Research Spotlight
Alternative Measures of Implicitly Priced Financial Services of Savings Institutions and Credit Unions

By Kyle K. Hood

SAVINGS INSTITUTIONS, credit unions, and commercial banks all offer a generally similar selection of financial services, though each differs in the ability to make certain kinds of loans.[1] As a result, many personal sector customers of these institutions would likely be unable to identify any distinguishing characteristics. Indeed, savings institutions and commercial banks sometimes change their charter types ("flip" their charters) without any substantive change in their operations; credit unions may also undergo such a process, and though rare, banks may even convert to credit unions.[2] Nevertheless, in the case of a charter flip, the measure of the institution's output in the national income and product accounts (NIPAs) changes substantially. If a commercial bank becomes a savings institution, for example, the implicitly priced financial intermediation services that had been allocated to borrowers when the institution was chartered as a commercial bank are instead allocated to depositors.

The goal of this article is to determine the extent to which harmonization of the methods used for savings institutions, credit unions, and commercial banks would alter the picture of the production and consumption of implicitly priced financial services in the United States. To this end, the paper develops methods for measuring the output of savings institutions and credit unions (referred to as "nonbank depository institutions") that are similar to those already used for commercial banks. It should be noted that no time line for bringing the methods outlined in this paper into the NIPAs has been established; this paper is merely meant to illustrate the sort of revisions that could result if methods like those now used for commercial bank were to be implemented.

Measurement of financial services in the NIPAs

National accounts statisticians have long recognized that the measurement of the financial intermediation services provided by depository institutions requires some special treatment because depository institutions generally embed a charge for services in their interest rates. The implicit service charges reduce the rate paid to depositors, who forego some interest in exchange for services, and increase the rates charged to borrowers. These implicitly priced services include processing of checks and electronic payments, disbursing or transferring funds when and where needed, protecting deposited funds, bookkeeping, bill payment, check cashing, investment services, screening and monitoring borrowers, and loan underwriting. In the *2008 System of National Accounts* (*2008 SNA*), services for which depository institutions are remunerated through adjustments to interest rates are referred to as "Financial Intermediation Services Indirectly Measured," or FISIM (*2008 SNA*, paragraph 6.163, 115). In this paper, they will simply be referred to as "implicit services."

Hood (2013) provides an overview of the history of the measurement in the *SNA* of implicit services of commercial banks. The *1993 System of National Accounts* recognized that some implicit intermediation services are provided to borrowers, and it measured these services based on the margin between loan rates and a reference rate that represented the bank's opportunity cost of funds. Previously, all of banks' net interest income (the difference between the interest receipts and interest payments) had been treated as implicit services consumed by depositors.

This reference-rate approach to measuring borrower and depositor services was implemented in the NIPAs in 2003 (Fixler, Reinsdorf, and Smith 2003), but only the method for estimating the services of commercial banks was revised. The methods used for savings institutions and credit unions continued to treat depositors as the consumers of all of the implicit services. One major effect of the 2003 change in methodology was to reduce implicit services allocated to final uses (the portion that contributes to gross domestic product (GDP)). Whereas deposits are held to a large extent by persons, borrowing is dominated by both corporate and household business (primarily owner-

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1. Savings institutions consist of depository institutions chartered as thrift banks and mutual or stock savings banks. Although the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2011 abolished the Office of Thrift Supervision and eliminated some regulatory advantages that thrift banks enjoyed, the thrift charter itself remains intact.

Credit unions are member-owned not-for-profit associations that accept deposits from members and make loans (usually) to members. In 2009, savings institutions accounted for about 10 percent and credit unions about 8 percent of the approximately $8.9 trillion in deposits at U.S. depository institutions.

2. For example, see Alan Kline, "Thrivent Financial Bank Converting to a Credit Union," *American Banker* (January 13, 2012); accessed on October 29, 2012 at www.americanbanker.com.

occupied housing). In addition, total implicit services were reduced to some extent, as loans funded through the bank's own funds do not produce any depositor services. These revisions and the subsequent improvements introduced as part of the 2013 comprehensive revision of the NIPAs will be discussed in more detail below.

Because of disparate accounting methods, changes in market shares of commercial banks and nonbank depository institutions may produce a misleading picture of the growth of financial intermediation services. To investigate this problem, this paper harmonizes the methods for computing implicit services for each of these types of institution. The methods that the NIPAs currently use for commercial banks provide better measures of the production and consumption of implicit services and conforms to the recommendations of the *2008 SNA*. This paper therefore applies these methods to savings institutions and credit unions, instead of applying the method currently used for savings institutions and credit unions to the commercial banking sector.

The new methods produce quite a different picture of the consumption of the output of these institutions from the methods presently used in the NIPAs. Although output does not fall by much, measured services for final use are substantially reduced, resulting in a downward revision to the estimate of GDP. Most of the downward revision results from a reduction in personal consumption expenditures. Additionally, the picture of the history of consumption of depository institution output changes. The new methodology reduces the volatility of measured output of savings institutions in the wake of the financial crisis and the recession and the subsequent recovery. It also shows that during this period, credit unions fared quite well.[3]

Current methods for measuring implicit services of nonbank depository institutions

The current method for computing the implicit output of savings institutions and credit unions assumes that the total value of this output equals the net interest income of these institutions. Consumption of this output is then apportioned to depositors in different sectors. For savings institutions, implicit services are allocated to households and other sectors based on their deposits at these institutions. For credit unions, households consume all such services.

The estimates that are currently published in the

NIPAs are not used as the baseline for comparison because they differ from the experimental estimates in ways other than the methods discussed in this article. To illustrate the effects of the change in methods, an alternative "current method" measure of the output of savings institutions and credit unions will be used as the baseline. The use of a simulated version of "current method" output means that the revisions calculated below reflect a concise set of effects: (1) the reduction in total implicit services due to the different treatment of own funds, (2) a reallocation of final and intermediate uses of implicit services due to sectoring changes, and (3) some other changes in implicit services that result from the methodological update for implicit services of commercial banks that were part of the 2013 comprehensive NIPA revision, discussed below. While the use of a simulation of current methods as the benchmark for comparison makes the results easier to interpret, it means that the revisions reported in this article will not necessarily be the same as the revisions that would be expected to result from the implementation of the new methodology in the accounts.

To get an idea of the size of the nonbank depository institution sector, in the 2012 revision of the NIPAs, credit unions were estimated to produce approximately $25.3 billion in implicit services in 2008. Savings institutions produced approximately $34.0 billion in that year, of which $22.8 billion was consumed by persons and $11.2 billion by businesses. This means that only about 19 percent of the output of these institutions was consumed by businesses, whereas 81 percent went to final consumption. From 2000 to 2008, the output of savings institutions grew by approximately 19 percent, and the output of credit unions grew by approximately 92 percent.

Current methodology for implicit services of commercial banks

In 2003, the NIPA methods for computing implicit services of commercial banks underwent a substantial revision (Fixler, Reinsdorf, and Smith 2003). This change recognized that some of the implicit services produced by commercial banks are consumed by borrowers. The updated approach, known as the reference rate approach, allocates services to borrowers and depositors using a reference rate of interest that lies between the average interest rate that banks pay on liabilities and the average interest rate that banks earn on assets. The reference rate was computed as the interest rate that the bank earned on its holdings of Treasury and agency debt. The margin between the reference rate and the interest rate paid on liabilities is known as the service margin on liabilities, and the margin between the asset interest rate and the reference rate is the service margin

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3. This fits what is generally seen in the pattern of credit union membership, asset holdings, and performance during this period; for example, see Richard G. Anderson and Yang Liu, "Banks and Credit Unions: Competition Not Going Away," *The Regional Economist* 21, no. 2 (April 2013): 4–9; accessed on May 2, 2013 at www.stlouisfed.org.

on assets. The output of implicit depositor services is computed as the product of the liability service margin and total liabilities. The output of implicit borrower services is computed as the product of the asset service margin and total assets. Other depository institutions were not included in this methodological change and in some subsequent changes because of the lack of sufficient resources to complete all of the needed revisions in a timely fashion.

This methodological improvement resulted in revisions both to the total estimate of implicit services of commercial banks and to the estimates of these services' uses. The downward revision to total implicit services produced by banks was equal to the banks' equity capital (assets less liabilities or own funds) multiplied by the reference rate. This amount represents the interest expense that the banks avoided by obtaining their funding from stockholders rather than borrowing at the reference rate of interest. This revision was small, because own funds were small relative to assets and liabilities. Nevertheless, while using the reference rate approach resulted in small revisions to *total* implicit services of commercial banks, the assignment of some services to borrowers did substantially affect how the consumption of bank services was apportioned between the personal sector and the business sector. These revisions to the estimates of the uses of imputed services resulted in large reductions in estimated final consumption of implicit services by persons, because borrower services are consumed as intermediate inputs in higher proportion than depositor services. Consequently, the methodological change of 2003 was associated with significant reductions in estimates of GDP.

Another revision to these methods was part of the 2013 comprehensive revision of the NIPAs released in July 2013 (Hood 2013). Three changes were incorporated into the commercial bank implicit services methodology: the boundaries of the sets of assets and liabilities included in computations of implicit services were narrowed to include only loan and trading account assets and deposit and deposit-like liabilities; loan interest rates were adjusted for expected losses of principal due to borrower default; and a new method was introduced to reduce spurious volatility in implicit services due to fluctuations in the relative position of the reference rate.

Methods and data

The method used for computing the output of savings institutions and credit unions matches closely the method that is now used to compute output of commercial banks. However, some minor differences, due mostly to data limitations, are unavoidable. Reference rates and the default adjustment method will differ from those used for commercial banks, as will details on how total implicit services are apportioned among sectors of the economy.

Measures of implicit services are computed based on loan interest rates, loan balances, deposit interest rates, deposit balances, and a reference rate. Loan and deposit interest rates are computed by dividing the interest income on loans and interest expense on deposits by loan balances and deposit liabilities to derive "book" interest rates. After adjusting loan rates for the expected rate of losses of principal from borrower defaults, the service margin on loans is computed as the net loan rate less the reference rate. The service margin on deposits is the reference rate less the deposit rate, because no default adjustment is needed. Output is measured by multiplying service margins by loan or deposit balances.

Default adjustments. As in the 2013 revision of the methods used for commercial banks, loan interest rates are adjusted for the expected losses of principal due to borrower defaults. Costs of borrower defaults are measured using net charge-offs. A charge-off is an accounting entry made when a loan is recognized as having gone bad and is removed from the institution's balance sheet. Thus, charge-offs represent the amount of principal lost to default during the accounting period; the charge-off rate is total charge-offs divided by total loan principal. Because loan interest rates are set in advance and reflect expected rates of loss based on historical default patterns, a measure of expected default is used to adjust loan interest rates; expected charge-off rates are calculated using geometrically declining weighted averages of past realizations as described in Hood (2013). However, charge-offs of credit unions are already quite smooth, so the smoothing procedure is not applied.[4] The term "expected default" is used to refer to the smoothed charge-off measure for savings institutions and the charge-off rate for credit unions, and the expected-default rate is expected default divided by loan balances. Loan interest rates are adjusted by subtracting the expected-default rate from the interest rate earned on loans, and then the adjusted rates are used to measure implicit services to borrowers.

Reference rate calculation. Because of differences in data availability, the methods for computing reference rates are not precisely the same for commercial banks, credit unions, and savings institutions. The specification of the reference rate for each class of institution is discussed in more detail below. The reference

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4. If this method were used for credit unions in the NIPAs, smoothing might be appropriate, because the stability of past charge-off rates cannot guarantee that future charge-off rates will be smooth.

rate may be derived from two possible sources: 1) a book interest rate on a service-free asset or liability class on the institution's balance sheet, and (2) a "market" interest yield on government bonds. It may also be computed as an average of (1) and (2). The source of the book rate depends on the type of institution. As was done for commercial banks, the reference rate is also stabilized to dampen spurious volatility. This stabilization allows the allocation between borrower services and depositor services to change slowly, reflecting the lags that are built into the repricing of loans and deposits.

The method used in this article allocates consumption of borrower and depositor services to sectors in a way that is similar to the method used for commercial banks. The data that are used to estimate services of nonbank depository institutions do not indicate loan or deposit balances for each sector (or how much interest each sector pays and receives), but the Federal Reserve Board releases data on categories of loans and deposits on sector balance sheets in the flow of funds accounts (FFAs). Savings institution and credit union data indicate interest paid and received and balances by category of loan or deposit. Output is computed separately for each category; categories are assigned to sectors based mostly on FFA information.

Savings institutions

Annual estimates of implicit output of savings institutions from 1993 to 2002, and quarterly output estimates from 2003 to 2011 were computed. The dates were based on the availability of source data.

Basic data for savings institutions are available from *Statistics on Depository Institutions (SDI)* from the Federal Deposit Insurance Corporation. These data are aggregated from Thrift Financial Report (TFR) filings and from the reports of condition and income administered by the Federal Financial Institutions Examination Council, known as Call Report filings. The recent transfer of supervisory powers from the OTS to the Office of Controller of the Currency and other regulators has resulted in the elimination of the TFR; savings institutions that formerly filed TFRs now file Call Reports.[5] Some savings institutions that were not regulated by the OTS before its elimination also filed Call Reports.

The SDI data contain savings institutions' asset and

liability balances by type of asset and liability as well as interest income and expenses. These data are available on a quarterly basis from the first quarter of 2002 to the present quarter, and on an annual basis from 1992 forward. Asset data include loans and leases by type of loan (residential real estate loans, other real estate loans, commercial loans, personal loans, and other loans), cash and balances due, securities, and federal funds sold and reverse repurchase agreements. Liability data include deposits (total deposits, time/saving deposits and other deposits, and interest-bearing/non-interest-bearing deposits), federal funds purchased and repurchase agreements, and borrowings. Total interest income is available for loans, and a combination of securities and other deposit-like assets; total interest expenses are available for deposits, Federal Home Loan Bank advances, and some other categories of borrowing. Savings institutions also report net charge-offs on loans and leases. Because of the way that interest income and expense detail are reported in TFRs, a method for allocation of interest rates to the asset/liability categories above was necessary. (For the sake of brevity, the method is not discussed here in detail.)

The income statement data reported in the TFRs is also lacking in detail, so selecting an appropriate definition for the reference rate for computing the implicit output of savings institutions is not straightforward. Based on available data from the TFRs and other sources, the potential rates from savings institutions that could approximately meet the SNA criteria are: (1) the rate of return on securities assets including mortgage-backed securities (MBSs) and deposit assets (the latter of which are deposits in other depository institutions), (2) the rate of return on securities assets excluding mortgage-backed securities but including deposit assets, (3) the rate of return on Federal Home Loan Bank advances, (4) the market yield on a government security, such as the 5-year Treasury bond, or (5) the reference rate used to compute implicit services of commercial banks. From these alternatives, the one that produced a split that was closest to the split used in the NIPAs for the commercial banking sector was used.

The illustrative computations of output use an average of the interest rate earned on securities (excluding mortgage-backed securities) and deposit assets and the interest rate paid on FHLB advances; this rate is averaged with a four-quarter moving average of 5-year treasury bond yields. While it is possible that the set of securities on savings institution balance sheets includes some securities that would preferably not be included in the reference rate (such as corporate

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5. Section 313 of the Dodd-Frank Wall Street Reform and Consumer Protection Act abolished the Office of Thrift Supervision, which was the main regulator overseeing savings institutions (U.S. House (2010), *The Dodd-Frank Wall Street Reform and Consumer Protection Act*, 111th Congress, 2nd Session, H.R. 4173).

bonds), this rate produces a split of borrower and depositor services that is relatively stable.[6] The split is also on average close to the one that the reference rate for commercial banks generates. While this rate is quite close to the reference rate used to compute the implicit output of commercial banks, it appears to better match the turning points in the interest rates earned on assets and paid on liabilities of savings institutions; if the commercial bank reference rate had been used, the results would have been quite similar (chart 1).

The relative position of the reference rate is stabilized using the methodology that was developed for commercial banks (Hood 2013). Intuitively, this procedure ensures that any changes in relative borrower services and depositor services are incorporated over a period of about 3 years that approximately equals the maturity of loans held by savings institutions. Chart 2 shows the stabilized reference rate and the unstabilized rate, along with the effect of the charge-off adjustment on the rate of return earned on assets.

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6. An appropriate reference rate should be risk-free and service-free, and it should match the maturity structure of the loans and deposits on the institutions' balance sheets (*2008 SNA,* paragraph 6.166, 116). For commercial banks, the book rate earned on Treasury and agency securities (excluding mortgage-backed securities) is used, averaged with a four-quarter moving average of 5-year Treasury bond yields. However, a series for savings institutions' holdings of Treasury and agency securities cannot be computed, because of the lack of interest income detail; in particular, all savings institution securities and deposit assets are combined on the income statement and cannot be further decomposed into the constituent parts (except for mortgage-backed securities).

Chart 1. Interest Rates and Unstabilized Reference Rates, Savings Institutions, 2003–2011

NOTE. The commercial bank reference rate is the unstabilized rate used to compute implicit services of commercial banks, which has been used since the July 2013 comprehensive revision. The return on savings institution assets is net of a margin to offset default losses.

U.S. Bureau of Economic Analysis
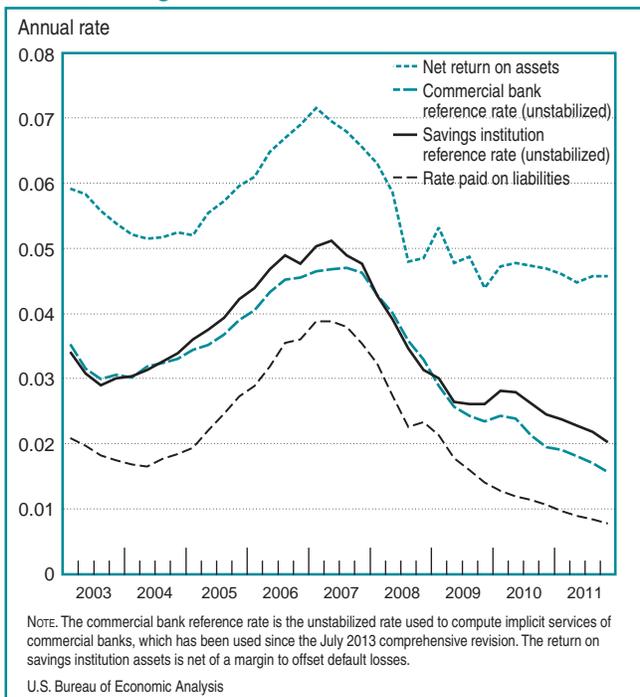
Chart 2 also shows the effect of the abrupt increase in charge-offs in the wake of the 2007 financial crisis on the interest margin used to calculate implicit borrower services. For savings institutions, expected high default rates continued into 2011.

Chart 2. Interest Rates Showing the Effect of Default Adjustment and Reference Rate Stabilization, Savings Institutions, 2003–2011

U.S. Bureau of Economic Analysis
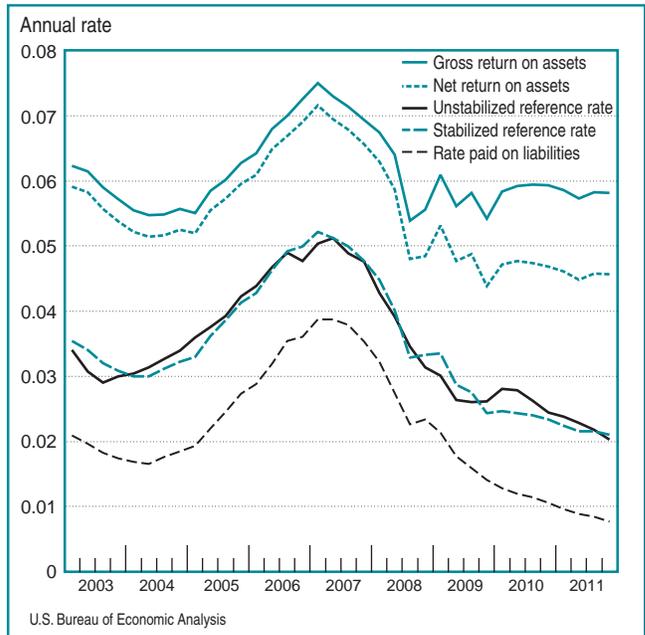
Credit unions

Basic data on condition and income for credit unions are available on a quarterly basis from Financial Performance Reports from the National Credit Union Administration (NCUA), a federal agency which serves as the primary regulator for federally chartered credit unions and administers the National Credit Union Share Insurance Fund (NCUSIF).[7] All NCUSIF participants (including state-chartered credit unions) submit FPRs, which thus cover the vast majority of credit unions. (Only a handful of small credit unions are not insured by the NCUSIF, and all federally chartered credit unions are required to be insured by this fund; because the number of uninsured is so small, no adjustment is made for those credit unions not in the data.) Because basic quarterly data are available for a longer time span than what is available for savings institutions, output for credit unions is computed quarterly from 1997 to 2011, and annually from 1985 to 1996.

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7. Aggregated FPR data are available at www.ncua.gov. Some inconsistencies were noted in some of these data before to 2002. Each quarterly summary reports several previous quarters of data, and in some quarters, the data were different across files. The data were checked against the credit union reports from the Credit Union National Association to ensure that the levels of each reported aggregate figure were correct.

Like savings institutions, credit unions are asked to report substantial detail regarding balance sheet items, but report income and expense items at a higher level of aggregation. (Credit unions report interest income on loans, investments, and trading securities; they report interest expense on shares, deposits, and borrowed money.) As was the case with savings institutions, the lack of detail on interest income and expense prevents use of the same reference rate definition that is used for commercial banks. Testing the same set of alternatives for the definition of the reference rate that was mentioned in the previous section revealed that the rate paid on all interest-bearing liabilities excluding deposits, denoted as "other borrowing," gives a more stable picture of output for credit unions than alternative that was selected for the reference rate for savings institutions. On average, this reference rate is quite close to commercial bank reference rate, and it seems to respond to the interest rate environment similarly to the way that credit union loan and deposit rates respond. On the other hand, interest rates that credit unions report earning on investments are quite a bit more volatile than loan or deposit rates, so that using investments as part of the reference rate calculation would generate an unnecessarily large amount of volatility in credit union output. The rate paid on borrowings is averaged over four quarters, and this figure is averaged with a four-quarter moving average of the yield on 5-year Treasury bonds (as was done with savings institutions) to form an unstabilized reference rate, and then the stabilization procedure is applied. Chart 3 shows how the rates on assets (loans) and lia-

Chart 3. Interest Rates and Reference Rates, Credit Unions, 1997-2011

Annual rate

Legend:
- Net return on assets
- Unstabilized reference rate
- Stabilized reference rate
- Commercial bank reference rate (unstabilized)
- Rate paid on liabilities (dividends and deposits)

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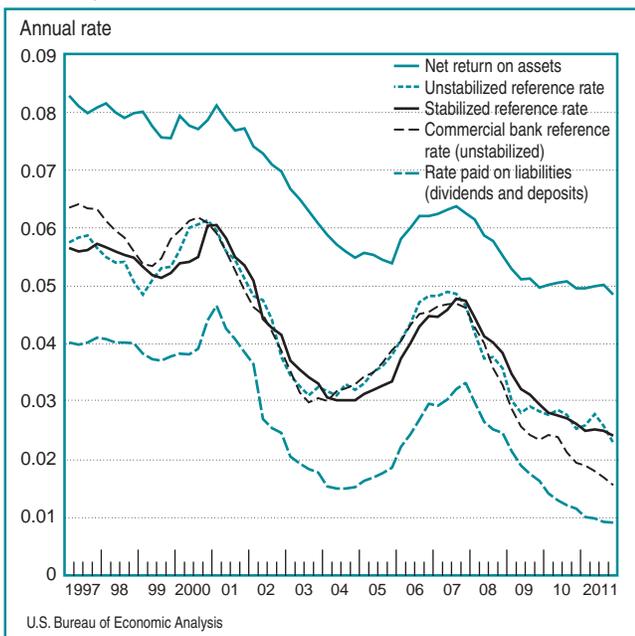
bilities (dividends and deposits), the unstabilized reference rate, the stabilized reference rate, and the reference rate used for commercial banks trended over time.

The output of credit unions is apportioned to the types of loans on the basis of loan balances. Mortgage loans are subsequently sectored according to monetary interest paid on mortgage loans by sector, resulting in the same ratios as those used to sector mortgage loans of savings institutions and commercial banks. Business loans are assigned entirely to nonfinancial business, and deposits and personal loans to personal consumption expenditures.

Results

The discussion of the results is organized in two sections. The first section presents estimates of implicit services implied by applying the reference rate approach to savings institutions and credit unions. The second section presents the differences in the estimates of GDP and of personal consumption expenditures implied by the current method and the reference rate method. Note that these results are experimental.

Consumption of implicit intermediation services by sectors

The implicit output of depositor services produced by savings institutions that was calculated with the new method climbs from 2001 to 2006 and then begins to drop off in 2007, which was the year when prices of securities backed by subprime mortgages collapsed (chart 4). The fall in depositor services continues until 2009, and remains well below the precrisis peak in 2011.

In chart 5, the imputed borrower services produced by savings institutions exhibits a similar pattern of increasing up to 2006, and starting to drop in 2007. However, borrower services have not recovered since the recession. Much of the increased output of these services during the boom of the first part of the 2000s was consumed by businesses, and thus neither the increase nor the subsequent decrease in output would directly affect the calculation of GDP using the final expenditures approach.

Chart 6 shows the new measures of imputed output of credit unions, and the line shows the estimate of total imputed output implied by the current method. All credit union depositor services are consumed by persons, so no breakdown of the consumption by different sectors of the imputed output calculated with the current method is shown. Interestingly, credit union output using the new method follows a different pattern than that of savings institutions, showing more counter-cyclicality. Credit unions have not experienced

highly cyclical charge-off rates, so the default adjustment is more stable for them. Credit unions have also tended to expand during recessions over this period. Finally, when interest rates are increasing, deposit rates at credit unions tend to increase more quickly than loan rates, which compresses their total net interest margin; when interest rates are decreasing, the opposite happens. Over the period shown, interest rates have increased in booms and decreased in recessions.

Differences between the current method and the new method

Chart 7 shows total imputed output of savings institutions and final consumption of this imputed output

Chart 4. Imputed Output of Depositor Services of Savings Institutions by Sector, 1993–2011

Billions of current dollars

Legend:
- Rest of world
- Federal government
- State and local governments
- Financial business
- Nonfinancial business
- Households and NPISH

NPISH Nonprofit Institutions Serving Households
U.S. Bureau of Economic Analysis
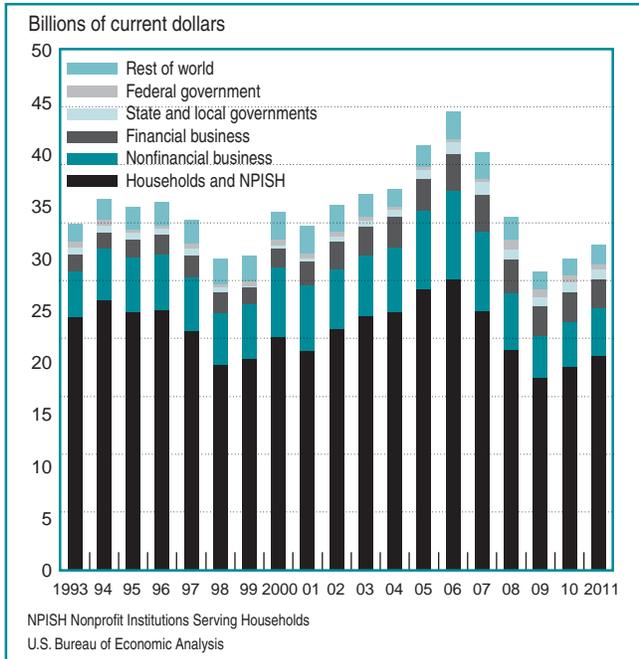
Chart 6. Imputed Services of Credit Unions by Type of Service and by Sector, 1985–2011

Billions of current dollars

Legend:
- Borrower services, owner-occupied housing
- Borrower services, nonfinancial business
- Borrower services, households and NPISH
- Depositor services
- Depositor services, current method

NPISH Nonprofit Institutions Serving Households
U.S. Bureau of Economic Analysis
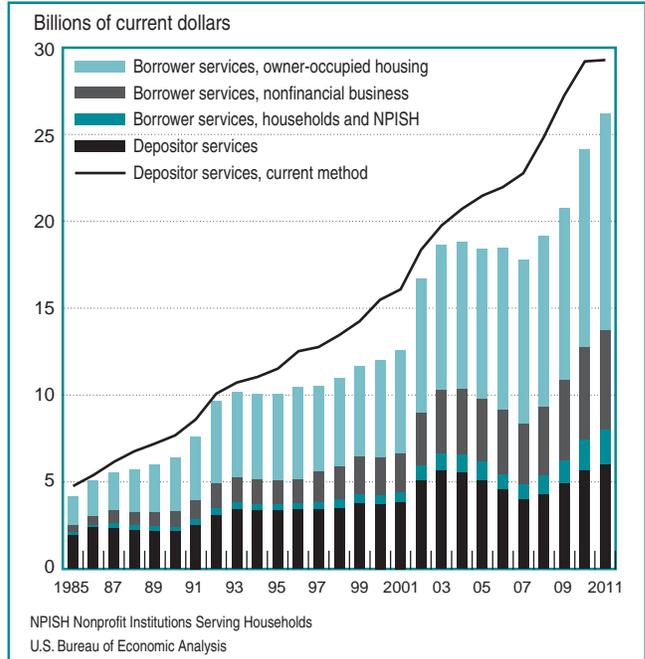
Chart 5. Imputed Gross Output of Borrower Services of Savings Institutions, 1993–2011

Billions of current dollars

Legend:
- Owner-occupied housing
- Rest of world
- Federal government
- Financial business
- Nonfinancial business
- Households and NPISH

NPISH Nonprofit Institutions Serving Households
U.S. Bureau of Economic Analysis
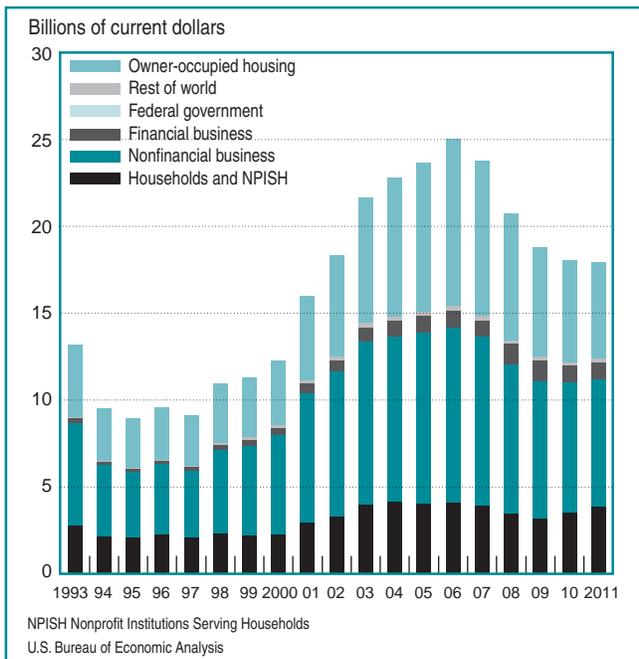
Chart 7. Total Gross Output and Final Demand by Method for Imputed Services of Savings Institutions, 1993–2011

Billions of current dollars

Legend:
- Total gross output, current method
- Total gross output, new method
- Final demand, current method
- Final demand, new method

U.S. Bureau of Economic Analysis
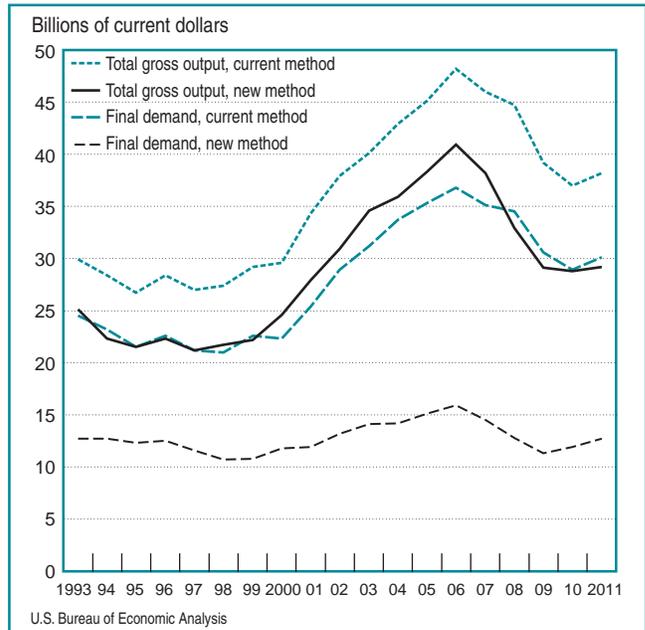
using the current method and using the new method proposed in this paper. The patterns of overall output are similar for the two methods; however, the new method gives much lower estimates of final consumption of this output. These estimates are also less volatile, especially during the run-up to the subprime crisis and during its aftermath. The difference in estimates of final consumption of imputed services (and thus to GDP) ranges from just under $10 billion to more than $20 billion. Over this time period, the average difference in the estimate of savings institution output for final demand using the new method is about 54 percent of the estimate based on the current methodology.

Chart 8 shows the analog of chart 7 for credit unions. A downward level shift can be seen here, as well. It is initially somewhat smaller, around $2.5 billion in 1993. However, it rapidly increases to more than $10 billion in recent years. The overall pattern of

Chart 8. Total Gross Output and Final Demand by Method for Imputed Services of Credit Unions, 1985–2011

Billions of current dollars

— Total gross output and final demand, current method
– – – Total gross output, new method
– – Final demand, new method

U.S. Bureau of Economic Analysis
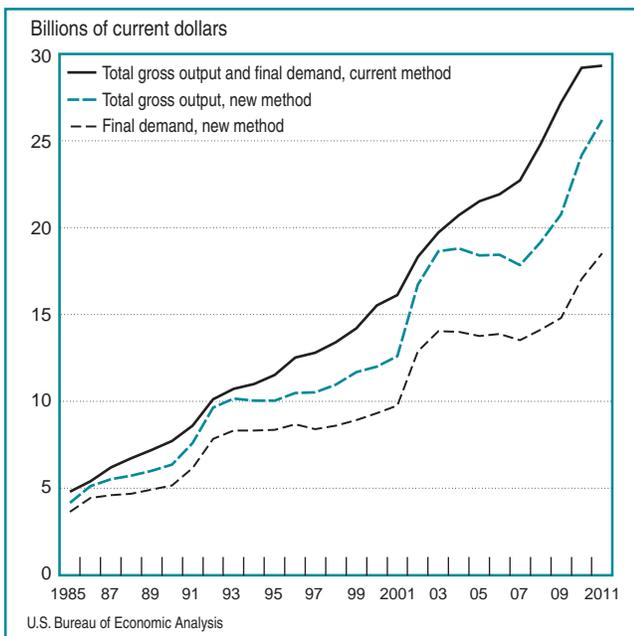
credit union output also changes, with a flat pattern over the 2000s but a sharp increase after the crisis. This has followed a large increase in credit union memberships during the crisis period. Over this period, the average difference between the estimate of final demand using the new method is about 36 percent of the estimate using the current method.

These results show a downward revision in total GDP that ranges from under $15 billion to more than $30 billion in 1993–2011 (table 1). These figures represent an approximation of the revisions to GDP that would be expected, if this new methodology were to be implemented in the NIPAs. In 2008, the revision would represent about 16 percent of total imputed services from all depository institutions (including commercial banks) consumed by persons or 13 percent of the final expenditures on the implicit output of depository institutions, according to published estimates.

Conclusion

This article has shown that a reference rate method similar to the one used to estimate implicit services of commercial banks can be used to estimate implicit services of nonbank depository institutions. Although this method is not yet ready for implementation in the NIPAs, this exercise shows how such an update of the national accounts might affect gross output, and it demonstrates concerns that linger regarding the suitability of available data—in particular, with regard to the choice of reference rate.

The change in methodology would yield a downward restatement of GDP ranging from about $15 billion in the mid-90s to more than $30 billion in recent years, or about half of the published contributions of these institutions to GDP. The revisions show a similar picture of the growth of output of savings institutions over this period; however, they suggest that final demand is somewhat more stable. The new method picks up a relatively solid performance of credit unions over recessionary periods. The results suggest a continued goal of further developing these methods with the goal of eventual implementation in the NIPAs.

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Table 1. Personal Consumption Expenditures, Final Demand, and Total Gross Output by Type of Institution and by Method

[By type of institution; billions of dollars]

	Savings institutions																		
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Current method																			
Personal consumption expenditures	21.9	20.7	19.0	20.0	18.5	18.1	19.6	19.3	21.8	25.1	27.9	30.6	32.0	32.9	31.2	30.1	26.5	25.4	26.5
Final demand	24.5	23.2	21.5	22.6	21.2	21.0	22.6	22.3	25.4	28.9	31.2	33.7	35.3	36.8	35.1	34.5	30.6	28.9	30.1
Total gross output	29.9	28.4	26.7	28.4	27.0	27.4	29.2	29.6	34.3	37.9	40.1	42.9	45.1	48.2	46.0	44.7	39.2	37.0	38.2
New method																			
Personal consumption expenditures	11.6	11.5	11.0	11.2	10.3	9.4	9.5	10.4	10.5	11.7	12.7	13.1	13.7	14.2	12.8	11.1	9.9	10.5	11.3
Final demand	12.7	12.7	12.3	12.5	11.6	10.7	10.8	11.8	11.9	13.2	14.1	14.2	15.1	15.9	14.5	12.8	11.3	11.9	12.7
Total gross output	25.1	22.3	21.5	22.3	21.2	21.7	22.2	24.6	27.9	30.9	34.6	35.9	38.3	40.9	38.2	32.9	29.1	28.8	29.2
Difference																			
Personal consumption expenditures	−10.3	−9.2	−8.0	−8.8	−8.2	−8.6	−10.1	−8.9	−11.3	−13.4	−15.1	−17.5	−18.2	−18.7	−18.4	−19.0	−16.6	−14.9	−15.2
Final demand	−11.8	−10.5	−9.2	−10.1	−9.5	−10.3	−11.8	−10.5	−13.4	−15.7	−17.1	−19.4	−20.2	−20.9	−20.6	−21.7	−19.3	−17.0	−17.4
Total gross output	−4.7	−6.1	−5.3	−6.1	−5.8	−5.7	−7.1	−5.0	−6.4	−6.9	−5.4	−7.0	−6.8	−7.3	−7.8	−11.7	−10.2	−8.3	−9.0
	Credit unions																		
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Current method																			
Total (all to personal consumption expenditures)	10.7	11.0	11.5	12.5	12.8	13.4	14.2	15.5	16.1	18.3	19.7	20.7	21.5	21.9	22.7	24.8	27.2	29.2	29.3
New method																			
Personal consumption expenditures (final demand)	8.3	8.3	8.4	8.7	8.4	8.6	8.9	9.3	9.7	12.9	14.0	14.0	13.7	13.8	13.5	14.1	14.8	17.0	18.5
Total	10.2	10.0	10.0	10.5	10.5	11.0	11.7	12.0	12.6	16.7	18.6	18.8	18.4	18.4	17.8	19.2	20.7	24.1	26.2
Difference																			
Personal consumption expenditures (final demand)	−2.4	−2.7	−3.2	−3.8	−4.4	−4.8	−5.3	−6.2	−6.3	−5.5	−5.7	−6.7	−7.7	−8.1	−9.3	−10.7	−12.5	−12.2	−10.8
Total	−0.6	−1.0	−1.5	−2.1	−2.3	−2.5	−2.6	−3.5	−3.5	−1.6	−1.1	−1.9	−3.1	−3.5	−4.9	−5.7	−6.5	−5.1	−3.1
	All nonbank depository institutions																		
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Current method																			
Personal consumption expenditures	32.6	31.7	30.5	32.6	31.3	31.5	33.8	34.8	37.9	43.4	47.6	51.3	53.4	54.8	53.9	54.9	53.7	54.6	55.8
Final demand	35.2	34.2	33.0	35.1	33.9	34.5	36.8	37.8	41.4	47.2	50.9	54.4	56.8	58.8	57.9	59.3	57.8	58.1	59.3
Total gross output	40.6	39.5	38.2	40.9	39.8	40.8	43.5	45.1	50.4	56.2	59.8	63.6	66.6	70.1	68.8	69.5	66.5	66.2	67.5
New method																			
Personal consumption expenditures	19.9	19.8	19.4	19.9	18.7	18.0	18.4	19.7	20.3	24.5	26.8	27.1	27.5	28.0	26.3	25.2	24.7	27.6	29.8
Final demand	21.0	21.0	20.6	21.2	20.0	19.3	19.7	21.1	21.7	26.0	28.1	28.2	28.8	29.8	28.0	26.9	26.0	28.9	31.2
Total gross output	35.3	32.3	31.5	32.8	31.7	32.7	33.8	36.6	40.5	47.6	53.3	54.7	56.7	59.3	56.0	52.1	49.8	52.9	55.4
Difference																			
Personal consumption expenditures	−12.7	−12.0	−11.1	−12.6	−12.5	−13.5	−15.4	−15.1	−17.6	−18.9	−20.9	−24.2	−26.0	−26.8	−27.6	−29.7	−29.1	−27.0	−26.0
Final demand	−14.2	−13.3	−12.4	−13.9	−13.9	−15.1	−17.1	−16.7	−19.7	−21.2	−22.8	−26.1	−28.0	−29.0	−29.8	−32.5	−31.8	−29.2	−28.1
Total gross output	−5.3	−7.1	−6.7	−8.1	−8.1	−8.2	−9.6	−8.5	−9.9	−8.6	−6.5	−8.9	−9.9	−10.8	−12.8	−17.4	−16.6	−13.3	−12.1