Estimation of financial intermediation services indirectly measured (FISIM): Thailand's case

Puntharik Supaarmorakul[1]

1. Introduction

Financial intermediation services are defined in the System of National Accounts 1993 (SNA 1993) as "a productive activity in which an institutional unit incurs liabilities on its own account for the purpose of acquiring financial assets by engaging in financial transactions on the market" (SNA 1993, para. 4.78). The role of these institutional units, defined in the SNA 1993 to include almost all institutions defined as "banks", is to provide intermediation services by channelling funds between depositors and borrowers. In the process of providing such services, financial corporations incur liabilities and place themselves at risk. To compensate for the risk, financial institutions charge fees for the services provided.

Financial services constitute the output of financial corporations. Fees charged by financial corporations for financial services provided can be both explicitly and implicitly priced. The measurement of explicitly priced financial services poses no difficulties, as the output of these services can be valued based on the actual fees or commissions charged. However, the valuation of implicitly priced financial services requires the imputation of bank service charges, as these fees are embedded in the interest rate margin. Proper allocation of implicitly priced financial services is important and deemed an improvement to the national accounts compilation, since more accurate GDP levels can be obtained. Furthermore, it has the advantage of reflecting the entire output and value added of financial corporations.

The estimation of financial intermediation services indirectly measured (FISIM) for Thailand is at an early stage, and current SNA compilation does not include the estimation of FISIM.[2] This paper focuses on the concept of FISIM based primarily on SNA 1993 and the valuation of implicitly priced financial services provided by financial corporations in the context of Thailand. It also discusses whether the methodology and input parameters recommended by SNA 1993, and those that are used by other countries, can be applied to Thailand's FISIM compilation. For constant price FISIM data series, the paper will discuss how the use of different deflators, and/or the use of single and multiple deflators, can affect the outcome of FISIM. The final section addresses outstanding issues or concerns.

2. What is FISIM?

FISIM is a measure of the value of financial services that financial intermediaries do not explicitly charge for. In principle, FISIM refers to "the total property income[3] receivable by financial intermediaries minus their total interest payable, excluding the value of any property

---

income receivable from the investment of their own funds, as such income does not arise from financial intermediation" (SNA 1993, para. 6.125).

The SNA 1993 concept of measuring value on financial services that are not explicitly priced recommends the calculation of FISIM based on the "reference rate approach", ie as the "difference between the actual rates of interest payable (to depositors) and interest receivable (from borrowers) and a reference rate of interest." The theory behind this approach assumes the existence of a reference rate, which is a pure cost of borrowing funds for which the risk premium has been eliminated to the greatest extent possible. As financial corporations pay a lower rate of interest to depositors and charge higher rates of interest to borrowers, the difference between the interest payable and receivable and the reference rate is considered as an indirect charge for intermediation services rendered.

3. Estimation of FISIM for Thailand

The methodology adopted for measuring financial intermediation services in this paper is based on the reference rate approach. Because of the linkage between the reference rate approach and the "user cost approach",[4] certain pre-conditions must be met in order for the approach to be effective in measuring financial intermediation services. Specifically, financial institutions must behave as profit-maximising firms operating in a deregulated environment, facing interest rates that are fully market driven (Barman and Samanta 2004).

In the case of Thailand, as a result of the recent changes to the Thai financial system,[5] competition in the Thai banking system has intensified as the scope of banking business has broadened. Interest rates on financial products, such as loans and deposits, are mostly deregulated, with the sole exception of specialised financial institutions (SFIs). Thus, using the reference rate approach would provide a reasonable estimate of financial intermediation services.

3.1 Determining the scope of financial intermediaries generating FISIM

As defined in the SNA 1993, financial intermediaries generating FISIM encompass institutional units whose role is to channel funds between depositors and borrowers. Under the scope of this definition, financial intermediaries generating FISIM will cover only the transactions of "other depository corporations" (S.122) and "other financial intermediaries except insurance corporations and pension funds" (S.123). Not included in the calculation of FISIM is the output of the central bank (S.121), as central banks do not perform commercial operations and are non-market producers. The main functions of the Bank of Thailand (BOT) are to promote monetary stability and formulate monetary policy, promote financial stability and supervise financial institutions, and print and issue banknotes – all functions that do not generate FISIM as part of its output.

The structure of the Thai financial sector comprises commercial banks, international banking facilities, finance companies, credit foncier companies, specialised financial institutions (consisting mostly of government regulated financial corporations, such as the Export Import

---

[4] Schreyer and Stauffer (2002) highlighted the concept of the user cost of financial capital approach, based on extensive FISIM literature, for measuring the economic return to the financial corporation for providing a financial product, where the economic return is the difference between the financial corporation's opportunity cost of money and the holding revenue, in the case of an asset, and the holding cost, in the case of a liability.

[5] The Financial Sector Master Plan implemented in 2004, which aims to rationalise the structure and roles of existing financial institutions to enhance operational efficiency.

Bank of Thailand, Government Savings Bank, Government Housing Bank, etc.) and other deposit-taking institutions such as cooperatives. Thai banks remain the major players, accounting for more than 80 percent of the deposits and loans of financial institutions, with the remaining share attributable to deposit-taking specialised financial institutions, foreign banks, finance companies, credit foncier companies and cooperatives.

This paper will limit its examination of financial intermediaries to commercial banks, international banking facilities, finance companies and credit foncier companies, all of which fall under the supervision of the BOT. Excluded from the calculation are specialised financial institutions, due to the fact that the services provided by these institutions are policy driven, and that most of the interest rates on their financial products are regulated. Moreover, due to limitations in obtaining disaggregated data on cooperatives, transactions of such units are also excluded. Transactions of non-financial corporations are also not covered, as only explicit service charges are deemed to be recorded for such units.

3.2   Determining the scope of financial products generating FISIM

In line with the recommendations made by the Organisation for Economic Co-operation and Development (OECD) Task Force on Financial Services (Banking Services) in National Accounts, concerning the changing nature of financial activities provided by financial institutions, the scope of financial products generating FISIM used in this paper will be based on the new proposed definition for the production of non-insurance financial corporations. The new definition focuses primarily on the output of financial services as a result of risk management and liquidity transformation activities, so as to better describe the activities of intermediation, thereby extending the indirect measure of financial services to incorporate other financial products beyond traditional deposits and loans.

This paper will expand the scope of financial products generating FISIM, moving beyond the recommendation of SNA 1993 to include all financial products classified as deposits and loans, encompassing transactions in bonds and notes. Interest rates on the aforementioned financial products are identifiable. Clear distinctions can be made between the interest rates charged and payable on each financial product. Transactions in other financial instruments do not accrue service charges that need to be indirectly measured.

3.3   Choice of reference rate

Common practice for many OECD countries is to use the "reference rate approach" for measuring indirectly priced financial services. The reference rate represents the pure cost of borrowing funds. It is a rate from which the risk premium has been eliminated to the greatest extent possible, and does not include any intermediation services. The SNA 1993 recommends the use of the inter-bank lending rate as a suitable choice and recommends that the risk-free reference rate used should reflect the maturity structure of the financial assets/liabilities.

In practice, using a reference rate such as the inter-bank rate can lead to negative FISIM for some sectors. An example of this is where the actual interest rate on loans is fixed for several years at a lower rate than the reference rate. Furthermore, the use of the inter-bank lending rate as a reference rate may be volatile. The problem of negative FISIM and volatility in the reference rate can be avoided by using a method suggested in the joint OECD/ESCAP meeting on national accounts in 1998. This involves using the mid-point between the average deposit rate and the average borrowing rate, with the two average rates being calculated as interest payable/receivable divided by outstanding deposits/loans averaged over the period. This method is considered to be practical and is recommended for use by many national statistics offices, international organisations and communities. However, one drawback in using the mid-rate is that the rates may be inadequate in reflecting current economic conditions and corresponding movements in interest rates. Another method

suggested by European Council Regulation No. 448/98 is the use of an internal reference rate and an external reference rate, with the internal reference rate representing the inter-bank lending rate between resident financial institutions, while the external reference rate represents the rate between resident and non-resident financial institutions.

Currently, there is no consensus on which reference rate should be adopted; however, the selection of reference rate should reflect the country's economic conditions and should therefore also reflect the maturity structure of loans and deposits. Based on current economic conditions and the structure of the Thai financial market, interest rates that can be used as a reference rate include: (1) the Bangkok Inter-bank Offered Rate (BIBOR); (2) the 14-day repurchase rate (RP); and (3) the yield on government bonds – all of which are market related.

BIBOR is the average of the borrowing rates quoted by pre-determined banks.[6] The repurchase rate is the interest rate used in the buying and selling of bonds by financial institutions that are members of the repurchase market. The 14-day RP rate[7] had also been used as a signalling device for the implementation of monetary policy under the Inflation Targeting System. As for the yield on government bonds, in the case of Thailand, because the bond market is relatively small in size and not highly liquid, changes in the term structure of interest rates reflect market expectations of future interest rates but, at the same time, can also be influenced by demand and supply factors.

In examining the characteristics of the three types of reference rates, and due to the fact that BIBOR is relatively new and is not quoted for the periods prior to 2005, BIBOR cannot be used in this empirical study. Hence, the estimation of FISIM in this paper will be based on the use of the 14-day RP rate as the reference rate. Furthermore, banks tend to revise their deposit and lending rates in line with the movement in RP rates, although slow pass-through is usually expected.

3.4 Estimating FISIM at current prices

Using the reference rate approach, the spread between the reference rate and the rate on deposits should reflect the implicit price paid to depositors, while the spread between the reference rate and the rate received on loans from borrowers should, accordingly, reflect the implicit service charge. The reference rate method requires data on the average end-period stock of loans and deposits for different sectors of the economy, as well as the interest rates applicable, and can be estimated using a simple equation.

FISIM estimated by this approach is valued at *current prices*.

$$\text{FISIM} = (r_L - r_r) y_L + (r_r - r_D) y_D$$

Where:

r_r = Reference rate

r_L = Interest rate on loans

y_L = Average balance on loans

r_D = Interest rate on deposits

y_D = Average balance on deposits

---

[6] BIBOR is calculated based on data obtained from 16 commercial banks. The average rate is derived by eliminating the top and bottom quartiles of the quotes and arithmetic-averaging the remaining rates for the day. BIBOR is a reference rate that is fixed at 11.00 a.m. each working day and published by BOT at 11.15 a.m.

[7] Since January 2007, the BOT has changed the policy rate from the 14-day RP rate to the 1-day RP rate.

The choice of interest rate on loans and deposits used in the estimation can affect the outcome of FISIM. To illustrate this, alternative approaches for estimation of FISIM at current prices were reviewed. The first approach uses the effective rate of interest on loans and deposits, which is based on the actual interest flow received and paid by financial institutions. The effective rate of interest is calculated by using the following formulas:

Effective rate of interest on loans = Interest received on loans/Average outstanding on loans

Effective rate of interest on deposits = Interest paid on deposits/Average outstanding on deposits

The second approach uses the market interest rate, which is based on the rate announced by financial institutions, calculated by using the weights proportional to the average balance of deposits and loans.

Chart 2 illustrates the differences in interest rates calculated using the approaches outlined above. The deposit interest rate does not exhibit any significant divergence between effective and market rates. However, in the case of the interest rate on loans, a significant disparity between market rate and effective rate is evident and, to some extent, will have an effect on the value of FISIM.

Using the approaches outlined above and 14-day RP as the reference rate, the resulting FISIM value estimated at current prices is shown in Tables 1 and 2. When the resulting FISIM value estimated at current prices is plotted in Chart 3, it is apparent that the FISIM value obtained using the market interest rate is higher than the FISIM value calculated using the effective interest rate. The differences in value observed are primarily due to the interest rate margin on loans.

The interest rate margin between effective and market interest rate for loans can be attributed to two main factors. The first relates to the practices of financial institutions in reporting interest rates. Financial institutions under the supervision of the BOT are required to file quarterly reports detailing interest rates for both lending and deposits. Using the data submitted, market interest rate can be estimated by applying the weights proportional to the outstanding balances. Interest on loans is assumed to be received on the entire outstanding balance, without deduction of interest on non-performing loans (NPLs).

The second reason for the differences is the exclusion of NPLs in the calculation of the effective interest rate. The effective interest rate is compiled using the interest received that is recorded on the profit and loss statements of financial institutions. This interest accrued excludes the interest on NPLs. As a result, the estimated effective interest rate would be lower than the announced market interest rate. Consequently, the FISIM value calculated using the effective interest rate would also be lower than when using the market interest rate.

The differences in value obtained from the two approaches highlight the importance of the effect of NPLs on the value of FISIM – an issue that, though it has been the focus of many discussion forums, remains unresolved. The Advisory Expert Group (AEG) on National Accounts, in a meeting in Frankfurt in 2006, proposed three options[8] for recording of interest on NPLs. Thus, given the concept on the treatment of NPLs in the SNA 1993, and taking into consideration the options proposed by the AEG on the treatment of NPLs, along with the

---

[8] The AEG Meeting on National Accounts in Frankfurt in 2006 suggested three possibilities for the treatment of NPLs:

(1) Continue to estimate FISIM on NPLs and allocate it to the corresponding borrowers, but consider how unpaid FISIM is recorded in the accounts in such a way as to increase principal outstanding.

(2) Estimate FISIM on interest received (rather than receivable), ie record interest on a cash, rather than an accrual, basis, so that FISIM is not attributable to NPLs.

(3) Allocate FISIM only to the stock of performing loans.

current economic conditions in Thailand, **FISIM estimation based on the market interest rate best reflects the output of the Thai financial sector**. The rationale behind this is that financial services should be recorded based on the services provided, irrespective of whether or not they are eventually paid for, since (1) the risk of default will have been priced into the interest rate charged by financial corporations; and (2) financial corporations have provided intermediation services in the form of funds channelled to the loan market, thus increasing their output.

Charts 4 and 5 illustrate the FISIM value estimated at current prices for loans and deposits. The overall interest rate movement for the reference period 2004–2006 remained in line with the policy rate; movements are within a narrow range consistent with high liquidity in the financial system. FISIM on loans (Chart 4) shows a decreasing trend, mainly due to the economic slowdown as well as excess liquidity in the financial system. The lending rate remained low in 2004, and was adjusted upwards in 2005–2006. The decline in the value of FISIM on loans was due to the deceleration in credits following the slowdown in domestic demand, particularly in private investment. In contrast, FISIM on deposits (Chart 5) exhibits an increasing trend, due to the increase in both the deposit rate and deposit balances as banks competed to maintain their share in the overall deposit base. For the first half of 2004, the deposit rate remained low and mostly unchanged; however, short-term deposit interest rates were adjusted upwards slightly towards the end of 2004, as reflected in an increase in FISIM on deposits. Continual increases in FISIM on deposits were seen in 2005 and in the first three quarters of 2006.

In addition to the effects of the choice of deposit and lending rates, changes in other input parameters, such as the reference rate, also have an impact on the value of FISIM at current prices. This can be demonstrated through the use of sensitivity analysis, which is the procedure to determine the sensitivity of the outcome to changes in the parameters. In the context of the Thai financial sector, due to the fact that deposit balances are greater than loan balances, an increase (or decrease) in the reference rate by 100 basis points will impact the value of FISIM such that (1) a change in the reference rate at a certain period will affect the value of FISIM by approximately –3% to +3%; and (2) a change in the reference rate for the entire period will have varying effects on the value of FISIM, depending on whether the reference rate increases or decreases. In the case of an increase in the reference rate, the value of FISIM on loans would decrease, while FISIM on deposits would increase, thereby increasing total FISIM. On the other hand, a decrease in the reference rate would result in an increase in FISIM on loans and a reduction in FISIM on deposits, and consequently the reduction of total FISIM.

3.5   FISIM at constant prices

In order to construct constant price FISIM data series, the total balances of loans and deposits would be deflated separately by a general deflator to remove the influence of price changes, which would otherwise feed into the volume measure. The resulting balance would then be multiplied by the base year "price", which is the difference between the loan rate and the reference rate in the base year and, for deposits, the reference rate less the deposit rate in the base year.

The choice of an appropriate deflator will, to a certain degree, impact the value of constant price FISIM. At present, there is no consensus on which price deflator should be adopted; however, the choice of suitable deflator(s) should take account of the changes in the price of money. Many OECD countries use general price indices such as the price deflator for GDP. In the case of Thailand, there are numerous alternatives for choosing a deflator, such as the implicit GDP deflator, producer price index (PPI) and consumer price index (CPI).

The approach taken in this paper will be twofold. As suggested by much of the literature on FISIM, the first approach will be to use (1) a single deflator (GDP deflator) to deflate the balances on both loans and deposits. The second approach is to apply multiple deflators to

deflate the balances on loans and deposits, with the deflators used consisting of (2) overall PPI to deflate the balances on loans and CPI to deflate the balance on deposits, and (3) deflating the balance on loans using PPI, by product groups, for the manufacturing sectors, and CPI for all other sectors and for deflating the balance on deposits. The rationale for choosing PPI to deflate the balance on loans is justified by the fact that the structure of the loan portfolio for the Thai financial sector is dominated by corporate loans, while consumer loans account for less than 20 percent of the total, of which two thirds are collateralised housing loans. The CPI is used to deflate the balance on deposits, as the structure of deposits is composed mostly of deposits from households. Furthermore, the level of CPI also affects households' propensity to save and consume. Variations of the different alternatives for deflators are given in Table 3. The resulting FISIM value at constant prices, deflated using the GDP deflator, is given in Table 4. Table 5 shows the FISIM value at constant prices, deflated using multiple deflators.

Chart 7 illustrates FISIM at constant prices deflated by using single and multiple deflators, namely (1) the GDP deflator; (2) overall PPI on loans and CPI on deposits; and (3) sectoral PPI on loans for the productive sectors and CPI on loans of other sectors and on deposits. The empirical study showed that there is no significant divergence between the series deflated using a single deflator, such as the GDP deflator, and the series deflated using more detailed multiple deflators, eg using sectoral PPI to deflate loans for the corresponding sectors, CPI to deflate loans of other sectors and CPI to deflate deposits. Moreover, the use of multiple deflators of overall PPI to deflate loans and CPI on deposits tends to give lower values of FISIM at constant prices, as compared to the other two series. This difference may be due to the fact that the weights applied to each PPI product group are not consistent with the proportion of lending made to the corresponding sectors. Nevertheless, due to limitations in time-series data used in this empirical exercise, the results obtained are provisional, and thus require further study in order to substantiate the results.

4. Issues and concerns

Estimation of FISIM based on the reference rate approach requires information on interest rates on loans and deposits, and average outstanding balances of loans and deposits, classified by sector. Data for balances on loans and deposits by sector can be obtained from the balance sheets of financial corporations. However, some data gaps remain, such as:

1. The availability of interest rates on loans and deposits by sector

2. The feasibility of obtaining historical data at the same level of detail and aggregation

3. The availability of a suitable reference rate that can be applied to historical data series

4. The fact that the timeliness of the parameters used may not be sufficient for the compilation of quarterly GDP

There are also some concerns over the theoretical aspects outlined in the SNA 1993. These include the following:

1. **Limitation to the definitions in SNA 1993**

    The definition of financial corporations in the SNA 1993 places emphasis on the activity of financial intermediation and not on the services provided, thus limiting the scope of intermediation services and financial products generating FISIM to the deposit and loan business of financial corporations. However, because of the changing nature of financial activities, financial corporations are able to provide a

greater variety of services beyond loans and deposits in order to attract and invest funds.

Another issue of interest is the role of "own funds" as a resource for financial services. The SNA 1993 states that lending own funds does not give rise to production and should be excluded from the estimation of FISIM. In practice, it may be difficult to distinguish whether the funds available for lending are generated from deposits or own funds. Thus, financial services should be considered to be produced generally from accepting and investing funds, regardless of the origin of the funds.

2. Estimation of trade in FISIM

The reference rate approach can be used to measure trade in FISIM. For countries with foreign exchange controls, such as Thailand, data for balances on loans and deposits by currency may not be too difficult to obtain. However, the difficulty of estimating import and export of FISIM lies in the choice of reference rates and whether to use an external reference rate based on the currencies in which the transactions are denominated or a single reference rate.

5. Concluding remarks

This paper adopted the reference rate approach in estimating FISIM value. Broadly in accordance with the recommendations in the SNA 1993, the approach described attempts to illustrate the effect of using different input parameters, such as interest rates and deflators, on the estimated FISIM valued at current and constant prices.

The empirical results obtained are provisional and show that the level of FISIM can be affected by changes in the choice of parameters used in the estimation, such as the interest rate, reference rate and deflators. In the Thai context, the FISIM value estimated using the market interest rate will best reflect the output of financial corporations, since the value of all intermediation services – including figures on NPLs – is recorded. For constant price data series, in order to adequately substantiate the finding of the empirical exercise pertaining to the use of single or multiple deflators to deflate the balances on loans and deposits, more detailed and longer time-series data need to be examined.

Further research and empirical studies in this area are required before the estimation of FISIM can be fully implemented in the Thai national accounts.
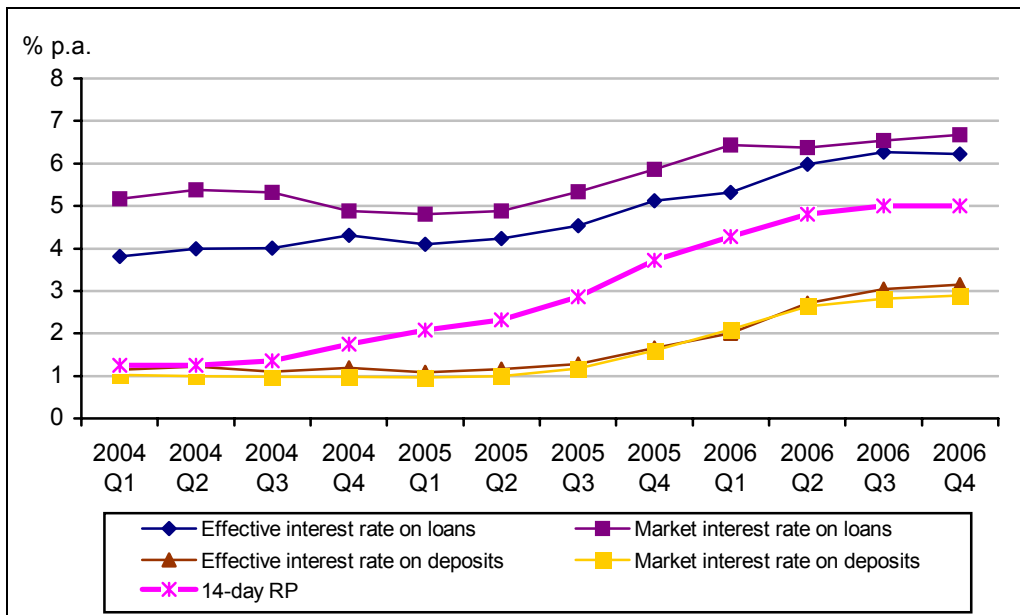
Annex

Chart 1

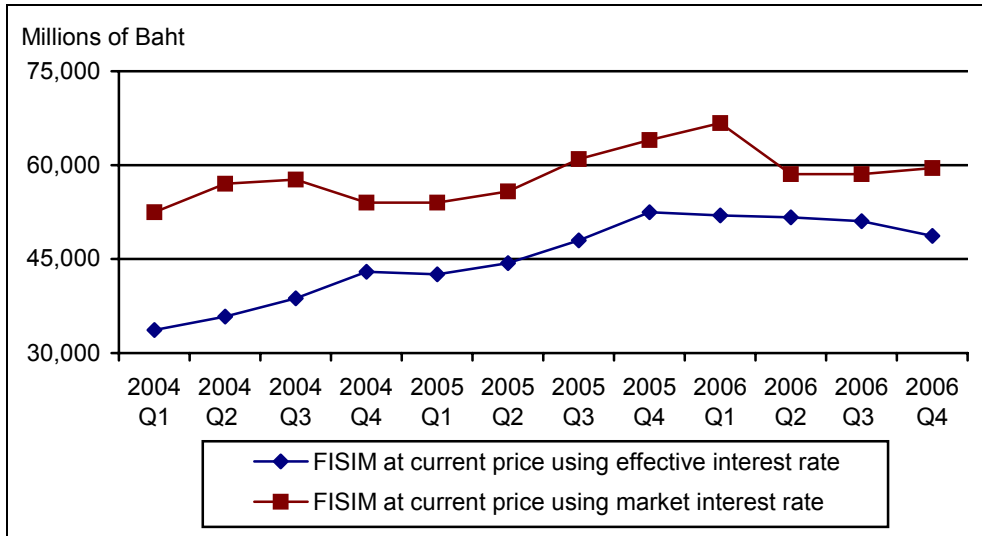### Reference rate
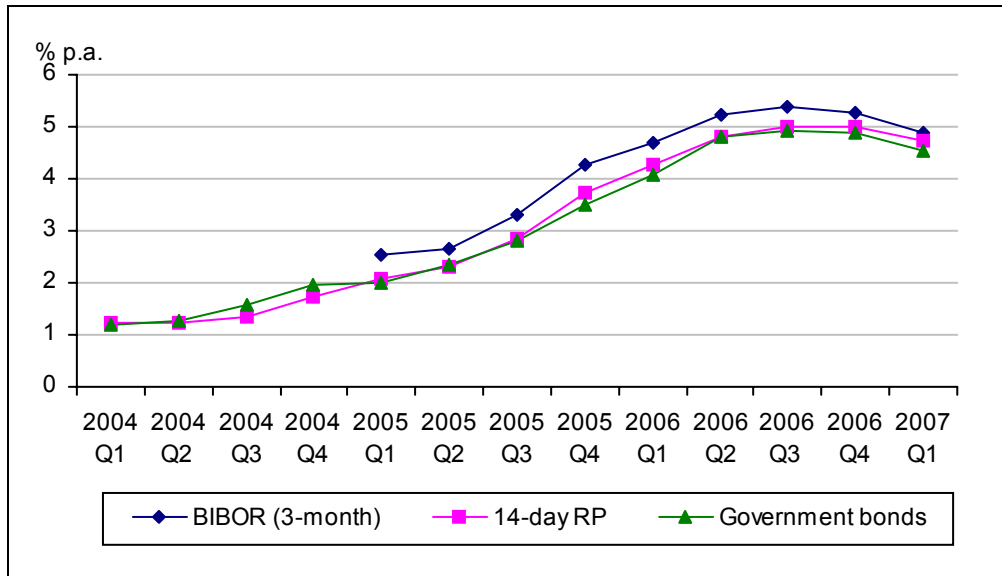
Source: Bank of Thailand.

Chart 2

Effective interest rate vs. market interest rate

Source: Bank of Thailand.

Chart 3

**Comparison of FISIM at current prices,
calculated using effective and market interest rates**

Millions of Baht

Source: Bank of Thailand.

Chart 4

**FISIM at current prices on loans
(using market interest rate)**
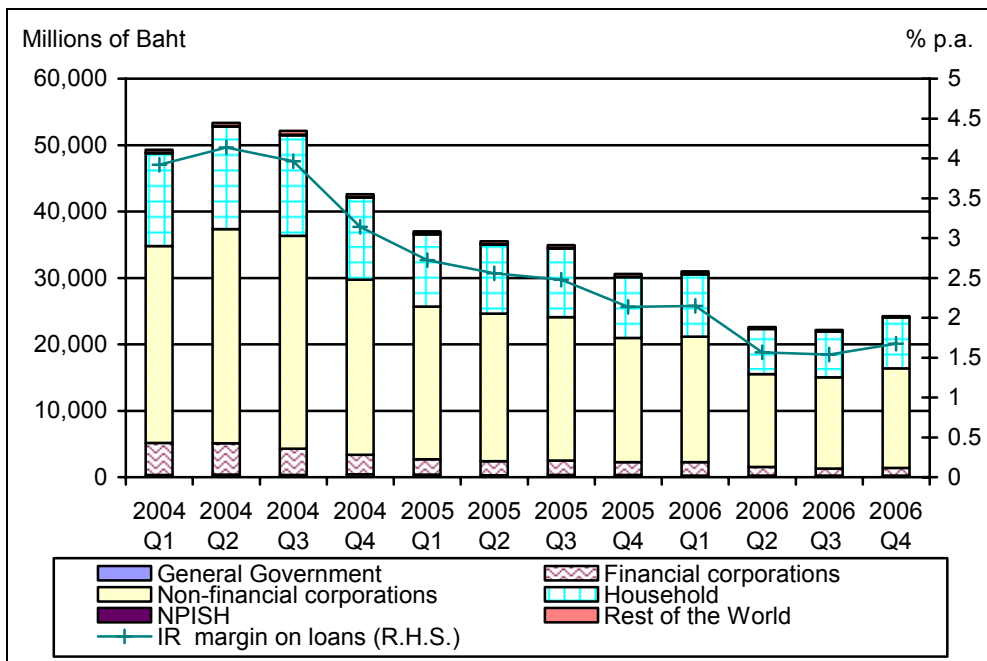
Source: Bank of Thailand.

Chart 5

FISIM at current prices on deposits
(using market interest rate)
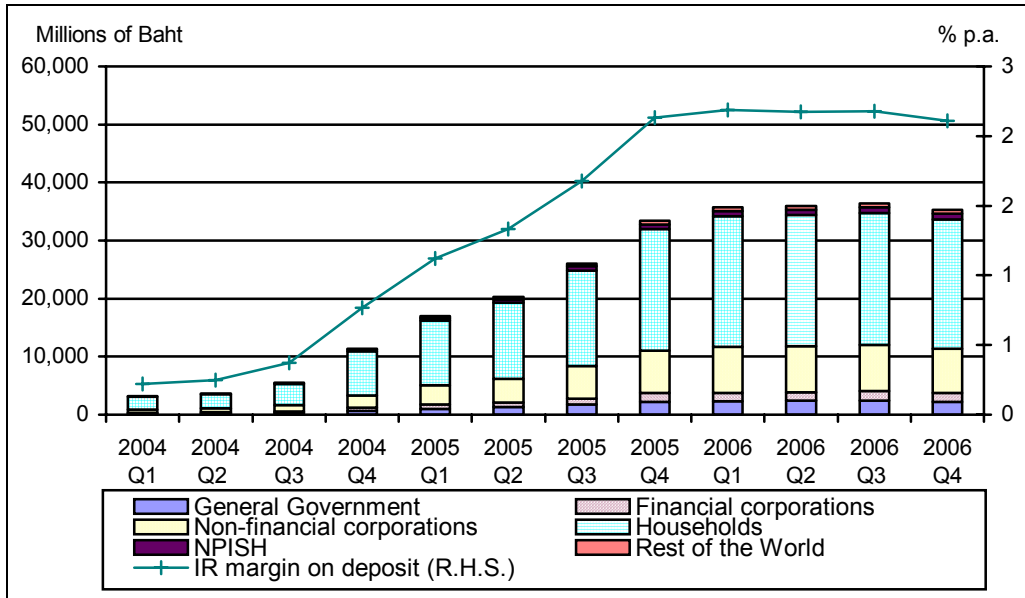
Source: Bank of Thailand.

Chart 6

Price deflators (base year 2004)

Source: Bank of Thailand.

Chart 7

FISIM at constant prices

Millions of Baht

Source: Bank of Thailand.

Chart 8

FISIM Price Index

Index

Source: Bank of Thailand.

Table 1

FISIM at current prices estimated using effective interest rate on loans and deposits
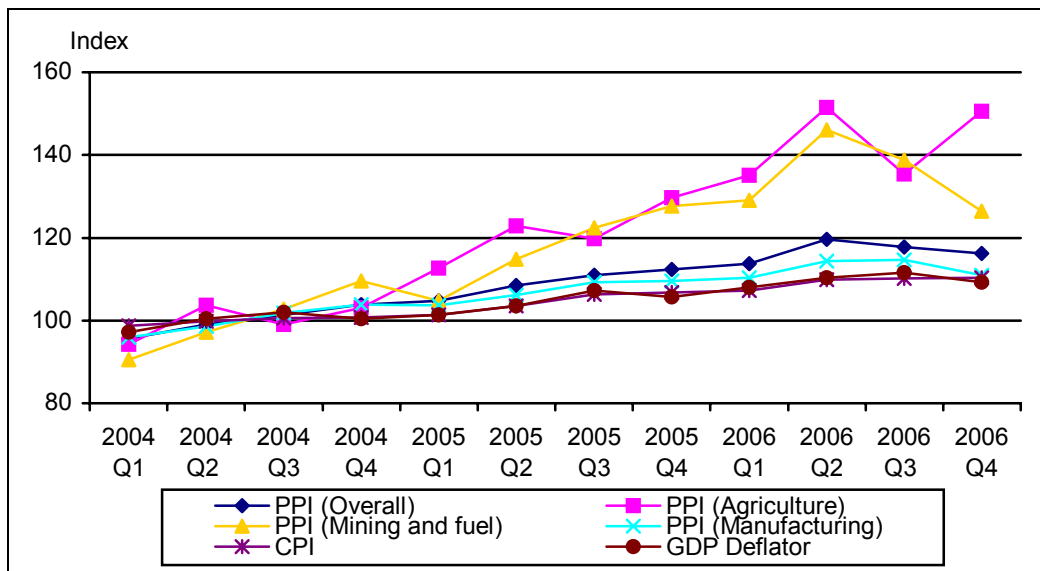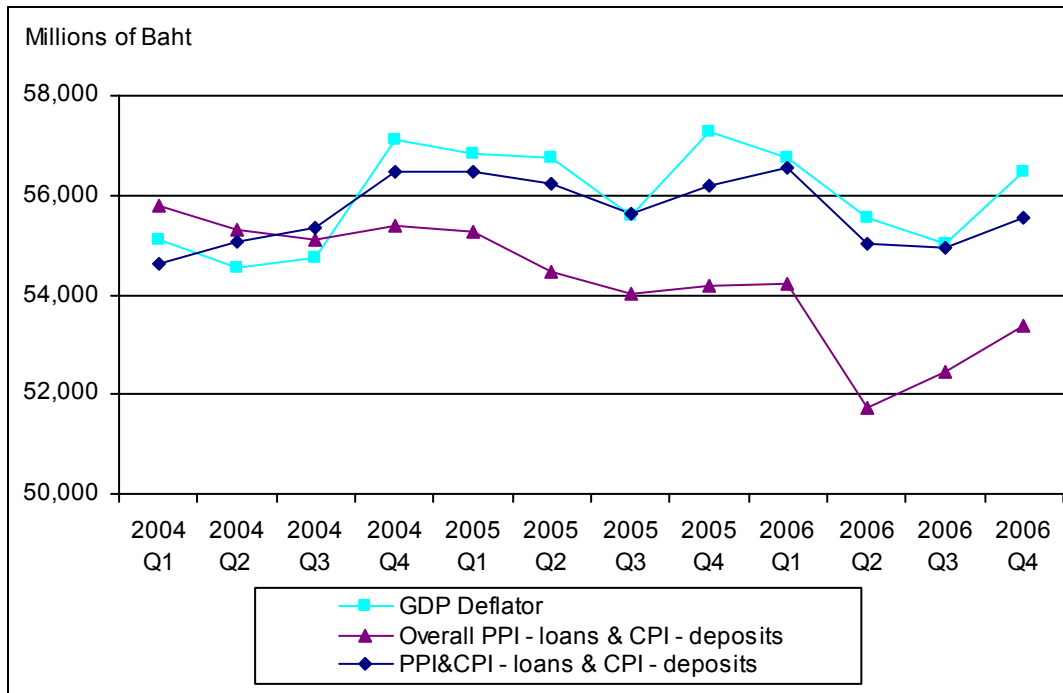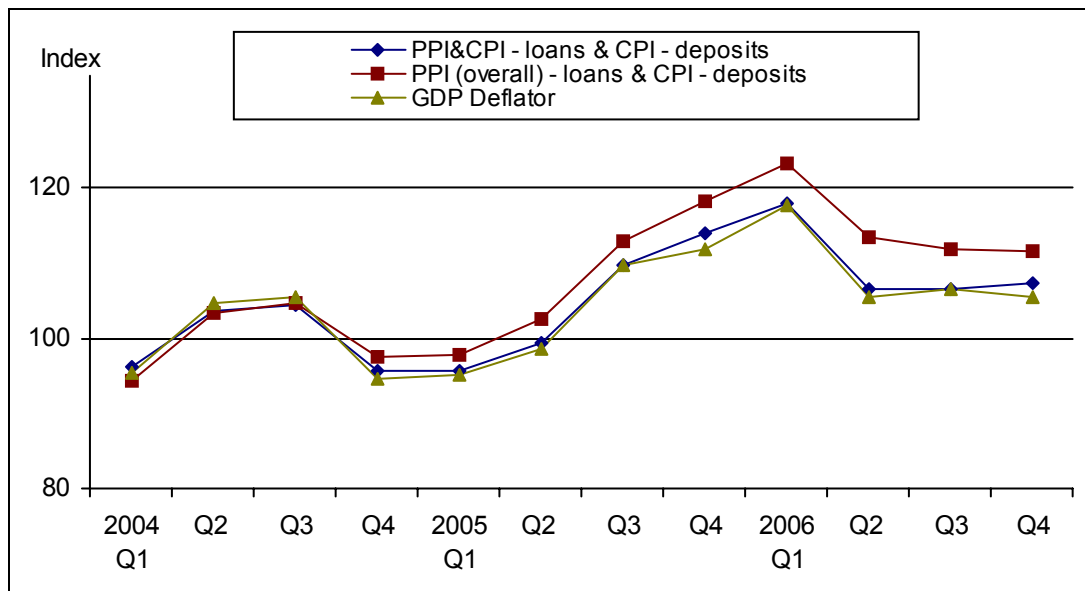
Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Total FISIM	**33,696**	**35,798**	**38,721**	**42,963**	**42,568**	**44,358**	**47,990**	**52,485**	**51,974**	**51,648**	**51,068**	**48,685**
FISIM on loans	**32,234**	**35,337**	**34,966**	**34,677**	**27,466**	**26,576**	**23,636**	**20,106**	**14,947**	**16,959**	**18,348**	**17,677**
General Government	207	251	236	356	284	232	227	209	127	181	180	175
Financial corporations	3,172	3,142	2,654	2,396	1,702	1,569	1,473	1,268	959	961	896	846
Non-financial corporations	19,353	21,342	21,478	21,448	17,084	16,613	14,617	12,284	9,111	10,489	11,395	10,925
Households	9,149	10,237	10,168	10,078	8,074	7,817	6,990	6,043	4,546	5,119	5,684	5,582
NPISH	53	51	45	44	33	31	28	20	8	9	10	10
Rest of the World	300	315	385	356	289	313	300	282	195	198	184	140
FISIM on deposits	**1,462**	**460**	**3,755**	**8,286**	**15,102**	**17,782**	**24,355**	**32,379**	**37,028**	**34,689**	**32,720**	**31,007**
General Government	80	26	222	486	908	1,173	1,619	2,138	2,370	2,322	2,160	1,894
Financial corporations	73	22	180	362	638	672	988	1,469	1,522	1,443	1,514	1,443
Non-financial corporations	267	87	709	1,592	2,970	3,595	5,198	7,088	8,230	7,600	7,085	6,627
Households	978	304	2,481	5,480	9,919	11,531	15,475	20,268	23,331	21,819	20,494	19,652
NPISH	41	13	102	222	402	488	645	841	937	908	862	835
Rest of the World	23	8	62	145	264	323	430	575	637	597	605	556

Source: Bank of Thailand.

Table 2

FISIM at current prices estimated using market interest rate on loans and deposits

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Total FISIM	**52,490**	**57,036**	**57,672**	**53,995**	**54,015**	**55,791**	**60,934**	**64,000**	**66,721**	**58,567**	**58,559**	**59,519**
FISIM on loans	**49,309**	**53,345**	**52,126**	**42,594**	**37,025**	**35,516**	**34,929**	**30,604**	**30,998**	**22,607**	**22,150**	**24,250**
General Government	317	379	352	437	383	310	335	318	264	242	217	240
Financial corporations	4,852	4,743	3,957	2,943	2,294	2,097	2,177	1,930	1,989	1,282	1,081	1,161
Non-financial corporations	29,604	32,217	32,018	26,344	23,029	22,202	21,601	18,698	18,896	13,983	13,756	14,987
Households	13,995	15,453	15,158	12,379	10,884	10,447	10,329	9,198	9,428	6,824	6,862	7,658
NPISH	81	77	67	54	44	41	42	30	17	12	12	13
Rest of the World	460	475	575	438	390	419	444	430	405	264	222	191
FISIM on deposits	**3,181**	**3,690**	**5,546**	**11,401**	**16,990**	**20,275**	**26,006**	**33,396**	**35,722**	**35,960**	**36,409**	**35,269**
General Government	174	209	328	668	1,022	1,337	1,728	2,205	2,287	2,407	2,404	2,154
Financial corporations	158	180	266	498	718	766	1,055	1,515	1,468	1,496	1,685	1,642
Non-financial corporations	580	695	1,047	2,190	3,341	4,099	5,551	7,311	7,940	7,879	7,884	7,537
Households	2,129	2,440	3,664	7,540	11,160	13,148	16,524	20,904	22,509	22,618	22,805	22,354
NPISH	90	106	150	306	452	556	689	868	904	941	959	950
Rest of the World	50	61	91	199	297	369	459	593	615	619	673	632

Source: Bank of Thailand.

Table 3

Price deflators (base year 2004)

	PPI (Overall)	PPI (Agriculture)	PPI (Mining and fuel)	PPI (Manu-facturing)	CPI	GDP Deflator
2004 Q1	95.6	94.2	90.5	96	98.7	97.1
Q2	99.1	103.6	97.2	98.6	99.8	100.5
Q3	101.4	99	102.7	101.8	100.6	102.0
Q4	103.9	103.1	109.6	103.8	100.8	100.4
2005 Q1	104.7	112.6	104.8	103.6	101.4	101.4
Q2	108.4	122.9	114.8	106.2	103.5	103.5
Q3	110.9	119.8	122.4	109.3	106.3	107.3
Q4	112.4	129.6	127.6	109.5	106.8	105.7
2006 Q1	113.8	135.1	129.1	110.3	107.2	108.0
Q2	119.6	151.5	146.1	114.4	109.8	110.4
Q3	117.8	135.4	138.8	114.7	110.2	111.5
Q4	116.2	150.5	126.4	111	110.3	109.2

Sources: National Economic and Social Development Board; Bank of Thailand.

Table 4

Constant price FISIM (deflated using single deflator – GDP deflator)

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Constant price FISIM on loans	49,120	48,632	48,892	51,149	50,816	50,828	49,775	51,330	50,679	49,505	48,985	50,311
Constant price FISIM on deposits	5,996	5,910	5,851	5,966	6,020	5,923	5,817	5,966	6,085	6,040	6,028	6,163
Total FISIM at constant prices	**55,117**	**54,542**	**54,743**	**57,115**	**56,836**	**56,751**	**55,593**	**57,296**	**56,763**	**55,545**	**55,013**	**56,475**

Source: Bank of Thailand.

Table 5

Constant price FISIM (deflated using multiple deflators)

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Constant price FISIM on loans												
PPI + CPI	48,709	49,110	49,411	50,536	50,447	50,315	49,750	50,278	50,438	48,951	48,858	49,440
PPI (overall)	49,873	49,337	49,164	49,442	49,235	48,527	48,157	48,280	48,080	45,678	46,372	47,265
CPI	48,307	48,991	49,555	50,962	50,837	50,825	50,241	50,812	51,040	49,755	49,570	49,793
Constant price FISIM on deposits												
CPI	5,931	5,945	6,023	5,923	5,872	5,906	6,128	6,070	6,100	6,100	5,931	5,945
Total FISIM at constant prices												
PPI&CPI – loans & CPI – deposits	55,341	56,480	56,470	56,238	55,622	56,183	56,566	55,021	54,958	55,540	55,341	56,480
PPI – loans & CPI – deposits	55,095	55,386	55,258	54,450	54,029	54,186	54,208	51,748	52,472	53,364	55,095	55,386

Source: Bank of Thailand.

References

Barman, R. B. and Samanta, G. P. (2004), "Banking Services Price Index: An Exploratory Analysis for India".

Bank of Thailand, Supervision Report 2004 and 2005.

European Council Regulation No. 448/98 (February 1998), Official Journal of the European Communities.

Eurostat (2001), "Handbook on Price and Volume Measures in National Accounts", prepared for the prepared for the seminar on Price and Volume Measures, 14–16 March 2001, Statistics Netherlands, Voorburg.

Fixler, D. J., Reinsdorf M. B., and Smith G. M., (2003), "Measuring the services of commercial banks in the US national accounts: Changes in concepts and methods", OECD National Accounts Experts Meeting.

Harrison, A. (2006), "Non-performing Loans – Impact on FISIM", Fourth Meeting of the Advisory Expert Group on National Accounts.

Moulder, P., Blekh A., and Finz, D. (2004), "Non-performing loans, interest arrears and FISIM estimates", Conference on European Statisticians, working paper No. 3.

Nordin A., (2006), "The production of financial corporations and price/volume measurement of financial services and non-life insurance services", Fourth Meeting of the Advisory Expert Group on National Accounts.

OECD Secretariat (1998), "FISIM", Joint OECD/ESCAP Meeting on National Accounts, Bangkok, 4–8 May 1998

Schreyer P. and Stauffer P. (2002), "Measuring the Production of Financial Corporations", Progress report by the OECD Task Force on Financial Services (Banking Services) in National Accounts.

United Nations (1993), "System of National Accounts, 1993", Washington, D.C.