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Sector Paper on:
Banking and Credit, Reference Rates and Negative Prices

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Banking and Credit

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Sources for the sector paper

General Framework

Classification issues (Industry/Product)

Sector characteristics

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Summary and suggestions

Sources for the sector paper (1)

Early contributions

➢ background papers for VG meetings in Ottawa 1989 and Williamsburg 1992 (by J.E. Triplett, US bureau of Economic Analysis)

➢ discussion papers to first Oslo VG meeting in 1993 (Ann Chadeau/OECD, INSEE, R. Collins/G. Sciadas/StatCan)

➢ Price and TO measurement for banking services (N. Palmer, VG meetings 2001 and 2002)

Recent works and discussions

➢ VG meetings Oslo 2009 and Vienna 2010

▪ mini-presentations on turnover measurement from Norway, Mexico, United States and Canada

▪ mini-presentations on service producer price index from Australia, Canada, Japan, the United Kingdom and United States.

▪ Matt Berger's introduction to FISIM

General framework

System of National Accounts (especially new version SNA 2008) provides:

- a comprehensive, consistent and integrated system of accounts and

- a set of definitions on FISIM
  - Paragraph 6.163: on financial intermediation
  - paragraph 6.164: on imputation of implicit service charge
  - paragraph 6.165: on financial institutions
  - paragraph 6.166 : on the reference rate
  - paragraph 6.168: on financial lease

Classification issues (1)

Industry

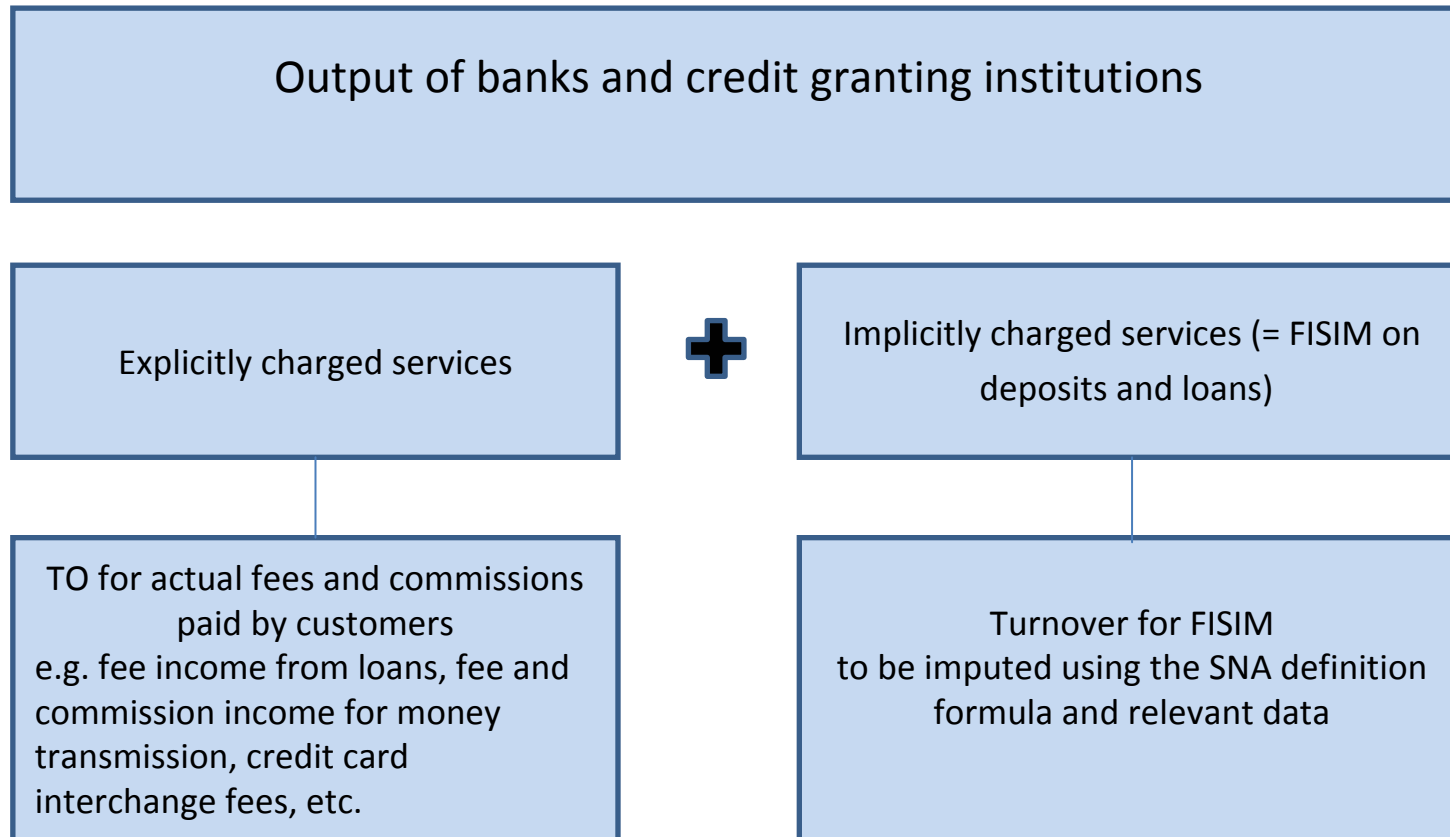| NACE rev. 2	ISIC Rev.4	NAICS
64 Financial service activities, except insurance and pension funding	64 - Financial service activities, except insurance and pension funding	Sector 52, Finance and Insurance
64.1 Monetary intermediation	641 - Monetary intermediation	
64.11 Central banking	6411 - Central banking	521 "Monetary Authorities – Central Bank"
64.19 Other monetary intermediation	6419 - Other monetary intermediation	522, "Credit Intermediation and Related Activities";
6420 - Activities of holding companies	6420 - Activities of holding companies	52211 Banking
6430 - Trusts, funds and similar financial entities	6430 - Trusts, funds and similar financial entities	522111 Personal and Commercial Banking Industry
6491 - Financial leasing	6491 - Financial leasing	522112 Corporate and Institutional Banking Industry
6492 Other credit granting	6492 - Other credit granting	523 Securities and Commodity Contracts Intermediation and Brokerage
6499 Other financial service activities, except insurance and pension funding activities, n.e.c.	6499 - Other financial service activities, except insurance and pension funding activities, n.e.c.	52311 Investment Banking and Securities Dealing

Classification issues (2)

Products

CPA 2008	CPC Ver.2
641110 Central banking services	7111 Central banking services
641911 Deposit services to corporate and institutional depositors	71121 - Deposit services to corporate and institutional depositors
641912 Deposit services to other depositors	71122 - Deposit services to other depositors
641921 Inter-industry credit granting services by monetary institutions	71135 Non-mortgage loan services for business purposes
641922 Consumer credit granting services by monetary institutions	71133 Personal non-mortgage loan services for non-business Purposes
641923 Residential mortgage credit granting services by monetary institutions	71131 Residential mortgage loan services
641924 Non-residential mortgage credit granting services by monetary institutions	71132 Non-residential mortgage loan services
641925 Commercial non-mortgage credit granting services by monetary institutions	
641926 Credit card services by monetary institutions	
641929 Other credit granting services by monetary institutions	71139 Other credit-granting services
641930 Other monetary intermediation services n.e.c.	71190 Other financial services, except investment banking, insurance services and pension services

Sector characteristics

- Substantial contribution to GDP (e.g. Canada: 6.0 %, Norway:6.0%, US: 5.4%, Mexico: 3.3 %)

- Coverage seems different between countries

- Sector is highly regulated everywhere

- Measurement issues highly determined by NA standards

- only a part of services can be directly observed and reported

- the other part has to be indirectly measured (FISIM)

- Different approaches
  - NA based compilation of output volume (Norway)
  - Explicit compilation of banking SPPI (US, Canada)

What is turnover in banking and credit?

Output of banks and credit granting institutions

Explicitly charged services

+

Implicitly charged services (= FISIM on deposits and loans)

TO for actual fees and commissions paid by customers
e.g. fee income from loans, fee and commission income for money transmission, credit card interchange fees, etc.

Turnover for FISIM
to be imputed using the SNA definition formula and relevant data

Turnover for explicitly charged services

= actual fees and commissions paid by customers

- Main data sources : P/L statements
- In many countries collected periodically by statistical agencies and/or supervisory authorities.
- collected together with balance sheet data, interest rates on deposits and loans, incomes and profits

Turnover for implicitly charged services (1)

- Turnover for implicitly charged services → measured as nominal FISIM

  Deposit FISIM at period t = $(rr_t - rd_t) * D_t$
  - rr_t: the reference rate at period t
  - rd_t: average interest rate paid on deposits at period t
  - D_t: balance of deposits at period t

  Loan FISIM at period t = $(rl_t - rr_t) * L_t$
  - rl_t: average interest rate earned from loans at period t
  - L_t: balance of loans at period t

- Adjustments or modifications for each country will be needed.

- The choice of the reference rate significantly affects measured turnover figures.
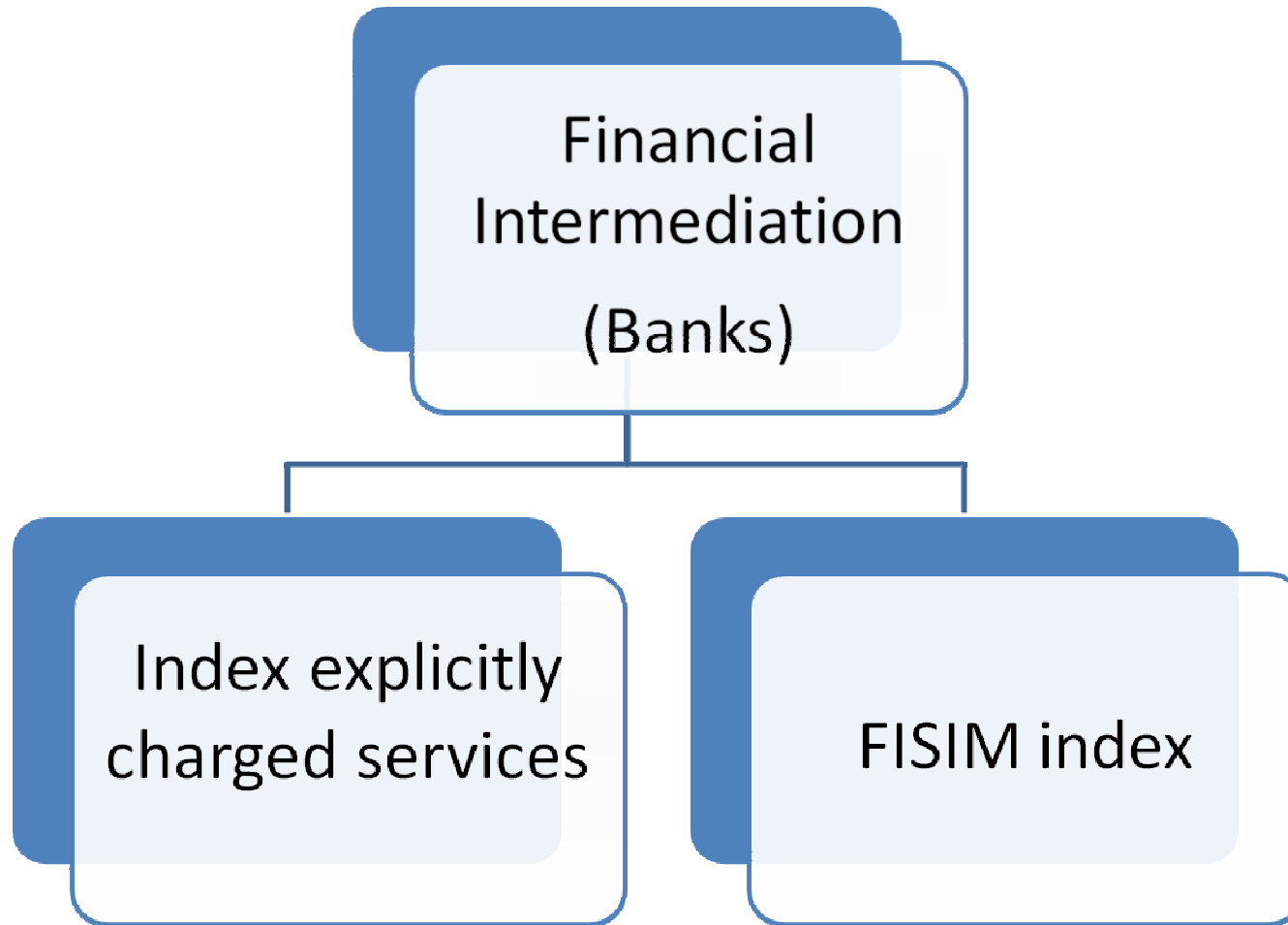
Turnover for implicitly charged services (2)

- Data can be collected from B/S and P/L statements

  -- Periodically collected by statistical agencies and/or supervisory authorities in many countries, at least for chartered/supervised banks.

  -- Quarterly data are available in some countries.

  -- Data for certain credit granting institutions which are not subject to licensing or supervision tend to be more difficult to collect.

- Theoretically, D_t and L_t figures should be the <u>average balance</u> during period t, and rd_t and rl_t are calculated as follows:

  $$rd_t = (\text{interest on deposits paid during period t taken from P/L})/D_t$$
  $$rl_t = (\text{interest on loans earned during period t taken from P/L})/L_t$$

  → However, B/S data normally gives only the <u>end of the period balance</u> figures.

  → This inconsistency could become the source of volatility or negative values.

Recommended Development Options for FISIM

Category	Data Source	Level of Detail Collected	Frequency	Cost
Best	B/S and P/L statements of all banks and credit granting institutions	Interst payments / receipts and average balance of deposits and loans	Quarterly	High
Good	B/S and P/L statements of all chartered banks	Interest payments / receipts and the end of period balance of deposits and loans	Quarterly	Modest
Minimum	B/S and P/L statemets of major chartered banks	Interest payments / receipts and the end of period balance of deposits and loans	Annual	Low

SPPI for banking and credit

```
                    ┌─────────────────────┐
                    │     Financial       │
                    │   Intermediation    │
                    │                     │
                    │      (Banks)        │
                    └──────────┬──────────┘
              ┌────────────────┴────────────────┐
    ┌─────────────────────┐        ┌─────────────────────┐
    │  Index explicitly   │        │                     │
    │  charged services   │        │    FISIM index      │
    └─────────────────────┘        └─────────────────────┘
```

SPPI for explicitly charged services

- Scope usually restricted
  - to activities associated with loans and deposits
  - to services offered to other domestic businesses, e.g. private non-financial corporations
- sampling frame: all banks, both large and small
- Sampling
  - cut-off and/or by probability proportionate-to-size, sub-sampling using different service categories (e.g. mortgage loans, agricultural loans, commercial loans, consumer and other loan services, etc.).

SPPI for indirectly charged services (1)
(deposits and loans)

- The exact method to estimate a SPPI for FISIM
  $\rightarrow$ Nominal FISIM/Constant price (real) FISIM (=deflator for FISIM)

  Constant price deposit FISIM at period t
  $$= (rr_0-rd_0)*(\text{real balance of deposits at period t})$$
  $$= (rr_0-rd_0)*(Dt / (\text{deflator for the value of money}))$$

  Constant price loan FISIM at period t
  $$= (rl_0-rr_0)*(\text{real balance of loans at period t})$$
  $$= (rl_0-rr_0)*(L_t / (\text{deflator for the value of money}))$$

  Deposit FISIM deflator at period t
  $$= ((rr_t-rd_t) / (rr_0-rd_0))*(\text{deflator for the value of money})$$

  Loan FISIM deflator at period t
  $$= ((rl_t-rr_t) / (rl_0-rr_0))*(\text{deflator for the value of money})$$

SPPI for indirectly charged services (2)
(deposits and loans)

- SPPI for indirectly charged services consists of two parts:
    1) interest rate differentials (rr_t-rd_t and rl_t-rr_t)
    2) the deflator for the value of money

- The interest rate differentials part should be simultaneously and consistently defined with SNA definition of FISIM

  -- The same reference rate and the same r_d and r_l as in SNA should be used

  -- Or the rates adopted in SPPI should be passed on to SNA

- The deflator for the value of money is best measured by the general price level;
    1) GDP deflator
    2) CPI
    3) other index for the general price level
  → The most suitable indicator for the general price level would vary from country to country.

Choice of the reference rate (1)

- SNA definition of the reference rate :

  -- A rate from which the risk premium has been eliminated to the greatest extent possible and which does not include any intermediation services (1993 SNA).

  -- The reference rate should contain no service element and reflect the risk and maturity structure of deposits and loans. The rate prevailing for inter-bank borrowing and lending may be a suitable choice as a reference rate (2008 SNA).

  -- It is also assumed in SNA that the single reference rate should be applied both to deposits and loans.

- Theoretically, the "risk-free" market interest rate with an appropriate maturity should be the best candidate
  → It is not easy to find a market interest rate that fulfills these conditions

Choice of the reference rate (2)

- The actual choice of the reference rate:

  1) Market interest rate

  -- UK → LIBOR (3-month interbank rate) for FISIM and SPPI for banking

  -- Norway → NIBOR (3-month interbank rate) for national part and EURIBOR (3-month interbank rate) for international part of FISIM

  2) Average rate derived from banks' B/S and P/L

  -- US → average rate earned by banks on US Treasury and US agency security for both FISIM and SPPI for banking

  -- Japan → average interest rate on financial institutions' borrowing from other financial institutions for FISIM

  3) Mid-point rate

  -- Australia → simple average of r_d and r_l for CPI for banking

Choice of the reference rate (3)

- The choice of the reference rate should be considered based on the following perspectives:

1) maturity

-- The maturity of the reference rate should broadly correspond to the maturity structure of deposits and loans.

→ Short-term interbank rates such as LIBOR could be too short.

→ To use some average rate could be a solution to this problem.

-- If we follow the theory of the user cost, different reference rates should be used for deposits and loans as their maturity is not the same.

2) risk premium involved

-- Interbank rates are not risk-free (contains risk premium on banks).

→ A rapid increase in the risk premium on banks could result in negative prices.

-- if the rates on government securities with wide range of maturities can be observed in the market, it might be better to use them as the reference.

Recommended Options for the choice of the reference rate

Option	Advantage	Risk	Aspects
Market interest rate	Observed directly, theoretically consistent	Maturity can be different from the averages of deposits and loans Possibly contains risk premium factor (interbank case)	Difficult to find an appropriate single market rate Inappropriate choice is likely to lead to negative prices
Average rate	Broadly reflects average maturity of deposits and loans	Needs detailed P/L and B/S data	Little risk of leading to negative prices
Mid-point rate	Simple calculation	Lacks of theoretical basis	No risk of leading to negative prices

Treatment of possible negative prices (1)

- An appropriate choice of the reference rate is most important.
  -- <u>Persistent</u> negative prices → the choice of the reference rate is not appropriate

- Even if we carefully and properly choose the reference rate, negative prices could still <u>sometimes</u> occur (→see next slide for possible sources).

- The simplest way of avoiding negative prices is to use some mid-point rate.
  → Mid-point reference is within the current SNA standards.
  → It is subject to the critics of lacking theoretical basis.

- We should still find the way to deal with the remaining negative prices.
  → Tentative treatments (without proper theoretical reasoning)
    -- Excluding them from SPPI/FISIM
    -- Setting to zero, when they are negative

Treatment of possible negative prices (2)

- Possible sources of negative prices :

  1) mis-match in timing of data collection between B/S and P/L
  2) accounting anomalies (tax, etc.)
  → Careful treatment and correction of data

  3) difference in adjustment speeds in various interest rates
  → This would occur especially when using certain short-term market rate as the reference.
  → Smoothing of interest rates, such as taking moving averages, would be an effective solution to this problem

  4) cross-subsidization / service bundling
  → aggregating the products might be effective.

  5) official (government) subsidization on housing or SMB loans
  → estimating the government subsidies and adjusting prices/FISIM for them, or
  → using the separate reference rate for them

Possible monthly SPPI (1)

- Banks' financial statements are available at most on quarterly basis and with lags.
  → We have to find out some different methodology for <u>monthly</u> SPPI.

- Possible monthly measures:

  1) implicit prices for deposits:
  -- Chose several representative deposits (demand deposits, 3-month time deposits, etc..)
  -- Listed rates applicable for deposits newly credited with banks could be used.
  -- Chose the appropriate reference rate for <u>each</u> representative deposit (not the single reference rate for all deposits), with the same maturity.
  -- For demand deposits with no maturity, an average remaining period could be used.
  -- Then, the price for each representative deposit can be calculated as:

  (reference rate) - (deposit interest rate)

Possible monthly SPPI (2)

2) implicit prices for loans:

-- Chose some representative loan rates (prime rates, standard mortgage rate, etc..)

-- Listed Rates applicable to new loans could be used.

-- Chose the appropriate reference rate for <u>each</u> representative loan rate (not the single reference rate for all loans), with the same maturity.

-- Then the price for each representative loan can be calculated as:

(loan interest rate) – (reference rate)

- This methodology is intended to observe i) representative and ii) constant quality prices.

    -- SPPI for banking in Canada seems to be broadly following this way.

    → It is unlikely that this methodology might lead to negative prices.

- Monthly data for banks' deposit and loan balances are available in many countries as a part of monetary statistics

    → Combining them with monthly SPPI will lead to monthly turnover figures.

Quality adjustment issues

- Banking services are facing a quite high amount of changes and improvements.

  -- ATMs, internet banking, extended hours, and debit and credit cards for consumers as well as for the commercial side

  → Research is under way to explore the question of how to evaluate quality change from a practical and quantifiable perspective.

- The method proposed for monthly SPPI will be effective in collecting constant quality, representative prices for representative services.

  → Further quality adjustments will be necessary if services associated with representative products are expected to have significantly improved.

- Current FISIM formula uses the average interest rates and a single reference rate

  → Changes in the average quality of deposits/loans can be mis-measured as the changes in turnover.

  → Further improvements in the definition of FISIM in SNA is expected.

Summary and Further Suggestions (1)

- Although classifications are rather detailed in the new versions Banking and Credit industries in the countries under consideration seem to have a slightly different coverage (activities of holding companies, trust funds and similar financial entities are covered in US, Canada and Mexico whereas not included in Norway).

- Turnover for indirectly charged banking services is simply calculated using the FISIM definition formula in SNA.

- Data (B/S and P/L statements) availability is different from country to country, but minimum data (annual statements for chartered banks) are available in most cases.

- SPPI for indirectly charged services are also defined by SNA, but the choice of the reference rate should be different from country to country.

Summary and Further Suggestions (2)

- Careful choice of the reference rate largely reduces the possibility of negative prices, but they still can occur in some occasions, and tentative treatments are necessary.

- Monthly SPPI measure for indirectly charged banking services cannot be developed following the SNA methodology.
  → An alternative method of collecting constant quality, representative prices and the corresponding reference rate is proposed in this paper.

- If we could also change the SNA definition of FISIM to use these representative prices, further improvement of FISIM measure will be possible.
  → The future task for the international SNA forum

THANK YOU ！