Measurement of Banking Services in the U.S. National Income and Product Accounts: Recent Changes and Outstanding Issues

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Banks and other depository institutions channel funds from depositors to borrowers. In conducting these intermediation activities, banks also produce services, such as the processing of checks or electronic funds transfers, bookkeeping, protection of deposited funds, and investment services.[1] Payment for these services may involve explicit charges or they may take the form of implicit charges--if the banks pay depositors lower rates of interest than they would otherwise earn on these funds. By paying lower rates of interest on deposits than they receive on loans, banks can cover their expenses and earn a profit, yet avoid charging for each service provided.

In the national accounts, a service charge is imputed for the services that banks furnish without payment in order to provide a meaningful measure of their value added and gross output as well as to keep gross domestic product (GDP) invariant to whether banking services involve an explicit or implicit service charge.[2] The imputed service charge is measured as the monetary

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[1]This paper focuses on commercial banks, but the accounting treatment of other types of depository institutions (that is, mutual savings banks, savings and loan associations, credit unions, and regulated investment companies) is similar. Depository institutions are treated differently than life insurance carriers and pension plans, but those plans will not be described in this paper. For more information see U.S. Department of Commerce, Bureau of Economic Analysis, Personal Consumption Expenditures, Methodology Paper No. 6 (Washington, DC: U.S. Government Printing Office, 1990).

[2]In the absence of the imputed service, the gross output of banks would consist of only the explicitly priced bank services (the national income and product accounts do not treat interest receipts as a sale of a service), so the industry's gross output would be much smaller and value added--the difference between gross output and intermediate inputs--could be negative.

interest received from lending deposited funds less the monetary interest paid on deposits. In order to prevent the imputed service charge from affecting the measures of saving, the banks are also considered to pay imputed interest to depositors who then use it to purchase these unpriced services.[3]

In preparing for the 1999 comprehensive revision of the national income and product accounts (NIPA's), BEA conducted research focused on two possible changes to the treatment of banking imputation: changing the method for separating "real" (i.e., quantity) changes from price changes for this service, and changing the method for allocating the consumption of the imputed to the various users of the service. Only the first of these research projects was successful, in the sense that an improved methodology for real banking services was adopted and implemented. The remainder of this paper summarizes the two research projects, the new methodology, and the outstanding issues.

Price and Quantity Measurement

The measure of real explicit bank service charges is obtained by deflation; the current-dollar estimate is divided by the consumer price index for personal financial services. For real implicit service charges, however, an appropriately defined price index does not exist. Consequently, real implicit bank service charges are measured using quantity extrapolation—a

[3]The imputed service charges are shown as "services furnished without payment by financial intermediaries except life insurance carriers," a component of personal consumption expenditures in NIPA tables 2.4, 2.5, 2.6, 2.7, and 7.5. In exports, they are included in "other" exports of services and are shown separately as a reconciliation item in table 4.5. In government consumption expenditures, they are included in Federal nondefense "other" services, and in State and local "other" services. The imputed interest is shown in tables 4.5, 8.20, 8.21, and 8.28.

quantity indicator is used to extrapolate the current-dollar measure of these service charges for the reference year forward and backward for the other years.

Prior to the most recent comprehensive revision of the NIPA's, which was released beginning in October 1999, the quantity indicator that was used was employee hours worked in the banking industry. This quantity indicator was problematic; the measure did not allow for any increases in labor productivity, and had, in fact, shown a decline in real imputed services since 1986. Gullickson and Harper (1999) found that rapid growth in capital and intermediate inputs used by banks resulted in an implausible large, negative growth rate for the industry's multifactor productivity.

In preparation for the 1999 comprehensive revision, BEA staff reviewed and compared alternative approaches to measuring real implicit bank services. Two major alternative approaches to measuring real banking services were noted.

The first approach uses stocks of financial assets and liabilities. The Australian Bureau of Statistics (1996) recommended that the constant-price measure of services should be proportional to the value of the stock of deposits and loans deflated by a measure of the general price level. A variant of this approach is the "user-cost" approach of Fixler and Zieschang (1999), which relies on the user-cost formula of Barnett (1978) and Donovan (1978) to aggregate deposits and loans.

The second approach assumes that the real output of banks is proportional to the volume of banking transactions; this is the approach that was taken by the U.S. Bureau of Labor Statistics for measuring productivity of the commercial banking industry.[4] The BLS output index aggregates measures of output for deposits, loans and trusts. For deposits, the components

[4]See Brand and Duke (1982) and Kunze, Jablonski, and Sieling (1998).

include Federal Reserve data on the number of checks written, Automated Clearing House data on electronic fund transfers (EFT), Federal Reserve, FDIC, and American Bankers Association data on deposits and withdrawals from time and savings deposits, and trade source data on transactions conducted at automated teller machines (ATM). For loans, the components include HUD, FHA, and FDIC data on the number of residential mortgage loans, FDIC and American Council of Life Insurance data on commercial real estate loans, Federal Reserve data on auto loans, FDIC data on other consumer installment loans, trade source data on credit card transactions, and Federal Reserve data on commercial loans. For trusts, the output is measured by the number of accounts by type.

The weights used to aggregate these components are based on labor input data from the Federal Reserve's functional cost analysis and are held fixed, then updated every five years. For 1992, deposits accounted for 55 percent of the weight, loans for 38 percent, and trusts for 7 percent. Although the index has many components, a handful of them account for most of the weight; in 1992 demand deposits (mostly checks cleared) accounted for 73 percent of the deposit index and more than 40 percent of the overall index. On the other hand, ATM transactions accounted for only 2.3 percent of the deposit index and 1.5 percent of the overall bank output index.

In comparing the deflated deposits and the transaction approaches, a key difference was that the BLS output index captured a growing volume of transactions, whereas the deflated aggregates of deposits did not exhibit similar growth. From 1981 to 1997, the average annual growth rate of the BLS bank output index was 3.1 percent, while the growth rate of deflated deposits was about the same as average growth rate under the previous BEA methodology, which

was 0.3 percent.

The conclusion drawn by BEA was that for the deflated deposits approach to be workable, the measures must be adjusted for quality to take account of improvements in technology for recording transactions.[5] The downside of the BLS transactions-based measure is that the weights used to aggregate the components are ad hoc; the weights are based only on labor inputs, taking no account of capital or intermediate inputs, and consequently may understate the relative importance of capital-intensive services such as ATM transactions. Nevertheless, the BLS index was workable and captured at least part of the productivity improvements in the banking industry.

Because the BLS index was clearly an improvement over the employee-hour indicator, it was adopted by BEA in October 1999.[6] Changes in the real value of the unpriced bank services provided by commercial banks are now estimated by assuming that the total output of these banks increases at the same rate of growth as the output of this industry in the BLS estimates of productivity by industry. This change had a modest, yet noticeable, effect on the measured growth rate of real GDP, raising the average annual growth rate for 1981-96 by about 4/100 percentage point.

Allocation of Implicit Bank Services

The logic that banks produce an unpriced service implies that the use or consumption of

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[5] Fixler and Zieschang (1999, pp. 558-61) agree that quality adjustment is needed. They argue (p. 549), however, for not deflating the nominal asset measure to obtain a "real" volume measure. This results in a volume measure that has the undesirable characteristic that it would record an inflationary monetary policy as resulting in real GDP growth for implicit banking services.

[6] See Moulton and Seskin (1999).

that output ought also to be recorded. For many years BEA has recorded the consumption of the unpriced services by the depositors, and has allocated the consumption to persons, government, exports, and business in proportion to each sectors' share of deposits. Thus, services furnished without payment by banks are included in personal consumption expenditures, government consumption expenditures, and exports of services; consumption of business is intermediate consumption and is not counted as part of final expenditures. Imputed interest paid by banks is included in interest received by persons, government, nonresidents, and business, with the same allocation as that for unpriced services.

BEA's treatment of these services contrasted with the 1968 version of the System of National Accounts (SNA), the international guidelines for compiling national accounts, which followed a convention of treating the entire service as intermediate consumption of a nominal (that is, fictional) industry. This difference in allocation of unpriced financial services was one of the major differences between the NIPA's and the 1968 SNA. The 1993 version of the SNA takes a flexible position, permitting countries to continue to follow the 1968 SNA's convention, though recommending that the total output should be allocated to the recipients or users of the services so that part of the output is allocated to final consumption.[7] The 1993 SNA proposes that part of the output might be allocated to depositors and part to borrowers and specifically suggests that one way of allocating the services is to use a "reference" interest rate. Under the reference rate approach, the difference between the interest received by depositors and the interest they would have received had they been paid the reference rate is the imputed service received by depositors; the difference between the interest paid by borrowers and the interest they would have paid had

[7]See Commission of the European Communities, et al. (1993, pp. 139-41, 563-68).

they borrowed at the reference rate is the imputed service received by borrowers.

Conceptually, if borrowers receive unpriced services by paying a higher interest rate than they otherwise would, it makes sense that these services should be allocated as consumption by the borrower. In practice, however, separating services going to borrowers from those going to depositors is problematic.

For the recent comprehensive revision, BEA staff examined the possibility of using the reference-rate approach to allocate unpriced banking services between depositors and borrowers, rather than just allocating them among depositors. The 1993 SNA recommends using a rate of interest that does not include risk premium or intermediation services as the reference rate; it suggests the inter-bank lending rate as a suitable choice. Several reference rates were considered, but they all shared the characteristic that they were very volatile relative to the average rates paid on deposits and on loans.

Figure 1 shows, on top, the effective average rate of interest received on loans by U.S. commercial banks. The thick line shows one possible reference rate -- the current rate on 1-year U.S. Treasury bills -- and, on bottom, the effective average rate of interest paid depositors by the banks. Under the reference rate approach, the spread between the reference rate and the risk-adjusted rate on loans should reflect the implicit charge for services to borrowers, and the spread between the reference rate and the rate paid depositors, the implicit charge for services to depositors. The volatility of these spreads, for both the borrower and depositor service values, was troubling (see Figure 1). The volatility of the spreads was mostly due to volatility of the reference rate; the average loan and deposit rates were much less volatile. Presumably, institutional factors account for this divergence. A significant share of interest payments (both on

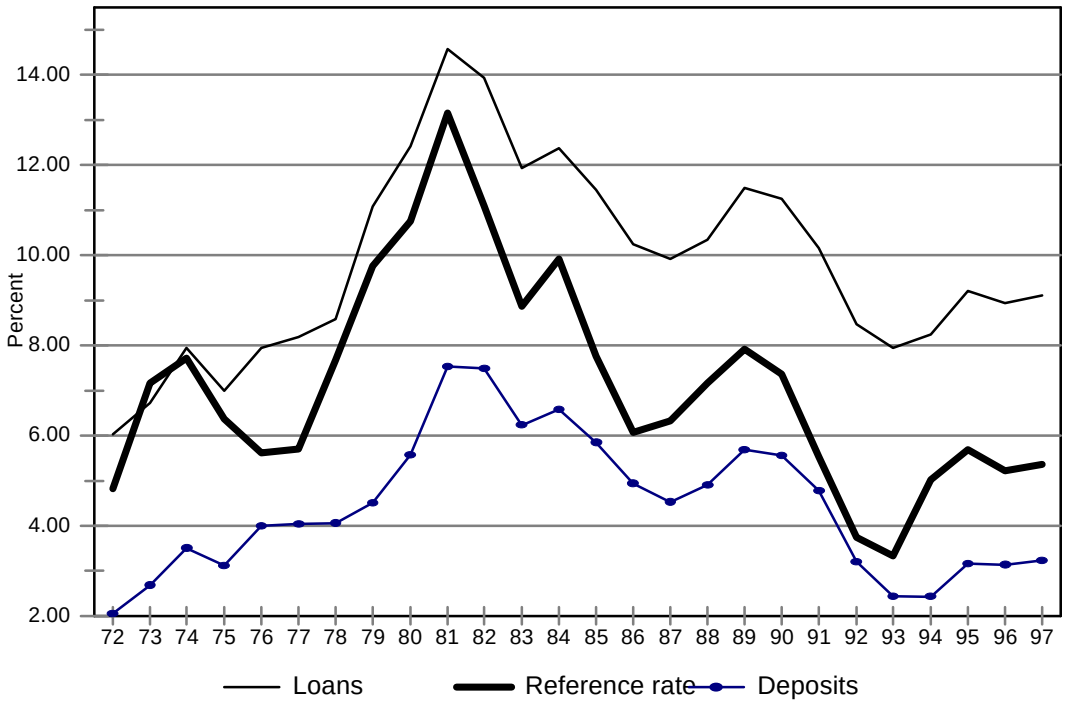
deposits and on loans) represent fixed-rate financial instruments that had been contracted in previous years. In addition, transactions costs related to switching banks may allow a bank temporarily to pay or charge rates that are less competitive than those for the reference rate.

The implication of this volatility is that, if the reference-rate approach were used to allocate the implicit services, GDP in current prices would also be quite volatile. This volatility would occur because the business sector accounts for a substantially larger share of loans than of deposits, so the share of unpriced services allocated to final expenditures would vary with the shares allocated to deposits or loans. Indeed, for some periods the reference rate was outside the bounds of the average loan-deposit rates, which would imply negative services for one of the groups. BEA researchers considered possible methods for smoothing the reference rate.

In addition to the empirical problems, there were some unresolved conceptual questions about imputing an implicit service to borrowers. Hill (1998) describes the nature of these services as "mobilising funds, ... evaluat[ing] the credit worthiness of their borrowers, ... [and] having funds readily available for lending." The implication of the reference-rate approach is that if unpriced services weren't provided, then borrowers would be able to borrow at the reference rate. For some types of loans (e.g., mortgages), however, many or most of the services received by borrowers entail a explicit charges--loan origination fees, credit reports, etc. Nevertheless, borrowers pay rates that exceed the suggested reference rates, presumably because the lender must be compensated for bearing risk. The role of risk-bearing is also apparent in the large differences in rates offered by a lender at a point in time depending on the quality of the collateral and on the credit-worthiness of the borrower. Is risk-bearing an unpriced service? This aspect of unpriced financial services has not yet been adequately explored.

As the deadline was reached for considering a possible definitional change for the recent NIPA comprehensive revision, it was decided that further research was needed before any change is made to the allocation of unpriced banking services. We note that the United States is not alone in grappling with the difficulties in measuring and allocating imputed bank services; the European Union has not yet reached agreement on which of the 1993 SNA guidelines to follow. Furthermore, several recent academic papers and conferences on this subject also suggest that there is not yet a consensus within the scholarly community. While BEA intends to continue working on this issue, it also welcomes advice from outside the agency.

Figure 1. Effective Rates of Interest, U.S. Commercial Banks 1972-97



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