

Fisim Methodology and Options of Its Estimation: the Case of the Czech Republic

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Abstract

Financial intermediation services indirectly measured, or simply FISIM, is an adjustment made in national accounts which constitutes significant element in output of the financial institutions. Therefore, the methodological aspects of this adjustment are still broadly discussed issue.

In case of the Czech Republic, the institution responsible for the estimation is the Czech Statistical Office. The paper deeply analyses the approach of this institution and compare it with opinions of many authors. Based on this literature research, the aim of this paper is to propose improvements in the current estimation and find out other options how to estimate the most accurate value of FISIM.²

Keywords

National accounts, FISIM, methodology, Czech Statistical Office, production, interests

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INTRODUCTION

The estimations of productivity are broadly discussed issue for a relatively long time because the productivity from an economic point of view is an extremely significant indicator which influences many other statistics. Nevertheless, it is essential to keep in mind that it is only an estimation affected by observational errors and methodological assumptions. These are the main reasons why valuating production more and more accurately is a challenge and many different approaches have been used, especially in the sector of financial institutions (S.12).

The valuation of financial services provided by the financial institution faces up to a few obstacles such as obstacles associated with the payment for the services, which may be done directly or indirectly. Direct payments such as fees and commissions are easily detectable in statistical surveys. However, this part does not include the whole production of financial institutions and as a treatment of differences

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between business and national accounts the estimations of indirect payments for the financial services are needed. The indirect payments arise from the financial operations such as acquisition and disposal of financial assets and liabilities in financial markets (for more details, see Kramulová, Houžvičková and Vincenc, 2019), insurance and pension schemes and from the financial services provided in association with interest charges on loans and deposits.

This paper focuses on the last-mentioned indirect payment which is part of the interest rates on loans and deposits. The adjustment estimating the value of this payments is called financial intermediation services indirectly measured (hereinafter FISIM). In this article I would like to follow up on the discussion of the current form of FISIM adjustment from a methodological point of view and point out possible changes in the current methodology or to find alternative methods of FISIM estimation. The above mentioned will be illustrated on the current methodology and data sources of the Czech Statistical Office (hereinafter CZSO).

The paper is organized as follows: Section 1 contains literature research to show the current level of knowledge. It briefly presents many authors' opinions on the methodological background. It mentions a few controversial aspects in comparison with the CZSO. Section 2 arises from findings made in the first section. It is dedicated to applying the findings into the formulas and shows the calculation and results of the alternative methods in case of the CZSO.

1 CURRENT STAGE OF KNOWLEDGE

1.1 FISIM as a portion of the interest

The FISIM represents the part of services charged by financial intermediary. Payments for these services are included in interest rates on loans and deposits. In case of loans it means, the client pays a higher interest than the reference rate. On the other hand, in case of deposits the client receives a lower interest rate than the reference rate and by that is the intermediation service paid.

The reference rate stays for pure costs of borrowed funds which basically means the cost of money without risk premia and without payment for the intermediation service. This rate is in general located somewhere between the interest rate on loans and the interest rate on deposits. The spread between these rates and the reference rate is FISIM from deposits or FISIM from loans. Their sum is the total FISIM which represents the volume of payments for the intermediation of the financial services related to the providing loans or taking deposits.

In the Czech Republic FISIM takes around 30% of output in the sector of financial institutions and the rest of the output (directly measured part) is estimated almost the same way in each of its subsectors.³ Especially in the subsectors, which are supervised by the Czech National Bank (hereinafter CNB). It means that directly measured part of the output is mainly sum of two items: "Income from fees and commissions" and "Other operating income". Differences in the calculation within subsectors are non-significant in our case, more relevant is to focus on what specific kind of data these two items contain.

The item called "Other operating income" consists of returns on investments to property and other commodities, earnings from lease or received compensations such as fines. There would be nothing related to lending money or deposit-taking, even if these activities were at the very beginning of banks existence, which make an essential part of S.12.

The output coming from these activities is at least partly included in the item called "Income from fees and commissions", because commissions and fees captured here are linked with financial instrument operations in general. Nevertheless, the output of the financial institutions based on these two items

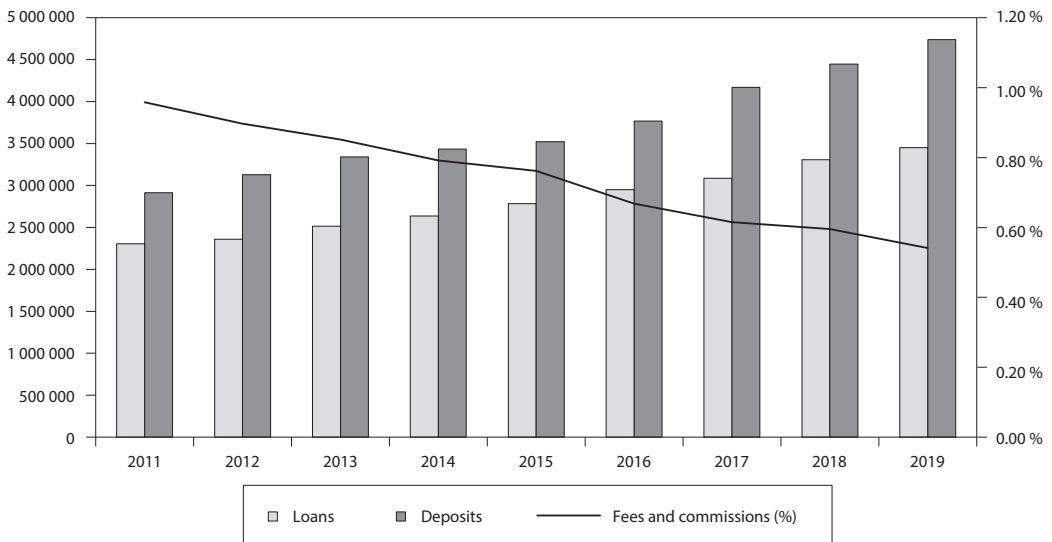
³ The sector of financial institutions in national accounts has nine subsectors according to European System of Accounts ESA 2010 (Eurostat, 2013) – an accounting framework for the system of national accounts and regional accounts used by members of the European Union.

is not high enough. In some subsectors, the gross value added could be under zero, which is not consistent with the profits in the sector.

Great example in the Czech Republic is the banking sector which is in profit for such a long period. At the end of 2018, banks turned in a profit of CZK 82.1 billion. It was a rise of 8.9% on a year earlier. In 2019 the profit increased by 11.6%, year-on-year, and reached a historical level of CZK 91 billion. Nowadays, the profits of banks decrease mainly due to the coronavirus pandemic. Still, if their output was measured using just these two items mentioned above, it would not reflect the reality (Czech National Bank, 2019 and 2020).

In the field of national accounts was and still is a debate about this topic. The basic agreement is that there are missing parts of the output that must be measured indirectly, as mentioned in the introduction, because these services are not fully paid through fees and commissions. The output captured in item “Income from fees and commissions“ decreases over time. The drop can be caused by increasing competitiveness or marketing strategies. However, the point is that the volume of services provided by banks is still rising and their profits as well. The rising volume of deposits and loans in comparison with decreasing fees illustrates Figure 1.

Figure 1 Volume of deposits and loans provided by deposit-taking corporations except for the central bank in the Czech Republic (in mil. CZK), fees and commissions as a ratio to sum of these deposits and loans (in %)



Source: ARAD

The issue is that the item “Income from fees and commissions“ includes only fees and commissions paid directly according to the commission agreement and not the indirect part. In this case, this part is included in the interest payments, because according to the manuals for national accounts the interest earnings are not part of the output, although the interest is an earning related to money lending services (at least according to business accounting). The interest in national accounts is a property income only, but the part of it is moved to the output, because “interest on loans and deposits payable to and receivable from financial institutions include an adjustment for a margin that represents an indirect payment for the services provided by the financial institutions in providing loans and accepting deposits” (Eurostat, 2013, p. 98).

The adjustment is called FISIM and is used to solve the problem of different treatment on interest between business and national accounting as the national account's manuals explain that the payment for the intermediation service is included in the interest payment. This part of the interest marked as service must be moved to the output. At the same time, this adjustment also results in better international comparison of the statistics, as in each country may dominate a different charging policy of the financial institutions. Thus, if only direct payments were included in the output, there would be significant irregularities.

The national accounts compilers mostly agree that financial intermediators charge for their services by a portion of interests. This way of charging is typical, especially for banks, because their interest profit has long been the main profitability source (Czech National Bank, 2019).

Hood (2013) explains that banks compensate low profit from fees and commission by a portion of the interest they charge on loans or by a reduction in the interest rates they pay to depositors. The banks use this way of charging rather than charging by explicit fees.

Among others, the financial services occurring in the interest also confirms Akritidis (2007), who adds that commission, account charges and flat rate fees for overdrafts are significantly below the costs paid by the banking industry on wages and bonuses and intermediate costs such as rental, electricity and stationary purchases. It means that when you use conventional treatment of measuring output, which includes direct payments only, the threat of what the OECD described as "the paradox of a prosperous industry" can occur.

The paradox of prosperous industry indicates prosperous industries which have a negligible impact on the national product. The paradox is linked with neoclassical ideas about economy rooted in nineteenth century and makes the opposite view. Neoclassical economics saw banks generate a profit, despite providing activities inherently unproductive (according to the neoclassical economics), therefore the profit was considered accidental. Productivity in general was defined inherently just to some activities and labours; the others were inherently unproductive. The great political economists of the eighteenth and nineteenth centuries saw the productiveness as already determined at the moment when there is an input of labour and depending on whether such labour create material goods (Christophers, 2013).

Christophers (2013) explain that this problem or paradox occurred just because national accountants could not realize the existence of bank's intermediation services. Therefore, this kind of problematic neoclassical theory has long been overcome and there is no doubt about indirect payments for financial services, which must be estimated by some adjustments and added to the output such as FISIM. The approach of the CZSO is in line with that.

1.2 Producers of FISIM

Banks are not the only ones able to produce FISIM. There are other financial institutions to be involved in the estimation. The ESA 2010 says that FISIM is produced by "...deposit-taking corporations except for the central bank (hereinafter S.122); and other financial intermediaries, except insurance corporations and pension funds (hereinafter S.125)" (Eurostat, 2013, p. 331).

In the System of National Accounts SNA 2008⁴ (United Nations, 2009), FISIM producer's delimitation is less strict. "These indirect charges in respect of interest apply only to loans and deposits and only when those loans and deposits are provided by, or deposited with, financial institutions" (United Nations, 2009, p. 116). It means that in a theoretical way, the producer of FISIM can be every financial institution that can deposit or lend money. It is not necessary to do both because the amount of money lent usually does not match with the amount of money deposited. Therefore, the indirect charging is imputed in all loans

⁴ SNA 2008 is the international standard system of national accounts, which is the background to ESA 2010. In the case of this paper, which focuses on the national accounts compiled by the CZSO, the SNA 2008 provides different, usually looser, interpretation. Nevertheless, the ESA are obligatory for the CZSO.

and deposits offered by a financial institution irrespective of the funds' source and the volume of indirect charges can be different depending on the source of money and its costs.

The manuals (especially SNA 2018) suppose that the producers of FISIM are the financial corporations (S.12) only. It means that financial institutions as a non-market producers captured in general government (S.13) are excluded from the estimation. In case of the Czech Republic, it has a significant impact mainly due to the two institutions: the Czech Export Bank and the National Development Bank. Still, the possibility of negligible FISIM outside S.12 is also mentioned there, but the manual adds that providing financial services is typically under strict regulation and retailers usually do not provide them as secondary production. There are also discussions about the central bank as a FISIM producer, but it is usually also a non-market producer. Moreover, ESA 2010 defines its production as the sum of its costs and its interest rates are affected by monetary policy (United Nations, 2009).

Zieschang (2012) also says that FISIM might occur outside the sector of financial institutions. He respects that these kinds of loans are not included in FISIM estimation and agrees that the value of FISIM from these loans probably will not be quantitatively significant. However, he adds that the treatment of the SNA 2008 does not have to be the most accurate.

We can suppose that almost no consumer's loans are provided directly by retailers, but the CZSO does not even estimate FISIM from loans provided by Other financial intermediaries (hereinafter OFI) classified as a part of S.125. These financial intermediaries usually provide consumers loans instead of retailers, and from my perspective, there is no reason to exclude them from the estimation. ESA 2010 also confirms that OFI are involved in lending money, so the CZSO should enlarge its FISIM producers list by them. Nowadays, the list includes only S.122 and the financial lease provided by the financial intermediary as a part of S.125, but S.125 includes more suitable units such as OFI or Financial payment institutions. Moreover, leasing companies can provide consumers loans as well; at least as a smaller part of financial services which they provide. These loans should be added to the estimation as well.

All the proposed units belong to NACE 64 which refers to "the activities of obtaining and redistributing funds other than for the purpose of insurance or pension funding or compulsory social security" (European Commission and Eurostat, 2008, p. 257). Therefore, they are suitable FISIM producers instead of almost similar units captured in NACE 66 which do not do them-selves (directly) provide financial services.

The impact of this extension in case of the Czech Republic using data of the CZSO is calculated in Section 2.1.

1.3 Allocation of FISIM

On the other hand, the volume of FISIM produced, must be used. There are limited options how to allocate these services on the user side, which includes intermediate consumption, final consumption expenditure or export. In practice, it may be difficult to find the right method of allocating FISIM to the various recipients or users of the services. Therefore, in the past, the manual allowed to record the whole FISIM output as the intermediate consumption of a notional unit with zero output, the so-called "nominal sector". Nowadays, the allocation depends on the institutional sector of user:

- a) FISIM used by non-financial corporation, other financial corporation, general government, households as owners of dwellings, households as owners of unincorporated enterprises and non-profit institutions serving households belong to the intermediate consumption;
- b) FISIM used by households for individual consumption belong to the final consumption;
- c) FISIM used by non-residents belong to the export.

To allocate FISIM, it is necessary to have data about the stock of loans and deposits as well as related value of interests broken by sector of depositor or borrower. Then, it is possible to identify who borrowed or deposited the money and, accordingly, allocate FISIM correctly. The correct allocation is important for many reasons, but the major one is linked with its impact on GDP.

ESA 2010 manual excludes loans and deposits provided between banks from the estimation of FISIM, because there is almost no FISIM occurrence, thus these transactions are used for calculation of internal reference rate (see Section 1.5). Deposits and loans provided by the central bank are also excluded, because it is non-market producer and its interest rates are affected by the monetary policy. Nevertheless, the CZSO excludes also loans and deposits, where the sector of user are Money market funds (S.123), Non-MMF investment funds (S.124) and Other financial intermediaries, except Insurance corporations and Pension funds (S.125). It means that FISIM is not estimated from these loans and deposits and not allocated in these subsectors as well.

Units captured in S.123 and S.124 are in general just funds issuing shares, etc. However, they can also invest on their own account and borrow money for this purpose. This idea is supported by the fact that the CNB reports data, which says that stock of loans and deposits used for FISIM estimation belongs among the other sectors to S.123 and S.124. It is possible that these funds can reach better interest rates with almost no FISIM occurrence, because they are often closely related to the banks, but it is not the reason for the exclusion. Moreover, there is also no reason to exclude S.125, because these units also arrange loans with banks or have deposits there.

In the ARAD⁵ database are the volumes of loans and deposits provided by banks to S.123, S.124 and S.125 available. The estimation of FISIM including S.123, S.124 and S.125 on the user side is part of Section 2.2.

1.4 Financial assets and liabilities affected by FISIM

According to the current regulation,⁶ the only financial instruments affected by FISIM adjustment are loans and deposits. It is due to suitable properties of its interest rates. Akritidis (2007) explains that these interest rates are under control of commercial banks unlike the interest rates on other financial instruments, such as bonds or securities. They are easily identifiable in division into interest rates on loans and interest rates on deposits, which has consequences in the current method of FISIM estimation. Extending the estimation by bonds may lead to a negative FISIM, it means to produce a negative service.

There is still a debate whether negative FISIM occurrence is explainable, but it is not in line with the current convention and that debate is not the aim of this article. In general, it is not appropriate to include bonds and especially the bonds with interest rates often lower than the reference rate to the estimation (Akritidis, 2007).

Reinsdorf (2011) mentions direct contact between bank and a customer as a key factor for providing implicit services. Thus, the bond purchased by bank on the open market does not produce services that are used by the actual bond issuer. Based on above mentioned, it is possible to also exclude securities. The interbank borrowings are also excluded. Even though SNA 2008 confirms impact of the exclusion on the FISIM estimation, in these transactions is a little if any FISIM. Banks usually borrow from and lend to each other at a risk-free rate.

Zieschang (2012) confirms mentioned above and says that deposits and loans only are affected by FISIM, thus there is nothing inconsistent in the approach of the CZSO.

1.5 Reference rate approach of FISIM estimation

The volume of FISIM is estimated using reference rate approach adopted from the theory of user cost of money which determines whether a financial product is an input or an output due to its net contribution to its revenue. This approach is applied to loans and deposits in the FISIM estimation (Abhiman and Ramesh, 2017).

⁵ ARAD is a public database, forming part of the Czech National Bank's information service. The purpose of the database is to create a unified system for presenting time series of aggregated data for individual statistics and financial market areas.

⁶ ESA 2010, paragraph 14.03.

FISIM from loans is calculated as a difference between interest rate on loans and the reference rate because the reference rate basically represents the average costs of the lender. Hence, FISIM in general should reach positive values. In case of deposit, FISIM is calculated conversely as a difference between reference rate and interest rate on deposits. This means that the interest rate applied to deposits is generally lower than the reference rate. In this case, the client receives a lower interest rate and thus essentially pays for the service. So, the main concept is to divide whole amount of interest by reference rate into two parts. First one which should remain classified as the interests (D.41) and second one which should be part of the output (FISIM (from loans and from deposits)).

The SNA 2008 claims that: "The reference rate should contain no service element and reflect the risk and maturity structure of deposits and loans." This is because, after adjusting interest using the reference rate, the service payment should be the only component of FISIM. The interest rate used for inter-bank borrowing and lending may be a suitable choice for a reference rate. Because "for banks within the same economy, there is often little, if any, service provided in association with banks' lending to and borrowing from other banks" (United Nations, 2009, p. 583).

According to the ESA 2010 manual "the internal reference rate is calculated as the ratio of interest receivable on loans within and between subsectors S.122 and S.125 to stocks of loans within and between subsectors S.122 and S.125. When the deposits data is more reliable, the internal reference rate (hereinafter IRR) should be calculated on interbank deposits" (p. 331).

To use the IRR based on the inter-bank transactions has also some pitfalls, mainly because of the risk premia. The risk premia is another part of the interest and serves as a compensation for the possibility that the borrower will not repay the entire liability. To exclude it from FISIM it is necessary for the IRR to include a proportion of the risk, but the risk premia differ from loan to loan. The IRR based on the inter-bank transactions involves almost no risk premia.

The choice of IRR can significantly affect the resulting volume of FISIM. Thus, it is important to set it right based on financial instrument (loan or deposit) with the same maturity (term premia) and with the same risk premia as the instrument from which the FISIM is estimated. Otherwise, some fluctuations may occur, because as Zieschang (2012) presents, using a single IRR inherently allows maturity and risk premia to enter FISIM estimations which are the parts of the interest that should not be captured in the output.

When the stock of loans is multiplied by the IRR (containing an appropriate level of risk and term premia), the result is the volume of interests that represent the costs of the intermediary with the risk and term premia included. Then the amount of interest charged by the intermediary is by these costs. The result obtained is FISIM from loans including only the payment for the intermediation services. Therefore, there is an effort to use the IRR without any intermediation services, but with risk premia (default margin) and term premia corresponding to the affected loans and deposits.

Using more IRRs for loans and deposits differing in risk and term premia is one possibility. The other option is to use its average amount in the economy. However, according to the Advisory Expert Group on National Accounts (2013): "...excluding credit default risk from FISIM, in practice it does not seem feasible, at least in a way that can ensure reasonable comparability across most countries, and so the Task Force concluded that credit default risk should remain part of FISIM in order to facilitate international comparability, at least in the immediate future" (p. 5).

There are opinions that keeping the risk premium as part of FISIM is not just because we are unable to exclude the risk premium while maintaining international comparability. Based on these opinions the real reason is that the risk premia serves to cover the costs related to insurance activities in case of the intermediary does these activities to mitigate the risk. In my point of view, the risk premia should be excluded from FISIM anyway, because it is not the payment for the service of intermediation. However, it does not mean, that the risk premia should not be part of the output in general (Advisory Expert Group on National Accounts, 2013).

The Advisory Expert Group on National Accounts (2013) has also concluded that a term premium should be reflected in FISIM as well. This means that the IRR should be without any payments for services and should include the risk and term premia. “The Task Force stated that channelling funds from borrowers to lenders is a fundamental function of banks, and maturity transformation is inherent to Financial Intermediaries” (p. 41). Moreover, the possible exclusion of the term and risk premia from FISIM faces the very limited suitable data availability.

Except the term premia and risk premia is the currency mix of loans or deposits which can be significantly different from the inter-bank transactions influencing the IRR. Therefore, in the UK the IRR is at first computed separately for each currency and then their weighted average is made to get the overall IRR, but this issue is not of such importance in the Czech Republic (Akritidis, 2017).

Another reason for using more than one IRR may be the difference between the so-called "creditor" and "debtor approach". Debtor approach means that interest payments are predetermined and unchanged in the future. This is how nearly all commercial bank rates are set. On the other hand, the IRR is always based on current financial market conditions and is therefore different for each FISIM estimation (creditor approach). In order to calculate FISIM correctly, it would be necessary to have a unique IRR applied to each loan and deposit at the time of its origin and not to change it for their whole duration. In practice, this method of calculation is hardly implementable, especially due to the volumes of loans and deposits arranged, the limitations of data sources, etc.

Based on the motioned above, Section 2.3 shows some applications of different IRRs in the CZSO approach, which is currently based on interbank loans according to the ESA 2010.

2 VARIOUS METHODS OF FISIM ESTIMATION IN CASE OF THE CZECH REPUBLIC

The alternative methods of calculating the FISIM adjustment discussed above are summarized in the following chapters, which serve for a general overview of this issue. In each chapter of Section 2 I will try to apply the methodological findings made in Section 1 to the data of the CZSO in a time series from 2015 to 2019. Due to the limited possibilities of publishing some data needed for estimations I will focus on the results mainly and its impact on key macroeconomic indicators.

2.1 Enlargement of FISIM producers

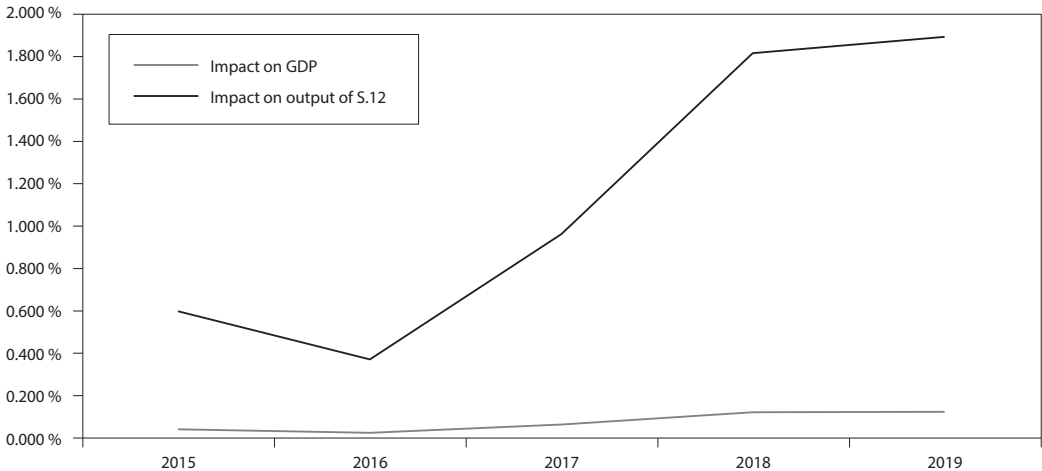
In case of the CZSO, S.125 is further subdivided into four divisions: Leasing companies, Securities dealers on own account, Other financial intermediaries, Financial payment institutions including electronic money institutions. And as I stated in Section 1.2, S.125 includes much more FISIM producers than just Leasing companies which are already included, but only in case of providing financial leasing. However, according to the Czech Leasing and Financial Association (CLFA, 2021) these companies also provide customer loans. Interests from these loans should be also affected by the estimation and when the rest of S.125 as a part of NACE 64 can also provide these loans, it should be included, too. Therefore, I enlarged the current CZSO approach by customer loans provided by units mentioned above and in the estimation I used the same IRRs used by the CZSO. It means that the results show only the impact of the enlargement.

In general, the data needed was taken from national accounts compiled by the CZSO. The volume of loans provided by S.125 was taken from the item Loans (AF.4) with exclusion of financial leasing which is already included. The volume of interests comes from the item Interest (D.41). The exclusion of interests from financial leasing was also made.

This enlargement results in an average increase of 3.2% in the current volume of FISIM produced by resident units between 2015 and 2019. It leads to the growth of output in the whole sector S.12 by 0.9% and by 7.2% in S.125. As you can see in Figure 2 the impact on the output of S.12 is still rising and is driven mainly by an increasing volume of interests in OFI (group of units as a part of S.125).

It is possible that the main part of this enlargement consists of consumer loans, whose borrowers are mainly households. Therefore, on the user side the output would be captured mainly in final consumption of households. Adding these values in the system of national accounts will affect the level of GDP. The increase will be on average 0.063% of GDP at current prices (see Figure 2).

Figure 2 The percentage increase in GDP and output of S.12 (both in current prices) caused by adding customer's loans provided by units classified in S.125 to the FISIM estimation – the Czech Republic (in %)



Source: Own computation from CZSO data

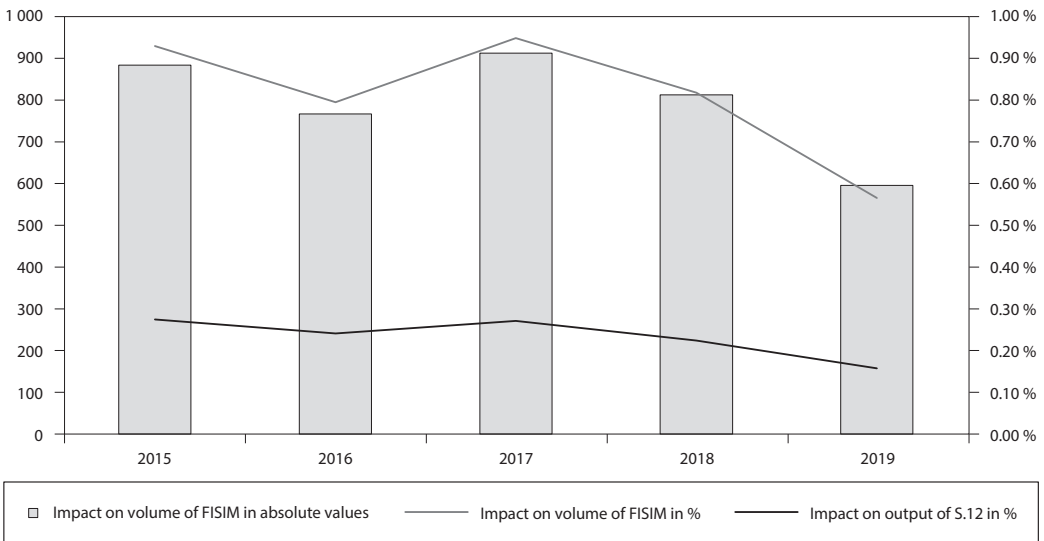
It is necessary to consider that units in S.125 probably have higher cost of money than banks, so the use of current IRR arising mainly from loans within S.122 may not be appropriate. In addition, the interest rates of loans provided by units in S.125 may contain significant default margin, because in my opinion they are often used by clients who would not be able to apply for cheaper loans. Therefore, it can be assumed that actual FISIM coming from this enlargement would be a little lower.

2.2 Enlargement of FISIM users

The FISIM is not estimated from deposits and loans where the bank is a borrower and depositor as well. In these interbank transactions can occur at least small FISIM, but the IRR is based on them, thus the estimation of FISIM in S.122 according to the current approach would be zero. The exclusion of central bank as a user of FISIM was already mentioned in Section 1.3, but the current FISIM estimation made by the CZSO is furthermore underestimated by excluded loans and deposits provided by banks to S.123, S.124 and S.125. According to my finding, these subsectors are suitable for the FISIM estimation and the following results shows the impact of adding them.

These loans and deposits are provided by commercial banks to S.123-5, so the banks are the producers in this case. S.123-5 are the enlargement on the user's side. I used the same IRRs used by the CZSO in 2015–2019 again, the data for loans based on ARAD database and the bank interests coming from the report provided by the CNB. The results approved the occurrence of FISIM in these subsectors even if it is low in comparison to the other subsectors. The average growth of the output makes about 0.23% impact on the output of whole S.12 and the average growth is 0.79%. For more details see Figure 3.

Figure 3 The absolute growth of FISIM produced in the Czech Republic due to the enlargement of the estimation on users' side (in mil. CZK) and the resulting increase in the output of S.12 and the volume of FISIM produced (both in %)



Source: Own computation from CZSO data

These three subsectors belong into financial institutions, which usually have a close relationship with banks. Especially the funds in S.123 and S.124. This is probably the reason why, despite high levels of deposits and loans, these units do not have as high FISIM as in other sectors. In addition, there is sometimes even negative FISIM on the deposit side. This means that these units are able to negotiate a higher interest rate than the IRR.

Based on the above mentioned occurrence of negative FISIM and the close links of some units with the banks, we can have a debate here about their non-market behaviour. This would result in the non-inclusion of these units in the FISIM estimation. Moreover, their small impact on the output would become part of the intermediate consumption with no effect on GDP. There is a possibility to exclude only some of the units closely linked with banks, which probably make the negative FISIM occurrence. However, in general, I assume that at least part of this FISIM is missing in the national accounts of the CZSO.

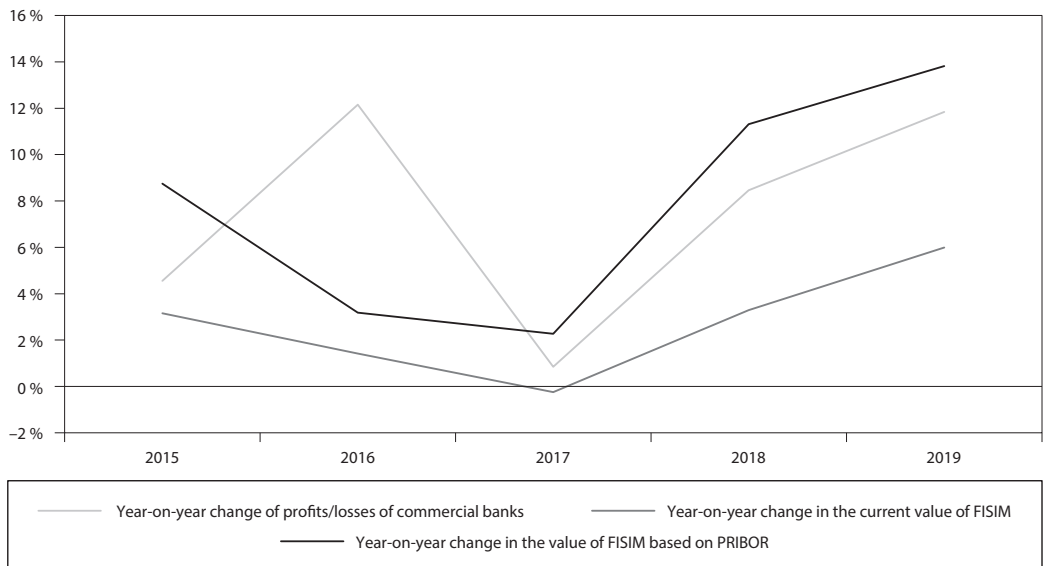
2.3 Alternative reference rate

The sectors included in the following estimations remain the same as they are in the current approach made by the CZSO. No enlargement is made. The focus is only on possible alternatives to the currently used IRRs and their impact on the value of FISIM, GDP or S.12 output.

The first option how to replace currently used IRR is PRIBOR. The interest rate which reflects the willing of bank to lend money on the Czech interbank money market. Several of its values exist and differ according to the length of the interbank loan. As based on ARAD database more than 88% of client loans are provided for a period longer than one year. Most of the deposits (about 75%) can be withdrawn on-demand, but their volume is still rising in time and usually much faster than inflation. It means that even if they are on-demand, they remain on accounts more than one year. Therefore, I decided to use the average annual PRIBOR rate, which is the longest one published by the CNB on its website.

The issue of using PRIBOR as an IRR is that its value is obviously more sensitive, and it is changing much more quickly, especially in 2018 when its value was more than double of 2017. It leads to significant year-on-year changes of total FISIM and huge year-on-year changes in the proportion between FISIM from loans and FISIM from deposits, which does not look reliable. On the other hand, if we accept the idea that the year-on-year change in the total FISIM (as one of the main indicators of banks' output) should be consistent with the year-on-year change in profits of the banking sector, then the use of annual PRIBOR does not seem to be a bad choice (see Figure 4). However, the current value of FISIM still has a better correlation coefficient.

Figure 4 Year-on-year changes of the current FISIM values, FISIM values according to PRIBOR with year-on-year change of profits/losses of commercial banks (in %)



Source: Own computation from CZSO data

The second option as a potential IRR should be interest rates published by the CNB. However, these rates are heavily affected by needs of monetary policy, especially in the couple of last years. For example, in 2016 the two-week repo rate hit the "technical zero" as an effort to prevent potential deflation. So, the usage of these interest rates as IRR is not appropriate.

CONCLUSION

Situation on the financial market reflected in a drop of fees and commissions led to the need of national accountants to develop the concept of indirectly measured services. The FISIM, as one of these services, is an important part of the S.12 output. However, its most appropriate estimation is still broadly discussed issue in the field of national accounts.

The estimation has been developing through the years, but most authors assume that FISIM is charged only as part of interest on loans and deposits. No more financial assets or liabilities are affected, even if they are linked with interest profits or losses. The purpose of FISIM is to replace the missing interest earnings in the output of financial institutions, because the interests are captured only as a property

income according to the manuals. This is where the different approach of national accounting from business accounting becomes visible.

In case of banks, the interest from loans and deposits is the main source of profitability. Therefore, the part of them must be marked as FISIM and moved to their output. The banks are not the only producers of FISIM. The CZSO estimation approach also includes the leasing companies. However, based on the manuals and the opinion of Zieschang (2012), it is possible to enlarge the current range of FISIM producers. Enlargement should focus primarily on those financial institutions that provide consumer's loans. It means that at least all the units captured in S.125 should be marked as FISIM producer.

Possibility to enlarge the estimation is also on the side of consumers (users) of FISIM, because the CZSO approach does not calculate the FISIM from loans and deposits provided to units captured in S.123, S.124 and S.125. The stock of borrowings and deposits provided by S.122 to them is available and I have not found a reason to exclude all of the units in these three subsectors. The possible exclusion could only apply to those units that are able to negotiate interest rates on the financial market at better than market conditions.

Methodology of the estimation is based on the reference rate approach. Thus, the choice of IRR is crucial to get the most accurate results, but the IRR is usually badly affected by many factors such as risk and term premia, different maturity or currency mix and it is not easy to find the most accurate one. The IRR currently used by the CZSO is based on the inter-bank transactions, so PRIBOR seemed to be suitable alternative. However, it does not lead to better results. The second alternative, interest rates published by the CNB, are badly affected by the monetary policy needs. Therefore, I did not come up with an improvement of IRR.

The main outcome of my thesis is that the approach of the CZSO reflects the reality of financial markets, but could be enlarged on the producers and consumers side. However, as my calculations have shown, in the Czech Republic the impact of these enlargements is not so significant in the absolute values of FISIM.

In the case of the IRR, there remains room for further exploration, in particular with regard to the use more than one reference rate in the estimation. Then, the reference rate could be more closely aligned with maturity, risk and term premia or currency mix of loans and deposits provided, which could lead to more accurate results. Leaving aside the high workload needed, which may not result in the corresponding improvement in the FISIM values, this approach is likely to face a shortage of quality data sources.

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