

Incorporating Financial Services in a Consumer Price Index

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Paper prepared for NBER Conference on
Price Index Concepts and Measurement
Vancouver, Canada
June 28-29, 2004

I am greatly indebted to George Smith and Gabriel Medeiros for their extensive work on compiling the indexes presented in the paper. I also thank Jeremy Nalewaik for his comments. The analysis and comments solely reflect the view the author and not necessarily those of the US Bureau of Economic Analysis or the US Department of Commerce.

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Dennis Fixler, 18-Jun-04

I. Introduction

In recent years, the use of financial services by consumers has grown with technological advances in both computers and telecommunications as well as product innovation by financial firms. As a result, including financial services in measures of consumption and including them in a consumer price index (CPI) has received much attention. Indeed, the national account measures of consumption include many financial services and as part of the comprehensive revision to the national accounts released last December, BEA improved its measure of the consumption of bank financial services. In regard to CPIs, though some financial services are included, two complications are often cited that stand in the way of improving the coverage. First, financial services involve activities that could be viewed as income generating and thus they are generally deemed to be out of scope in such indexes; that is such services are outside the domain of CPIs. Second, financial service prices contain both explicit charges and implicit charges—the latter creating the problem of what value to place in the price index. The latter was the focus of the improvement by BEA in its measure of consumption.

Setting the domain of the CPI involves a determination of the underlying purpose of the index. Most statistical agencies base their consumer price indexes on the cost of living (COL) conceptual framework.¹ That framework is not usually characterized with money or other financial assets in the utility function. The placement of money in a utility function has a long history in the literature and its justification rests on the fact that money facilitates transactions and provides a way of intertemporal transfers. However, Alchian and Klein (1973) argued that assets in general should be placed in the utility function in order that a CPI should provide a better measure of inflation under the COL framework. More specifically they argued that assets must be included to obtain a meaningful answer to the question

¹ See National Research Council (2001)

“Does the individual need more or less money to remain at the same level of satisfaction?” (page 186).

Another way to place financial assets in the domain would be to view them as though they were durable goods that provide implicit services that attend their holding. This is the view of the user cost of money approach, developed by Donovan (1978), Diewert (1974) and Barnett (1978). The precedent for putting such a framework in a CPI has already been set by the common treatment of housing in CPIs. The treatment of housing imputes a rental value of the services received in the case of owner occupied housing. Just as in the case of capital equipment owned by a business firm the idea is that there is a flow of services that is received that has to be valued.

Both of the above perspectives relate to a multiperiod analysis rather than the single period analysis of the standard cost of living framework. Pollak (1975) pointed out that there are several difficulties in constructing a multiperiod cost of living index: futures markets are not always available, expectations about the future do not hold with certainty and capital markets are not perfect. One way to handle the multiperiod problem in the context of the cost of living index is to treat a single time period as a subindex of the multiperiod problem and apply the single period analysis. Similarly, Barnett (1980) constructs a multiperiod optimization problem for a consumer on the basis of separability of financial assets from other goods and services and shows that the optimization problem regarding financial assets can be reduced to a one period problem. In this paper the focus is on the one period problem with the emphasis on the consumption of financial services within the period being considered.

Consumers purchase many types of financial services that are concomitant with financial assets and liabilities. Whether such services are included in a CPI rests on their relationship to income generation, which to some extent is shorthand for distinguishing a multiperiod analysis from a single period analysis. For example, the purchase of automobile insurance is commonly included in CPIs, as are other forms of property and casualty insurance. Yet the purchase of life insurance is not included because it is viewed as both an intertemporal transaction, in the sense that it is about transferring wealth to others and tantamount to purchasing an annuity,

especially in the case of whole life insurance. Similarly, professional fees that are associated with financial management, such as accounting, are included in CPIs while fees for the services such as financial advice, or portfolio management are generally excluded.² Thus the boundary for the inclusion of financial services in a CPI rests on the notion that consumers do not purchase financial services to produce income. However, this notion is inconsistent with the fact that the purchase of financial services by a consumer is consumption in the current period even though the purpose of the services is to increase income in subsequent periods. Therefore, these services should be included in the domain of a CPI. In principle, all financial services should be candidates for inclusion in a CPI. Schreyer and Stauffer (2003) consider an extensive set of financial services provided by financial firms and purchased by consumers and businesses.

As mentioned above, setting the boundary is only part of the complication of including financial services; the valuation of these services is sometimes not straightforward. This is especially true in the case of bank provided financial services that are not explicitly charged-for. Thus a method of imputing the price of these services must be chosen.

Section II sets out more of the theory of incorporating financial services into a consumer price index. To give an idea of what a financial service component of a CPI might look like, Section III presents two financial service price indexes that are constructed from data in the Personal Consumption Expenditures component of the national accounts. Section IV provides a summary and conclusions.

II. Theory

Consumers are viewed as having a utility function that contains goods and services, inclusive of financial services. The definition of financial services used here is the services associated with the use, acquisition or sale of financial and real assets. Woolford (2001) uses this definition in discussing the incorporation of finan-

²Further discussion on the inclusion of financial services in the domain of a CPI can be found in Woolford (2001), Triplett (2000) and Chapter 10 in International Labour Organization (2004)—a new version of their CPI manual.

cial services in the Australian CPI. The definition includes expenditures on fees for portfolio management and investment advice.³

Though the purchase of financial services is tied to the acquisition or holding of a financial asset or liability, either of which can be cast a financial product, the multiperiod dimension of the demand for these is not considered; the focus is on the per period consumption of the attending financial services.⁴ One can think of the consumer as having both long-term and short-term optimization problems that are linked. In the long-term problem, the consumer plans consumption over time—the intertemporal optimization problem. This dynamic problem considers both consumption and the expected changes in income available for consumption. The short-run problem concerns the purchase of goods, services and assets/liabilities in a particular period, given the income and stock of financial assets available in the period.⁵ The short-run problem therefore concerns the period purchase of any financial services that attend financial assets. For example, a depositor purchases the record keeping and safe keeping services implicit in the holding of deposits in the period that the deposit is held. Similarly, a portfolio manager is paid for his services (carrying out transactions and providing advice) in the period that they are provided. The fact that there are intertemporal considerations underlying the holding of deposits or a portfolio do not preclude the consideration of the purchases of the attending financial services in any period. The purchase of any asset, however, would not be included in the period measure of consumption .

³ This definition is also used in the discussion of financial services in International Labour Organization (2004). Among the services listed by Woolford is real estate broker services. In the US, the fees paid to real estate agents are intermediate expenditures because housing is considered production that is resold to homeowners.

⁴ Some might be concerned that the definition of financial services transforms the CPI from an expenditure basis to use basis, which affects the price recorded for goods and services that span more than one time period. For example, under the current expenditure approach the price of a purchased auto would be recorded in the CPI while under a use approach some estimate of the per-period value of the service flowing from the auto would be incorporated in the index. But this is not the intent. The focus is on the financial services inextricably attached to the asset/liability. One cannot purchase a deposit product without purchasing record-keeping and safe-keeping.

⁵ In the standard one period model underlying the cost of living framework, the dual optimization problem is employed: consumers minimize expenditures to achieve a given level of utility in the period in which the consumption is to take place.

Determining the per-period price of the financial services, especially those that are not explicitly charged-for, presents an impediment to the inclusion of financial services in a CPI because many important financial services fall into this category. For example, the services of record-keeping and safe keeping mentioned above are not explicitly charged for. The price problem is to estimate the value of these implicit services.

The user cost of money approach developed by Diewert (1974), Donovan (1978), and Barnett (1978) is one way to impute the price of the implicit financial services.⁶ One can derive the user cost of assets and liability products from a complex dynamic model or one can infer from the cash flow that results. This approach is taken below and it is identical with the one that underlies the user cost approach for implicit banking services that was implemented by BEA in the comprehensive revision released on December 10, 2003.⁷

The key feature for the incorporation of financial services is presenting a characterization of price that includes both an imputed component and an explicit component. Consumers are viewed as price takers. Consumers purchase deposit products in which the attending cash flow represents a deduction from cash with the return of the cash plus an interest component at the end of the time period. Further suppose that there is a period service fee of s_D . Let D denote the deposit amount, r_D the interest rate paid on deposits and ρ the risk free interest rate that serves as an opportunity cost of money. The cash flow is given by:

$$-D + \frac{(1 + r_D - s_D)D}{1 + \rho} = \left[\frac{(r_D - \rho - s_D)}{1 + \rho} \right] D;$$

this assumes no withdrawals during the period. The bracketed term on the right-hand side of the equality is the user cost of deposits from the consumer perspec-

⁶ See Fixler and Zieschang (2001) for a discussion of the application of the user cost approach to CPIs.

⁷ See Moulton and Seskin (2003) and Fixler, Reinsdorf and Smith (2003) for a discussion of the changes in the measure of implicit banking services in the national accounts that were implemented in the comprehensive revision.

tive. This user cost price is the negative of the user cost price of deposits from the financial intermediary's point of view that was used in the 2003 comprehensive revision to the national accounts, as shown in Fixler, Reinsdorf and Smith (2003).⁸ The sign difference results entirely from the fact that the asset and liability designations for the consumer are the reverse of that for the financial intermediary. In keeping with the assumption that consumers are price takers, the form of the user cost price for deposits will be that charged by the financial intermediary:

$$p_D = \frac{\rho + s_D - r_D}{1 + \rho}.$$

The above characterization of the deposit price is consistent with Dick (2002) that found that the demand for deposit services is based on both the service fee and interest rates.⁹

A similar analysis applies in the case of loans. From a consumer's perspective a loan is a liability that provides an amount L at the beginning of the period and at the end of the period requires the payment of L plus interest $r_L L$, where r_L is the loan interest rate, and any service fee s_L . From the financial intermediary's perspective, however, the cash flow is the exact opposite, as the loan is an asset that provides earnings. The user cost price of the loan from the bank's perspective is thus:

$$p_L = \frac{r_L + s_L - \rho}{1 + \rho}.^{10}$$

⁸ In the computation of the user cost prices from bank data it is quite frequently found that for deposit products, $(\rho - r_D) > 0$ implying that the bank treats the deposit product as an output. In the consumer problem this means that the parenthetical term above is negative. The negativity is consistent with the notion of a payment for financial services by consumers and the positive sign for the bank is indicative of a receipt.

⁹ Furthermore, it is not just the deposit rate that is important but also the loan rate—evidently consumers consider the potential costs of having to switch to another bank in order to obtain a loan.

The interest rate differential in the above loan price captures the idea that consumers go to banks because it is relatively easier to convince a bank of one's credit worthiness than the market (or even one's relatives) and the consumer pays the bank a fee for its assumption of this credit risk. Such fees, whether explicitly or implicitly charged, represent period consumption expenditures because the consumer is paying for a service throughout the duration of the loan.

The user cost price concept can be applied to a numerous financial services. In countries where universal banking (one-stop financial service centers) the set of financial products is quite large and thereby creates more possibilities for implicitly charged for financial services. The extension of the user cost approach to different kinds of financial services is in Schreyer and Stauffer (2003).

A key component of the user cost price is the reference rate or benchmark rate. This rate represents a risk-free opportunity cost of funds. The rates on US Treasury securities are often used to create an operational measure of the risk free rate.¹¹

As can be seen from the discussion of the mirror images between the consumer user cost price and the financial intermediary user cost price, it is assumed that both entities use the same reference rate. The argument is that both the consumers and the financial intermediaries can make use of these rates. Instead of depositing funds in a bank, consumers could purchase Treasury bonds. Though they will earn a higher interest rate by doing so they forgo transaction services and liquidity. From a bank's perspective, deposited funds can be invested in Treasury securities—they provide a safe source of investment income—no default possibility and they are easily tradeable and therefore a source of liquidity.

The inclusion of interest rates in the user cost prices raises the general question of whether to use book or market rates. Some considerations are: (i) individuals hold assets and liabilities over time so that the actual flow of interest expenses and re-

¹⁰ Holding gains or losses can also be included here and in principle in the deposit user cost as well. In the national accounts the inclusion of such values as part of valuation of financial services is currently being studied.

¹¹ For a discussion of the selection of different reference rates and their impact see Fixler and Zieschang (1991, 1992)

ceipts can be different from the one that is consistent with the market rate for any specific period; (ii) the detail available on the financial products held by individuals may not permit an assignment of a correct market rate; and (iii) there is a national accounting convention to use book rates instead of market rates. Accordingly, interest rates here are computed in a way that reflects book rather than market values. Fixler, Reinsdorf and Smith (2003) describe how unit value interest rates (loan, deposit and reference) are computed to create the user cost prices. Generally, the interest rates are computed by dividing some interest flow (receipt or expense) by the stock of the corresponding financial product at a point in time.

As is well known, the nominal interest rate in any period is directly related to the expected rate of inflation in that period, which implies that the interest rate dependent financial service prices can be affected by inflation. As a result, the user cost prices are deflated by a general price index. More specifically, the gross domestic purchases chain price index is used to deflate the user cost price relative between t and $t-1$.

In addition to the general price level changing over time, the characteristics of financial products change over time and thereby creates a need for quality adjustment as well. For example, suppose that in period t a deposit product has a minimum balance requirement and a service fee s and in period $t+1$, this minimum balance requirement is dropped and the service fee increased. Because there is a change in the quality of the service—the customer has more of the amount of deposit available to him, one would want to adjust the change in s for the change in the quality of the service. Fixler and Zieschang (1999) and Triplett (2000) demonstrate similar ways of adjusting the user cost prices for changes in the quality of financial services.¹² The price indexes constructed in the next section are not adjusted for change in the quality of the financial services.

¹² In some instances the characteristics of the financial product and the financial service coincide. If the characteristic set of a deposit product were amended to include internet banking, then there would simultaneously be a new form of transaction service. However it is viewed, a quality adjustment would be necessary.

III. A PCE based Financial Services Price Index

To illustrate what a financial service component of a CPI might look like, data from BEA's Personal Consumption Expenditures (PCE) are used to construct such an index. Because the purpose of PCE is to record expenditures of consumers (and non profit institutions serving households) as part of the overall measure of economic activity, PCE is not based on a cost of living framework and does not draw a distinction between expenditures for consumption and expenditures for income generation. Table 1 lists the financial services included in PCE; most of which are in the personal business category and provides their average share of the total for the financial services in 2000.¹³ These financial services totaled 559 billion dollars in 2000. There is some overlap with the services included in the US CPI. In fact BEA uses the information regarding the explicit fees included in the CPI when computing real explicit bank services in PCE.

Most of the data that are used to compile the PCE components for bank provided financial services come from regulatory sources, principally the Reports of Condition and Income (the Call Reports) that banks have to file quarterly. Some additional information comes from the Federal Reserve. Because these data are bank reported, there is no identification of the buyer of the financial services and so allocations must be made. For the most part the household portion of bank financial services was determined by looking at the household share of deposits and loans based on the Federal Reserve's Flow of Funds Accounts. In some cases it was straightforward to identify the purchaser—for example, personal loans can be confidently assigned to the household sector. These allocations are changed annually. The time period of consideration is 1987Q1 to 2002Q4. This period was selected because it is one in which the reporting requirements are relatively unchanged.

Two financial service price indexes are computed below: one is based on the current BEA procedure that uses implicit price deflators and the other is a price index that is based on user cost prices. In the first, the published BEA estimates for the price indexes of the services listed are used to form a financial services price index component for PCE. Many of the prices of these services are based on explicit

¹³ Other financial services are located in the category related to the service. For example, auto insurance is in the transportation category.

charges. For the implicit services provided by banks as well as for auto and household insurance, the price indexes are actually implicit price deflators that reflect the changes in the computation of nominal values that were implemented in the 2003 comprehensive revision.

As described in Moulton and Seskin (2003) and Fixler, Reinsdorf and Smith (2003), a user cost approach was implemented to compute the nominal value of the implicit bank services. This change, however, did not change the computation of real values. To estimate the real implicit service output of banks, BEA calculates a Fisher aggregate of a Laspeyres constant-dollar measure and a Paasche constant-dollar measure. Each constant-dollar measure of banks' implicit output equals (a) the constant-dollar value of banks' total output, estimated by extrapolating the base-year (2000) current-dollar estimate of banks' total (both explicitly and implicitly priced) output by the BLS estimate of the growth in banks' total output less (b) the constant dollar real value of banks' explicitly priced output, estimated by deflating banks' service charges on deposit accounts and other noninterest income with the BLS CPI for checking account and other bank services and then adding an estimate of banks' real fiduciary activities based on the growth of the number of trust department discretionary accounts.¹⁴ This real implicit service output measure is then used to obtain a price index for the implicit services and observe that this price index does not directly relate to the user cost prices presented above.

Similarly, Moulton and Seskin (2003) and Chen and Fixler (2003) describe the changes in the nominal measure of property and casualty insurance output that were implemented in the comprehensive revision. These changes were the addition of premium supplements and the use of a measure of normal claims instead of actual claims; the nominal value of property and casualty insurance became premium plus premium supplement less normal claims.¹⁵ Again, the computation of real values was not altered. Generally speaking, the computation of the real values involves the use of various components of the BLS' CPI and PPI programs to de-

¹⁴ The BLS methodology is explained in Kunze, Jablonski and Sieling (1998).

¹⁵ Premiums supplements are the income earned by the insurer from investing unearned premiums and unpaid claims and this income is attributed to policyholders. Normal claims are computed as a moving average of actual claims—the idea is that insurers base their pricing on expected rather than actual claims.

flate premiums (and premium supplements) and (normal) claims components.¹⁶ These price indexes are used to compute real values in terms of the base year and then these real values are used to compute an implicit price deflator, which is the price index published by BEA¹⁷. Some might argue that a premium less claims based measure of price is inappropriate for a CPI. It is beyond the scope of this paper to discuss the merits of different approaches to measuring insurance services in a consumer price index. The purpose here is to present an example of such index in the context of Personal Consumption Expenditures, which uses the premiums less claims based measure of price.

Because the financial services shown in Table 1 are found in different categories of PCE the corresponding implicit price deflators must be aggregated in some way. In keeping with the fixed-base nature of the indexes, the aggregation is performed by using a Laspeyres-type aggregation—each implicit price deflator is weighted by its share of financial service expenditures in the base period. More specifically, let $IPD_i^{fs}(t,2000)$ be the implicit price deflator for the i^{th} financial services listed in Table 1. The aggregate fixed weight price index for financial services is then:

$$P_{FW}^{FinServ} = \sum_i IPD_i^{fs}(t,2000) s_{i,2000}^{fs} \quad (1)$$

where $s_{i,2000}^{fs}$ is the share of the i^{th} financial service in the base year, 2000.

Figure 1 shows the fixed weighted financial services price index in (1). It is compared to an aggregate PCE price index that is computed by weighting the PCE component prices by their shares in 2000, as done in (1). Clearly the financial services index is more volatile but that volatility does not appear to effect the overall PCE because the 2000 share of the financial services subset in Table 1 is approxi-

¹⁶ In the case of expenses for handling life insurance BEA uses a composite index of BLS measures of earnings—that is, the deflation is based on input prices.

¹⁷BEA recognizes that this method of deflation is limited and has on its research agenda improving the method of deflation. One aspect of that research will be the possible use of the PPI for property and casualty insurance which already incorporates investment income in its price index.

mately 8%. Interestingly, the share remains approximately constant throughout the period examined.

Under the current procedure for determining the real value of implicit banking services, no distinction is made between depositor and borrower services; all the implicit services are treated as a single value. The sector allocation of real implicit services is in proportion to the sector allocation of nominal implicit services. The sector allocation of nominal implicit services reflects both changes in user costs for depositor services and borrower services, and changes in sector shares of nominal deposit and loan balances. For example, suppose that nominal depositor services increase given an increase in the user cost of deposits, *ceteris paribus*. Each sector's share of this nominal increase is in proportion to its ownership of deposit balances. Because about 60 percent of deposits at commercial banks are owned by persons, a value that does not change much over time, that percentage of the nominal increase in depositor services will be allocated to persons. Thus 60% of real implicit deposit services will be allocated to the real personal consumption of implicit services.¹⁸

One way to remove the influence of changing user costs on the real consumption of implicit services would be to perform the quantity extrapolation by type of service—depositor and borrower services.¹⁹ This procedure is possible because the BLS measure distinguishes between these two types of services. In this scheme, the sector allocation of real implicit services is only in proportion to changes in the sector shares of nominal deposit or loan balances. Using the example above, estimates of the overall real implicit depositor services reflect extrapolation of the base-year estimate of total (implicit and explicitly-priced) depositor services with the deposit component of the BLS quantity index, less deflated measures of explicitly-priced depositor services. The amount of the personal consumption of real implicit depositor services is determined by the proportion of nominal deposit balances

¹⁸ To illustrate, suppose that initially the nominal value of implicit deposit services were 100 and that 50 was allocated to persons and 50 to business. Now suppose that the user cost of deposits increases the nominal value to 120. Using the 60% figure the split of the nominal implicit depositor services would be 72 to persons and 48 to business. Thus the increase in the user cost price, without any change in deposit share, will result in higher allocation of real implicit services to persons.

¹⁹ This procedure was suggested by George Smith.

owned by persons. Therefore, changes in real personal consumption of implicit depositor services reflect changes in the BLS quantity index, changes in deflated measures of explicitly-priced depositor services, and changes in the personal sector's share of nominal deposits, but not changes in the user cost of deposits

Figure 2 illustrates the price indexes (implicit price deflators) that result from the two methods of quantity extrapolation. The extrapolation by type has a large influence on total PCE after about 2000Q3 that reflects its greater influence on financial services at about that time. Note that the pattern of the financial services index does not change with the quantity extrapolation by type.

Figure 3 focuses on the effect of the change in the method of quantity extrapolation on the total implicit services component. Observe that the implicit depositor services price index for banks, when the quantity extrapolation is by type, has a substantial positive impact on total implicit services by type after 2000Q3. It should be noted that approximately 80% of the implicit services consumed by persons are deposit services. Accordingly, when treated separately the influence of implicit depositor services will be more pronounced; in other words the joint treatment of depositor and borrower services obscures the relative weight difference.

To ascertain the impact of incorporating the user cost prices directly, a Törnqvist financial service price index is constructed. The Törnqvist is used for mathematical simplicity; it easily allows for the isolation of sub-indexes and allows for an easy rescaling of expenditure shares. Furthermore because the Törnqvist formula and Fisher index formula used by BEA are both superlative, there will be no loss in the ability to compare the movements of this index with PCE chain Fisher price index published by BEA.²⁰ The general form of a Törnqvist price index is given by

$$P_{Tornq}(t, t-1) = \prod_i \left(\frac{p_i^t}{p_i^{t-1}} \right)^{0.5(s_i^t + s_i^{t-1})}$$

²⁰ See Diewert (1976) for the relationship among superlative index number formula.

where p_i is the price of the i^{th} good or service and s_i is the expenditure share of the i^{th} good.

In the financial services price index, there are two types of services; those that are explicitly priced (some bank services, brokerage services and insurance) and those that are implicitly priced (bank deposit and loan services).²¹ For the explicitly priced component of the financial services price index, the Törnqvist index above is used and let this index be denoted by $P_{Tornq}^{explicit}(t, t - 1)$. In this indexes the prices are derived from actual charges and the shares are the expenditure on these services as a fraction of the expenditures on all of the financial services listed in Table 1.

For the implicitly priced services, the following Törnqvist formula is used

$$P_{Tornq}^{implicit}(t, t - 1) = \left(\frac{\frac{p_L^t}{t-1}}{p_L} \right)^{0.5(s_L^t + s_L^{t-1})} \cdot \left(\frac{\frac{p_D^t}{t-1}}{p_D} \right)^{0.5(s_D^t + s_D^{t-1})}$$

where L identifies loan prices and share (loan services as a fraction of total financial services) and D identifies the deposit prices and share. Each is comprised of the interest rate differential component in the user cost prices presented above—the service charge fee is captured in the is explicitly priced component. The term δ is given by

$$\delta(t, t - 1) = \frac{\text{Gross Domestic Purchases Price Index (t, 2000)}}{\text{Gross Domestic Purchases Price Index (t - 1, 2000)}}$$

²¹ Abstracting from the fact that some deposit services are explicitly charged for.

and is intended to adjust the user cost prices for general inflation.

The complete financial services price index is thus given by

$$P_{Tornq}^{FinServ}(t, t - 1) = P_{Tornq}^{explicit}(t, t - 1) \bullet P_{Tornq}^{implicit}(t, t - 1). \quad (2)$$

This bilateral index is a component of the chain Törnqvist price index that is used to compute the financial service price index for more than two periods.

Because of the user cost prices depend on book value based interest rates, Figure 4 shows the relationship among the interest rates used to construct the user cost prices. Note that there are downward trends in all of the interest rates during the 1990-91 and 2001 recessions, despite these rates not being market rates.

Figure 5 shows a comparison between the chain Törnqvist financial services price index and the published chain Fisher PCE price index. Though the financial services price index is more volatile that volatility does not appear to present itself in the overall PCE price index because, as noted earlier, the financial services subset of PCE amounts to approximately 8% of PCE for the period under consideration.

Figure 6 presents a closer examination of the movements of the components of the Törnqvist financial services price index. As can be seen the overall steady increase is driven by the steady increase in the insurance component that is comprised of the insurance services listed in Table 1. The insurance component amounts to approximately 40% of financial services in 2000, with the share not varying much over the considered time period. Observe that there is a decrease in price in 2001Q3 owing to the attacks on September 11, 2001.²² The explicit fees component share in 2000 was approximately 18% and remained fairly constant. Bank implicit services had a share of about 12% with 9% deriving from depositor services and 3% from borrower services. Observe that some of the movement in the implicit financial services index influences the movement of the overall financial services index.

²² This reduction would have been larger without the change in the measure of insurance implemented in the comprehensive revision.

Figure 7 presents a closer look at the movement of the implicit financial services by presenting the depositor and borrower price indexes separately. Clearly the implicit component follows the movement in the depositor series and this is due to the fact that depositor services range from 60-90% of implicit services while borrower services range from 10-40%. Starting in 2000Q4 depositor services start to rise toward their peak of 90% while borrower services move toward their low of 10%. Looking at Figure 4 one can see that during this time all of the interest rates are falling but that rate of decline in deposit rates is relatively great which serves to increase the user cost price of deposits. Note that the decrease in deposit rates in the early 1990s also contributed to the large increase in the deposit user cost price index.

Figures 8 and 9 explore the movement of the user cost prices of deposit and borrower implicit services. Figure 8 shows the user cost price of deposits with and without its deflation by a four quarter moving average of the Gross Domestic Purchases price index. Also shown is the implicit price deflator for depositor services that is achieved by dividing the nominal value of implicit depositor services by a corresponding real value that reflects quantity extrapolation with the BLS deposit output index. Though the levels are different the movement in all three series is very similar. This result derives from the fact that both the amount of deposits, which together with the user costs yields the nominal measure, and the quantity extrapolator do not change much over the period. In other words the variation in all three series is due to the variation in the user cost price.²³ The borrower counterparts for these series are presented in Figure 9 and the same analysis applies. Of course the differences in levels influence the attending real values of depositor and borrower services as will be shown below.

Figures 10-14 present the quantity indexes that correspond to the price indexes discussed above. The quantity indexes are computed by taking the quantity in year t and dividing by the quantity in 2000. Figure 10 shows the quantity index for total PCE is not changed when the quantity extrapolation is by type instead of combined—the two quantity index series effectively lie on top of each other. This re-

²³ The movement in the moving average of the Gross Domestic Purchases price index is fairly stable, as would be expected from using a moving average.

sult seems to be due to the small weight of financial services subset in total PCE. Observe that the two financial services indexes differentiated by the method of quantity extrapolation show different levels, though the paths are very similar. Figure 11 focuses on the fixed weight quantity indexes for bank implicit services and shows that there is considerably more volatility in the quantity index for borrower services. The total implicit services have similar patterns but note that the large discrepancy that began in 2000Q4 is akin to the difference presented in early 1990s. In the earlier period depositor services increase slightly and given their higher share of implicit services it makes sense that the implicit services index would increase. The index with the combined quantity extrapolation gives depositor services a relatively higher weight because, as explained earlier, the deposit share is influenced by the rising user cost of deposits for the period that is illustrated in Figure 8. The influence of the user cost prices on the shares also explains the divergence in the two total implicit services index in the later period. Starting in 2000Q4, borrower services rise relative to depositor services and this difference in trend is accentuated by the fact that the user cost of borrower services is rising, as illustrated in Figure 9, while the user cost of depositor services is falling, as illustrated in Figure 8.

Figure 12 compares the published chained Fisher PCE quantity index with the Törnqvist quantity index—computed implicitly using the Törnqvist price index.²⁴ In this user-cost-deflation methodology, the sector allocation of real implicit services is in proportion to changes in the sector shares of nominal deposit and loan balances. Thus the amount of real implicit depositor services allocated to personal consumption is determined by the proportion of nominal deposit balances owned by persons—this method of sector allocation is similar to that with the quantity extrapolation by type. Observe that the Törnqvist financial services quantity index does not rise as steadily as the PCE quantity index. The indexes approach each other in 2000 because that is their common base period. Again, the movements in the financial services index do not have much influence on the movement in the overall PCE index because of its relatively small weight.

²⁴ For period t , the nominal value was deflated by the Törnqvist price index for t . This value was then divided by the quantity index for 2000 to obtain a quantity index between periods t and 2000.

Figure 13 presents the quantity index for bank implicit services and its component depositor and borrower services quantity indexes. Observe that the large differences between the borrower and depositor indexes occurs in the period 1990Q2 to 1992Q1, which includes the 1990-91 recession, and in the period 2000Q4 to 2001Q4, which includes the last recession. In both cases, the beginning is characterized by a falling quantity of implicit borrower services and a rising quantity of implicit depositor services. Figure 9 shows that both the implicit price deflator and the user cost price of borrower services are declining in these periods. The implication is that the volume of borrower services did not increase with the fall in borrower services prices. In fact the growth rate of total consumer credit, as measured by the Flow of Funds, fell continuously in the period 1990-92 and in the period 2000-02. Regarding the quantity of implicit depositor services, it increases during both the periods noted above. Figure 8 shows that large increases in the user cost price of implicit deposit services occurs in the period 1990Q2 to 1992Q1 and the period 2000Q4 to 2001Q4. The implication is that the volume of deposits did not fall during these periods. Yet, as measured by the Flow of Funds, checkable deposits at commercial banks fell in 1990 increased in 1991 and 1992, fell in 2000 and 2001 and increased in 2002.. Thus the increase in the user cost price of implicit deposit services offset the decrease in checkable deposits when they occurred.

Figure 14 illustrates the implication of the different price index measures for implicit financial services on the attending quantity indexes. In the most recent periods the current procedure leads to an understatement of the quantity of implicit financial services relative to the user cost price index. Observe that the decomposition of the quantity extrapolation by type has a greater understatement. The difference in the two fixed weighted quantity indexes is due to the influence that changes in user cost prices have on the sector allocations under the current procedure. More specifically, the large quantity increases under the current procedure immediately after 1988Q3 and 2000Q3 primarily reflect large increases in depositor user costs which flow through to the quantity measures through the sector allocation methodology currently used. As discussed earlier changes in user-cost prices do not flow through to quantity measures using the sector allocation method under quantity extrapolation by type. The decreases shown in Figure 14 for these same periods reflect the separate quantity extrapolation of base-period depositor

services and of borrower services, allocated by sector with fairly stable deposits and loan balances.

IV. Summary and Conclusions

The importance of financial services to the conduct of households has grown over time. However, the domain of consumer price indexes under standard practices is to exclude such services if they involve income generation; that is, if the financial services involve a future time then they are excluded as not being part of current consumption. This paper maintains that expenditures on such services ought to be included in current period expenditures. The difficult operational question is how to measure the current period price of the financial services that are not explicitly charged-for.

It is shown that the user cost of money approach, that has been used in several studies of bank output and price measurement and most recently adopted by BEA in the comprehensive revision can also be used to form prices of uncharged-for bank services in a consumer price index. To illustrate, a financial services price index is constructed from a set of financial services covered in Personal Consumption Expenditures. It is shown that the quantity of implicit financial services using a user cost price measure can be substantially different from the quantity measured using the current BEA procedures for producing quantity indexes for implicit bank services. Given the differences among the quantity indexes, which one is likely to be the most accurate measure? The user cost price based index has a two key advantages over the index under the current procedure. First, it directly relates to the user cost prices of the implicit services and thereby has a direct link to the nominal value of the implicit services. Second, the data are available quarterly—the quantity extrapolation used in the current procedure is based on an annual index provided by BLS. Currently the Bureau of Labor Statistics is developing a user cost based price measure for banking services that will be part of the Producer Price Index. BEA is also investigating the improvements in the price index for implicit bank services.

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Table 1. The Set of Financial Services	
(Number in parentheses is the average share of Financial Services in 2000)	
Brokerage charges and investment counseling	
Equities commissions	
1.	Exchange listed equities (2.4%)
2.	Market making in over-the-counter equity securities (1.3%)
3.	Other equity securities, including specialists on registered exchanges and dealer trading (0.97%)
4.	Listed options Transactions (0.22%)
5.	All other securities transactions (4.6%)
6.	Broker charges on mutual fund sales (1.8%)
7.	Trading profits on debt securities (0.22%)
8.	Trust services of commercial banks (0.47%)
9.	Investment advisory services of brokers (2.4%)
10.	Commodities revenues (0.43%)
11.	Investment counseling services (3.1%)
Bank service charges, trust services, and safe deposit box rental	
12.	Commercial bank service charges on deposit accounts (3.2%)
13.	Commercial bank fees on fiduciary accounts (2.5%)
14.	Commercial bank other fee income (3.3%)
15.	Charges and fees of other depository institutions (2.6%)
Services furnished without payment by financial intermediaries	
16.	Commercial banks (11.5%)
17.	Other financial institution (18.4%)s
18.	Expenses of handling life insurance and pension plans (17.2%)
19.	Household insurance (0.69%)
20.	Auto insurance (7.7%)
Health insurance	
21.	Medical and hospital insurance (12.2%)
22.	Income loss insurance (0.3%)
23.	Workers Compensation (2.5%)

**Figure 1 - Fixed-weighted Price Indexes (IPD), PCE,
Financial Services Subset**

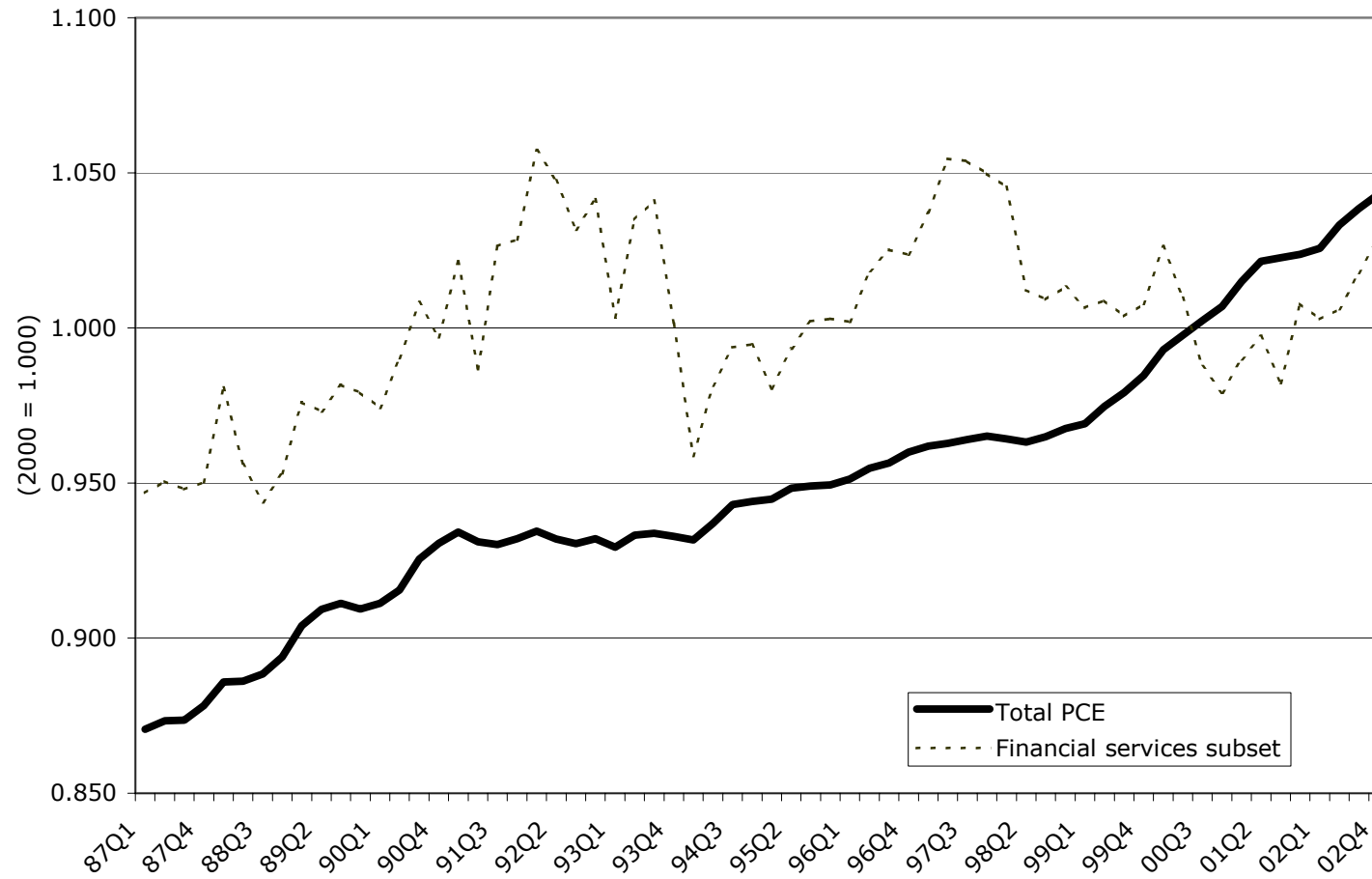
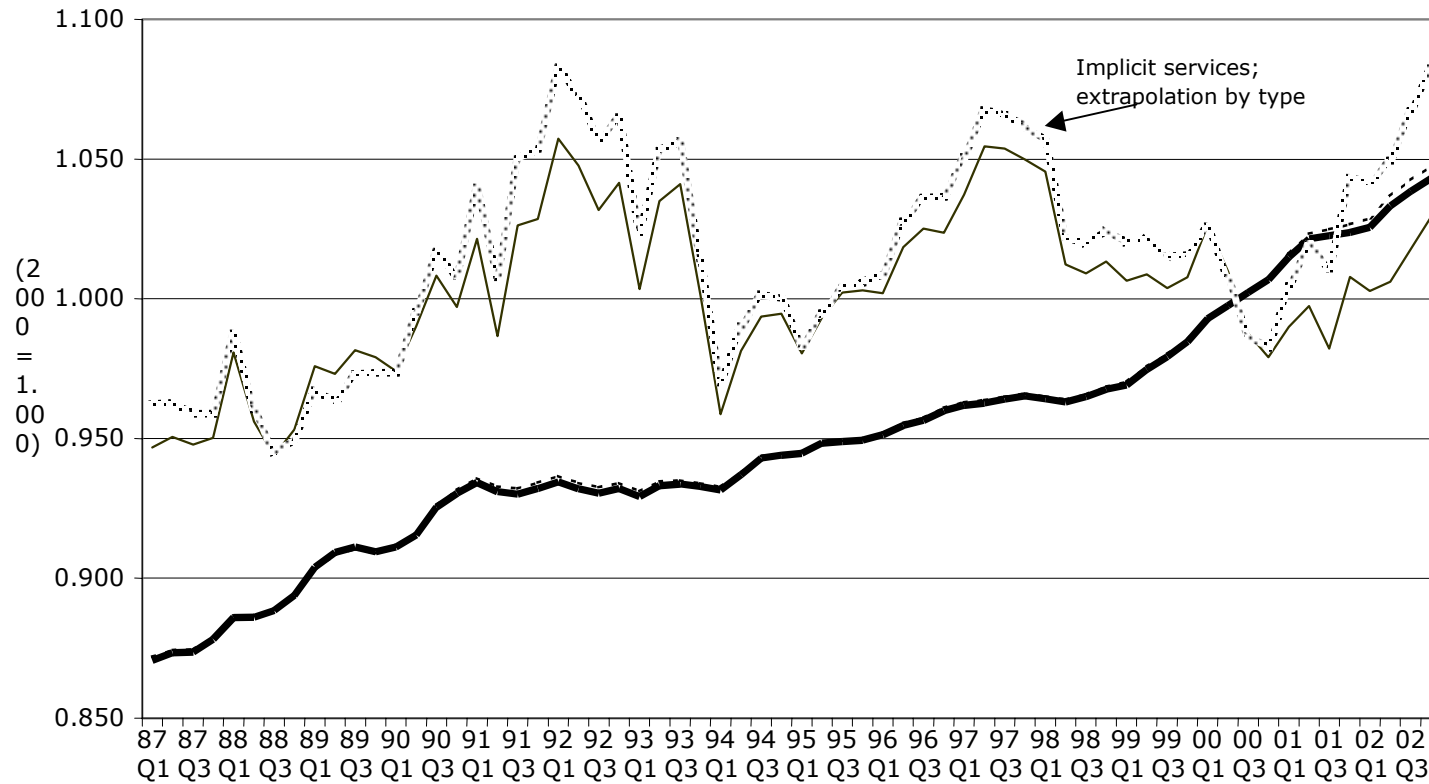


Figure 2. Comparison of Fixed-weighted Price Indexes for Financial Services and total PCE



- Total PCE, current procedure
- Financial services subset current
- Total PCE, reflects Banks' Implicit Services Quantity
- Financial services subset, reflects Banks' Implicit Services Quantity

Figure 3. Price Indexes (Implicit Price Deflators) for Total Implicit Services; two methods of Quantity Extrapolation

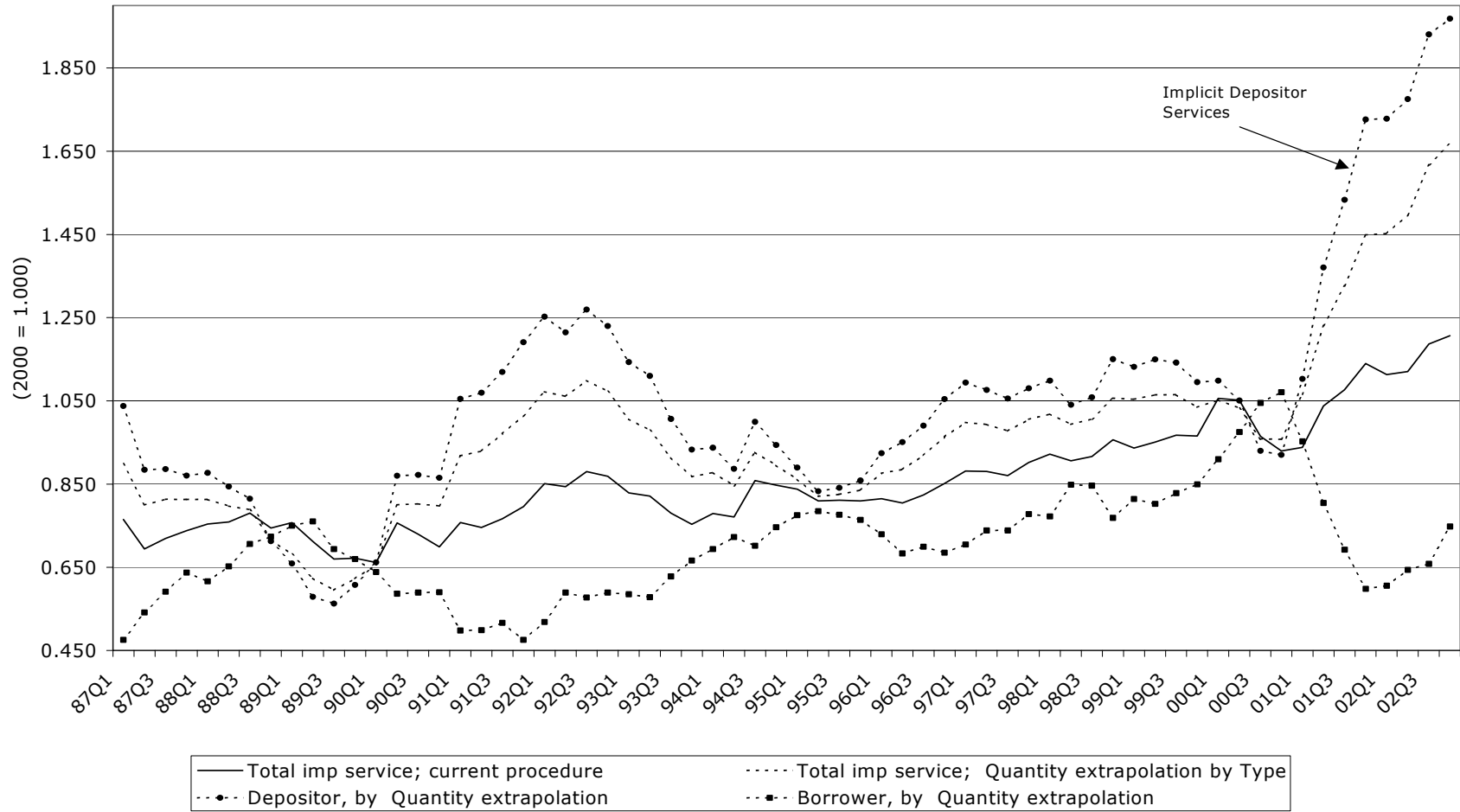


Figure 4. Average Interest Received and Paid by Banks, Book Values

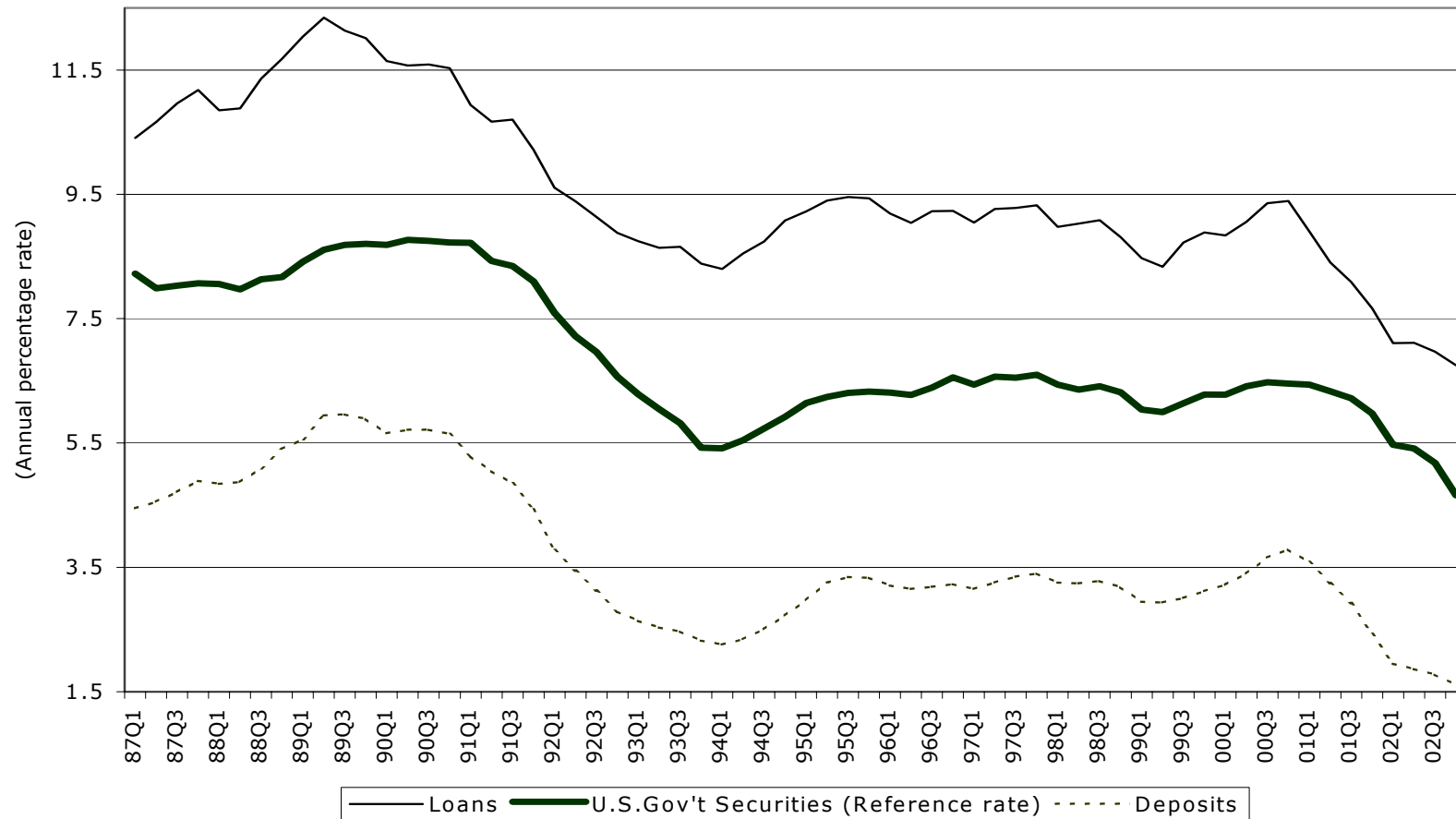


Figure 5. Comparison of published PCE price index with Tornqvist user cost based financial services price index .

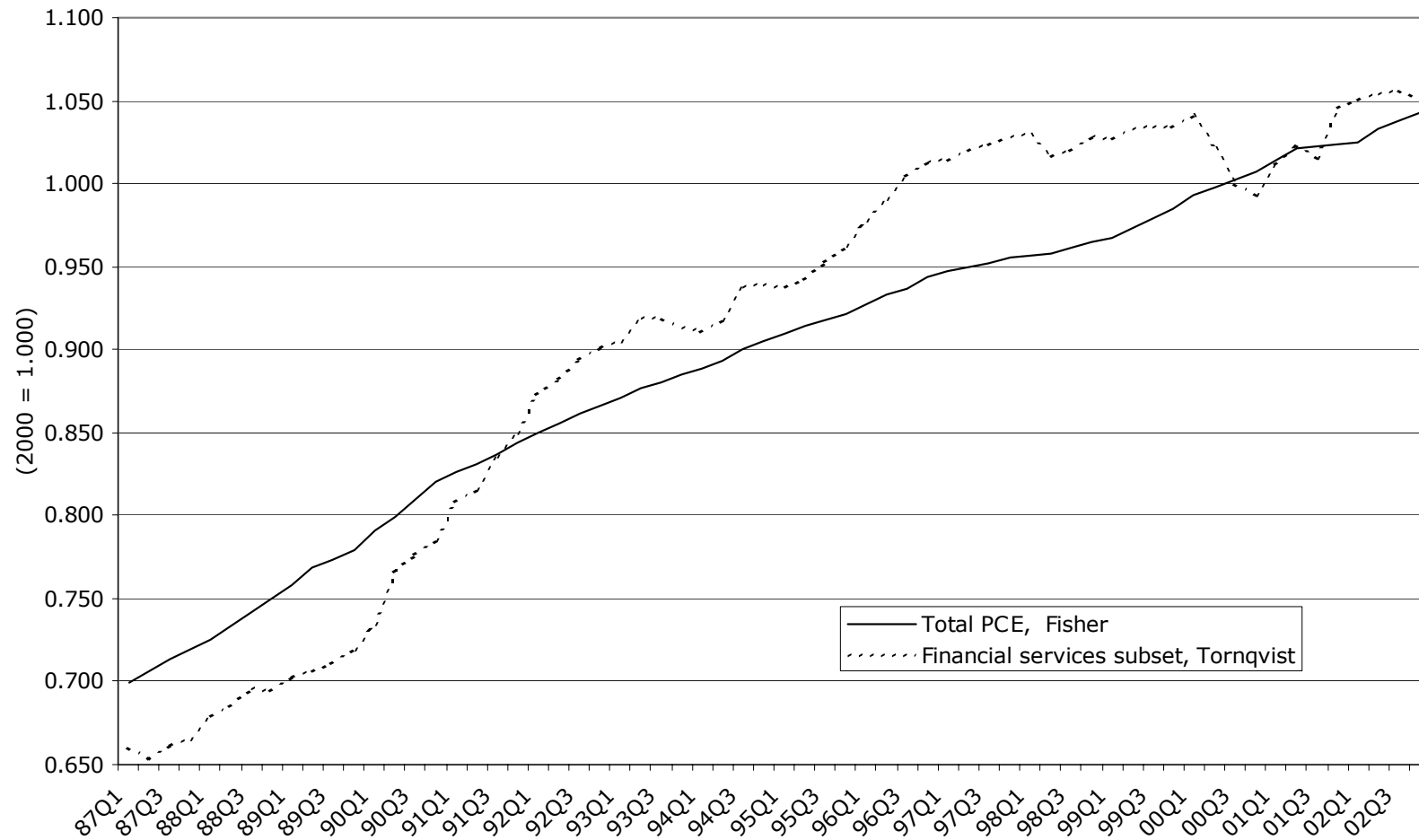


Figure 6. Tomqvist Chained Price Indexes for Financial Services

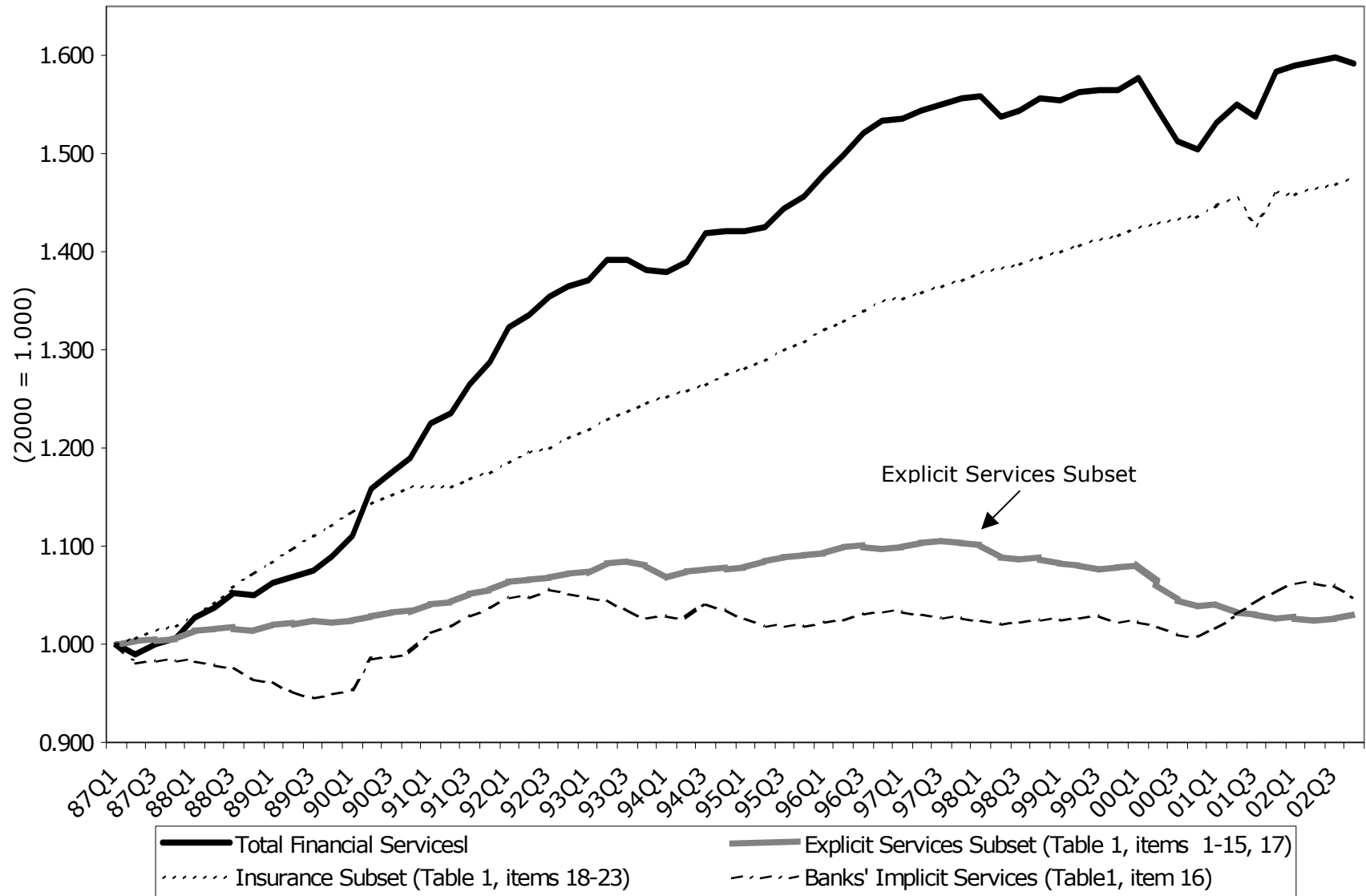
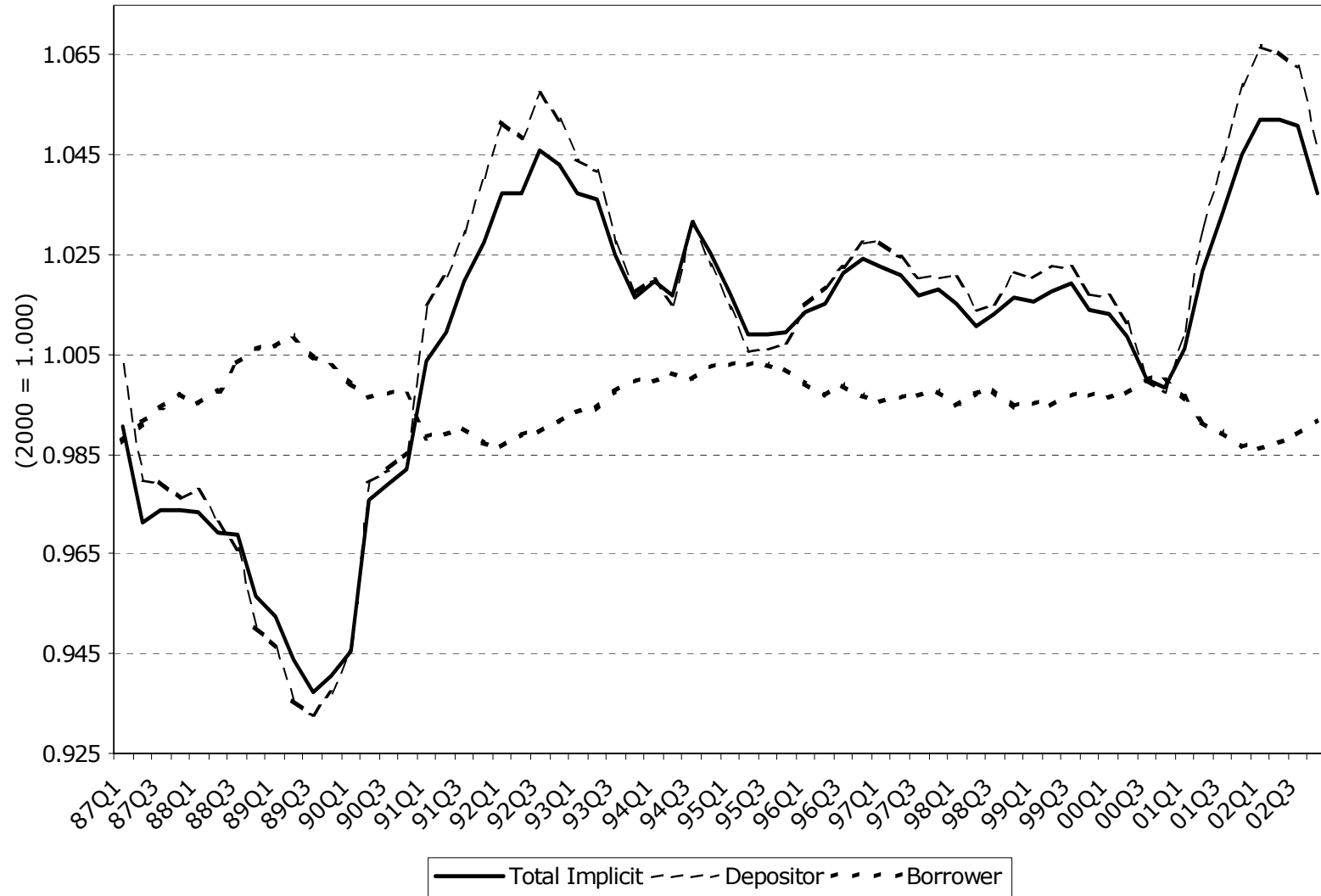
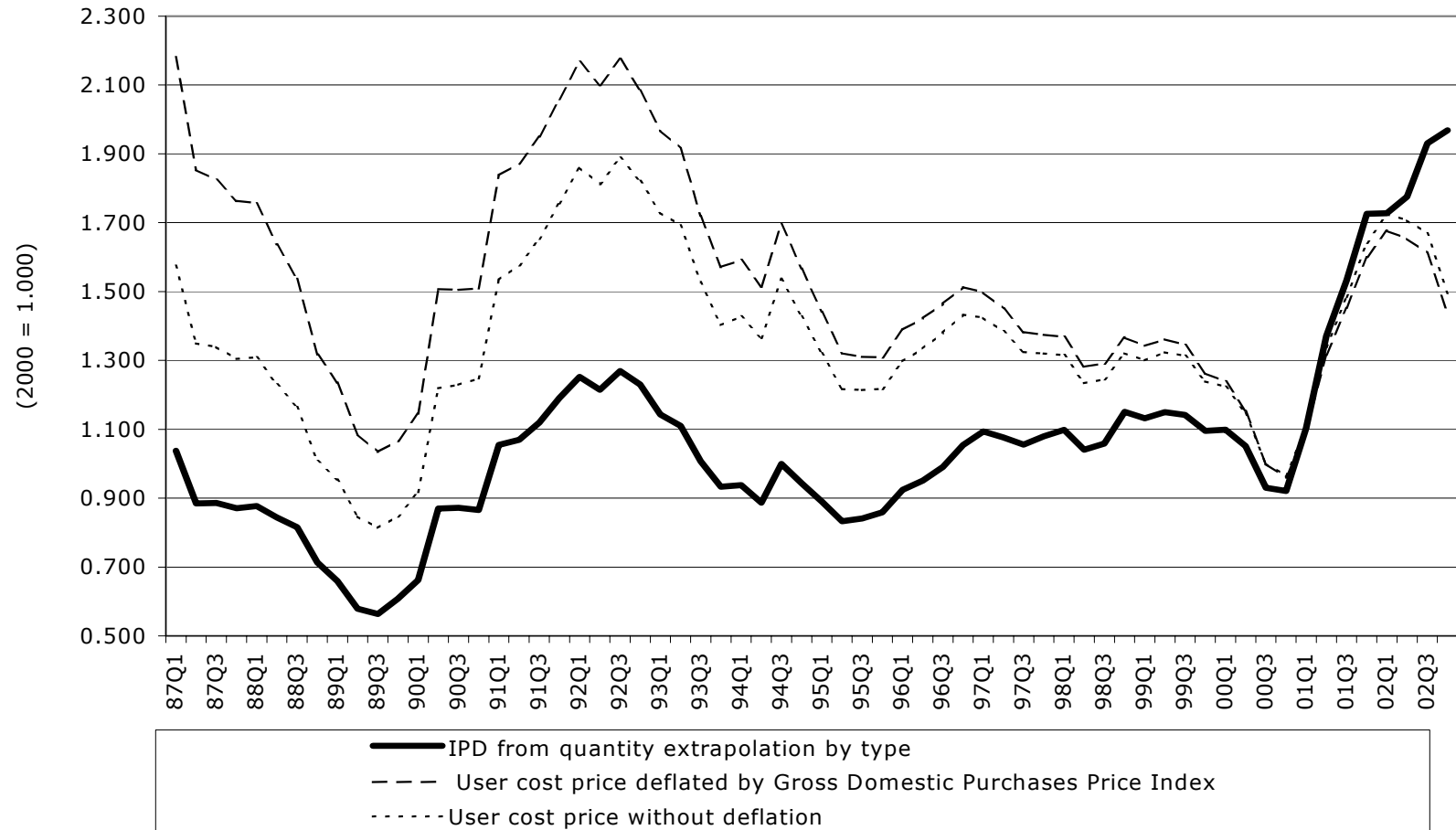


Figure 7. Tomqvist price indexes: Total implicit, Depositor and Borrower Services



**Figure 8. Comparison of Depositor service prices:
implicit price deflator versus user cost**



**Figure 9. Comparison of Borrower service prices:
implicit price deflator versus user cost price**

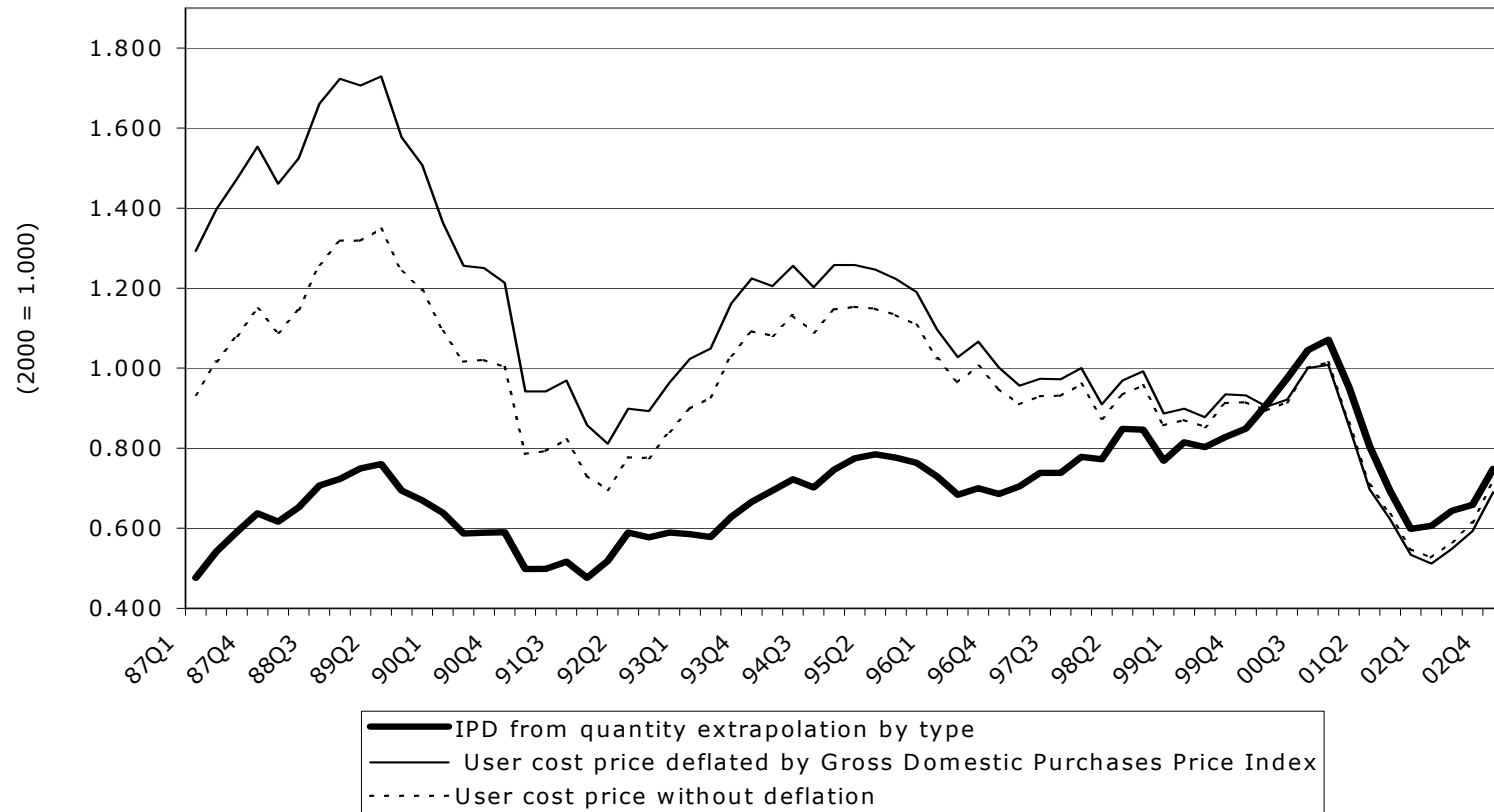


Figure 10. Comparison of Fixed-weighted Quantity Indexes

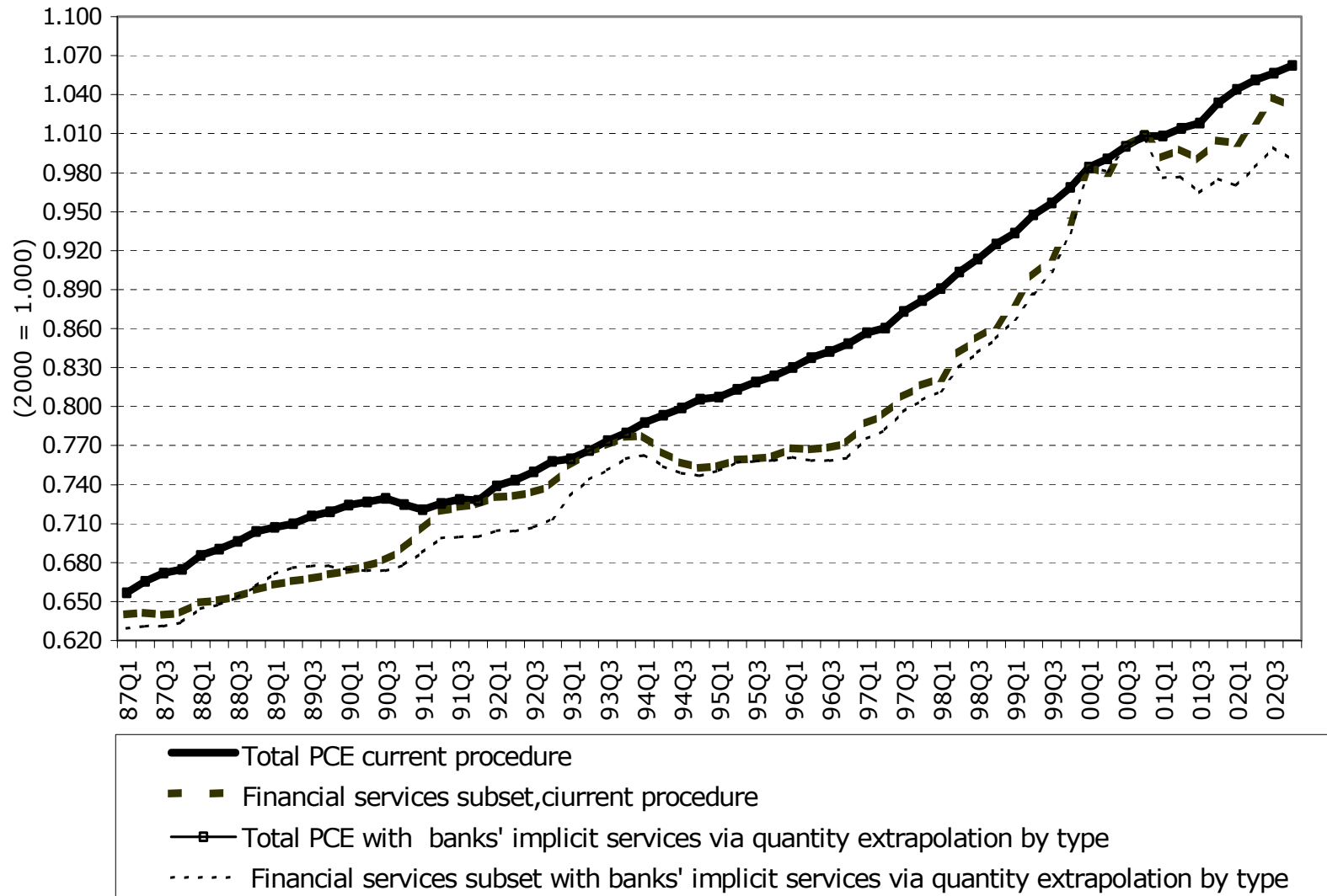


Figure 11. Fixed-weighted Quantity Indexes Banks' Implicit Services

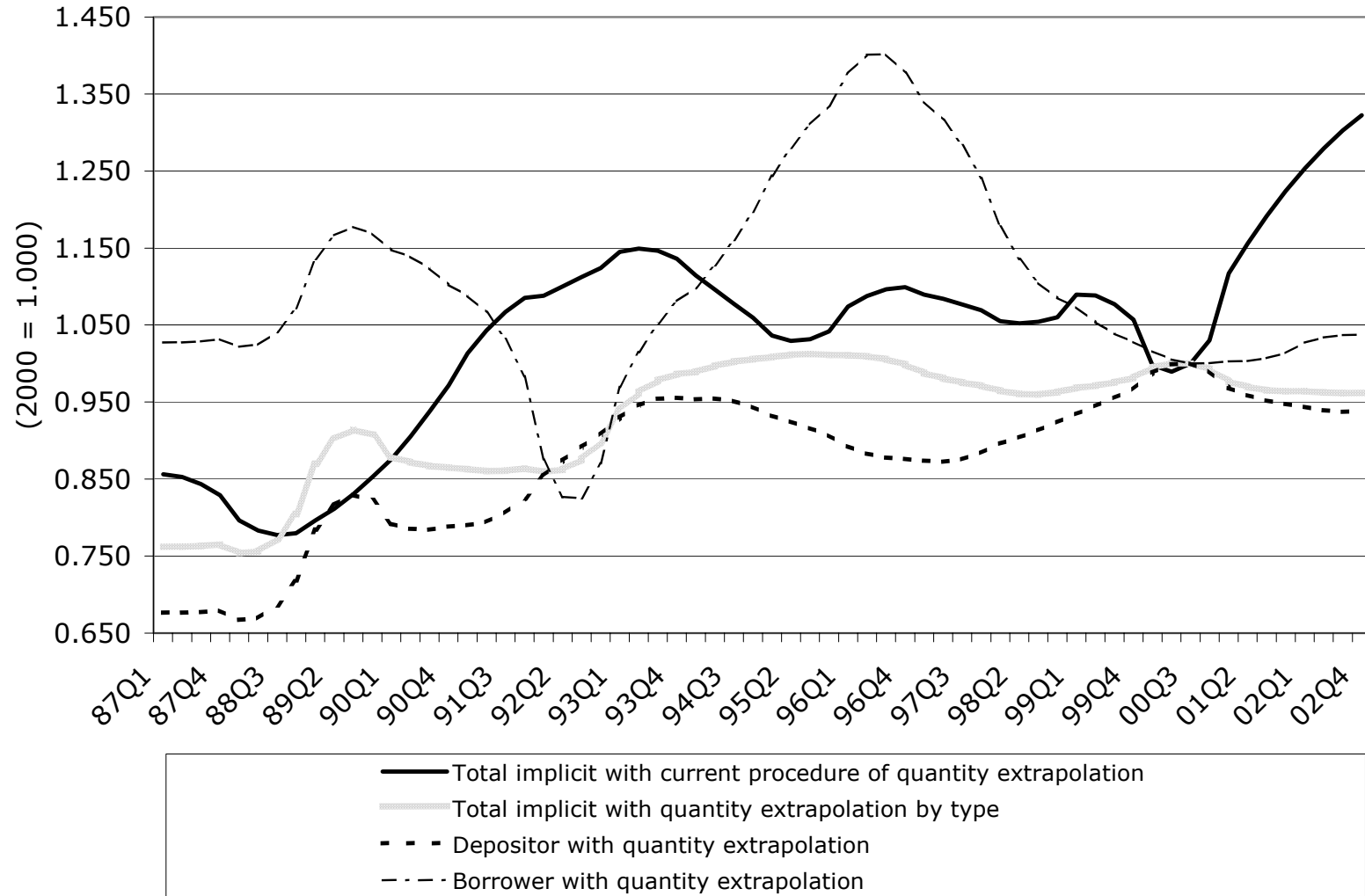
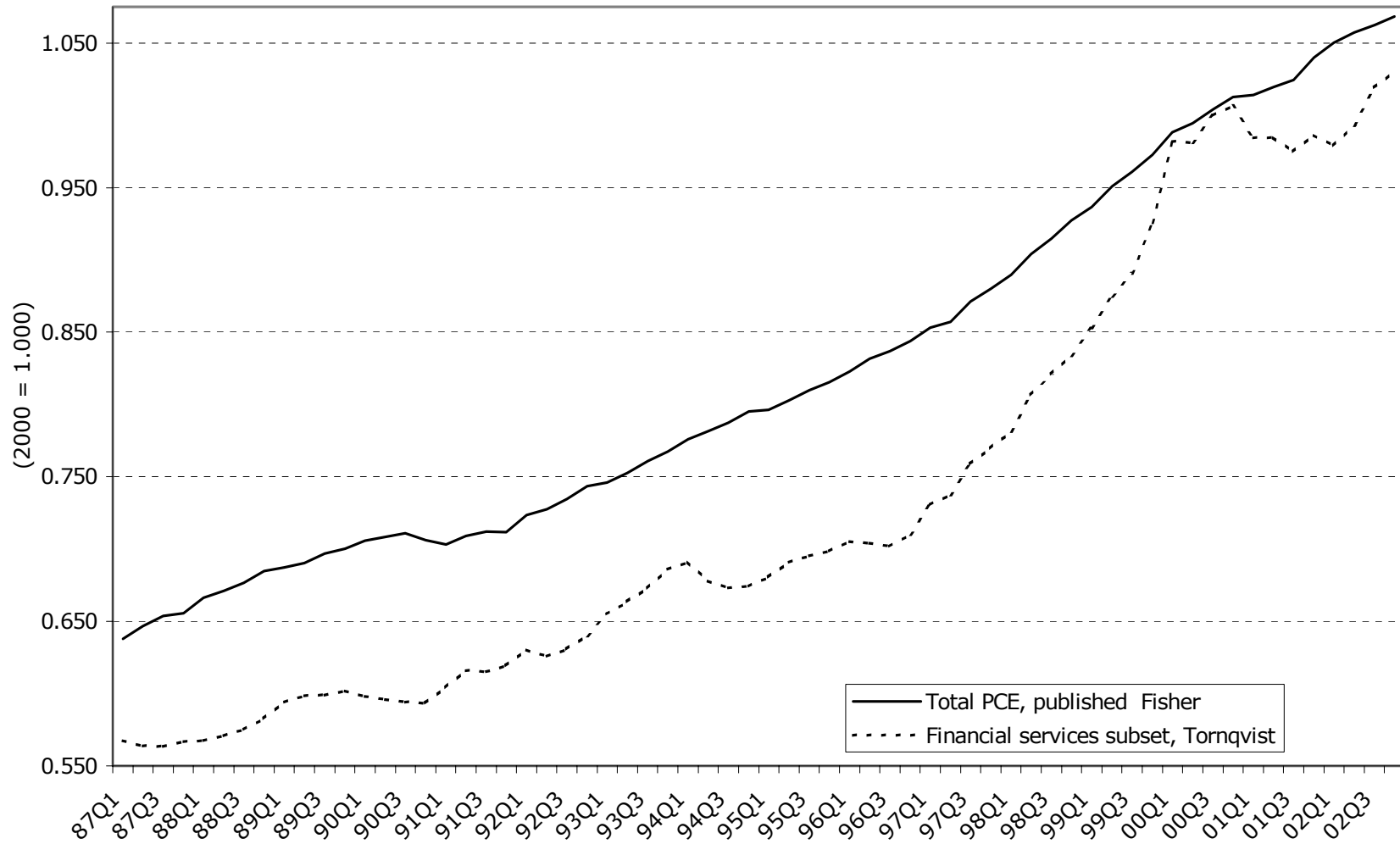


Figure 12. Chain-weighted Quantity Indexes, PCE and Financial Services



**Figure 13. Implicit quantity indexes from Tornqvist price indexes:
Total implicit, Depositor and Borrower servicesx**

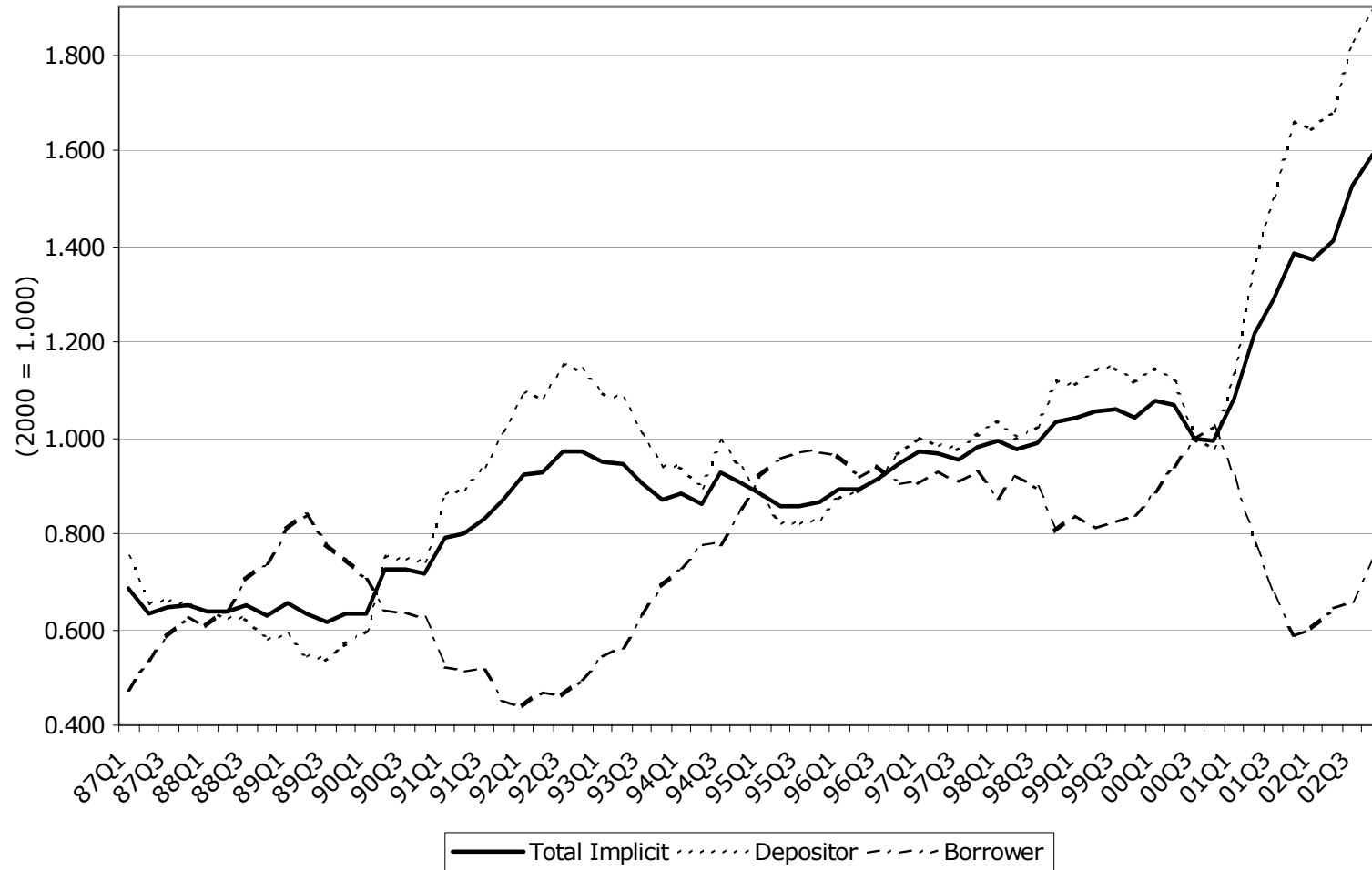


Figure 14. Comparison of Quantity Indexes for PCE Banks' Implicit Services

