

Methodology of Estimating “Financial” Margins and their Capturing in the System of National Accounts

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Abstract

Margins on buying and selling transactions, or simply “financial” margins, form one part of the complex system of national accounts. These financial services in acquiring and disposing of financial assets and liabilities on financial markets constitute an important role in output of financial institutions. Up to now, the Czech Statistical Office recorded only small part of these margins in national accounts, but in the next revision which is to be published in June 2020 the system should include all types in the whole time series 1993–2019.

The aim of this paper is to develop the missing methodology of capturing margins and demonstrate all difficulties connected with their estimation.

Our approach is influenced by the fact that in the Czech Republic no suitable database with detailed information about transactions is available. That is why simplifications and assumptions needed to be formulated. The paper contains time series of cross-border margins and domestic margins on transactions with securities, shares, investment fund shares and foreign currencies.⁴

Keywords

National accounts, margins on buying and selling transactions, methodology, Czech Statistical Office, cross-border and domestic margins, tradable financial assets

JEL code

E44, G20, O16

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INTRODUCTION

This paper deals with margins on buying and selling transactions with financial assets and their capturing in the system of national accounts. The system of national accounts is a complex model of total economy that tries to describe relations among economic entities as well as flows of money. The whole system consists of several various accounts that characterise the economic process from production and intermediate consumption through generation and redistribution of income up to financial account and balance sheets. Each economic activity should be recorded in national accounts on the corresponding accounts with all consequences. All the tables (accounts) are published worldwide by official statistics, i.e. national statistical institutions (hereinafter NSIs). The system is in detail described, explained and standardised in manuals of national accounts – in European System of Accounts ESA 2010 (European Commission and Eurostat, 2013) in the European Union or in System of National Accounts SNA 2008 (European Commission et al., 2009) in other countries.

Although the national accounts cover plenty of crucial information, items and phenomena, the far most important, discussed and cited are probably the gross domestic product (hereinafter GDP) and gross national income (hereinafter GNI). Giovannini (2008, p. 162) even states, that “of all the variables in the national accounts, the most prominent is gross domestic product (GDP)”. Both indicators assess the performance of the economy, GDP using the total output of a country produced by both residents as well as non-residents (Kramulová and Musil, 2013), GNI considering also “net primary incomes (mainly dividend, interests and reinvested earnings) with non-residents” (Vltavská and Sixta, 2015, p. 107). Margins on buying and selling transactions affect the final value of GDP as well as of GNI.

ESA 2010 includes more types of margins in national accounts. The main ones are trade and transport margins in the system of input-output tables (for details see also Streicher and Stehrer, 2015), then merchanting margins in services in export and import (for details see also Broussolle, 2015), interest margins (for details see e.g. Fungáčová and Poghosyan, 2011) connected with FISIM (Financial Intermediation Services Indirectly Measured) and, finally, margins for the provision of financial services, called sometimes margins on buying and selling transactions (see e.g. International Monetary Fund, 2009) or “financial” margins or financial services in acquiring and disposing of financial assets and liabilities in financial markets.

Why are these “financial” margins even present in economy? According to our opinion there are two main reasons. The first is the information asymmetry, i.e. the fact that the financial intermediary has always more information about the prices than the customer. The second reason is that the customer is ready to pay the margin within the price of a financial asset, because he knows that the service is included.

Although the margins on buying and selling transactions were defined even before ESA 2010, up to now, the Czech Statistical Office (hereinafter CZSO) has recorded only a small part of “financial” margins in national accounts. As it is quite a complicated topic, Eurostat has recently been very active in investigation about proper recording of the margins in national accounts throughout Europe. This topic is very up-to-date because the CZSO is now developing methodology for estimation of these margins and will include them in benchmark revision in June 2020. Apart from ordinary revisions that are done each year and cover mainly changes due to better data sources, irregularly occur extraordinary revisions that are carried out usually due to changes in methodology or standard of national accounts.

The aim of this paper is to develop missing methodology of capturing the margins and demonstrate all difficulties connected with their estimation. It starts with the decision about national accounts sectors of margin producers, items that are affected or data that you need but cannot obtain.

The paper is organized as follows: Section 1 briefly presents different types of financial services defined in ESA 2010 and provides information about institutional sectors and items that are relevant for margins on buying and selling transactions. Section 2 shows methodological approaches discussed at the beginning of our project as possible sources of methodology. Section 3 introduces our final proposed methodology of estimation of “financial” margins for tradable financial assets. Section 4 is aimed at experience from other

institutions. In Section 5 we discuss difficulties and obstacles faced during our methodology development. Section 6 shows preliminary results of estimates in the Czech national accounts and different approaches that needed to be applied. Section 7 is devoted to capturing of “financial” margins in national accounts. Section 8 brings the discussion about reinterpolation of time series of margins dated back to the year 1993.

1 THEORETICAL BACKGROUND

1.1 Financial services

Let us aim now at the theoretical background. Corporations covered by the system of national accounts could be divided into two main groups: “units mainly providing financial services and those mainly providing goods and other services” (United Nations Statistics Division and European Central Bank, 2014, p. 44). Units providing financial services are financial corporations, classified in the sector of financial institutions in the system of national accounts; their production is “the result of financial intermediation, financial risk management, liquidity transformation or auxiliary financial activities” (United Nations Statistics Division and European Central Bank, 2014, p. 44).

Financial corporations are not all the same; there are many varied units (e.g. monetary institution, investment funds, holding companies, insurance companies). In these cases it is not possible to estimate the output using one universal method. Manual ESA 2010 (European Commission and Eurostat, 2013, p. 63) defines three types of financial services:

- a) “financial intermediation (including insurance and pension services);
- b) services of financial auxiliaries; and
- c) other financial services.”

“Financial services may be paid for directly or indirectly. Some transactions in financial assets may involve both direct charges and indirect charges. Financial services are provided and charged for in four main ways”:

- a) “Financial services provided for direct payment” – in form of fees and commissions are usually implicitly included in profit and loss statement.
- b) “Financial services paid for through loading interest charges” – marked as FISIM, cannot be directly obtained from data sources; estimation is made under Council Regulation (EC) No 448/98 (Council of the European Union, 2003).
- c) “Financial services in acquiring and disposing of financial assets and liabilities in financial markets” represent indirect charges not directly included in business accounting system of corporations. Estimation method is not commonly set up by ESA 2010. Developing of method for estimation in the Czech national accounts is the main topic of this article.
- d) “Financial services provided in insurance and pension schemes, where the activity is financed by loading insurance contributions and from the income return on savings” are estimated as model calculation under ESA2010, see chapter 16 (European Commission and Eurostat, 2013, p. 63).

All above mentioned parts of output should be recorded in the system of national accounts. For example if a NSI ignores the margins, the value of output of financial services arising from these transactions would be understated (United Nations Statistics Division and European Central Bank, 2014, p. 105) which subsequently leads to an understatement of GDP and GNI estimates.

1.2 Institutional sectors and financial assets relevant for “financial” margins

Whereas other types of margins are cited in scientific papers, margins on buying and selling transactions are mainly subject of official statistics and are discussed among NSIs or national central banks (hereinafter NCBs). These financial services in acquiring and disposing of financial assets and liabilities in financial markets constitute an important role in output of financial institutions. Financial institutions (labelled S.12)

form one of six main institutional sectors in the system of national accounts, apart from non-financial corporations (S.11), general government (S.13), households (S.14), non-profit institutions serving households (S.15) and the rest of the world (S.2). They are further divided into nine institutional sub-sectors, see Table 1. Some other sectors are also divided, for details see European Commission and Eurostat (2013, p. 31).

Table 1 Nine sub-sectors of financial institutions (S.12)

Sub-sector	Label
Central bank	S.121
Deposit-taking corporations except the central bank	S.122
Money market funds (MMF)	S.123
Non-MMF investment funds	S.124
Other financial intermediaries, except insurance corporations and pension funds	S.125
Financial auxiliaries	S.126
Captive financial institutions and money lenders	S.127
Insurance corporations	S.128
Pension funds	S.129

Source: Adapted from European Commission and Eurostat (2013, p. 511 and following)

One of our first tasks was to select institutional sectors (see Table 1) that are affected by “financial” margins. The Financial Handbook (United Nations Statistics Division and European Central Bank, 2014) suggests in paragraph 3.126 as producers of margins three financial sub-sectors: S.122 (banks), S.125 (security and derivative dealers) and S.126 (foreign exchange bureaux). From user side, volume of the margins should be according to paragraph 3.128 allocated in national accounts into final household consumption expenditures (FHCE) in case of S.14, into intermediate consumption in case of other residential sectors (S.11, S.12, S.13 or S.15) and into export of services for S.2.

Concerning financial assets (for the list of financial assets see European Commission and Eurostat, 2013, p. 521 and following) that should be covered, manual ESA 2010 in paragraph 3.73 proposes to apply margins on securities (AF.3), equities (AF.51), investment fund shares (AF.52) and foreign currencies (AF.21). The Financial Handbook (United Nations Statistics Division and European Central Bank, 2014, p. 105) recommends in Chapter 3 to estimate margins for “foreign exchange, shares, debt securities – such as bills and bonds – financial derivatives and investment fund shares”, i.e. only AF.71 in addition to what ESA 2010 proposes.

2 VARIOUS METHODOLOGICAL APPROACHES TO “FINANCIAL” MARGINS

In case of estimation of “financial” margins in national accounts any required approach does not exist. There are only some suggestions how the estimation can be done. Especially ESA 2010 manual is open to any method which will be able to calculate appropriate value of the margin. Based on this situation at the beginning of our research we skipped all the official suggestions and tried to develop our own methodological approach.

2.1 Alternative ways

The very first approach was focused on the Czech stock market index PX and other indexes of relevant financial funds. Using these data on suitable financial instruments we wanted to measure their real

reevaluation. Then the idea was to take the differences between stock of each instrument at the beginning and at the end of the period and try to exclude the transactions and the revaluation. The part which remains should be the margin, because no other changes usually happen.

However, we faced variety of obstacles. Firstly, turnover on the Prague Stock Exchange is too low and covers only a few titles. Almost the same problem was with the indexes of financial funds. Moreover, they usually cover mix of different financial instruments and it was impossible to separate them. Due to these reasons the approach does not provide useful data for estimation of the margin.

The aim of the second approach was to estimate the margin using data from VAT returns, as the data are managed by the Czech Statistical Office and are easily available. Although, according to the Czech law the financial services in general are excluded from deduction of VAT that is the reason why most of the margin producers are not even taxpayers. Nevertheless, it seemed to us that there might be some possibility. Especially when we have read the statement of the Ministry of Finance of the Czech Republic (Czech Ministry of Finance, 2007), which mentions the margins in connection with VAT returns in case of exchange bureaux.

As a result, we made analysis of exchange bureaux VAT returns and found out the following information. When the producer of the margin has except the main activity also a secondary activity and one of them is not excluded from deduction of VAT, then it might be more convenient for him to become a taxpayer. If this happens, he has to divide his costs into two parts; one part which is suitable for VAT deduction and the second one which is not. For this separation it is necessary to use a special coefficient you can see in Formula (1).

$$\text{coefficient} = \frac{\text{revenues for taxable part}}{\text{total revenues for both activities}} \quad (1)$$

Back to the margin which is hidden in the formula in the part called total revenues. It is a sum of incomes from activities excluded (financial services in general) and not excluded from the deduction of VAT. The statement suggests that the incomes from financial services should be determined as a margin, especially in case of exchange bureaux. It means that when we can easily get the coefficient from VAT returns and the value of total income as well, then we are able to separate the margin from the total income at least for transactions with foreign currencies.

But this approach brings also many problems. The most serious one is that only a few exchange bureaux are VAT payers (to be exact, just 46 out of 126 units in NACE 66.12). In addition, we are not sure who determinates income from financial services as a margin. Considering the above; it is only a suggestion. Thus, in order to obtain the best possible results, we have to create our methodology based on suggestions in manuals.

2.2 What do the manuals say?

At the beginning we went through many handbooks and manuals. The oldest one which probably came up with the margins relating national accounts is the ESA 95 manual (European coal and steel community, European communities, European atomic energy community, 1996). The manual (paragraph 3.64) defines the margins as a production of financial services obtained by customers with no direct payments. And the financial services mean acquiring and disposing securities with financial intermediary.

According to the manual the treatment of this margin should be the same as the treatment of wholesale and retail trade margins. It means that the estimation of the margin is described as a difference between bid (buy) and ask (sell) price. Nevertheless, it includes holding gain which has to be eliminated (for more information about holding gains and revaluation see Rybáček, 2010).

Almost the same description of the margin you can find in the Balance of Payments and IIP manual (BPM6) published in 2006 (International Monetary Fund, 2009), in comparison to ESA 95 it brings practical recommendation for estimation: “The service can also be measured by applying the dealers’

average margin as a percentage to the value of transaction through dealers” (paragraph 10.123). This approach deals with the holding gain problem, however, the dealers’ average margin is definitely not easily accessible. Moreover, the BPM6 says that the margins are a part of “...the financial transaction to which they relate” (paragraph 10.123).

It is obvious that the updated manual ESA 2010 had to develop the definition of margins in more details. One of the differences between both manuals is that the producer of the margin is not defined institutionally as a financial intermediary, but by financial market area. Nevertheless, the main difference is hidden in the description of the margin which was divided into two parts. The description depends on whether it is buying or selling transaction and sounds as follows. “When a financial institution offers a security (e.g. bill or bond) for sale, a service charge is levied. The purchase price (the ask price) is equal to the estimated market value of the security plus a margin ... when a security is sold, the price offered to the seller (the bid price) being equal to the market value minus a margin” (paragraph 3.73).

Our last source of methodological background was the Financial Production, Flows and Stock in the SNA Handbook (United Nations Statistics Division (UNSD), European Central Bank (ECB), 2014), which proceeds from ESA 2010 manual. Furthermore, it brings useful information about allocation of the production of the margins. According to this manual the production is a part of intermediate consumption or a part of final consumption in case of S.142. The manual does not forget to mention how to care about the cross-border transactions: “Margin should be recorded in exports of goods and services if the financial services are provided to the rest of the world” (paragraph 3.128).

The manual also more deeply develops BPM6 methodology of the estimation of the margins and divides it into two approaches. “Bottom-up” approach is based on “...computing the value of the margin consumed by each sector by applying an average sectoral margin as a percentage of the sectoral value of transaction” (paragraph 3.128). However, the calculation of the value of the margin by sectors is impossible in almost every country due to missing data.

This is the reason why most of the countries will probably use the “top-down” approach, which unlike the bottom-up use the economy-wide average margin. Then the allocation of the economy-wide value of the margin to the appropriate sectors should be done by the volume of the financial transactions in each sector. The manual also admits to use other indicators, which in our point of view could be the stock of relevant assets. Nevertheless, the volume of the financial transactions is the most corresponding one.

2.3 Similarities with FISIM

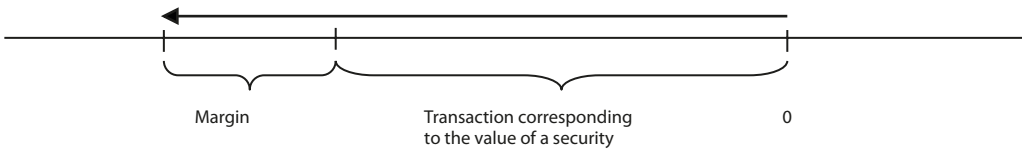
The above information leads to the idea that the margins are similar to the FISIM in many ways. Both of these belong to the group of services which are interesting in the fact, that on one hand their production is indirectly measured and on the other hand they should be allocated as a part of intermediate or final consumption and export of services. The only difference comes from the fact the margins are focused on buying and selling transactions with securities and the FISIM on interests.

It means that if the allocation of the FISIM is by the volume of interests then the margins should be allocated by the financial transactions. And, for the same reason, the correction in case of the margins ought to be done to the financial transaction unlike the FISIM where the correction touches the interests. However, one more difference should be mentioned here. As the FISIM correction is made on both sides of the resources and uses, the margin correction has to be done only in assets. That is because the margins arise from the trading of financial assets only and the FISIM is calculated from borrowings and loans as well.

2.4 Illustration of the margin hidden in financial transaction with securities

To be more accurate let us show you on following figures where the margins are actually hidden, but keep in mind one rule. The arrow always shows the value of the transactions which is currently captured in national accounts of the Czech Republic. And the sense of the margins correction is simply to move a part of these transactions to the production.

Figure 1 Financial transaction with a security when financial intermediary sells it (from his point of view)

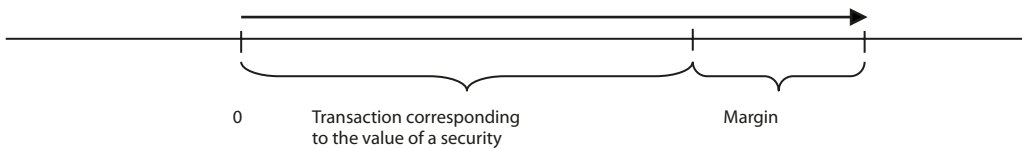


Source: Own elaboration

Figure 1 shows the financial transaction with a security from the financial intermediary point of view, when he sells a security to the customer. The value of the transaction is negative, because it is the opposite of the corresponding money flow. As it is mentioned in introduction, the financial intermediary has more information and that is the reason why the money flow includes also a hidden pay for the services – the margins, which should be part of the production.

In these situations the financial transactions are negative and we have to add the margin to them. Hence, according to the ESA 2010 manual (European Commission and Eurostat, 2013) “Transactions in shares in circulation are recorded at their transaction value” (paragraph 5.156). However, these transactions currently include also a payment for the services, which will be relocated to the production of the financial intermediary.

Figure 2 Financial transaction with a security when common customer buys it (from his point of view)

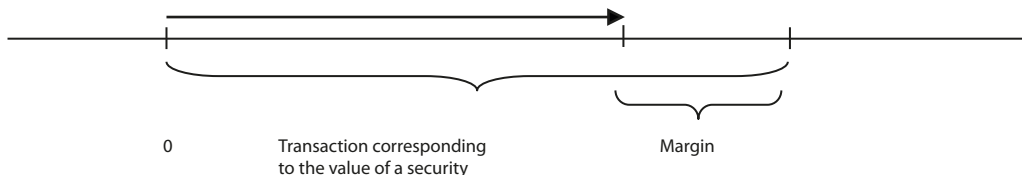


Source: Own elaboration

Figure 2 shows the same situation from the common customer point of view, who buys a security from more experienced financial intermediary. The customer paid more money for a security than he had to pay due to the margin. This issue is also included in the corresponding financial transaction with a security as you can see in Figure 2. In these cases the financial transactions are positive and we have to relocate the margin from them to the intermediate or final consumption.

The financial intermediary is a producer of the margin even if he buys a security, because he is able to reach a better price. It means that the money flow is underestimated in comparison to the value of a security and the corresponding financial transaction is underestimated as well. These situations are illustrated in Figure 3 which shows that according to the margin correction we have to add margin to the financial transactions and the same part to the production of the financial intermediators.

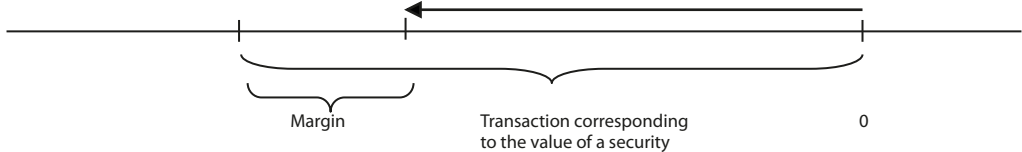
Figure 3 Financial transaction with a security when financial intermediary buys it (from his point of view)



Source: Own elaboration

If we look at this situation from the common customer point of view, we can realize that he receives less money than he has to. Figure 4 shows this fact on the negative financial transaction with a security. The transaction is negative because the customer sells a security. However, it should be even more negative due to the margin as the value of a security is currently based on the underestimated money flow. On the other hand, the margin goes to the intermediate or final consumption.

Figure 4 Financial transaction with a security when common customer sells it (from his point of view)



Source: Own elaboration

To sum up previous paragraphs we can say that in case of the financial intermediators we have to add the margins to the financial transactions with securities and it does not matter whether we speak about buying or selling transaction. Unlike the case of the common customer, the margins have to be deducted from these transactions. Nevertheless, the capturing of the margins will be described in Section 7 in more detail.

3 PROPOSED METHODOLOGY TO ESTIMATION OF “FINANCIAL” MARGINS

Within the effort to find the optimal estimation method of the margins with knowledge of all the background above, we have continued with tendency to find inspiration in computation of the FISIM. Nevertheless, because of partial dissimilarities of both services (the main one is, that adjustment of the FISIM relates to interest from deposits and loans and margins are derived from transactions with the financial assets only), we have faced different obstacles.

When thinking about estimation of the margins, we can mention a parallel with FISIM, where interest is adjusted in order to correspond to real value of money i.e. internal rate of return (IRR). In case of margins, the financial transactions with the assets AF.21, AF.3 and AF.5 should be adjusted to correspond to real value of each asset. It means without added payment for the financial services to the financial intermediary – the margin. Based on these similarities and suggestions of the manuals we have finally decided to develop a spread.

3.1 Treatment of the debt securities, equity and investment fund shares/units

Our spread is an analogy to IRR and expresses an average economy-wide margin as a ratio to each financial transaction. The ratio comes out of the analysis of the margins at the Prague Stock Exchange made by the Czech National Bank (CNB) which assumed that in the Czech Republic the spread equals to 0.03%. Therefore, we can argue that we use the “top-down” approach in the terminology of SNA Handbook.

According to Formula (2) we have to use the ratio to multiply the value of the financial transactions with AF.3 and AF.5. Since no suitable data source with detailed information about transactions is available, we get these transactions from a database which is monthly compiled by the CNB as a difference between the stock of assets at the beginning and at the end of the month. Transactions, connected with emission and expiration of the securities, are excluded from the database because there is no margin included.

$$\text{Margins} = \text{Transaction volume} \cdot \text{Spreads (as a ration to mid - price)} \quad (2)$$

Moreover, the transactions in the database are divided per various financial assets. It means that after the multiplication we reach the volume of the margins separately for each asset as you can see in Table 6, which helps us to make the margin correction to the right item of the financial transactions.

Procedure of estimation of cross-border margins will be described in Section 4.4.

3.2 Treatment of the exchanging money services

Production of the margins in the field of money exchanging services takes part only in the sub-sector S.126. We neglect bank exchange bureaux, because they realize only 2–3% of exchanges. The treatment of these margins is slightly different.

The main principal is to charge fees for the services provided by exchange bureau when exchanging foreign currency. These fees are again hidden in offered exchange rate that is not equal to market exchange rate. It can be even dramatically different; we can point out documented cases of exchange with the exchange rate 15 CZK/EUR (iDNES.cz, 2018).

We can say that currency can be treated in the similar way as securities, because it is also traded on the market. But during the estimation process a special approach is needed.

The spread for the money exchanging services is based on the rate published by one of the biggest exchange bureaux in the Czech Republic, Exchange s.r.o. Then, the difference between its monthly average and the average of the market exchange rate (published by the CNB) for the same period is made to reach the spread.

In this case the spread shows the margin which exchange bureau gets for exchanging one Czech crown. We have six different spreads for the most exchanged currencies in the Czech Republic such as CHF, EUR, GBP, HRK, PLN, and USD. For example the spread of EUR/CZK and CZK/EUR transaction was CZK 0.6 in the second quarter 2017.

For the calculation of these margins we use the buy and sell turnovers unlike equation (2). These turnovers are divided by currencies which are available from statistical statement Dev(ČNB) 26-04 entitled “Purchase and sale of foreign currency”. This survey is done by the CNB and is obligatory for exchange bureaux with the higher turnover than 20 million per year.

4 EXPERIENCE FROM ELSWHERE

As written in Section 2 almost no source of the best practice exists in the manuals. Moreover, no information from Eurostat or other NSIs exists either. Despite each country should elaborate the GNI inventory (for public versions see Alfresco Content Repository, 2018), i.e. procedure of step-by-step estimation of total GNI. To date in all available documents (12 countries in October 2018) there is no evidence of “financial margins”. It is a question if it would be truly useful, because various countries have different conditions at the market, different data available and can be able to use various estimation methods.

We also present some information about estimation procedures throughout Europe from Eurostat questionnaire and the CNB methodology.

4.1 Questionnaire from EUROSTAT

At the beginning of the year 2018 EUROSTAT sent a questionnaire on financial services to all EU countries. One part of it was dedicated to margins from selling and buying transactions. The questionnaire asked for quite detail information about data sources and methods of estimation of margins. In Table 2 you can find summary results of this questionnaire presented by the European Commission and Eurostat.

From figures listed in the Table 2 we can conclude, that there are imperfections in this field almost by all EU countries. As a result most of the EU countries were assigned a task to check their attempt to calculate margins.

Table 2 Overview of the country practices concerning services associated with the acquisition and disposal of financial assets and liabilities (ESA2010 paragraph 3.73)

Question	Yes	Partly	No	N/A	No answer
Output from trading financial assets reported to be included in GNI?	13	6	6	0	3
Output derived from a model using value of transactions and an average percentage margin?	0	2	18	5	3
Margins deemed to be explicitly included in the source item?	16	0	3	6	3
Does the category in the source used to calculate output explicitly refer to "margin" or "spread"?	1	2	13	9	3
Adjustments to the source item made?	0	1	15	8	4
Adjustments made on the use side to reflect the consumption of services associated with trading financial assets?	11	0	7	6	4

Source: Adapted from European Commission and Eurostat (2018)

4.2 Czech National Bank

The CNB has already calculated margins from selling and buying cross-border transactions of securities. These figures have been already involved in balance of payment for the Czech Republic since 2012.

Calculation of margins is based on two main sources (European Commission and Eurostat, 2018):

- 1) Item portfolio investment is used for the estimation of:
 - a) Export of services – purchase or sale of domestic securities by non-residents,
 - b) Import of services – purchase or sale of foreign securities by residents.
- 2) Item foreign exchange reserves held by the CNB (sub-item foreign securities as a part of reserve assets) is used for the estimation of import of services – purchase or sale of foreign securities by residents (i.e. by the CNB).

“Because of the system of data collection on portfolio investment by kind of securities (security by security) and availability of data in CNB database (SBS database), the basis for the estimation procedure is net monthly purchase/sale of each kind of security on a market in a reference period (month)” (European Commission and Eurostat, 2018, p. 21).

“When the margins are calculated each financial market has its own (percentage) spread assigned (i.e. transaction rate – mid rate). The estimation of spread is based on supplement data provided by financial market supervision by the CNB” (European Commission and Eurostat, 2018, p. 21). As far as estimation of spread related to trade in securities in CNB reserve assets is concerned the calculation is analogous and is consulted with CNB dealing centre.

“Estimated spreads are applied to purchases and sales of securities by instrument and territory of an issuer” (European Commission and Eurostat, 2018, p. 21).

5 DIFFICULTIES AND OBSTACLES (DATA)

Apart from obstacles that were up to now mentioned in previous sections (e.g. no best practice in GNI inventories) we faced several other difficulties and obstacles.

Although ESA 2010 defines in paragraph 3.73 (European Commission and Eurostat, 2013, p. 64) financial services consisting of acquiring and disposing of financial assets and liabilities in financial markets, there is no more specific description, how to estimate these margins.

The best way under the handbook of United Nations Statistics Division and European Central Bank (2014, p. 105) is “to develop a securities database capturing each transaction in the financial asset together with the bid and offer prices so that it can calculate the margin for each transaction”. But in practise

such a database does not exist and it is impossible to create it, too costly and also badly feasible for NSI. This is the case of the transactions with securities which represent the difference between the stock of each security at the beginning and at the end of the month, because the real turnovers are not available. Therefore, there is an assumption that these securities are not traded too frequently during a month. If we are wrong and the real turnovers are much higher, this assumption underestimates the value of the margin from trading securities.

The other possible obstacle is unavailability of required data. This problem can have more forms. The data are not available in a desirable time series, as often as it is needed, in the suitable form or no one provides us all the needful data. Let us show an example. The task (now, in the year 2018) is to estimate “financial” margins of exchange bureaux in the Czech Republic for the whole time series Czech national accounts are published (i.e. since 1993), if possible in quarterly periodicity. If the necessary assumptions are formulated, there could be the chance to estimate let’s say all quarters of the year 2017. But what is the situation like with the estimation of previous years?

Using Japanese case (Takeda, 2013) we can formulate previously mentioned Formula (2) for calculation of margins. It means that we need for estimation of margins transactions and spreads, the assumptions relate to both parts of the equation. Firstly, we have some requirements on data about buy price; sell price and also mid-price. Mid-price is for simplicity defined as the middle between buy and sell price (or alternatively bid and ask) as in Formula (3), because usually the “real” mid-price is not known. The mid-price is then used for calculation of the spread according to Formula (4).

$$\text{Mid - price} = \frac{\text{bid} + \text{ask}}{2} \quad (3)$$

$$\text{Spread} = \frac{\text{ask} - \text{mid}}{\text{mid}} \quad (4)$$

But, secondly, we have other requirements also on data about transactions. Not in all cases we even have the transactions and sometimes we have to replace them by another indicator, e.g. transaction as closing stock less opening stock.

Another important requirement in this field is a necessity of a narrow cooperation between NSI and NCB. The difficulty may occur when these two institutions do not communicate; fortunately this is not the case of the Czech Republic. CZSO and CNB cooperate on a long-term basis in both financial accounts and balance of payment / international investment position areas. Margins are then the result of both sides according to a joint methodology.

6 PRELIMINARY RESULTS – FIRST ESTIMATES IN THE CZECH NATIONAL ACCOUNTS

Due to data limitations and various types of financial assets different approaches had to be used, as we introduced in previous sections. Since we are in the middle of our grant, we have still preliminary results for margins that are subject to further possible changes. All results would be impossible without perfect cooperation with our colleagues from CNB. We can divide the results into three categories.

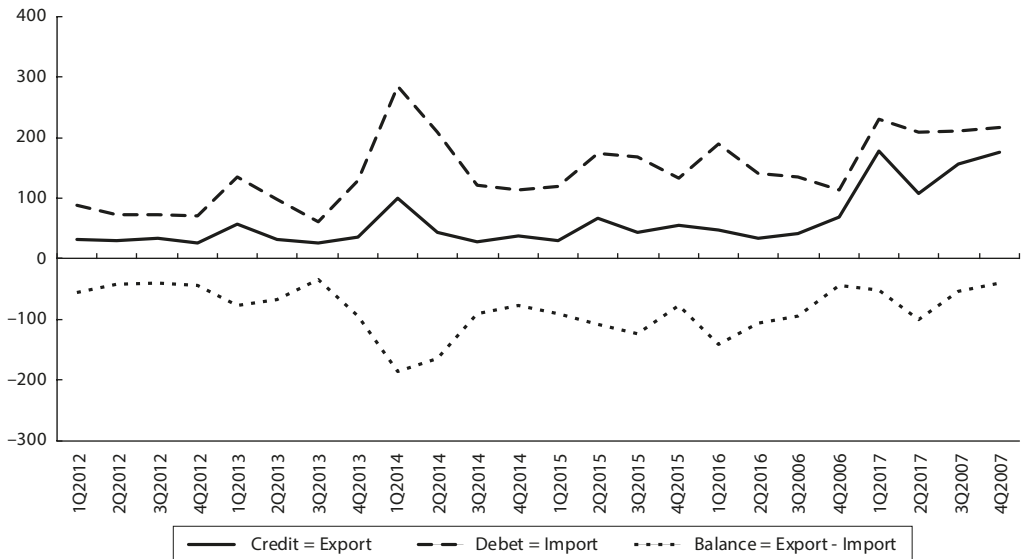
Firstly, we can present export and import of margins on securities, shares and investment fund shares. This part is included in the Czech national accounts already for a longer time. Secondly, new estimates of domestic margins on securities and shares are newly available. And finally, the first estimates of margins on foreign currencies are at our disposal. Let us show the results.

6.1 Export and import of margins on securities, shares and investment fund shares

The methodology of estimation of cross-border margins is introduced in Section 4.4. Figure 5 shows export and import of margins on securities, shares and investment fund shares in quarterly time series

(since the first quarter of 2012 to the last quarter of 2017). These are aggregated upon the whole world. These data are also available on the level of other, smaller, supranational units (e.g. EURO-area 19, EU-28 countries and other). It is evident, that in the whole period the balance remains quite stable around CZK -100 mil. Export and import have usually similar course during the whole examined period.

Figure 5 Export, import and their balance of margins on securities, shares and investment fund shares – whole world (in CZK mil.)



Source: Own elaboration from CNB data

6.2 Estimates of domestic margins on securities and shares

These margins are again estimated in association with the CNB. The methodology of computation is based on the same principle and assumptions as in case of cross-border margins (see Section 4.4). We have obtained the preliminary estimates for 4Q2017 and 1Q2018 and the provisional numbers can be subject to changes and investigation. Table 3 points out the aggregated results for financial assets AF.3, AF.511, AF.512 and AF.52.

Table 3 Estimates of domestic margins on securities and shares (in CZK mil.)

Code	Financial asset	4Q2017	1Q2018
AF.3	Debt securities	39.65	28.09
AF.511	Listed shares	1.47	0.81
AF.512	Unlisted shares	6.94	1.63
AF.52	Investment fund shares	0.96	0.56
	Total	49.01	31.10

Source: Own computation from CNB data

6.3 Margins on foreign currencies

First of all we analysed exchange bureaux market. Table 4 summarises results of this analysis. We can see that only almost 50% of exchange bureaux are classified in S.126 (for institutional sectors see Table 1), but their share on purchases as well as sales raises up to 78% or 80%. From these data we could formulate some assumption, e.g. that the producers' sector will be limited only to S.126.

Table 4 Shares of exchange bureaux, purchases and sales according to sector classification in 3Q2017 (in %)

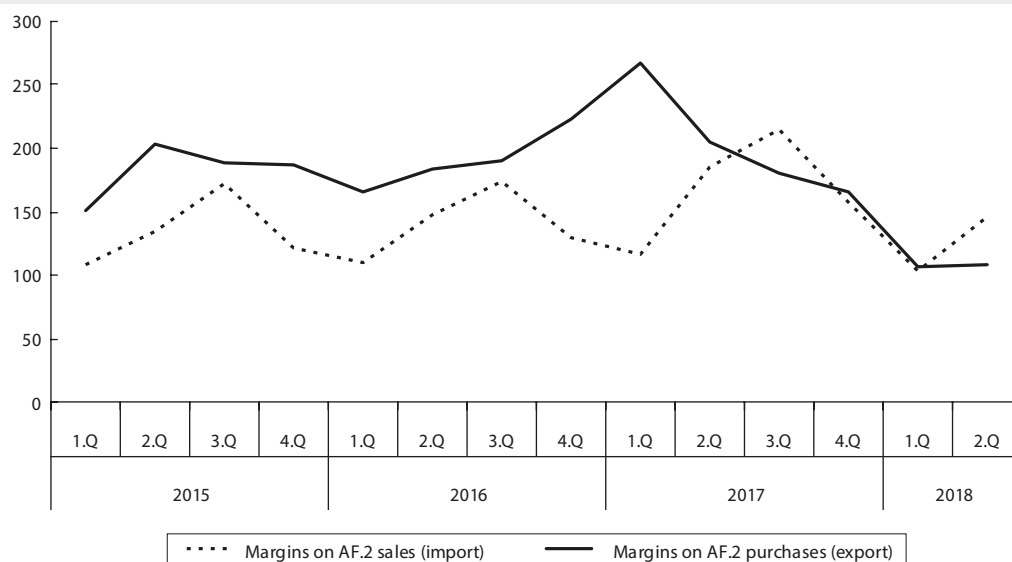
Sector	Exchange bureaux	Purchases	Sales
S.11	35.96	14.48	17.20
S.125	0.44	0.06	0.03
S.126	47.37	78.30	80.17
S.141	7.46	2.15	0.87
S.142	8.77	5.01	1.73

Source: Own computation from CNB and CZSO data

The data for margins on foreign currencies are surveyed by CNB using statistical statement Dev(ČNB) 26-04 entitled "Purchase and sale of foreign currency". By this statement approximately 200 big exchange bureaux are surveyed quarterly. They cover approximately 90% of all cash transactions with foreign currencies.

The preliminary results for quarterly time series (since 1Q2015 to 2Q2018) are in Figure 6 below. They are divided to margins from purchases and margins from sales. Into the computation six main foreign currencies are taken into account: EUR, USD, GBP, CHF, PLN and HRK (as already stated in Section 3.2).

Figure 6 Margins on foreign currencies (in CZK mil.)



Source: Own computation from CNB data

6.4 Importance of margins in the Czech national accounts

From the preliminary results we can assume that the total value of margins in comparison to GDP is not significant in the Czech Republic because it does not even reach 0.1% of GDP in the year 2017. However, under ESA 2010 manual margins form an important part of financial services and must be estimated in national accounts for each country.

7 CAPTURING OF “FINANCIAL” MARGINS IN NATIONAL ACCOUNTS

We have already discussed that on the resources side there are three sectors in which the margins form the part of their output. These are S.122 (trade with residents and non-residents), S.125 (trade with residents) and S.126 (foreign exchange bureaux). We decided to impute margins into the item adjustment for FISIM (P.119) or import of services (P.72).

On the uses side we took our inspiration from the United Nations Statistics Division (UNSD), European Central Bank (ECB) (2014), paragraph 3.128: “The margins should be recorded as the intermediate consumption of corporations, general government or NPISHs if the financial services are provided to these sectors. If they are provided to households, these should be recorded as their final consumption expenditure unless the financial service is provided to an unincorporated enterprise. The margins which are recorded as the intermediate consumption of general government and NPISHs are also recorded in their output and final consumption expenditure, since the institutional units in these two sectors are non-market producers whose output is calculated as the sum of costs. On the other hand, the margins should be recorded in exports of goods and services if the financial services are provided to the rest of the world.” It means that the margins are recorded into items intermediate consumption (P.2), individual consumption expenditure (P.31), collective consumption expenditure (P.32) and export of services (P.62).

7.1 Export and import of margins on securities, shares and investment fund shares

When we focus on export and import of margins on tradable financial assets, Table 5 shows resources and uses in the relevant sectors of national accounts.

Table 5 Export, import of margins on securities, shares and investment fund shares in 2017 – in CZK mil.

	Resources	Uses	Value
Export of services	Output (S.122)	Export of services (S.2)	617.239
Import of services	Import of services (S.2)	All relevant sectors according to financial assets	865.294

Source: Balance of payment (CNB)

Uses are divided into relevant sectors according to transactions with financial assets into items intermediate consumption (P.2), individual consumption expenditure (P.31) or collective consumption expenditure (P.32). Apart from changes shown in Table 5 we can emphasize also changes in financial account. Export of margins is added into transaction of S.122 (producer) and import of margins is deducted from transaction value in all other sectors.

7.2 Domestic margins on securities and shares

If we provisionally calculate yearly domestic margins as simply four times 4Q2017, we can again analyse resources and uses (see Table 6).

Table 6 Domestic margins on securities and share in 2017 (in CZK mil.)

	Resources	Uses	Value
AF.3	Output (S.122 and S.125)	All relevant sectors according to financial assets	158.60
AF.511	Output (S.122 and S.125)	All relevant sectors according to financial assets	5.88
AF.512	Output (S.122 and S.125)	All relevant sectors according to financial assets	27.76
AF.52	Output (S.122 and S.125)	All relevant sectors according to financial assets	3.84
Total	Output (S.122 and S.125)	All relevant sectors according to financial assets	196.04

Source: Own computation from CNB data

Resources are divided into S.122 and S.125 according to volume of transactions, the same approach is applied in case of uses into items intermediate consumption (P.2), individual consumption expenditure (P.31) or collective consumption expenditure (P.32). Additionally, in financial account margins are added to transaction volumes in case of margin producers (S.122 and S.125) and excluded from transaction volumes in case of other sectors on uses side.

7.3 Margins on foreign currencies

The only thing which has to be solved is allocation of margins produced in S.126. We have no information about who exchanges. But we suppose that foreign currencies are bought only by S.14, so the whole production coming from these transactions is allocated in their final consumption (FHCE). On the other side we suppose that the foreign exchange bureaux buy foreign currencies only from S.2 and in this case the produced margin is exported. We omit other sectors such as S.11, because we expect, that they are able to reach better exchange rate than S.14 with almost no margin included.

If we take an example with values from our experimental results for 2017, we can see the proper capturing in Table 7.

Table 7 Margins on foreign currencies in 2017 (in CZK mil.)

	Resources	Uses	Value
Purchases of foreign currency	Output (S.126)	Export of services (S.2)	818.6
Sales of foreign currency	Output (S.126)	Individual consumption expenditure (S.14)	672.7

Source: Own computation from CNB data

From the Table 7 we can sum up, that the output of S.126 raises of about +1 492 mil. CZK (819 + 673), export of services in S.2 of about +819 mil. CZK and individual consumption expenditure in S.14 of about +673 mil. CZK. Additionally, changes are made also in financial account; there is an increase in transaction value in currency in S.126 of about +1 492 mil. CZK and decrease in transaction value in currency in S.14 of about -673 mil. CZK and -819 mil. CZK in S.2.

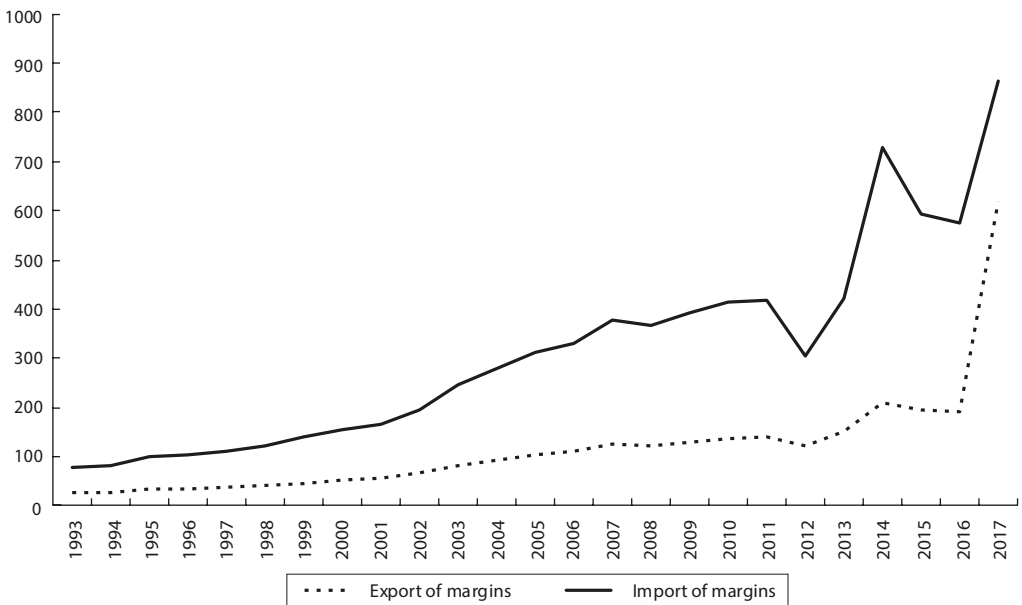
8 DISCUSSION ABOUT RETRAPOLATION OF TIME SERIES BACK TO 1993

At present time (October 2018) estimates for export and import of margins quarterly from 2012 onwards, for domestic margins on securities and shares since 4Q2017 onwards and for margins on foreign currencies from 2015 onwards are available.

There are more possibilities how to make estimates back to the year 1993. We assessed all three introduced types of margins and tried to choose the best method for each of them. This part of our paper is still subject to discussion and future possible changes. Final data will be available in June 2020.

Concerning export and import of margins, the current state of our research prefers to apply average share of export or import margins (from available years) either on transactions or stocks, and to retrapolate the values back to the year 1993. The transactions are more volatile whereas stocks are successively rising in the whole time series. An experimental estimate of export and import of margins based on stock is shown in Figure 7.

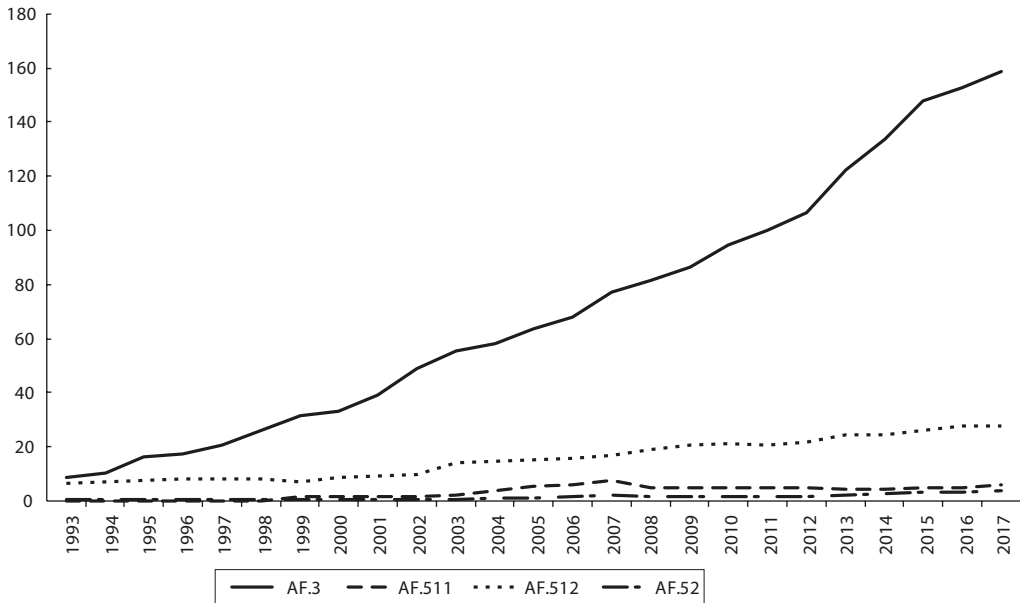
Figure 7 Experimental estimate of export and import of margins based on stocks (in CZK mil.)



Source: Own computation from CNB data

If we turn to domestic margins on securities and shares, we are willing to apply the same procedure as in case of export and import of margins. We have again two possibilities – to retrapolate the values according to stocks or transactions. Analogously, transactions are much more volatile than the stocks. In this case there is one additional problem, some transactions (especially with shares) are negative, i.e. they would produce negative margins. Figure 8 shows experimental estimate of time series of domestic margins on securities and shares divided into the individual items based on stocks.

As for margins on foreign currencies, there will be no available information for previous years as the computation is done using exchange rates in a reference foreign exchange bureau. We decided to use an average of available data and retrapolate them back to 1993. Some inflation coefficient from CPI statistics will probably be used.

Figure 8 Experimental estimate of domestic margins on securities and shares based on stocks (in CZK mil.)

Source: Own computation from CNB data

CONCLUSION

Margins form an essential part of national accounts. As in the Czech Republic, so far, they are not recorded completely, this paper brings a methodological insight in this task. It summarises available theory and practical issues connected with estimation of margins as part of financial services, which are hidden in transactions with financial assets. At the beginning the role of these margins in the system of national accounts is introduced. We present various methodological approaches that we discussed and final methodology that will be applied on estimation of margins.

Apart from methodological questions we discussed also the difficulties and obstacles connected mainly with the data. One of the most important is the non-existence of overall guideline for computation of this kind of margins that is why we try to find the best methodological way for the Czech Republic. Some examples of practice from other countries and institutions are included as well.

Despite the aforementioned limitations, the paper contains the first ever preliminary results estimated for the Czech Republic as well as assumptions that should be formulated and taken into account. Section 6 is divided into three independent parts; each of them dealing with different types of margins in financial services and showing our attempt to their calculation. The preliminary results could be subject to a change and further obtained knowledge will be incorporated. Section 7 shows the practical capturing of “financial” margins in the whole system of national accounts, i.e. which items will be adjusted. Section 8 introduces our very first attempts of retrapolation back to the year 1993. The final results will be included in national accounts by June 2020 for period of 1993–2019 as a result of benchmark revision.

Last but not least, this paper is prepared under the support of EUROSTAT and is limited by rules of official statistics. Some research can naturally be done, but estimates must correspond to manuals that are crucial for NSIs.

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