	Loan balances in billions of current dollars .....		6,527.64	6,541.43	6,544.12	6,850.45
20	Charge-off rate (annual) .....	(18)/(19)*400	0.91	1.22	1.42	1.81
21	Expected default rate, previous quarter .....	(24)(previous)	0.59	0.61	0.66	0.71
22	Difference .....	(20)-(21)	0.33	0.61	0.76	1.09
23	Adjustment .....	(22)*0.075	0.02	0.05	0.06	0.08
24	Adjusted charge-off rate (expected default) <sup>4</sup> .....	(21)+(23)	0.61	0.66	0.71	0.80
<b>Computation of interest rates</b>						
<b>Assets</b>						
Borrower services						
25	Loans (net of expected default) .....	(10)/(1)*400-(24)	6.18	5.59	5.45	5.36
26	Trading account .....	(11)/(2)*400	4.84	4.51	4.38	4.81
Netted against liabilities						
27	Federal funds sold .....	(12)/(3)*400	3.43	2.59	2.56	1.42
28	Cash in the process of collection .....	(13)/(4)*400	0.00	0.00	0.00	0.00
29	Interest-bearing balances .....	(14)/(5)*400	5.20	4.87	4.06	5.61
30	Other balances .....	(15)/(6)*400	0.00	0.00	0.00	0.00
Other						
31	Federal and agency securities .....	(16)/(7)*400	4.63	4.47	3.95	3.79
<b>Liabilities</b>						
32	Domestic deposits .....	(17)/(8)*400	2.74	2.20	2.05	1.87
33	Fed funds purchased .....	(18)/(9)*400	3.43	2.52	2.41	1.25
<b>Reference rate, unstabilized</b>						
34	Rate on federal and agency securities .....	(31)	4.63	4.47	3.95	3.79
35	5-year Treasury yield <sup>5</sup> .....		3.95	3.55	3.20	2.80
36	Average .....	((34)+(35))/2	4.29	4.01	3.58	3.29

See the footnotes at the end of the table.

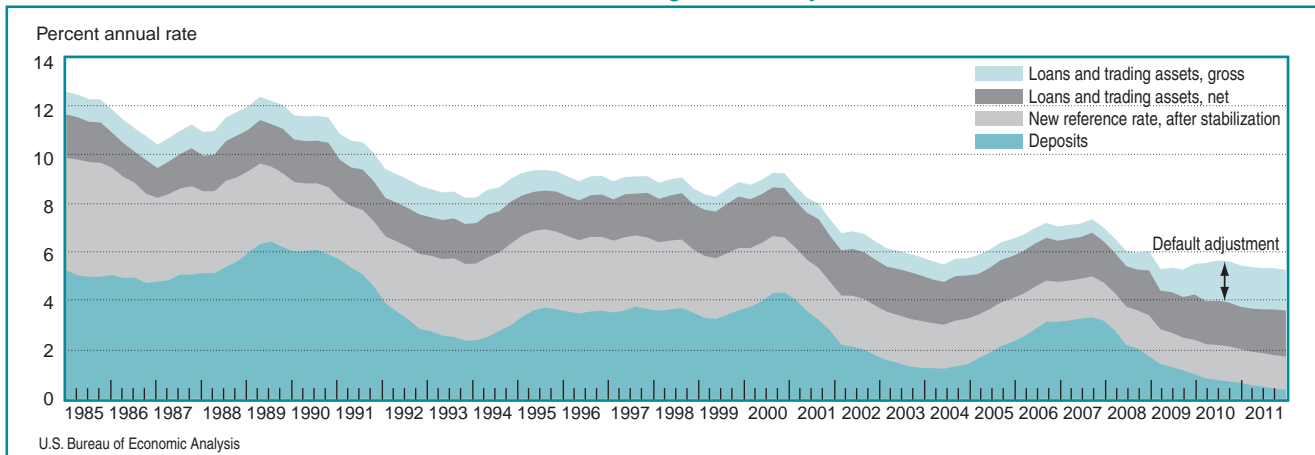
Table 1. Effects of New Methodology on Commercial Bank FISIM, 2008—Table Ends

Line	Formula	2008				
		I	II	III	IV	
Percentage points or billions of current dollars						
<b>Computations of user cost rates, unstabilized</b>						
<b>Assets</b>						
Borrower services						
37	Loans (net of expected default).....	(25)-(36)	1.89	1.58	1.87	2.07
38	Trading account.....	(26)-(36)	0.55	0.50	0.81	1.52
Netted against liabilities.....						
39	Federal funds sold.....	(27)-(36)	-0.86	-1.42	-1.02	-1.88
40	Cash in the process of collection.....	(28)-(36)	-4.29	-4.01	-3.58	-3.29
41	Interest-bearing balances.....	(29)-(36)	0.91	0.86	0.48	2.32
42	Other balances.....	(30)-(36)	-4.29	-4.01	-3.58	-3.29
<b>Liabilities</b>						
43	Domestic deposits.....	(36)-(32)	1.55	1.81	1.52	1.42
44	Federal funds purchased.....	(36)-(33)	0.86	1.49	1.17	2.04
<b>Computation of output, unstabilized</b>						
<b>Assets</b>						
Borrower services						
46	Loans (net of expected default).....	(37)*(1)/100	123.14	103.19	122.58	141.88
47	Trading account.....	(38)*(2)/100	4.82	3.98	6.09	10.15
Netted against liabilities						
48	Federal funds sold.....	(39)*(3)/100	-8.42	-13.05	-9.25	-15.44
49	Cash in the process of collection.....	(40)*(4)/100	-7.49	-6.84	-5.48	-5.06
50	Interest-bearing balances.....	(41)*(5)/100	2.14	2.20	1.30	7.71
51	Other balances.....	(42)*(6)/100	-4.58	-4.61	-4.52	-5.56
<b>Liabilities</b>						
52	Domestic deposits.....	(43)*(8)/100	106.09	124.37	106.77	103.41
53	Federal funds purchased.....	(44)*(9)/100	10.36	17.04	12.76	21.80
<b>Totals</b>						
54	Borrower services.....	(46)+(47)	127.95	107.17	128.68	152.02
55	Depositor services.....	(48)+(53)	98.10	119.13	101.58	106.86
56	Total services.....	(54)+(55)	226.05	226.30	230.26	258.88
<b>Computation of output, stabilized</b>						
57	Borrower services proportion.....	(54)/(56)	0.57	0.47	0.56	0.59
58	Stabilized proportion, last quarter.....	(61) previous	0.55	0.55	0.54	0.54
59	Difference.....	(57)-(58)	0.02	-0.07	0.02	0.04
60	Adjustment.....	(59)*0.075	0.00	-0.01	0.00	0.00
61	Stabilized proportion <sup>6</sup> .....	(58)+(60)	0.55	0.54	0.54	0.55
62	Borrower services, stabilized.....	(61)*(56)	123.67	122.56	125.00	141.40
63	Depositor services, stabilized.....	(56)-(62)	102.38	103.74	105.26	117.48
<b>Derived reference rate computation</b>						
64	Total assets.....	(1)+(2)	7,403.85	7,338.45	7,297.45	7,518.61
65	Total liabilities (net of corresponding assets).....	(8)+(9)-(3)-(6)	6,569.45	6,563.89	6,644.00	6,863.65
66	Income (net of default).....	(10)+(11)-(24)*(19)/400	111.38	100.39	97.40	99.88
67	Expense (net of corresponding income).....	(16)+(17)-(12)-(15)	45.92	36.04	34.00	29.77
68	Derived reference rate.....	((61)*(66)+(1-(61))*(67))/((61)*(65)-(1-(61))*(64))	4.35	3.79	3.63	3.44

1. Data are from Call Reports from the Federal Financial Institutions Examination Council that have been adjusted for foreign institutions operating in the United States.  
 2. Includes demand deposits, time deposits, and savings.  
 3. Charge-offs are adjusted for seasonality.

4. In the fourth quarter of 2007, the rate was 0.59 percent.  
 5. Source: Federal Reserve Board of Governors.  
 6. In the fourth quarter of 2007, the stabilized proportion was 0.55 percent.  
 FISIM Financial intermediation services indirectly measured

Chart 2. Interest Rates Used for FISIM Calculation Showing Default Adjustment and New Reference Rate



plausible, as it shows a modest increase in borrower services of approximately 1 percent over this period.

Chart 3 shows the effect of changing to the stabilized reference rate. The reference rate implied by current methods is given by the black dashed line. This line tends to lag changes in the interest-rate environment, as noted above. The black line, which is the average of the previous reference rate and the yield on 5-year Treasury bonds, better captures the patterns in loan rates and deposit rates. Stabilization (the green line) dampens the noise associated with high-frequency movements in this rate and in loan and deposit rates.

### Revisions to estimates of gross domestic product

The revisions to the measures of commercial bank output will generally lead to downward revisions of total gross output of commercial banks because the default adjustment reduces the amount of net interest that is viewed as an implicit payment for services.<sup>5</sup> The default adjustment lowers estimates of both final and intermediate uses of bank output. Similarly, the exclusion of certain assets and liabilities from the implicit services computation can be expected to lower the estimates of bank services. However, as the excluded assets and liabilities are not associated with significant service margins, the effect is small. Finally, the stabilization of the position of the reference rate has an ambiguous effect on the estimated level of bank services in any given quarter, but over time, it will be approximately neutral.

It should be noted that the default adjustment does not directly affect measures of saving by sectors, such

5. Revisions in this section are intended to illustrate the effects of the change in methods. While the figures are expected to be reasonably close to published estimates, they are subject to change before the release of the 2013 comprehensive revision.

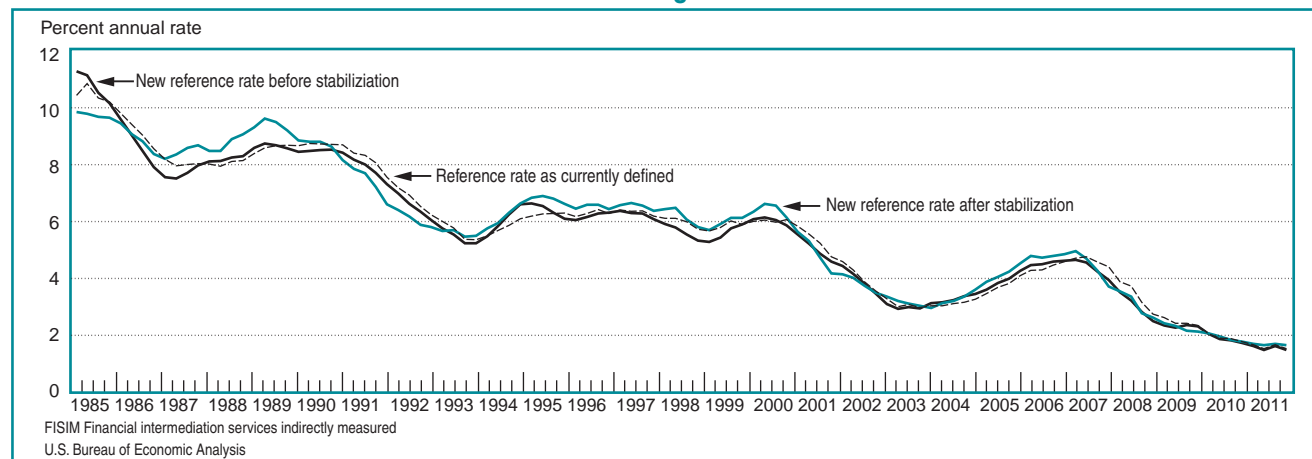
as persons, business, and government. The reductions in the amount of interest that is counted as a payment from borrowers for services are offset by increases in the amount of pure interest paid from borrowers to banks (referred to as “SNA interest” in the SNA).<sup>6</sup>

Table 2 shows the revisions to estimates of the consumption of implicit financial services of commercial banks for 2008 that result from the changes in methods. The implied revisions are broken down by borrower and depositor services. In addition, revisions are divided into two categories: revisions due to the default adjustment and revisions due to the change in the reference rate, the stabilization procedure, and the asset/liability boundary redefinition. The overall revision to the estimate of commercial bank gross imputed output of \$55.9 billion reflects a \$30 billion reduction in imputed borrower services and a \$26 billion reduction in imputed depositor services; as a percent of total borrower and depositor services gross imputed output, these revisions are nearly identical (–19 percent). The method used to allocate depositor and borrower services to sectors has not changed, so the effects of the revisions in methods used to calculate borrower and depositor services are evenly distributed across sectors. Revisions to estimates of total services will not be evenly distributed across sectors, however, because the sectors each consume borrower and depositor services in different proportions.

Table 2 also shows the effects of the different sources of revisions. In the year that is shown in the table,

6. Treating the interest that is earmarked to cover default losses as repayments of principal made by those borrowers who pay back their loans on behalf of other borrowers who default would have resulted in defaulting being counted as a form of saving by borrowers. Neither actual nor expected defaults are viewed as transactions in the SNA, so allowing banks’ default losses to raise estimates of saving by borrowers would be inconsistent with national accounting principles. To avoid this mistake, amounts that the default adjustment keeps from being counted as purchases of implicit services by borrowers will continue to be treated as interest payments from borrowers.

**Chart 3. Interest Rates Used for FISIM Calculation Showing New Reference Rate Definition and Stabilization**





defaults are high compared with defaults in previous years, and so the default revision is relatively high.

**Table 2. Revisions to FISIM of Commercial Banks by Sector, 2008**

[Billions of dollars]

	Previous estimate	Revised estimate <sup>2</sup>	Revision	Sources of revisions	
				Default	Stabilization and other
<b>Total FISIM</b> .....	<b>287.1</b>	<b>231.1</b>	<b>-55.9</b>	<b>-49.2</b>	<b>-6.7</b>
Borrower services.....	154.2	124.3	-30.0	-49.2	19.3
Depositor services.....	132.8	106.9	-26.0	0.0	-26.0
<b>Final consumption</b> .....	<b>121.7</b>	<b>98.0</b>	<b>-23.8</b>	<b>-8.7</b>	<b>-15.1</b>
Borrower services.....	27.2	21.9	-5.3	-8.7	3.4
Depositor services.....	94.5	76.0	-18.5	0.0	-18.5
<b>Persons</b> <sup>1</sup> .....	<b>98.5</b>	<b>79.3</b>	<b>-19.2</b>	<b>-6.2</b>	<b>-13.0</b>
Borrower services.....	19.4	15.6	-3.8	-6.2	2.4
Depositor services.....	79.1	63.7	-15.5	0.0	-15.5
<b>Federal government</b> .....	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Borrower services.....	0.0	0.0	0.0	0.0	0.0
Depositor services.....	0.1	0.1	0.0	0.0	0.0
<b>State and local government</b> .....	<b>12.2</b>	<b>9.8</b>	<b>-2.4</b>	<b>-1.8</b>	<b>-0.6</b>
Borrower services.....	5.6	4.5	-1.1	-1.8	0.7
Depositor services.....	6.6	5.3	-1.3	0.0	-1.3
<b>Rest of world</b> .....	<b>11.0</b>	<b>8.9</b>	<b>-2.1</b>	<b>-0.7</b>	<b>-1.4</b>
Borrower services.....	2.3	1.9	-0.4	-0.7	0.3
Depositor services.....	8.7	7.0	-1.7	0.0	-1.7
<b>Intermediate consumption</b> .....	<b>165.4</b>	<b>133.2</b>	<b>-32.2</b>	<b>-40.5</b>	<b>8.4</b>
Borrower services.....	127.0	102.3	-24.7	-40.5	15.9
Depositor services.....	38.4	30.9	-7.5	0.0	-7.5
<b>Domestic business</b> .....	<b>121.9</b>	<b>98.2</b>	<b>-23.7</b>	<b>-26.7</b>	<b>2.9</b>
Borrower services.....	83.6	67.3	-16.2	-26.7	10.4
Depositor services.....	38.4	30.9	-7.5	0.0	-7.5
<b>Households</b> .....	<b>40.3</b>	<b>32.4</b>	<b>-7.8</b>	<b>-12.9</b>	<b>5.0</b>
Borrower services.....	40.3	32.4	-7.8	-12.9	5.0
Depositor services.....	0.0	0.0	0.0	0.0	0.0
<b>Nonprofit institutions</b> .....	<b>3.2</b>	<b>2.5</b>	<b>-0.6</b>	<b>-1.0</b>	<b>0.4</b>
Borrower services.....	3.2	2.5	-0.6	-1.0	0.4
Depositor services.....	0.0	0.0	0.0	0.0	0.0

1. NOTE: Does not include revisions to nonprofit institutions.

2. Allocation of output to sectors is estimated and may not reflect figures that will be published. FISIM Financial intermediation services indirectly measured

Even though the default revisions are only applied to borrower services, the stabilization procedure causes some of the effect of high default margins to be reflected in a downward revision to depositor services. This can be seen in the downward revisions of both borrower services and depositor services.

Table 3 shows the effect of the methods discussed in this article on the summary NIPA accounts. (Slight differences between tables 2 and 3 occur because revisions to intermediate inputs of nonprofit institutions serving households are carried through to personal consumption expenditures in these accounts but not in the sectoring of bank output shown in table 2.) The revisions result in a reduction in the measure of GDP of approximately \$24.4 billion, with \$19.8 billion coming from reductions in personal consumption expenditures and the rest coming mostly from revisions to estimates of state and local government consumption expenditures and exports.

The output imputations of bank implicit services recorded in the calculation of GDP are balanced by income imputations (imputed interest) recorded in the calculation of gross domestic income and national income, such that the statistical discrepancy is unaffected. Because of a reduction in the inputs of banking services used by the business sector and by the owner-occupied housing industry, value added in these industries will be higher, but their profits will be unaffected because their interest expenses will also be higher. The reduction in the measure of bank gross output, however, will exceed the increase in the measure of value

added of other industries, resulting in a net reduction in total output of the economy. While value added of the housing sector increases, rental income of persons will remain the same because the implicit services are offset by imputed interest.

### Future Research

While BEA has made a number of improvements over the last 10 years in how it treats the output of financial intermediaries, a number of areas of future research remain. The application of the methods used to measure

**Table 3. Revisions to Summary National Income and Product Accounts, 2008**

[Millions of dollars]

**Account 1. Domestic Income and Product Account, Revised Less Published Estimates**

Line			Line		
1	Compensation of employees, paid.....	0	15	Personal consumption expenditures .....	-19,838
2	Wage and salary accruals.....	0	16	Durable goods.....	0
3	Disbursements .....	0	17	Nondurable goods.....	0
4	Wage accruals less disbursements.....	0	18	Services.....	-19,838
5	Supplements to wages and salaries .....	0	19	Gross private domestic investment.....	0
6	Taxes on production and imports.....	0	20	Fixed investment .....	0
7	Less: Subsidies.....	0	21	Nonresidential .....	0
8	Net operating surplus.....	-24,373	22	Structures .....	0
9	Private enterprises.....	-24,373	23	Equipment and software.....	0
10	Current surplus of government enterprises .....	0	24	Residential .....	0
11	Consumption of fixed capital.....	0	25	Change in private inventories.....	0
12	<b>Gross domestic income</b> .....	-24,373	26	Net exports of goods and services .....	-2,150
13	Statistical discrepancy .....	0	27	Exports.....	-2,150
			28	Imports.....	0
			29	Government consumption expenditures and gross investment .....	-2,386
			30	Federal.....	-15
			31	National defense .....	0
			32	Nondefense.....	-15
			33	State and local .....	-2,371
14	<b>GROSS DOMESTIC PRODUCT</b> .....	-24,373	34	<b>GROSS DOMESTIC PRODUCT</b> .....	-24,373

**Account 2. Private Enterprise Income Account, Revised Less Published Estimates**

Line			Line		
1	Income payments on assets.....	-18,466	19	Net operating surplus, private enterprises.....	-24,373
2	Interest and miscellaneous payments.....	-18,466	20	Income receipts on assets.....	5,907
3	Dividend payments to the rest of the world.....	0	21	Interest.....	5,907
4	Reinvested earnings on foreign direct investment in the United States.....	0	22	Dividend receipts from the rest of the world.....	0
5	Business current transfer payments (net) .....	0	23	Reinvested earnings on U.S. direct investment abroad .....	0
6	To persons (net) .....	0			
7	To government (net) .....	0			
8	To the rest of the world (net) .....	0			
9	Proprietors' income with inventory valuation and capital consumption adjustments.....	0			
10	Rental income of persons with capital consumption adjustment .....	0			
	Corporate profits with inventory valuation and capital consumption adjustments.....	0			
11	Taxes on corporate income .....	0			
12	To government.....	0			
13	To the rest of the world.....	0			
14	Profits after tax with inventory valuation and capital consumption adjustments.....	0			
15	Net dividends .....	0			
16	Undistributed corporate profits with inventory valuation and capital consumption adjustments.....	0			
17					
18	<b>USES OF PRIVATE ENTERPRISE INCOME</b> .....	-18,466	24	<b>SOURCES OF PRIVATE ENTERPRISE INCOME</b> .....	-18,466

**Account 3. Personal Income and Outlay Account, Revised Less Published Estimates**

Line			Line		
1	Personal current taxes .....	0	10	Compensation of employees, received .....	0
2	Personal outlays.....	-15,461	11	Wage and salary disbursements .....	0
3	Personal consumption expenditures .....	-19,838	12	Domestic .....	0
4	Personal interest payments .....	4,376	13	Rest of the world .....	0
5	Personal current transfer payments.....	0	14	Supplements to wages and salaries .....	0
6	To government.....	0	15	Employer contributions for employee pension and insurance funds.....	0
7	To the rest of the world .....	0	16	Employer contributions for government social insurance .....	0
8	Personal saving.....	0	17	Proprietors' income with inventory valuation and capital consumption adjustments.....	0
			18	Rental income of persons with capital consumption adjustment .....	0
			19	Personal income receipts on assets .....	-15,461
			20	Personal interest income .....	-15,461
			21	Personal dividend income .....	0
			22	Personal current transfer receipts .....	0
			23	Government social benefits.....	0
			24	From business (net).....	0
			25	Less: Contributions for government social insurance, domestic .....	0
9	<b>PERSONAL TAXES, OUTLAYS, AND SAVING</b> .....	-15,461	26	<b>PERSONAL INCOME</b> .....	-15,461

implicit services of commercial banks to nonbank depository institutions remains an area of research. In addition, the 2008 SNA recommends that implicit borrower services be imputed for financial intermediaries

that do not take deposits. Developing the data and methods for doing this are also current topics of research.

#### Account 4. Government Receipts and Expenditures Account, Revised Less Published Estimates

Line			Line		
1	Consumption expenditures .....	-2,386	14	Current tax receipts .....	0
2	Current transfer payments .....	0	15	Personal current taxes .....	0
3	Government social benefits .....	0	16	Taxes on production and imports .....	0
4	To persons .....	0	17	Taxes on corporate income .....	0
5	To the rest of the world .....	0	18	Taxes from the rest of the world .....	0
6	Other current transfer payments to the rest of the world .....	0	19	Contributions for government social insurance .....	0
7	Interest payments .....	1,084	20	Income receipts on assets .....	-1,302
8	Subsidies .....	0	21	Interest and miscellaneous receipts .....	-1,302
9	Less: Wage accruals less disbursements .....	0	22	Dividends .....	0
10	Net government saving .....	0	23	Current transfer receipts .....	0
11	Federal .....	0	24	From business (net) .....	0
12	State and local .....	0	25	From persons .....	0
13	<b>GOVERNMENT CURRENT EXPENDITURES AND NET SAVING .....</b>	<b>-1,302</b>	26	Current surplus of government enterprises .....	0
			27	<b>GOVERNMENT CURRENT RECEIPTS .....</b>	<b>-1,302</b>

#### Account 5. Foreign Transactions Current Account, Revised Less Published Estimates

Line			Line		
1	Exports of goods and services .....	-2,150	9	Imports of goods and services .....	0
2	Income receipts from the rest of the world .....	446	10	Income payments to the rest of the world .....	-1,703
3	Wage and salary receipts .....	0	11	Wage and salary payments .....	0
4	Income receipts on assets .....	446	12	Income payments on assets .....	-1,703
5	Interest .....	446	13	Interest .....	-1,703
6	Dividends .....	0	14	Dividends .....	0
7	Reinvested earnings on U.S. direct investment abroad .....	0	15	Reinvested earnings on foreign direct investment in the United States .....	0
			16	Current taxes and transfer payments to the rest of the world (net) .....	0
8	<b>CURRENT RECEIPTS FROM THE REST OF THE WORLD .....</b>	<b>-1,703</b>	17	From persons (net) .....	0
			18	From government (net) .....	0
			19	From business (net) .....	0
			20	Balance on current account, national income and product accounts .....	0
			21	<b>CURRENT PAYMENTS TO THE REST OF THE WORLD AND BALANCE ON CURRENT ACCOUNT .....</b>	<b>-1,703</b>

#### Account 6. Domestic Capital Account, Revised Less Published Estimates

Line			Line		
1	<b>GROSS INVESTMENT, CAPITAL TRANSFERS, AND NET LENDING .....</b>	<b>0</b>	2	<b>GROSS SAVING AND STATISTICAL DISCREPANCY .....</b>	<b>0</b>

#### Account 7. Foreign Transactions Capital Account, Revised Less Published Estimates

Line			Line		
1	<b>BALANCE ON CURRENT ACCOUNT, NATIONAL INCOME AND PRODUCT ACCOUNTS .....</b>	<b>0</b>	2	<b>CAPITAL ACCOUNT TRANSACTIONS (NET) AND NET LENDING, NATIONAL INCOME AND PRODUCT ACCOUNTS .....</b>	<b>0</b>

## References

- Barnett, William A. 1978. "The User Cost of Money." *Economics Letters* 1, no. 2, 145–149.)
- Basu, Susanto, Robert Inklaar, and J. Christina Wang. 2011. "The Value of Risk: Measuring the Services of U.S. Commercial Banks." *Economic Inquiry* 49 (January): 226–245.
- Corrado, Carol, Marshall B. Reinsdorf, and Kyle K. Hood. 2012. "Expanding the Definition of Financial Services in National Accounts." Paper presented at the 32nd General Conference of the International Association for Research in Income and Wealth, Boston, MA, August 5–11, 2012.
- Diewert, W. Erwin. 1974. "Intertemporal Consumer Theory and the Demand for Durables." *Econometrica* 42 (May): 497–516.
- Donovan, Donal J. 1978. "Modeling the Demand for Liquid Assets: An Application to Canada." *IMF Staff Papers* 25, no. 4, 676–704.
- European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank. 1993. *System of National Accounts 1993*. New York, NY: United Nations.
- European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank. 2008. *System of National Accounts 2008*. New York, NY: United Nations.
- Fixler, Dennis J., Marshall B. Reinsdorf, and George M. Smith. 2003. "Measuring the Services of Commercial Banks in the NIPAs: Changes in Concepts and Methods." *SURVEY OF CURRENT BUSINESS* 83 (September): 33–44.
- Hood, Kyle K. 2010. "Computing Nominal Bank Services: Accounting for Default." Paper presented at the 31st General Conference of the International Association for Research in Income and Wealth, St. Gallen, Switzerland, August 22–28.
- Seskin, Eugene P., Shelly Smith, and Teresa L. Weadock. 2005. "Annual Revision of the National Income and Product Accounts," *SURVEY OF CURRENT BUSINESS* 85 (August): 13–35.
- Reinsdorf, Marshall B. 2011. "Measurement of Implicitly Priced Output of Commercial Banks in the U.S. National Accounts." Paper presented at the Meeting of the Task Force on Financial Intermediation Services Indirectly Measured (FISIM), Washington, DC, March 3–4. Accessed on November 16, 2012 at [unstats.un.org/unsd/nationalaccount/RAmeetings/TFMar2011/PP12-1.PDF](http://unstats.un.org/unsd/nationalaccount/RAmeetings/TFMar2011/PP12-1.PDF).
- Wang, J. Christina. 2003. "Loanable Funds, Risk, and Bank Service Output." Working Paper 03–4. Boston, MA: Federal Reserve Bank.
- Wang, J. Christina, Susanto Basu, and John G. Fernald. 2009. "A General-Equilibrium Asset-Pricing Approach to the Measurement of Nominal and Real Bank Output." In *Price Index Concepts and Measurement*, edited by W. Erwin Diewert, John S. Greenlees and Charles R. Hulten, 273–320. Chicago: University of Chicago Press, for the National Bureau of Economic Research.