

Measuring output and value of financial services (banking): the case of Indonesia

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Introduction

It has been longstanding practice in Indonesia for Bank Indonesia (BI), the central bank of Indonesia, in cooperation with Statistics Indonesia, the Indonesian statistical office – hereafter referred to as BPS – to measure financial services output as part of measuring Gross Domestic Product. Bank Indonesia had adopted the method recommended by SNA 1968, known as Imputed Bank Service Charge (IBSC). Under this method, which is relatively simple to apply, the gross value added of the banking sector is calculated by measuring the difference between interest receivable and interest payable. This method has so far provided fairly representative measurements of financial services in Indonesia.

In time, however, with the economic crisis of 1998 and the adoption of more flexible exchange rates, a number of issues arose. The prevailing method, at the time, was not capable of addressing the issue of large revaluations due to exchange rate changes and structural changes in the balance sheets of commercial banks, nor of extremely large negative interest rate spreads. As a legacy of the massive bailout of banks in 1998, a significant number of the balance assets of commercial banks were converted into government debt notes (GDN) and Central Bank Certificates (SBI). Strict application of IBSC, therefore, would only create what would be considered anomalous results.

With the issuance of a new SNA proposed by the UN, Bank Indonesia is considering adopting the FISIM recommended by SNA 1993, allowing for cross-country comparisons and providing a clearer picture of the role of banking intermediation in the economy. Specifically, several variants of FISIM have been tried, including the European Union and the Canadian methods. Simulations using these methods showed that one critical factor in implementing FISIM is the measurement of reference rates.

In the Indonesian case, there are problems with low loan-to-deposit ratios (LDR) and the large share of government bonds on the banking balance sheet – problems that cannot be solved by the FISIM method even if a reference rate is available. Indonesia's problem has not yet been addressed satisfactorily in the SNA Handbook or in discussions with FISIM experts from the UN. Thus, Bank Indonesia has yet to adopt FISIM in measuring financial services output.

A. Gross value added of the banking sector

To date, measurement of the gross value added of the banking sector in Indonesia has been calculated using the Imputed Bank Service Charge (IBSC) method, as recommended by SNA 1968. This method measures the gross value added of the banking sector by calculating the difference between interest receivable and interest payable (imputed services). According to the IBSC method, the components of the gross value added consist of: (1) imputed bank services (interest receivable less interest payable); (2) net foreign transactions receivable; (3) provisions and commissions; (4) other income; and (5) intermediate costs.

Generally, the IBSC method does not pose any problem as long as total revenues continue to cover total expenses. However, problems will occur when total revenues fall below total expenses, as was the case during the Indonesian crisis of 1997–1998. During this period, the credit interest rate rose significantly, from 19.04% (1996) to 32.30% (1998). The higher interest rate led to a higher number of non-performing loans and, eventually, reduced the banking sector's interest receivable. Meanwhile, the deposit interest rate climbed from 16.43% (1996) to 41.42% (1998), creating higher interest payable for the banking sector. In 1998, with total expenses exceeding total revenues, the sector's gross value added turned negative.

The existence of negative value prompted the use of special treatment in measuring banks' value added. Bank Indonesia, in cooperation with the BPS, had to first assume that the operating surplus of the banking sub-sector was zero, which meant that all losses caused by the interest rate situation were covered by the government in the form of a subsidy. The total loss was then recorded in the reconciliation account. By using this treatment, the value added of the banking sub-sector appeared relatively stable, thus avoiding fluctuations in banking output caused by volatile exchange rates (Table 1). The negative value obtained for the banking sector's gross value added during the crises should indicate to us that the IBSC method fails to accommodate such extreme economic phenomena.

Table 1
**Output and gross value added
of the banking sector**

| Without Treatment | | | | | | | | | | |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Output | 34.627 | -39.389 | 43.826 | 70.970 | 80.181 | 87.279 | 95.633 | 104.042 | 116.625 | 126.856 |
| Gross Value Added | 29.491 | -61.676 | 43.826 | 55.063 | 64.409 | 68.307 | 74.499 | 78.534 | 88.287 | 97.708 |
| With Treatment | | | | | | | | | | |
| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Output | 34.627 | 42.591 | 43.826 | 70.970 | 80.181 | 87.279 | 95.633 | 104.042 | 116.625 | 126.856 |
| Gross Value Added | 29.491 | 36.325 | 43.826 | 55.063 | 64.409 | 68.307 | 74.499 | 78.534 | 88.287 | 97.708 |

Source : Bank Indonesia.

In line with Indonesia's plan to implement SNA 1993, the measurement method was to be changed to the FISIM (financial intermediation services indirectly measured) method. Theoretically, under normal conditions, this would capture the rising role of banking intermediation in the economy, as it would take account of value added in other sectors.

B. FISIM

The implementation of SNA 1993 will not be fully successful without the inclusion of FISIM. Using this method, the gross value added of the banking sector is measured as the total interest income received by financial intermediaries, minus total interest payable, excluding the value of any other income receivable from their investment of own funds, since, from a financial intermediation perspective, this is not considered income. The performance of the banking sector, as measured by FISIM, would be determined by the extent of the sector's

role in deposit taking and in activities involving lending to the real sector. By implication, the mere taking of deposits is deemed not to be productive unless the funds are eventually lent to sectors in need.

Bank Indonesia – in cooperation with the BPS – has been conducting a number of simulations by utilising banking account data from Deposit Money Banks (DMBs) and applying either the European Union or the Canadian method. Based on the results of those simulations, as well as technical considerations regarding data cross-checking, databases' ease of use and the characteristics of financial data, the Canadian FISIM method appeared better suited to Indonesia's case, specifically with regard to DMBs.

However, as a central bank, Bank Indonesia's business differs from that of commercial banks, since Bank Indonesia does not provide financial intermediation services. Our simulation resulted in large negative value added for the central bank, thus arguing against use of the FISIM method. The IBSC method therefore remains in use to measure the central bank's value added.

C. The Canadian method, and the simulation using this method

a. Canadian method

According to the SNA Handbooks, the calculation of FISIM using the Canadian methodology measures the differences between all interest receivable and all interest payable, with reference rates excluding banking sector own funds. The FISIM calculation is based on use of financial institutions' balance sheets (Table 2).

The FISIM formula under the Canadian method is:

$$\text{FISIM} = R_A B - R_L D - [C - (A + B_3 - D_3)] \times (R_A B + R_L D) / (B + D)$$

in which

$$B = B_1 + B_2 + B_3$$

$$D = D_1 + D_2 + D_3$$

R_A = the actual average interest rate on assets

R_L = the actual average interest rate on liabilities

The interest rate for banking sector own funds $[C - (A + B_3 - D_3)]$ is not included in the FISIM calculation and would reduce the total value of FISIM.

If $[C - (A + B_3 - D_3)]$ is positive, it means that a portion of the credit to debtors is being funded by banking sector own funds.

If $[C - (A + B_3 - D_3)]$ is negative, it means that a portion of the fixed assets are being funded by third parties.

Since $R_A B$ is interest receivable and $R_L D$ is interest payable, then $R_A B - R_L D$ is the net interest receivable. Sources of funds other than securities and loans are banking sector own funds $(C - A)$ and net other liabilities $(D_3 - B_3)$. Thus, the difference between net interest receivable and banking sector own funds plus net other liabilities is computed as follows:

$$-(C - A) + (D_3 - B_3) = -[C - (A + B_3 - D_3)]$$

Finally, $-[C - (A + B_3 - D_3)]$, as the reduction factor, is multiplied by $(R_A B + R_L D) / (B + D)$, measuring the percentage of total interest (receivable and payable) and total assets and liabilities. This rate is called the implicit interest rate for loans and deposits. In other words, the reduction factor is multiplied by the average of the loan and deposit implicit interest rates.

Thus we can obtain the estimated value of own funds net interest receivable. By taking the difference between net interest receivable ($R_{AB} - R_{LD}$) and own fund net interest receivable $[C - (A + B3 - D3)] \times (R_{AB} + R_{LD}) / (B + D)$, we can obtain the value of net interest receivable from third party funds.

Table 2
The balance sheet of financial intermediaries (DMBs)
and their interest incomes and expenses

| ASSETS | | | | LIABILITIES | | | |
|--------|---|--------|---------------------|-------------|---|--------|------------------|
| | | Stocks | Interest receivable | | | Stocks | Interest payable |
| A | Fixed assets, shares and accounts receivable less payable, other equity | | | C | Own funds (net worth and shares) | | |
| B.1. | Securities other than shares | | | D.1. | Securities other than shares | | |
| B.2. | Loans | | | D.2. | Deposits | | |
| B.2.1 | Interbank - Residents - Non-residents | | | D.2.1. | Interbank - Residents - Non-residents | | |
| B.2.2 | Other - Residents - Non-residents | | | D.2.2. | Other - Residents - Non-residents | | |
| B.3. | Other | | | D.3. | Other Liabilities | | |
| B.3.1 | Interbank | | | | | | |
| B.3.2 | Other | | | | | | |
| | TOTAL | | | | | | |

Source : Bank Indonesia.

b. Simulation of the calculation of banking sector FISIM and their value

Banking sector output (Bank Indonesia and DMBs) is measured based on its gross value added. The Imputed Bank Service Charge (IBSC) method is still being used to calculate the gross value added of the monetary authority – Bank Indonesia – based on characteristics of BI's financial data. The main issue in using the IBSC method for Bank Indonesia financial data concerns the Bank's varied functions as monetary authority, banking regulator, and payment system regulator capable of providing financial intermediation services. However, financial intermediation services provided by the central bank are not its principal activities. Therefore, the simulation used only DMB data (Table 3). In the simulation, we calculate the reference rate by using the Canadian formula, which measures the percentage of total interest (receivable and payable) and total assets and liabilities. This rate is known as the implicit interest rate on loans and deposits.

After the crisis, the structure of the banking sub-sector balance sheet in Indonesia changed considerably. The loan-to-deposit ratio dropped sharply in 2002 to its lowest level of approximately 40%. By 2006, it had gradually rebounded to about 60%. Central Bank Certificates, as well as government Recap Bonds, swelled on the balance sheets of almost all of the leading national and private banks in Indonesia. Applying all FISIM formulas to this type of situation would only result in anomalous numbers, thus suggesting the need for an alternative method.

To address Indonesia's problem of having a large volume of BI certificates and government Recap Bonds on banks' balance sheets, various simulations using the Canadian method

were tried. Alternatives for classifying Bank Indonesia Certificates (SBI) and Recap Bonds were used. However, none of these alternatives ultimately changed the value added of the banking sector under the FISIM. These alternatives are as follows:

- a. SBI and Recap Bonds in Placements (B2)
- b. SBI in Placements (B2) and Recap Bonds in Securities (B1)
- c. SBI and Recap Bonds in Securities (B1)
- d. SBI in Securities (B1) and Recap Bonds in Placements (B2)

Table 3

**The balance sheet of financial intermediaries (DMBs)
and their interest incomes and expenses**

| ASSETS | | | | LIABILITIES | | | |
|----------------|---|----------------------|---------------------|----------------|---|----------------------|-------------------|
| | | Stocks | Interest receivable | | | Stocks | Interest payable |
| A | Fixed assets, shares and account-receivable less payable, other equity | (22,846,195) | - | C | Own funds (net worth and shares) | 87,883,385 | - |
| B.1. | Securities other than shares | 513,152,920 | 18,996,289 | D.1. | Securities other than shares | 5,975,899 | 1,184,290 |
| B.1.1 | Interbank | 6,206,944 | 1,841,142 | D.1.1 | Interbank | 3,849,632 | 1,062,832 |
| B.1.2 | Others | 506,945,976 | 17,155,147 | D.1.2 | Others | 2,126,267 | 121,458 |
| B.1.2.1 | Securities | 17,315,765 | 585,969 | | | | |
| B.1.2.2 | Recaps. Bond | 399,204,751 | 13,509,164 | | | | |
| B.1.2.3 | Bank Indonesia Certificate | 90,425,460 | 3,060,014 | | | | |
| B.2. | Placements | 490,439,679 | 18,569,001 | D.2. | Deposits | 797,511,457 | 23,588,419 |
| B.2.1 | Loans | 307,618,726 | 11,716,682 | D.2.1. | Interbank | 11,538,970 | 3,134,592 |
| B.2.1.1 | Interbank | 1,096,618 | 180,279 | | - Residents | 1,978,434 | 537,447 |
| | - Residents | 88,378 | 14,529 | | - Non-residents | 9,560,536 | 2,597,145 |
| | - Non-residents | 1,008,240 | 165,750 | D.2.2. | Others | 785,972,487 | 20,453,827 |
| B.2.1.2 | Others | 306,522,108 | 11,536,403 | | - Residents | 780,317,257 | 20,306,658 |
| | - Residents | 306,204,047 | 11,524,432 | | - Non-residents | 5,655,230 | 147,169 |
| | - Non-residents | 318,061 | 11,971 | | | | |
| B.2.2 | Others placements | 182,820,953 | 6,852,319 | | | | |
| B.2.2.1 | Interbank | 110,900,235 | 6,063,089 | | | | |
| | - Residents | 48,855,177 | 2,670,989 | | | | |
| | - Non-residents | 62,045,058 | 3,392,100 | | | | |
| B.2.2.2 | Others | 71,920,718 | 789,230 | | | | |
| | - Residents | 69,863,359 | 766,654 | | | | |
| | - Non-residents | 2,057,359 | 22,577 | | | | |
| B.3. | Others | 73,694,431 | 7,931,205 | D.3. | Other Liabilities | 163,070,094 | 10,304,091 |
| B.3.1 | Interbank | 19,840,678 | 6,008,405 | D.3.1. | Borrowing | 29,334,185 | 1,799,818 |
| B.3.2 | Others | 53,853,753 | 1,922,800 | D.3.1.1 | Interbank | 11,737,898 | 1,645,717 |
| | | | | D.3.1.2 | Others | 17,596,287 | 154,101 |
| | | | | D.3.2. | Other Liabilities | 133,735,909 | 8,504,273 |
| | | | | D.3.2.1 | Interbank | 72,079,699 | 8,082,544 |
| | | | | D.3.2.2 | Others | 61,656,210 | 421,729 |
| | | | | | | | |
| | TOTAL | 1,054,440,835 | 45,496,495 | | | 1,054,440,835 | 35,076,800 |

Source : Bank Indonesia.

Based on the simulation, all of the above alternatives record FISIM at Rp 2.531 billion – 24% of the banking gross value added, using IBSC calculations (Rp 10.420 billion). The calculations for each alternative are as follows:

a. SBI and Recap Bonds in Placements (B2)

| ASSETS | | | | LIABILITIES | | | |
|-------------------|---|---------------|---------------------|-------------|----------------------------------|---------------|---|
| | | Stocks | Interest Receivable | | | Stocks | Interest Payable |
| A | Fixed assets, shares and account receivable less payable, other equity | (22,846,195) | - | C | Own Funds (net worth and shares) | 87,883,385 | - |
| B1 | Securities other than shares | 23,522,709 | 2,427,111 | D1 | Securities other than shares | 5,975,899 | 1,184,290 |
| B2 | Placements | 490,439,679 | 18,569,001 | D2 | Deposits | 797,511,457 | 23,588,419 |
| | - Recaps Bond | 399,204,751 | 13,509,164 | | | | |
| | - Bank Indonesia Certificate | 90,425,460 | 3,060,014 | | | | |
| B3 | Others | 73,694,431 | 7,931,205 | D3 | Other Liabilities | 163,070,094 | 10,304,091 |
| Total | | 1,054,440,835 | 45,496,495 | Total | | 1,054,440,835 | 35,076,800 |
| Note : | | | | | | | |
| Total B | | | 1,077,287,030 | | | | |
| Total D | | | 966,557,450 | | | | |
| R _A | Dividing the interest receivable by total B | | 0.042 | | | | |
| R _A * | (excluding the SBI and recap bonds interest rates) | | 0.049 | | | | |
| R _L | Dividing the interest payable by total D | | 0.036 | | | | |
| r | reference rate [(R _A B + R _L D) / (B + D)] | | 0.039 | | | | |
| r* | reference rate, excluding the SBI and recap bonds [(R _A *B + R _L D) / (B + D)] | | 0.043 | | | | |
| R _A B | | | 45,496,495 | | | | |
| R _A *B | | | 53,029,289 | | | | |
| R _L D | | | 35,076,800 | | | | |
| FISIM | R _A B - R _L D - [C - (A + B3-D3)] x (R _A B + R _L D) / (B + D) | | 2,531,062 | | | | (FISIM using reference rate) |
| FISIM | R _A *B - R _L D - [C - (A + B3-D3)] x (R _A *B + R _L D) / (B + D) | | 9,326,348 | | | | (FISIM using reference rate exclude SBI and recap bonds) |
| IBSC | | | 10,419,695 | | | | |

b. SBI in Placements (B2) and Recap Bonds in Securities (B1)

| ASSETS | | | | LIABILITIES | | | |
|-------------------|---|---------------|---------------------|-------------|----------------------------------|---------------|---|
| | | Stocks | Interest Receivable | | | Stocks | Interest Payable |
| A | Fixed assets, shares and account receivable less payable, other equity | (22,846,195) | - | C | Own Funds (net worth and shares) | 87,883,385 | - |
| B1 | Securities other than shares | 23,522,709 | 2,427,111 | D1 | Securities other than shares | 5,975,899 | 1,184,290 |
| | - Recaps Bond | 399,204,751 | 13,509,164 | | | | |
| B2 | Placements | 490,439,679 | 18,569,001 | D2 | Deposits | 797,511,457 | 23,588,419 |
| | - Bank Indonesia Certificate | 90,425,460 | 3,060,014 | | | | |
| B3 | Others | 73,694,431 | 7,931,205 | D3 | Other Liabilities | 163,070,094 | 10,304,091 |
| Total | | 1,054,440,835 | 45,496,495 | Total | | 1,054,440,835 | 35,076,800 |
| Note : | | | | | | | |
| Total B | | | 1,077,287,030 | | | | |
| Total D | | | 966,557,450 | | | | |
| R _A | Dividing the interest receivable by total B | | 0.042 | | | | |
| R _A * | (excluding the SBI and recap bonds interest rates) | | 0.049 | | | | |
| R _L | Dividing the interest payable by total D | | 0.036 | | | | |
| r | reference rate [(R _A B + R _L D) / (B + D)] | | 0.039 | | | | |
| r* | reference rate, excluding the SBI and recap bonds [(R _A *B + R _L D) / (B + D)] | | 0.043 | | | | |
| R _A B | | | 45,496,495 | | | | |
| R _A *B | | | 53,029,289 | | | | |
| R _L D | | | 35,076,800 | | | | |
| FISIM | R _A B - R _L D - [C - (A + B3-D3)] x (R _A B + R _L D) / (B + D) | | 2,531,062 | | | | (FISIM using reference rate) |
| FISIM | R _A *B - R _L D - [C - (A + B3-D3)] x (R _A *B + R _L D) / (B + D) | | 9,326,348 | | | | (FISIM using reference rate exclude SBI and recap bonds) |
| IBSC | | | 10,419,695 | | | | |

c. SBI and Recap Bonds in Securities (B1)

| ASSETS | | | | LIABILITIES | | | |
|--------|--|---------------|---------------------|-------------|----------------------------------|---------------|------------------|
| | | Stocks | Interest Receivable | | | Stocks | Interest Payable |
| A | Fixed assets, shares and account receivable less payable, other equity | (22,846,195) | - | C | Own Funds (net worth and shares) | 87,883,385 | - |
| B1 | Securities other than shares | 23,522,709 | 2,427,111 | D1 | Securities other than shares | 5,975,899 | 1,184,290 |
| | - Recaps Bond | 399,204,751 | 13,509,164 | | | | |
| | - Bank Indonesia Certificate | 90,425,460 | 3,060,014 | | | | |
| B2 | Placements | 490,439,679 | 18,569,001 | D2 | Deposits | 797,511,457 | 23,588,419 |
| B3 | Others | 73,694,431 | 7,931,205 | D3 | Other Liabilities | 163,070,094 | 10,304,091 |
| Total | | 1,054,440,835 | 45,496,495 | Total | | 1,054,440,835 | 35,076,800 |

Note :

Total B 1,077,287,030
Total D 966,557,450
 R_A Dividing the interest receivable by total B 0.042
 R_A^* (excluding the SBI and recap bonds interest rates) 0.049
 R_L Dividing the interest payable by total D 0.036
 r reference rate $[(R_A B + R_L D) / (B + D)]$ 0.039
 r^* reference rate, excluding the SBI and recap bonds $[(R_A^* B + R_L D) / (B + D)]$ 0.043
 $R_A B$ 45,496,495
 $R_A^* B$ 53,029,289
 $R_L D$ 35,076,800
FISIM $R_A B - R_L D - [C - (A + B3-D3)] \times (R_A B + R_L D) / (B + D)$ **2,531,062 (FISIM using reference rate)**
FISIM $R_A^* B - R_L D - [C - (A + B3-D3)] \times (R_A^* B + R_L D) / (B + D)$ **9,326,348 (FISIM using reference rate exclude SBI and recap bonds)**
IBSC **10,419,695**

d. SBI in Securities (B1) and Recap Bonds in Placements (B2)

| ASSETS | | | | LIABILITIES | | | |
|--------|--|---------------|---------------------|-------------|----------------------------------|---------------|------------------|
| | | Stocks | Interest Receivable | | | Stocks | Interest Payable |
| A | Fixed assets, shares and account receivable less payable, other equity | (22,846,195) | - | C | Own Funds (net worth and shares) | - | - |
| B1 | Securities other than shares | 23,522,709 | 2,427,111 | D1 | Securities other than shares | 1,054,440,835 | 35,076,800 |
| | - Bank Indonesia Certificate | 90,425,460 | 3,060,014 | | | | |
| B2 | Placements | 490,439,679 | 18,569,001 | D2 | Deposits | - | - |
| | - Recaps Bond | 399,204,751 | 13,509,164 | | | | |
| B3 | Others | 73,694,431 | 7,931,205 | D3 | Other Liabilities | 1 | 1 |
| Total | | 1,054,440,835 | 45,496,495 | Total | | 1,054,440,836 | 35,076,801 |

Note :

Total B 1,077,287,030
Total D 1,054,440,836
 R_A Dividing the interest receivable by total B 0.042
 R_A^* (excluding the SBI and recap bonds interest rates) 0.049
 R_L Dividing the interest payable by total D 0.033
 r reference rate $[(R_A B + R_L D) / (B + D)]$ 0.038
 r^* reference rate, excluding the SBI and recap bonds $[(R_A^* B + R_L D) / (B + D)]$ 0.041
 $R_A B$ 45,496,495
 $R_A^* B$ 53,029,289
 $R_L D$ 35,076,801
FISIM $R_A B - R_L D - [C - (A + B3-D3)] \times (R_A B + R_L D) / (B + D)$ **12,341,614 (FISIM using reference rate)**
FISIM $R_A^* B - R_L D - [C - (A + B3-D3)] \times (R_A^* B + R_L D) / (B + D)$ **20,054,089 (FISIM using reference rate exclude SBI and recap bonds)**
IBSC **10,419,695**

D. Simulation results

The simulation showed that the most critical factor in calculating the gross value added of the banking sector is determining the value of the reference interest rate. Generally, the reference interest rate for lending is calculated based on the ratio between total interest receivable and total outstanding loans, while the reference interest rate for deposits is calculated on the basis of total interest payable and total outstanding deposits. Our simulation showed that those calculations would not yield a valid result in the case of Indonesia. It gives results significantly different from our traditional calculation under the IBSC method, thus raising questions about the appropriateness of replacing the IBSC with the FISIM. We therefore tried applying our special treatment, in which we exclude the interest rates for SBI and Recap Bonds in measuring the reference rate. By excluding those interest rates, we were able to achieve reasonable results, compared to the old IBSC method. In light of this, the BI and BPS could probably apply FISIM using that special treatment. The FISIM gives Rp 9.326 billion, ie 90% of the banking gross value added arrived at through the IBSC method. We are, of course, keenly aware that the reference rate produced using this method would not reflect the true reference rate in the economy.

In view of the above, further research needs be conducted in this area. While the BI and BPS continue their work on this, further discussion should also take place at the global level. The UN should be able to offer other FISIM implementation alternatives for economies that are experiencing special conditions, as was the case in Indonesia, where the banks had very low loan-to-deposit ratios. Such alternatives should also include means of adopting the FISIM method for measuring the value added of central banks. Since central banks have different characteristics from one country to another, one should expect there to be alternatives for calculation of FISIM that take into account the differing functions of central banks. As with Indonesia's case, the IBSC method will continue to be used in calculating the value added of central banks. However, it can be expected that once alternative FISIM methods are available, improved results will be achieved, providing for a better explanation of the underlying economic – particularly banking sector – activities.

E. Conclusion

In the case of Indonesia, based on the results of simulations, and considering the characteristics of financial data from Bank Indonesia (the country's monetary authority), the FISIM method is only applicable to DMB data, while the Imputed Bank Service Charge (IBSC) method is still recommended in calculating the gross value added of the monetary authority. In addition, the simulation results show that the most critical factor, in calculating the gross value added of the banking sector, is the question of how to determine the value of the reference rate.

To date, Bank Indonesia has yet to adopt the FISIM in measuring the output of financial services. Thus, the gross value added of Indonesia's banking sector is calculated by using IBSC methods that measure the difference between interest receivable and interest payable, based on profit and loss statements.

Due to the negative gross value added during the 1997 crisis, we applied special treatment in measuring the value added of banks. We proceeded on the assumption that the operational surplus of the banking sub-sector was zero, which meant that all losses caused by the interest rate situation were covered by the government in the form of a subsidy. The total loss was then recorded in the reconciliation account.

In the future, if the FISIM method is used to measure the gross value added of banking sectors, the Canadian method, with special treatment, should yield results approximating the real economic situation.

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