Financial services provided in association with interest charges on loans and deposits

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- Financial services provided in association with interest charges on loans and deposits
    - Financial intermediation services indirectly measured (FISIM)
    - Financial services associated with institutional units which engage in lending using own funds or funds provided by a sponsor
    - Financial services provided by the central bank

FISIM output

$$FISIM = FISIM_L + FISIM_D = \left(\frac{r_L - rr}{100.0}\right)Y_L + \left(\frac{rr - r_D}{100.0}\right)Y_D$$

- $FISIM_L$ = FISIM on loans
- $FISIM_D$ = FISIM on deposits
- r_L = lending rate
- r_D = deposit rate
- rr = reference rate
- Y_L = average stock of loans
- Y_D = average stock of deposits

How to calculate reference rate

- Reference rate should be determined according to national circumstances using any of following methods

  - A single exogenous rate for a specific instrument such as interbank lending rates

  - A weighted average of interest rates on loans and deposits

    $$rr_w = \frac{R_L + R_D}{Y_L + Y_D} \times 100.0$$

    - rr_w = weighted reference rate
    - R_L = interest receivable on loans
    - R_D = interest payable on deposits

  - A simple average of interest rates on loans and deposits

    $$rr_s = 0.5 \left(\frac{R_L}{Y_L} + \frac{R_D}{Y_D} \right) \times 100.0$$

    - rr_s = simple reference rate

- One reference rate per each currency

How to allocate FISIM – 2 approaches

- Bottom-up approach
- Top-down approach

How to allocate FISIM – bottom-up approach

- If reliable data on average stocks of loans and deposits and interest by sector are available

	Average stock of loans	**Average stock of deposits**	**Interest on loans**	**Interest on deposits**
Non-financial corporations	Available	Available	Available	Available
Financial corporations	Available	Available	Available	Available
General government	Available	Available	Available	Available
Non-profit institutions serving households	Available	Available	Available	Available
Households	Available	Available	Available	Available
Final consumers	Available	Available	Available	Available
Owners of dwellings	Available	Not applicable	Available	Not applicable
Owners of unincorporated enterprises	Available	Available	Available	Available
Rest of the world	Available	Available	Available	Available

- Calculate domestically-produced FISIM directly for each sector

- Sum up sectoral FISIM to get total FISIM

How to allocate FISIM – top-down approach

- If reliable data on average stocks of loans and deposits and interest by sector are unavailable

	Average stock of loans	Average stock of deposits	Interest on loans	Interest on deposits
Total	**Available**	**Available**	**Available**	**Available**
Non-financial corporations	Not available	Not available	Not available	Not available
Financial corporations	Not available	Not available	Not available	Not available
General government	Not available	Not available	Not available	Not available
Non-profit institutions serving households	Not available	Not available	Not available	Not available
Households	Not available	Not available	Not available	Not available
Final consumers	Not available	Not available	Not available	Not available
Owners of dwellings	Not available	Not applicable	Not available	Not applicable
Owners of unincorporated enterprises	Not available	Not available	Not available	Not available
Rest of the world	Not available	Not available	Not available	Not available

- Calculate domestically-produced total FISIM for loans and deposits separately

- Allocate to sectors using appropriate indicators such as breakdown of data on stock of loans and deposits from various sources

Volume measures

- Deflation method is preferred
- Deflate average stock of each type of loan and deposit using general price indexes
  - GDP deflator (excluding FISIM)
  - Final domestic demand deflator (excluding FISIM)
  - All-items CPI

Volume measures

- Calculate base period margin for each type of loan and deposit

- Base period margin on loan is
    - Difference between average interest rate on loan and reference rate

- Base period margin on deposit is
    - Difference between reference rate and average interest rate on deposit

- Apply base period margin on loan (deposit) to deflated average stock of loan (deposit) to get unchained Laspeyres volume measure

Volume measures

- Sum up unchained Laspeyres volume measures of FISIM for each type of loan and deposit to get respective total FISIM

- Compute real growth rates for each type of loan and deposit and total FISIM by dividing the value at the prices of the previous year by the corresponding nominal value

- Compute annually-chained Laspeyres volume measures of FISIM for each type of loan and deposit and total FISIM by extrapolating the real growth rates from a reference year

Volume measures - example

- Compute deflated average stock of loans in time period *t+1*
  - Average stock of a type of loan = 259.8
  - GDP deflator (excluding FISIM) (previous year = 100.0) = 101.4
  - Deflated average stock of type of loan = (259.8/101.4)*100.0 = 256.2

Volume measures - example

- Compute base period loan margin and unchained Laspeyres volume measure of FISIM in time period *t+1*

  - Average interest rate of type of loan in time period *t* = 8.51%

  - Reference rate in time period *t* = 6.81%

  - Base period margin for loan = (8.51-6.81)/100.0

  - Unchained Laspeyres volume measure of FISIM for the type of loan at price of previous year = 256.2*[(8.51-6.81)/100.0] = 4.35

Volume measures - example

- Compute real growth rate of unchained Laspeyres volume measure of FISIM in time period *t+1*

  - Unchained Laspeyres volume measure for the type of loan at price of previous year = 4.35

  - Nominal value of FISIM for the type of loan in time period *t* = 3.99

  - Real growth rate = [(4.35/3.99)-1]*100 = 9.02%

- Some financial corporations make loans without accepting deposits by using own funds or funds from a sponsor
- Examples include
  - Credit card issuers
  - Finance associates of retailers responsible for financial leasing
  - Pawnshops
  - Moneylenders
    - Corporations
    - Unincorporated enterprises (likely to be important in developing countries)

Calculation of output

$$F_L = \left(\frac{r_L - rr}{100.0} \right) Y_L$$

- F_L = financial service on loans
- r_L = lending rate
- rr = reference rate
- Y_L = average stock of loans

Allocation

- Methods are similar to those for allocating FISIM

Volume measures

- Method is similar to that for calculating FISIM volume measures

- The central bank produces three broad groups of services
  - Monetary policy services
    - Collective – represents non-market output calculated as sum of costs
  - Financial intermediation services
    - Individual – represents market output
  - Borderline cases such as supervisory services
    - Market or non-market depending on whether explicit fees charged are sufficient to cover costs of production

- In principle, a distinction should be made between market and non-market output
- In practice, if the delineation cannot be made, treat entire output as non-market to be valued at sum of costs
  - Intermediate consumption
  - Compensation of employees
  - Consumption of fixed capital
  - Other taxes less other subsidies on production and imports
- Record non-market output as collective consumption expenditure of general government which is financed by a miscellaneous current transfer from the central bank to general government

Volume measures

- Calculated using changes in the weighted sum of volume measures of all inputs obtained by

  - Deflating inputs costs by appropriate price indices or
  - Using volume indicators that reflect input volume change (for example, number of hours worked by employees)

- Measuring changes in volume of collective services of central bank is harder compared to measuring changes in volume of individual services

- Further research is needed

Thank you