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**Session 2: Producer Prices for Banking Services**

**U. S. Producer Price Index for Banking**

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Producer Price Index  
U.S Bureau of Labor Statistics

## I. The US Producer Price Index for Banking

### *Industry Output*

1. The specific types of services provided by banks can further define the output. For example, in the US, the major service lines are:<sup>1</sup>
  - Loans
  - Deposits
  - Trust services
  - Other banking services
2. Loans are assets of a bank defined as funds advanced to a borrower to be repaid at a later date, usually with interest. Included in the loan category are residential real estate, nonresidential real estate, home equity, commercial and industrial, agricultural, new and used auto, and credit card loans.
3. Deposits are liabilities of a bank defined as funds placed with a bank in an account subject to withdrawal. Included in the deposit category are demand, time, and savings accounts.<sup>2</sup>
4. Trust activities involve the bank's acting in a fiduciary capacity for an individual or a legal entity, such as a corporation or an individual's estate. This typically involves holding and managing trust assets for the benefit of a third party.
5. Other banking services include standby letters of credit, correspondent banking, sale of securities, cash management and other miscellaneous services.

### *Item Selection*

6. In the US, the sample for this industry was drawn in two stages. For the first stage sample, banks were chosen by probability proportionate-to-size sampling based on revenue. For the second stage sample, selections were made from a set of departments that were defined. The selections were of companies in the top half of the sample creating multiple sample units for a single bank in most cases. The BLS-defined departments are listed below.

Mortgage loans  
 Agricultural loans  
 Commercial loans

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<sup>1</sup> In many countries, universal (one-stop) banking is allowed so additional services such as insurance, brokerage and travel services can also be outputs of a bank.

<sup>2</sup> Some might view deposits as an intermediate input to a bank. Because the focus is on financial services, the view here is that the services associated with deposit products are outputs of the bank.

Consumer and other loan services  
 Retail (deposits)  
 Trust services  
 Other banking services

7. The services to be priced were pre-selected. For loans and deposits, the unique item to be priced is represented by a homogeneous group of accounts (e.g. all 15-year fixed rate residential mortgages or all 1-year certificates of deposit). Trusts and other banking services are priced by selecting an individual transaction.
8. Once the actual service is selected, its price-determining characteristics are identified to permit monthly re-pricing of the same unique item. The following characteristics are common for most services:

Type of service; e.g., mortgage loans, money market savings account, corporate trust, etc.

Term of service; e.g., 15-year loan, 5-year certificate of deposit

Type of fees; e.g., late payment, automatic teller machine, early withdrawal penalty, etc.

### *Index Methodology*

9. One of the primary challenges in this industry is to measure financial intermediation services indirectly measured or *FISIM* as defined in the 1993 UN SNA. Banks often provide services for which they do not explicitly charge. Paying or charging different rates of interest to lenders and borrowers covers the cost of providing these services and provides an operating surplus. This scheme of interest rates avoids the need to charge customers individually for services provided and leads to the pattern of interest rates observed in practice<sup>3</sup>. Thus, the price measure must capture both direct and indirect charges for the provided services.
10. The US PPI program has implemented the user cost framework described above. A key feature of valuing the implicit component of the financial service price is the reference rate, or the opportunity cost rate of money, which does not include any intermediation services<sup>4</sup>. As shown above, the user cost prices for assets and liabilities differ. The price of an asset (e.g. loan) is equal to the asset holding rate less a reference rate. The asset holding rate is the interest received plus service charges. For liabilities (deposits), the price is equal to a reference rate less the liability holding cost rate. The liability holding cost rate is the interest paid to depositors less service charges.

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<sup>3</sup> 1993 System of National Accounts

<sup>4</sup> 1993 System of National Accounts

11. In measuring the prices for both loans and deposits, the same reference rate should be used. Possible reference rates include the central bank lending rate (discount rate), interbank lending rate (federal funds rate), or a weighted average of the interest rates on all banks' securities holdings where the weights are shares of the different securities in a bank's security portfolio.
12. In practice, the price of these services can be expressed as shown below. Again, both services are priced at the portfolio level.

$$\text{Loan Price} = \left[ \left( \frac{\text{Earned interest income} + \text{Fees}}{\text{Average loan balance}} \right) - \text{Reference rate} \right] * \$1000$$

13. Earned interest income includes all interest actually received in a given month for the portfolio of loans being priced. This includes interest earned on both old and new loans. The average loan balance is calculated by averaging the ending daily balances of the loans in the portfolio over the month.

$$\text{Deposit Price} = \left[ \text{Reference rate} - \left( \frac{\text{Interest payments} - \text{Earned fees}}{\text{Average deposit balance}} \right) \right] * \$1000$$

14. Interest payments include all interest actually paid to depositors on the funds held in the portfolio in a given month. Earned fees should include all fees, such as those for ATM withdrawals or insufficient funds, that are actually collected by the bank. Again, the deposit balance is calculated by taking the average of the ending daily balances of the portfolio.
15. For both equations, the calculation within the outer brackets results in a rate. This rate is multiplied by \$1000 to convert the rate to the dollar value used in index calculation. When the price is positive, the service will be considered on output. However, whenever the price is negative, the service will be considered an input and the price will be excluded from index calculation until it becomes positive.
16. For trust and all other banking services, the price is equal to the actual fee charged for performing the service. These fees can be a percentage of assets or a flat fee.

#### Weights

17. The PPI program uses bank revenue data collected by the Bureau of the Census and the Federal Deposit Insurance Corporation. Net interest revenue will be allocated between loan and deposit products by using the reference rate.

18. For individual products there will be an adjustment for changes in the purchasing power of money. In the case of asset products, the PPI will deflate by a price index that corresponds to the asset. For example, for a portfolio of car loans, the PPI Auto index will be the deflator. For deposits and any asset not associated with a particular price index, the GDP chain linked price index will be the deflator.

*Issues in Maintaining Constant Quality*

19. Another fundamental issue in pricing banking services is the ability to maintain constant quality. One can view the deflation described above as maintaining the constant quality of the money volumes. However, just as in any other service or product, there are observable service characteristics that can be monitored such as access to Automated Teller Machines, ability to use Internet banking, debit cards, and so on. When such changes are observed, quality adjustments should be performed.